### Rocky Flats Closure Project

#### Baseline Cost and Basis of Estimate

**Activity ID:** 1G00020100

**WBS No:** 1GAC0002

**Title:** Group 000-2 (OPWL)

**Description:** SAP Preparation - IHSS Group 000-2

<table>
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<th>Description</th>
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Total for Activity 1G00020100:

- **Labor Hours:** 840
- **Labor Cost:** 26,054
- **Total Cost:** 33,013

**Breakdown of Cost Data:**
- **Item:** Preparation of SAP Addenda
- **Unit Cost:** 400
- **Unit Cost Adjustment Factor:** none
- **Estimated Unit Hours:** 400

**Breakdown of Cost Data:**
- **Item:** Preparation of SAP Addenda
- **Unit Cost:** 480
- **Unit Cost Adjustment Factor:** none
- **Estimated Unit Hours:** 400

---

**Resources**

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**Line Item 0200 - HASP Addenda**

**BOE**

**Estimator's Experience:** 10 years of experience planning, estimating and conducting characterization projects. (A Primrose)

**Item Description:** Preparation of OPWL HASP addenda, send out for Site review and revise based on comments. This is a complex project with potential for multiple hazards. This document must have provisions to deal with known and unknown but suspected conditions.

**Breakdown of Cost Data:**
- **Item:** Preparation of addenda for HASP
- **Unit Cost:** 480
- **Unit Cost Adjustment Factor:** none

---

**Line Item 0100 - SAP Addenda**

**BOE**

**Estimator's Experience:** 10 years of experience planning, estimating and conducting characterization projects. (A Primrose)

**Item Description:** Preparation of SAP Addenda. Address KH, DOE and regulatory agency comments. This is a complex project which will require a rigorous approach to assure regulator acceptance. Numerous comments are anticipated.

**Breakdown of Cost Data:**
- **Item:** Preparation of SAP Addenda
- **Unit Cost:** 480
- **Unit Cost Adjustment Factor:** none
- **Estimated Unit Hours:** 400

---

**Line Item 0200 - HASP Addenda**

**BOE**

**Estimator's Experience:** 10 years of experience planning, estimating and conducting characterization projects. (A Primrose)

**Item Description:** Preparation of OPWL HASP addenda, send out for Site review and revise based on comments. This is a complex project with potential for multiple hazards. This document must have provisions to deal with known and unknown but suspected conditions.

**Breakdown of Cost Data:**
- **Item:** Preparation of addenda for HASP
- **Unit Cost:** 480
- **Unit Cost Adjustment Factor:** none

---

**Line Item 0100 - SAP Addenda**

**BOE**

**Estimator's Experience:** 10 years of experience planning, estimating and conducting characterization projects. (A Primrose)

**Item Description:** Preparation of SAP Addenda. Address KH, DOE and regulatory agency comments. This is a complex project which will require a rigorous approach to assure regulator acceptance. Numerous comments are anticipated.

**Breakdown of Cost Data:**
- **Item:** Preparation of SAP Addenda
- **Unit Cost:** 480
- **Unit Cost Adjustment Factor:** none
- **Estimated Unit Hours:** 400
### Rocky Flats Closure Project

#### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0002  
**Activity ID:** 1G00020100

**Activity Filter:** 1GAC  
**Starts In FY:**

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**Revised Unit Hours:**

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**Line Item SYS - Contingency And Escalation**

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**Activity ID:** 1G00020120  
**Description:** Procurement and Field Prep - HSS Group 000-2

**BOE Line Item 1000 - procurement & field prep**

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**Total for Activity 1G00020120:**

- Total Hours: 600
- Total Labor Cost: 18,235
- Total Material/Sub Cost: 7,071
- Total Contingency & Escalation: 25,306
- Total Prime Cost: 34,159
- Total Burden Cost: 6,309
- Total Cost: 40,468

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**BOE Estimator's Experience:** The following estimates are based on the recent (FY00) experience from the horizontal drilling project for Building 886. This is also a project with numerous radiological concerns.


- E050 Environmental Engineer 120 hours: 40 hours to develop Statement of Work, 80 hours for technical review of proposals and additional procurement activities.
- M040 Project Management 120 hours: 40 hours to develop Statement of Work, 80 hours for technical review of proposals and additional procurement activities.
- G040 Administrative 40 hours: 40 hours Secretarial support for document prep and distribution.
- P080 Health Physicist 80 hours for ALARA review, assist with RWP development and evaluate radiological concerns, review and comment on subcontractor HASP.
- P090 Industrial Hygienist 80 hours for health and safety concerns, review and comment.
- P070 Project Controls 80 hours for budget and project control support.
- P030 Procurement Support 120 hours for procurement activities.
- T050 RCT 40 hours to develop RWP.
- $5,000 Ecology Support based on most project requirements.

Total = 680 hours, $5,000 A5h

Basis for adjustment. None
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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### Line Item SYS - Contingency And Escalation

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Total for Activity 1G00020140:

| 444 | 13,233 | 3,045 | 0 | 16,278 | 4,579 | 22,061 | 4,579 | 26,639 |

### Line Item 0100 - readiness assessment

| BOE Resources |

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### Activity ID: 1G00020140

Breakdown of Cost Data:
- Item: Perform readiness evaluation
- Units: hours
- Unit Cost: 444 hours and $3,600 dollars
- Revised Unit Hours:
- Environmental Engineer 2 people fulltime for 9 days = 144 hours
- Project Management fulltime for 9 days = 72 hours
- Secretarial support 40 hours
- Health Physicist 50% support for 9 days = 36 hours
- Industrial Hygienist 50% support for 9 days = 36 hours
- RCTs 50% support for 9 days = 36 hours
- Compliance Inspectors 40 hours to assist with readiness determination
E110 Quality assurance Sup. 40 hours to assist with readiness determination
A5H  Subcontract Support  1 person for 9 days = 72 hrs @ $50/hr = $3,600

Basis for adjustment- None

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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### Breakdown of Cost Data:

**Item:** Site Personnel for support of geoprobe operations

**Units:** hours

**Unit Cost:**

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**Activity ID:** 1G00020150

**Description:** Field Sampling, Lab Analysis - IHSS Group 000-2

**Cost Risk:** 2

**Schedule Risk:** 3

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Total for Activity 1G00020150:

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**Total Cost:** 2,873,556

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Item Desc: All sample collection will be performed by subcontract personnel including drilling the boreholes; logging the core; collect, containerize, package, and ship the samples; prepare field documentation; and enter data into the Site environmental database. Five drill rigs will be used and two site Environmental Engineers will supervise field operations of a full time basis. One Site RCT will be required for each geoprobe rig to monitor operations for radiological contamination on a full time basis. Subcontract health and safety staff will be supplemented by part-time support from Site Industrial Hygienist and Radiological Engineers. Based on experience with the Site Geoprobe, 2 borings per day can be completed. 12 hour days will be worked to minimize project delays and maximize productive time.
2 Environmental Engineers fulltime for 60 12-hour days = 960 hrs straight time/480 OT hrs
1 Project manager full time for 120 hours = 480 hrs straight time/240 overtime hrs
6 RCTs full time for 60 12-hour days = 2,880 straight time/1440 overtime hrs. 1 additional
RCT is budgeted as per plant guidance to fund their required training.
0.25 FTE Industrial Hygiene support = 60 days * 8 hrs * 25% = 120 hours
0.25 FTE project controls and planning = 60 days * 8 hrs * 25% = 120 hours
0.25 FTE secretarial support = 60 days * 8 hrs * 25% = 120 hours
0.05 FTE Rad Engineering support = 60 days * 8 hrs * 10% = 48 hours
0.05 FTE QA support = 60 days * 8 hrs * 10% = 48 hours
Unit Cost Adjustment Factor: none
Revised Unit Hours: See above

Item: Subcontract Geoprobe equipment and crew.
Estimated at $1,000 per day for rig * 5 rigs = $5,000 * 60 days = $300,000
2 crew per rig = 2 crew*5 rigs*12 hours/day * 60 days = 960 hrs straight time/480 OT hrs
Full time data entry person = 10 hrs/day * 15/hr = 120 hours
Miscellaneous supplies and consumables = $100/rig/day = $100*5*60 = $30,000

Support vehicles/trucks = 5 @ $2,000/month * 3 months = $30,000

Based on similar projects, $5,000 is required to cover health and safety equipment for Site personnel, Site Personnel office supplies, and miscellaneous project supplies not covered under the subcontract.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### Rocky Flats Closure Project
#### Baseline Cost and Basis of Estimate

**WBS Filter**: 1GAC 1G00020150

**Baseline Devi**

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**WBS Filter**: 1GAC 1G00020150

**Activity Filter**: *

**Starts In FY**: *

### Line Item 0200 - Analyze samples

**BOE**

**Vendor Quote**

Email quote from average cost from Kaiser-Hill ASD (Pat Preese), received by Susan Serreze on February 22, 1999.

**Item Desc:**

Email quote from average cost from Kaiser-Hill ASD (Pat Preese), received by Susan Serreze on February 22, 1999.

**Details:**

- **Rad Screens** = 1,500 at $32/sample
- **Metals** = 1,500 at $345/sample
- **Rad isotopes** = 1,500 at $590/sample
- **VOCs** = 150 at $280/sample (based on analysis of 10% of all samples)

**Shipping charge** = $42/10 bottles = $42 * (3,150 bottles/10 bottles per shipment = 315 shipments)

**This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.**

---

### Resources

**Cost Element**

<table>
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<th>ASH</th>
<th>SUBCONTRACTED SRVS</th>
<th>P070</th>
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**Line Item SYS - Contingency And Escalation**

**BOE**

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### OFFICIAL USE ONLY
### Rocky Flats Closure Project
#### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0002  
**Activity ID:** 1G00020170

**Description:** Prepare Summary/NFA - IHSS Group 000-2

<table>
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**Total for Activity 1G00020170:** 648 18,702 2,842 29,389

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#### Line Item 0100 - develop report

**BOE**  
**Estimator's Experience on similar projects**

**Item Desc:** Perform Data Analysis including GIS representation of data, Characterization Report, and associated project management.

**Breakdown of Cost Data:**

- 2 Environmental Engineers full time for 2 weeks to develop draft: 160 hrs
- 1 Project Manager full time for 4 weeks: 160 hrs
- 1 Secretary 1/2 time for 4 weeks to format and copy: 80 hrs
- 1 QA person 8 hours for review: 8 hrs
- 2 GIS individuals 2 weeks to create/revise maps: 160 hrs
- 2 Environmental Engineer full time 1 week for comment response: 80 hrs
- 1 project planner 1/2 time for 4 weeks: 80 hrs

**Unit Cost Adjustment Factor:** none  
**Revised Unit Hours:**

**This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.**

---

#### Resources

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#### Activity ID: 1G00020170

**Description:** Prepare Summary/NFA - IHSS Group 000-2

**Cost Risk:** 2  
**Schedule Risk:** 1
## Rocky Flats Closure Project

### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0002  
**Activity ID:** 1G00020180

**Baseline Deviation Filter:** 1GAC

**Starts In FY:**

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**Cost Element** | **Skill** | **Department** | **Curve** | **Quantity** | **Units** |
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## Line Item 0100 - IM/IRA Decision Document

**BOE**

- Estimator's Experience based generally on historical data for Ryan's Pit. The Ryan's Pit PAM required 700 hours to complete. The IM/IRA costs are assumed to be 75% more than PAM costs.

**Item Desc:** Preparation of Decision Document in support of source removal of previously characterized UBC. Removal of contaminated soils that could impact surface water is anticipated to be the remedy.

**Breakdown of Historical Data:**

- **Units:** hours
- **Unit Cost:** $1,225
- **Unit Cost Adjustment Factor:** 15 additional hours for NEPA values section
- **Revised Unit Hours:** 1,240

**Resources**

- **E050 Environmental Engineer:** 4 staff 4 Weeks for document development = 640 hours
- **M040 Project Management:** Full time technical input and oversight = 160 hours
- **G040 Administrative:** Half time = 80 hours Secretarial support for document prep and distribution
- **E110 Quality Control Engineers:** 80 hours for section writing, doc review, comment resolution
- **P070 Project Controls:** 80 hours planning and scheduling support based on similar projects.
- **P060 Computer/GIS support:** 80 hours for map creation and revision.
- **P050 Compliance support:** 120 hours to write NEPA values section and develop ARARs.

**Total = 1,240 hours**

**Basis for adjustment:** The NEPA values and ARARs sections have become more extensive as a result of comments received on previous IM/IRAs and PAMs. This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Factors**

- **RMRS Salaried - ENVIRONMENTAL ENGINEERS:** Linear 640.00 Hours
- **RMRS Salaried - QUALITY CONTROL ENGINEERS:** Linear 80.00 Hours
- **RMRS Salaried - ADMINISTRATIVE ASSISTANTS:** Linear 80.00 Hours
- **RMRS Salaried - MANAGERS (GRADE 64 - 68):** Linear 160.00 Hours
- **RMRS Salaried - COMPLIANCE INSPECTORS:** Linear 120.00 Hours
- **RMRS Salaried - COMPUTER SYSTEMS ANALYSTS:** Linear 80.00 Hours
- **RMRS Salaried - COST ESTIMATORS PLANNERS AN:** Linear 2,841.75 Dollars

**Factors**

- **RMRS Salaried - CONTINGENCY:** Linear 5,300.36 Dollars
- **RMRS Salaried - ESCALATION:** Linear 4,213.19 Dollars
Rocky Flats Closure Project
Baseline Cost and Basis of Estimate

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Total for Activity 1G00020210:

800 23,574 8,491 5,526 37,594 44,242

**Line Item 1000 - procurement & field prep**

**BOE**

Estimator's Experience: The following estimates are based on the recent (FY00) experience from the horizontal drilling project for Building 886. This is also a project with numerous radiological concerns.


- E050 Environmental Engineers 200 hours: 80 hrs to develop Statement of Work. 120 hrs for technical review of proposals and additional procurement activities.
- M040 Project Management 160 hours: 80 hours to develop Statement of Work. 80 hours for technical review of proposals and additional procurement activities.
- G040 Administrative 80 hours Secretarial support for document prep and distribution.
- P080 Health Physicist 80 hours to perform ALARA review, assist with RWP development and evaluate radiological concerns, review and comment on subcontractor HASP.
- P090 Industrial Hygienist 80 hrs to address health and safety concerns, review and comment.
- P070 Project Controls 120 hours for budget and project control support.
- P030 Procurement Support 120 hours for procurement activities.
- T050 RCT 80 hours to develop RWP.

$5,000 Ecology Support Based on most project requirements. Not increased for project size due to the absence of pre-existing, non-industrial ecosystems.

Total = 960 hours, $5,000 A5h

Basis for adjustment. None

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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**Line Item SYS - Contingency And Escalation**

**BOE**

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6/23/00 9:20:05 AM OFFICIAL USE ONLY
Rocky Flats Closure Project  
Baseline Cost and Basis of Estimate

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**Activity ID:** 1G00020210  
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**Factors:**
- **Contingency:** 1810.69 Dollars
- **Escalation:** 3717.16 Dollars

**Line Item 0100** - HASP

**Historical Data Source:** Costs derived from the Ryan's Pit Remedial Action. Costs were not revised because the effort will be the same.

**Item Desc:** Preparation of Health and Safety Plan (HASP). The HASP from the OPWL characterization will be provided to the subcontractor for information on developing the remediation HASP.

**Breakdown of Historical Data:**
- **Item:** HASP development
- **Units:** each
- **Unit Cost:** $10,000
- **Unit Cost Adjustment factor:** 2
  - **Revised Unit Cost:** $20,000
- **Basis for adjustment:** Radiological concerns and other contaminant issues exceed that of Ryan's Pit. The area is in the heart of the Industrial Area, and potential for unknowns is greater.

**Item:** Review by Site Personnel. Based on historical costs, it was assumed that the HASP will be reviewed by an Environmental Engineer, Project Manager, QA/QC specialist, Site Health and Safety, and Site Rad Engineer. Each will require 40 hours review time.

**This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.**

**Resources**

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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<td>R100S BMRS Salaried</td>
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**Factors:**
- **Contingency:** 1810.69 Dollars
- **Escalation:** 3717.16 Dollars

**Line Item 0200** - SAP

**BOE**

*Estimator's Experience based generally on historical data for Ryan's Pit. Document assumed to take the same effort as the Ryan's Pit and T3/T4 SAPs.*

**Item Desc:** Preparation of SAP for Ryan's Pit source removal action.

**Breakdown of Historical Data:**
- **Item:** Preparation of SAP for Ryan's Pit source removal action.
- **Units:** hours
- **Unit Cost:** 300

**Factors:**
- **Contingency:** 1810.69 Dollars
- **Escalation:** 3717.16 Dollars

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### Resources

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### Line Item 01000 - readiness assessment

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### Line Item 010100 - readiness assessment

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<td>43,844</td>
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</table>

### Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Breakdown of Cost Data:**

- **Item**: Site Labor to perform Readiness Assessment
- **Units**: hours
- **Unit Cost**: 1020
- **E050**: 5 Env Engineers 19 days * 8 hrs/day = 760 hours
- **M040**: 1 Project Mgr for 19 days = 152 hours
- **P080**: 1 Rad Engineer 1/2 time for 19 days = 76 hours
- **P090**: 1 Safety Engineer 1/2 time for 19 days = 76 hours
- **T050**: 1 RCT 1/2 time for 19 days to address issues = 76 hours
- **T060**: 2 Steelworkers 1/2 time for 19 days to address questions = 152 hours
- **ASK**: Subcontractors - 4 fulltime for 19 days * $60/hour = $36,480

**Unit Cost Adjustment Factor**: none

**Revised Unit**: none

*This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.*
### Rocky Flats Closure Project

#### Baseline Cost and Basis of Estimate

**WBS Filter**: 1GAC

**Starts In FY**

---

### Resources

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<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
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#### Line Item 02000 - training

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

- **Item Desc**: Conduct perform Training in support of source removal action.

**Breakdown of Cost Data**:

- **Item**: Training Site Labor. Assumed that 16 site employees would require training at 16 hours each. 6 will be steel workers, 4 will be RCTs, 6 will be Env Engineers.
  - **Units**: hours
  - **Unit Cost**: 256 Hours
  - **Unit Cost Adjustment Factor**: none
  - **Revised Unit**: 256 hours

- **Item**: Subcontractor costs to perform above individual tasks
  - **Units**: 1 lot
  - **Unit Cost**: $36,000
  - **Subcontract training costs were based on T3/T4 costs. It was assumed that training the workers would require $1,000 each and there would be 36 workers. Unit Cost Adjustment Factor**: 1/3
  - **Revised Unit**: $12,000

**Basis for adjustment**: The primary personnel utilized will be onsite steelworkers and RCTs who are current on their training.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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### Resources

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<th>Skill</th>
<th>Department</th>
<th>Curve</th>
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#### Line Item 03000 - pre-evolution meeting

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

- **Item Desc**: Conduct Pre-Evolution Meeting in support of source removal action.

**Breakdown of Cost Data**:

- **Item**: Site Labor to perform above individual tasks
  - **Units**: hours
Unit Cost: 192 hours
Assume that 24 Site Salary employees attend an 8 hour pre-ev briefing = 192 hours
Assume 8 RCTs and 15 Steelworkers attend the 8 hour pre-ev briefing =
T050 64 hrs (8 RCTs*8hrs); T060 = 120 hrs (8hrs*15 steelworkers)
Unit Cost Adjustment Factor: none
Revised Unit: $14.4K
Unit Cost Adjustment Factor: 7/30ths
Revised Unit: $3,360

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

BOE Type: "CON"
Skill: "E050"
Department: "R100S"
Curve: Linear
Quantity: 192.00
Units: Hours

BOE Type: "ESC"
Skill: "T060"
Department: "KG10H"
Curve: Linear
Quantity: 120.00
Units: Hours

BOE Type: "ASH"
Skill: "T060"
Department: "KG10H"
Curve: Linear
Quantity: 2,841.75
Units: Dollars

Baseline Cost and Basis of Estimate

Line Item 01000 - mobilization

Estimator’s Experience based generally on historical data for T-3/T4 Remediation.
### Breakdown of Cost Data:

**Item:** Mobilization in support of remediation.

**Breakdown of Cost Data:**

It was estimated that mobilization would take 1 week. Two environmental engineers or similar people would take 50 hours each for these tasks, 40 hours plus 10 hours overtime. In addition, it was estimated that an industrial hygienist and a radiological engineer would spend 20 hours each. Project management is full time, 40 hours, RCT support for baseline surveys is 80 hours (2 RCTs). Mobilization will include the baseline surveys for the equipment and trailer installation. Steelworkers will not be used for mobilization because contaminated media is not involved.

**Units:** hours
**Unit Cost:** 260
**Unit Cost Adjustment Factor:** 3
**Revised Unit:** 780

Hours were assumed to be divided as follows:

- **E050 750 = 240 hrs regular**
- **E050 751 = 60 hrs ot**
- **M040 750 = 120**
- **E050 750 = 240**
- **P080 750 = 60**
- **E120 750 = 60**

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4. The subcontractor mobilization costs are based on the burdened costs for the T-3/T-4 project and consists mainly of setting up the thermal desorption treatment system. Because this project will not use thermal desorption, the costs were reduced to 25%. No further reduction was taken because contractor-supplied heavy equipment will be required for this project along with field trailer installation.

**Units:** lot
**Unit Cost:** 184k
**Unit Cost Adjustment Factor:** 0.75
**Revised Unit:** $138,000

**Basis for adjustment:** This was the cost of mobilization for the T3/T4 project. Most of the cost was for mobilization of the thermal desorption treatment unit. It is assumed that the thermal desorption unit will be mobilized for another project and the soil from this project will be treated there. No mobilization costs for the TDU are included in this task. Mobilization of one field crew with heavy equipment is estimated to take 25% of $184k or $46K. To accomplish this task in a reasonable timeframe, 3 crews with heavy equipment must be mobilized for a cost of 3*$46K or $138 in subcontract costs. This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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**Line Item 02000 - site prep BOE**

**Item Desc:** Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item:** Site Preparation including setting up fencing, trailer, etc. Based on T3/T4, it was assumed that average project site preparation costs were about $30,000.

---

0.84576 [SYS 061400]_84576000 - System
subcontract costs and would take 3 weeks. No RCT support will be required because there are no intrusive activities. No steelworker support will be required based on no handling of contaminated media.

Breakdown of Historical Data:
Item: Site Labor to perform site preparation activities.
  Units: 3 week for two Env Engineers 40 hrs + 10 hrs overtime each
  Unit Cost: 240 hrs + 60 hrs overtime E050
              120 hrs P090
              120 hrs M040 project management support
  Unit Cost Adjustment Factor: na
  Revised Unit: na

Item: Subcontractor costs.
  Units: Site prep costs
  Unit Cost: $30,000
  Unit Cost Adjustment Factor: none
  Revised Unit:

Basis for adjustment. None

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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<th>Department</th>
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**Line item 03000 - excavation**

**BOE**

Estimator's Experience based generally on historical data for T-3/74 Remediation.

Item Desc: Excavation includes overburden and contaminated soils, and potentially some infrastructure removal. Based on an excavation rate of 1,000 cubic yards per month and using 3 crews, this project will take approximately 7 months when time is added for weather delays and plant or project shut downs. A 12 hour day will be worked 5 days a week to remain on the working schedule.

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks. There will be three crews and each crew will consist of 3 Environmental Engineers, 3 RCTs, 7 steelworkers. An additional RCT is added per plant guidance to account for plant training requirements. Rad engineers, health and safety, and project management are included in a separate line item.

Units: 7 months/1,120 regular hours (code 750); 560 overtime hours (code 751) per person

Unit Cost:
E050 9 people at 10,080 750 hrs; 5,040 751 hrs
T050 10 people at 11,200 750 hrs; 5,600 751 hrs
T060 21 people at 23,520 750 hrs; 11,760 751 hrs

Unit Cost Adjustment Factor: see below
Revised Unit: see below

Item: Subcontractor costs to perform excavate soils
Units: 19,500 cubic yards
Unit Cost: $45/cubic yard = $877,500
Unit Cost Adjustment Factor: 2
Revised Unit: $1,755,000
Basis for adjustment. Based on the amount of other utilities, the tight working areas, the length of the project site, the excavation rate was doubled. This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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Line Item 04000 - remove and clean debris

Item Desc: Remove and clean debris. It was assumed that about five cubic yards out of 700 cubic yards would be debris and would be segregated and cleaned. Using T3/T4 as a model, it was estimated that each cubic yard of debris would cost $1,000 per cubic yard. Based on 19,500 cubic yards, this would equal 140 cubic yards of debris that require segregation and cleaning. However, because of all the other conduit and piping expected adjacent to the OPWL, and to account for all of the OPWL pipe itself, 5% or 975 cubic yards of debris are anticipated. All costs are assumed to be subcontract costs as Site labor costs are fully accounted for elsewhere.

Breakdown of Historical Data:

Item: Subcontractor costs to remove and clean debris.
Units: 975 cubic yards
Unit Cost: $1,000 per cubic yard * 975 cubic yards = 975,000
Basis for adjustment. None

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

Line Item 06000 - Remediation sampling

Item Desc: Confirmation and waste samples. Subcontractor costs to perform confirmation and waste acceptance sampling are included in the excavation costs. Analytical costs only are included here.

The recent characterization samples will be used to make most remedial action decisions including waste acceptance decisions. 50% additional samples will be collected during the remedial action, 750 samples each of rad screens, isotopics and metals. 75 samples will be collected for VOC analysis. These samples will be used both for waste characterization and for confirmation samples and also include the QA/QC samples for this project. These will only be analyzed for the following analytes:

- 750 rad screens to determine the appropriate sample shipment offsite to analytical labs
- 750 isotopic analysis
- 750 metals
- 75 VOCs
Vendor Name - KH ASD  
Vendor Quote - costs provided during baseline development  
Quote Received by - A. Primrose  
Date Received - 4/28/00  
Item being quoted - sample costs  
2325 sample bottles at 97 each = $16,275
Shipping at $42 for 10 bottles. There will be 233 groups of 10 bottles times $42 = $9,786
750 rad screens at $32 each = $24,000
750 isotopics at $590 each = $442,500
750 metals at $345 each = $258,750
75 VOCs at $280 each = $21,000
Data validation will be done for as sets of 20 samples each.
38 metals Data validation cost for > 11 samples at $335 each = $12,730
38 rad data validation costs for >11 samples at $312 each = $11,856
4 VOC data validation cost for >11 samples at $346 each = $1,384

Total Cost $798,281

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### Rocky Flats Closure Project
#### Baseline Cost and Basis of Estimate

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#### Backfill

**Trade Publication**
Means 1995, Site Work & Landscape Cost Data (page 34, 42, and 34)

**Item Desc:** Backfill.

**Breakdown of Historical Data:** Backfill costs were taken from Means (1995) Site Work & Landscape Cost Data as follows:

**Cost Reference**
- **Common Fill:** $4.77/cubic yard (page 34 Borrow Bank Measure)
- **Hauling:** $3.98/cubic yard (page 42 2-mile round-trip, 6 cubic yard dump truck)
- **Backfilling:** $1.69/cubic yard (page 34)
- **Burden (43%)** $4.49/cubic yard
- **Total:** $14.23/cubic yard or about $15/cubic yard

**Item:** Subcontractor costs to perform above individual tasks
- **Units:** 19,500 cubic yards will be disposed of site and will require replacement
- **Unit Cost:** $15 cubic yard delivered and placed for $292,500
- **Unit Cost Adjustment Factor:** none
- **Revised Unit:**

**Item:** Site labor to backfill excavation
- **Units:** hours
- **Unit Cost:** Steelworkers 1 truck driver, 1 front end loader operator, 2 spotters for 4 weeks, 12 hour days = 4 people * 12 hrs/day (8hrs code 750/4 hrs code 751) * 20 days = 640 hrs 750; 320 hrs 751
- **Unit Cost Adjustment Factor:** none
- **Revised Unit:** none

**Basis for adjustment:**
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

#### Resources

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OFFICIAL USE ONLY
### Rocky Flats Closure Project
#### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0002  
**Activity ID:** 1G00020250

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<td><strong>BOE</strong></td>
<td>Estimator's Experience based generally on historical data for T-3/T4 Remediation.</td>
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<tr>
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<td>Item Desc: The subcontractor cost for demobilization for the T-3/T-4 project was approximately $95,000 and required the following site support.</td>
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<tr>
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<td>Environmental Engineer 500 hours 5 people 2.5 weeks</td>
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<td>Health Physicist 100 hours 1 person 2.5 weeks to write PREs, etc.</td>
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<td>Industrial Hygiene 100 hours 1 person 2.5 weeks to supervise demobilization activities full time.</td>
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<td>Because there are 3 teams to be demobilized the costs were multiplied by 3.</td>
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<td><strong>Breakdown of Historical Data:</strong></td>
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<td></td>
<td><strong>Item:</strong></td>
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<td>E050 500 hrs * 3 = 1,500 hrs</td>
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<td>P080 100 hrs * 3 = 300 hrs</td>
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<td>P090 100 hrs * 3 = 300 hrs</td>
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<td>ASH $95,000 * 3 = $285,000</td>
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<td>In addition 7 steelworkers and 5 RCTs will be required for 2.5 weeks per team to break down site, and survey all equipment and materials for free release.</td>
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<td>T050 5 * 100 hrs * 3 teams = 1,500</td>
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<td>T060 7 * 100 hrs * 3 teams = 2,100</td>
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<td>This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.</td>
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### Line Item 12000 - Tank and Pipeline Foaming

**BOE**  
Experience Item Desc - CERCLA Tank project which foamed several process waste tanks.  
Breakdown of Cost Data:  
- **Unit Cost** - Unit Cost of $1.04 is based on the CERCLA Tanks Project  
- **Units** - Tank T-7 6,000 gallon * $1.04/gallon = $6,240  
  - Tank T-11/T-30 34,666 gallon * $1.04/gallon = $36,053  
  - Tank T-3 1,000 gallon * $1.04/gallon = $1,040  
  - Pipelines 4,100 cubic foot * 7.48052 gal/cft = 30,670 gallons * $1.04/gallon = $31,897  
- **Total Foaming costs** = $75,230  
- **Miscellaneous Equipment** $62,000 based on $200 per 100 feet of line  
- **Health and Safety Equipment** $15,500 Assume $50 per 100 feet of line  
- **Subcontractor Project Manager** 930 hours at 3 hours per 100 feet/line * $65/hr = $60,450  
- **Subcontractor Field Supervisor** 930 hours at 3 hours per 100 feet/line * $55/hr = $51,150  
- **Subcontractor Health and Safety** 930 hours at 3 hours per 100 feet/line * $55/hr = $51,150
Total Subcontract costs = $315,480

Unit Cost Adjustment factor - na
Revised Unit Cost - na
Basis for adjustment - na

Site Labor to access lines, flush and foam 31,000 feet of line, excavation is not required

T060 Steelworker Labor Hours 3720 hours at 12 hours per 100 feet of line
P090 Industrial Hygienist 930 hours at 3 hours per 100 feet of line
P080 Health Physicist-RMRS (Rad Eng.) 930 hours at 3 hours per 100 feet of line
T050 Radiological Control Technicians 1550 hours Assume 5 hours per 100 feet of line
E050 Environmental Engineer - RMRS 930 hours at 3 hours per 100 feet of line
M040 Project Manager - 930 hours at 3 hours per 100 feet of line. A separate project manager is needed for this task.
E120 Safety Engineer 930 hours at 3 hours per 100 feet of line

Total 9,920 hours

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
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Line Item 13000 - T-29 tank removal

BOE

Estimators Experience - Based on similar projects at the Site.
Experience Item Desc - Cut up, decon and remove this tank.
Breakdown of Cost Data:
Item - T-29 Tank Removal
Steelworkers Laborers 280 hours, Welders 80 hours to cut up tank = 360 hrs
RCTs 80 hrs to survey and release.
Environmental Engineer - 120 hours
Foremen 60 hours
ASC Supplies & Equipment 1 per tank $5,000.00

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Rocky Flats Closure Project
Baseline Cost and Basis of Estimate

WBS No: 1GAC0002
Activity ID: 1G00020250

Project: Baseline Devel
Baseline Cost Filter: 1GAC

Activity Filter: *  Starts In FY

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Line Item 15000 - regrade

BOE

Estimators Experience - The cost for regrading is based on $1.50/square yard from Barrow Source Evaluation for Closure of the OU 5 and OU 7 Landfills 11/17/93. For a 60 yard by 100 yard area (1.24 acres) this yields about $9,000.

Experience Item Desc - Regrading
Breakdown of Cost Data:
- Item - 1 regrade effort
- Units - 6 areas will require regrading
- Unit Cost - 6 at $9,000 each = $54,000
- Unit Cost Adjustment factor - none
- Revised Unit Cost - na
- Basis for adjustment - na

All work will be performed using subcontract labor because no contamination is involved. No RCT support will be required.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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Factors 54000 dollars

0.84576 [SYS 061400].84576000 - System

Line Item 16000 - infrastructure removal (lineal feet)

BOE

Infrastructure Removal - Removal of 100 feet of pipeline requires the following:
- Concrete Slab Demolition 20 cubic yards
- Concrete Curb Demolition 20 feet
- Asphalt Demolition 30 cubic yards
- Fence Demolition 20 feet

Trade Publication - Means Heavy Construction
Publication Date - 1995
Volume/Page - see below

Concrete Slab Demolition 6200 square yard at $4.02 = $24,951 1995 Means Heavy Construction - 6" thick, rod reinforced (page 24)
Asphalt Demolition 9300 square yard at $2.45 = $22,739 1995 Means Heavy Construction - Bituminous, 4-6" thick, (page 24)
Fence Demolition 6200 lineal foot at $.82 if = $52,240 1995 Means Heavy Construction - Chain link Fence 8' to 10' high, Remove and Reset (page 24)

Concrete Curb Demolition 6200 lineal foot at $1.81 if = $11,242 1995 Means Heavy Construction - rod reinforced (page 24)

Total $111,154 The above costs have been adjusted with a 4% escalation factor

Based on ER program guidance, the work will be performed by steelworkers. The subcontract costs were modified as follows:
- 19% of the subcontractor costs was reassigned for steelworkers at $60/hr to get 354 hrs.
- 15% of the subcontractor costs was reassigned for RCTs at $60/hr to get 279 hrs.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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Factors 73700 dollars

0.84576 [SYS 061400].84576000 - System

Line Item SYS - Contingency And Escalation

BOE

Resources

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Factors 279 hours

0.84576 [SYS 061400].84576000 - System

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### Activity Filter

**Activity ID:** 1G00020270  
**Description:** Prepare Closeout Report - IHSS Group 000-2  
**Cost Risk:** 2  
**Schedule Risk:** 3

#### Line Item 0100 - develop closeout report

Estimator's Experience on similar projects

**BOE**

**Item Desc:** Perform Data Analysis including GIS representation of data, Characterization Report, and associated project management.

**Breakdown of Cost Data:**

- **Item:** Develop Characterization Report  
  - **Units:** 648 hours

  - 2 Environmental Engineers full time for 2 weeks to develop draft: 160 hrs
  - 1 Project Manager full time for 4 weeks: 160 hrs
  - 1 Secretary 1/2 time for 4 weeks to format and copy: 80 hrs
  - 1 QA person 8 hours for review: 8 hrs
  - 2 GIS individuals 2 weeks to create/revise maps: 160 hrs
  - 2 Environmental Engineer full time 1 week for comment response: 80 hrs
  - 1 project planner 1/2 time for 4 weeks: 80 hrs

  **Unit Cost Adjustment Factor:** none  
  **Revised Unit Hours:** Basis for adjustment: None

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

#### Resources

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</table>

#### Line Item 0200 - develop NFA documentation

Estimator's Experience: This estimate was constructed based on actual hours required to complete previous NFA Reports (obtained from actual author) and professional judgement of level of effort required for remaining reports.

**BOE**

**Item Desc:** Perform Data Analysis including GIS representation of data, Characterization Report, and associated project management.

**Breakdown of Cost Data:**

- **Item:** Develop Documentation  
  - **Units:** Hours

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### OFFICIAL USE ONLY

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#### Project
Rocky Flats Closure Project

#### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0002

**Activity ID:** 1G00002070

**Baseline Deviation:**

**WBS Filter:** 1GAC

**Activity Filter:** *

**Starts In FY:** *

---

#### Unit Cost: 138

- **Environmental Engineer:** 45 hrs Evaluate \\n  assemble existing data. Draft Report.
- **SMD Technician:** 10 hrs Identify \\n  pull existing data from database.
- **GIS Technician:** 15 hrs Develop maps for Report. Print multiple copies.
- **Technical Editor:** 15 hrs Complete initial and revised tech edits of Report.
- **Technical Reviews:**
  - QA: 4 hrs Review and comment per area of expertise.
  - Peer (2): 8 hrs Review and comment per area of expertise.
  - Compliance: 4 hrs Review and comment per area of expertise.
  - Environmental: 4 hrs Review and comment per area of expertise.
  - Management (2): 8 hrs Review and comment per area of expertise.
  - Legal: 4 hrs Review and comment per area of expertise.
- **Environmental Engineer:** 15 hrs Disposition comments and finalize document.
- **Administrative Support:** 6 hrs Copy \\n  assemble final documents, submit to records.

#### Unit Cost Adjustment Factor: none

#### Revised Unit Hours: 138

#### Basis for adjustment: N/A

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#### Resources

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#### Line Item SYS - Contingency And Escalation

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**WBS No:** 1GAC0003

**Title:** Group 000-3 (Sanitary Sewer System)

**Activity ID:** 1G000030100

**Description:** SAP Preparation - IHSS Group 000-3

**Cost Risk:**

**Schedule Risk:**

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<th>Material/ Sub Total</th>
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Total for Activity 1G000030100:

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### Line Item 01000 - SAP/HASP Addenda

**BOE**

- **Estimator's Experience**: 10 years of experience planning, estimating and conducting projects of similar scope.
- **Item Desc**: Preparation of SAP Addenda to Industrial Area Characterization Plan for Sanitary Sewer and Storm Drains

#### Breakdown of Cost Data:
- **Item**: Prepare SAP and HASP addenda. Address KH, DOE and regulatory agency comments on SAP.
  - **Units**: hours
  - **Unit Cost**: 380
  - **Unit Cost Adjustment Factor**: none
  - **Revised Unit Hours**: 380

- **E050 Environmental Engineer**: 3 weeks for document development, 120 hrs
- **M040 Project Management**: 40 hrs oversight of project
- **P090 Industrial Hygienist**: 60 hrs 1 week for HASP development
- **P080 Health Physicist**: 40 hrs 1 week for ALARA review and RWP
- **G040 Administrative**: 30 hours Secretarial support for document prep and distribution
- **E110 Quality Control Engineers**: 10 hours planning and scheduling support based on similar projects.
- **P060 GIS support**: 40 hrs for map and figure construction

**Total** = 380 hours

**Basis for adjustment**: None

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

#### Cost Element

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<th>Cost Element</th>
<th>Skill</th>
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<th>Curve</th>
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#### Line Item SYS - Contingency And Escalation

**BOE**

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### Activity ID: 1G00003120

- **Description**: Procurement and Field Prep - IHSS Group 000-3
- **Cost Risk**: 1
- **Schedule Risk**: 1

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<th>Labor Cost Total</th>
<th>Material/ Sub Cost</th>
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<th>BURDEN Cost</th>
<th>Total Cost</th>
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<td>10002</td>
<td>procurement &amp; field prep</td>
<td>1.00 each</td>
<td>EE</td>
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## Rocky Flats Closure Project
### Baseline Cost and Basis of Estimate

**WBS Filter:** 
1GAC

**Activity Filter:** 
*  

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### Line Item 10002 - Procurement & Field Prep

**Activity ID:** 1G00030120


**Basis for adjustment:** None

**Estimator's Experience:** The following estimates are based on the recent (FY00) experience from the horizontal drilling project for Building 886.

**Line Item 10002 - Procurement & Field Prep**

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<th>Curve</th>
<th>Cost Element</th>
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<td>80 hours to develop Statement of Work, technical review of proposals and additional procurement activities.</td>
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<tr>
<td>040 Administrative</td>
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<tr>
<td>080 Health Physicist</td>
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<tr>
<td>090 Industrial Hygienist</td>
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<tr>
<td>050 RCT</td>
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**Total = 380 hours, $5,000 A5h**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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<td>Hours</td>
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<td>Hours</td>
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<td>Hours</td>
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### Line Item SYS - Contingency And Escalation

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**Activity ID:** 1G00030140

**Description:** Readiness Assessment - IHSS Group 000-3

**Schedule Risk:** 1

**Cost Risk:** 2

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<th>Units</th>
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<th>Labor Cost Total</th>
<th>Materials/Supply Cost</th>
<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
<th>Burden Cost</th>
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6/23/00 9:20:09 AM

OFFICIAL USE ONLY
## Rocky Flats Closure Project
### Baseline Cost and Basis of Estimate

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### Activity Filter:

- **Starts In FY:**
- **WBS No:** 1GAC0003
- **Activity ID:** 1G00030140

### Line Item 01000 - readiness assessment

**BOE**

*Estimator's Experience:* Based primarily on the horizontal drilling project for Building 886.

**Item Desc:** Evaluate readiness of the field characterization team and plans.

**Breakdown of Cost Data:**

- Item: Perform readiness evaluation
  - Units: hours
  - Unit Cost: 448 hours and $3,600 dollars
  - Unit Cost Adjustment Factor: none
  - Revised Unit Hours:

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<td>A5H</td>
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**Basis for adjustment:** None

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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### Line Item SYS - Contingency And Escalation

**BOE**

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<th>Units</th>
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### Activity ID: 1G00030150

**Description:** Field Sampling, Lab Analysis - IHSS Group 000-3
**Baseline Cost and Basis of Estimate**

**Rocky Flats Closure Project**

**WBS No:** 1GAC0003  
**Activity ID:** 1G00030150

### Line Item Details

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<th>Materials/Sub Cost</th>
<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
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<td>collect geoprobe samples</td>
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**Total for Activity 1G00030150:**  
5,680 | 153,857 | 1,630,994 | 2,096,050 | 2,150,135 | 54,085 | 311,199

**BOE Estimator's Experience**

**Item Desc:** All sample collection will be performed by subcontract personnel including drilling the boreholes; logging the core; collect, containerize, package, and ship the samples; prepare field documentation; and enter data into the Site environmental database. Five drill rigs will be used and two Site Environmental Engineers will supervise field operations of a full-time basis. One Site RCT will be required for each geoprobe rig to monitor operations for radiological contamination on a full time basis. Subcontract health and safety staff will be supplemented by part-time support from Site Industrial Hygienist and Radiological Engineers. Based on experience with the Site Geoprobe, 2 borings per day can be completed. 12 hour days will be worked to minimize project delays and maximize productive time.

One 10' boring will be place for every 100 linear feet of pipeline. With approximately 37,000 feet of sewer pipe with one geoprobe hole every 100 feet, this equals 370 boreholes for the sanitary sewer. Another 112 boreholes will characterize the 139 storm drains for a total of 482 boreholes. Two samples will be collected for each borehole for 964 samples. 25% additional samples will be collected for QA/QC samples for a total of 1,205 samples. Each sample suite will consist of:

- DOT Rad Screen
- Metals
- Isotopic Radionuclides (Uranium, Americium, & Plutonium)
- On 10%, Volatile Organic Compound analyses will be run
- PCBs and semivolatiles are assumed not to be present.

It is estimated that two borings per day can be completed per geoprobe rig. 5 geoprobe rigs will be used. 12 hours days will be worked to minimize delays caused by weather or plant/project shutdowns. For 482 boreholes/5 rigs/2 borings per rig per day = 50 day project with 2 weather days.

**Breakdown of Cost Data:**

1. **Item:** Site Personnel for support of geoprobe operations  
   **Units:** hours  
   **Unit Cost:** 5780 hrs

2. **Environmental Engineers fulltime for 50 12-hour days = 800 hrs straight time/400 OT hrs**

3. **Project manager full time for 50 12-hour days = 400 straight time/200 overtime hrs**

4. **6 RCTs full time for 50 12-hour days = 2,400 straight time/1200 overtime hrs. 1 additional RCT is budgeted as per plant guidance to fund their required training.**

5. **1/4 FTE Industrial Hygiene support = 50 days * 8 hrs * 25% = 100 hours**

6. **1/4 FTE project controls and planning = 50 days * 8 hrs * 25% = 100 hours**

7. **1/4 FTE secretarial support = 50 days * 8 hrs * 25% = 100 hour**

8. **10% Rad Engineering support = 50 days * 8 hrs * 10% = 40 hours**

9. **10% QA support = 50 days * 8 hrs * 10% = 40 hours**

**Cost Adjustment Factor:** none  
**Revised Unit Hours:** See above

1. **Item:** Subcontract Geoprobe equipment and crew.  
   **Estimated at 61,000 per day for rig * 5 rigs = $5,000 * 50 days = $250,000**

2. **2 crew per rig = 2 crew*5 rigs*12 hours/day * 50 days * $20/hour = $120,000**

3. **1 field sampler/data logger per rig = 5 rigs*12 hrs/day * 50 days * $20/hour = $60,000**

4. **1 full time subcontract field manager = 12 hrs/day*50 days*120/hr = $36,000**

5. **2 full time Safety supervisors = 2*12 hrs/day*50 days*50/hr = $60,000**

6. **1 full time geologist = 12 hrs/day*50 days*50/hr = $30,000**

7. **1 full time data entry person = 10 hrs/day * 15/hr * 50 days = $7500**

8. **Miscellaneous supplies and consumables = $100/rid/day = $100*5*50 = $25,000**

9. **Computer for data entry = $5,000**

10. **Support vehicles/trucks = 5 @ $2,000/month * 3 months = $30,000**

**Based on East Trenches Plume, personnel training will require $17,000**

**Total ASH = $640,500**

1. **Item:** Site Supplies  
   **Based on similar projects, $5,000 is required to cover health and safety equipment for Site personnel, Site Personnel office supplies, and miscellaneous...**
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#### Line Item 02000 - analyze samples

Vendor Quote Prices provided by Kaiser-Hill ASD during the FY00 rebaseline.

**Item Desc:** Analyze samples produced from geoprobe borings. It is anticipated that 2 samples from each boring will be collected, from a total of 482 boreholes for a total of 964 samples. An additional 25% samples will be collected for QA/AC purposes, for a total of 1205 samples. The samples will be analyzed as follows with costs from the KH ASD guidance provided for the FY00 rebaseline effort:

Rad Screens = 1,205 at $32/sample
Metals = 1205 at $345/sample
Rad isotopes = 1,205 at $590/sample
VOCs = 121 at $280/sample (based on analysis of 10% of all samples)

Bottle charge = $7 per bottle * (1,205 + 1,205 + 1,205 + 121) = $7 * 3,736 bottles

Shipping charge = $42/10 bottles = $42 * (2,531 bottles/10 bottles per shipment = 254 shipments) Note: rad screens are not shipped

Metals validation = 61 sets of 20 samples * $335/set
Rad validation = 61 sets of 20 samples * $312/set
VOC validation = 7 sets of 20 samples * $346/set

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

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OFFICIAL USE ONLY
### Rocky Flats Closure Project
#### Baseline Cost and Basis of Estimate

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**Line Item** 0100 - Develop Characterization Report

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- **Labor Hours/Unit:**
  - 648 hours

- **Material/Sub Cost:**
  - 0 dollars

- **Contingency & Escalation:**
  - 21,544 dollars

- **Total Cost:**
  - 28,015 dollars

**Line Item** 0100 - Develop Characterization Report

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- **Labor Hours:**
  - 648 hours

- **Material/Sub Cost:**
  - 0 dollars

- **Contingency & Escalation:**
  - 7,767 dollars

- **Total Cost:**
  - 7,767 dollars

**Total for Activity 1G00030170:**

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- **Labor Hours:**
  - 648 hours

- **Material/Sub Cost:**
  - 0 dollars

- **Contingency & Escalation:**
  - 29,311 dollars

- **Total Cost:**
  - 35,782 dollars

**Breakdown of Cost Data:**

- **Item Description:**
  - Perform Data Analysis including GIS representation of data, Characterization Report, and associated project management.

- **Breakdown:**
  - **2 Environmental Engineers full time for 2 weeks to develop draft:** 160 hours
  - **1 Project Manager full time for 4 weeks:** 160 hours
  - **1 Secretary 1/2 time for 4 weeks to format and copy:** 80 hours
  - **1 QA person 8 hours for review:** 8 hours
  - **2 GIS individuals 2 weeks to create/revise maps:** 160 hours
  - **2 Environmental Engineer full time 1 week for comment response:** 80 hours
  - **1 project planner 1/2 time for 4 weeks:** 80 hours

- **Unit Cost Adjustment Factor:** none

**Notes:**

- The estimator's experience on similar projects.

**References:**

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OFFICIAL USE ONLY
### Rocky Flats Closure Project
#### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0003  
**Activity ID:** 1G00030170

**Baseline Deviation**

**WBS Filter:** 1GAC  
**Activity Filter:** *  
**Starts In FY:** *

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**Project:** Baseline Cost and Basis of Estimate

**WBS Filter:** 1GAC

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**Revised Unit Hours:**

Basis for adjustment. None

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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**Line Item SYS - Contingency And Escalation**

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**Activity ID:** 1G00030180  
**Description:** Prepare Decision Document - IHSS 000-3  
**Cost Risk:** 2  
**Schedule Risk:** 3

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**Total for Activity 1G00030180:**  
740 22,244 0 8,384 30,628 7,696 38,324

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**Line Item 1000 - PAM**

**Estimator's Experience based generally on historical data for Ryan's Pit**

**Item Desc:** Preparation of PAM in support of source removal of a previously characterized IHSS.

**Breakdown of Cost Data:**

- **Item:** Preparation of PAM for Ryan's Pit source removal action modified to include GIS support.
  - **Units:** hours
  - **Unit Cost:** 40 hours GIS support, 72 hours project manager technical support, 628 hours for technical staff to write document.
  - **Unit Cost Adjustment Factor:** none
  - **Revised Unit Hours:** na

**Basis for adjustment:** None

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**Line Item SYS - Contingency And Escalation**

**BOE**
### Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

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**Starts In FY:**

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#### Line Item 1000 - procurement & field prep


- **E050 Environmental Engineers**
  - 200 hours: 80 hrs to develop Statement of Work, 120 hrs for technical review of proposals and additional procurement activities.
- **M040 Project Management**
  - 160 hours: 80 hours to develop Statement of Work, 80 hours for technical review of proposals and additional procurement activities.
- **P070 Project Controls**
  - 120 hours for budget and project control support
- **P080 Health Physicist**
  - 80 hours to perform ALARA review, assist with RWP development and evaluate radiological concerns, review and comment on subcontractor HASP
- **P090 Industrial Hygienist**
  - 80 hrs to address health and safety concerns, review and comment
- **T050 RCT**
  - 80 hours to develop RWP

**Total = 960 hours, $5,000 A5h**

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**Total for Activity 1G00030210:**

- **Labor Costs:** 24,709 dollars
- **Materials/Sub Costs:** 8,491 dollars
- **Total Prime Costs:** 33,200 dollars
- **Burden Costs:** 7,992 dollars
- **Total Costs:** 41,193 dollars

### Resources

#### Table: Resources

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**Factors:**

- **200 hrs**  
- **80 hrs**  
- **160 hrs**  
- **80 hrs**  
- **80 hrs**  
- **80 hrs**  
- **80 hrs**  
- **42 estimated $/hr**

**Basis for adjustment:** None

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
## Rocky Flats Closure Project

### Baseline Cost and Basis of Estimate

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### Line Item 01000 - HASP

**Historical Data Source:** Costs derived from the Ryan's Pit Remedial Action. Costs were not revised because the effort will be the same.

**Item Desc:** Preparation of Health and Safety Plan (HASP). The HASP from the OPWL will be provided to the subcontractor for information on developing this HASP.

**Breakdown of Historical Data:**
- Item - HASP development
  - Units - each
  - Unit Cost - $10,000
  - Unit Cost Adjustment factor - none
  - Revised Unit Cost - $10,000
- Basis for adjustment - None

**Item - Review by Site Personnel.** Based on historical costs, it was assumed that the HASP will be reviewed by an Environmental Engineer, Project Manager, QA/QC specialist, Site Health and Safety, and Site Rad Engineer. Each will require 40 hours review time.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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### Line Item 02000 - SAP

**Estimator's Experience based generally on historical data for Ryan's Pit.** Document assumed to take the same effort as the Ryan's Pit and T3/T4 SAPs.
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#### Line Item 03000 - WMP

**BOE**  
Estimator's Experience based generally on historical data for Ryan's Pit  

**Item Desc:** Preparation of WMP in support of source removal of previously characterized UBC.  

#### Breakdown of Historical Data:  
- Item: Preparation of WMP for Ryan's Pit source removal action.  
- Units: hours  
- Unit Cost: 80  
- Basis for adjustment: none

#### Resources

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#### Line Item 04000 - IWCP

**BOE**  
Historical Data Source - Horizontal Drilling under Building 886  

**Item Desc:** IWCP preparation  

#### Breakdown of Historical Data:  
- Item - IWCP preparation  
- Units - 80 hrs  
- Unit Cost - na  
- Basis for adjustment - The IWCP will mostly consist of the FIP, developed in a separate line item. This item will be for producing some text and obtaining approvals.
### Line Item 05000 - FIP

#### Historical Data Source - East Trenches Plume Project

**Item Desc:** Production of a Field Implementation Plan (FIP). Much of the data will be supplied to the subcontractor in the Decision Document.

#### Breakdown of Historical Data:
- **Item:** Preparation of a FIP
- **Units:** $17,400 from successful bidder
- **Unit Cost:** na
- **Unit Cost Adjustment Factor:** none
- **Revised Unit Cost:** na
- **Basis for adjustment:** none

Based on similar projects, the FIP will be reviewed by QA/QC - 20 hrs, environmental engineer 40 hrs, and project manager 40 hrs.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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#### Line Item SYS - Contingency And Escalation

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#### Activity ID: 1G00030240

**Description:** Readiness Assessment - IHSS Group 000-3

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**Total for Activity 1G00030240:**

1,924  53,440  43,844  16,044  113,336  15,072  128,409
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**Factors**
- 750 STRAIGHT TIME BASE
- 760 Hours

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**Factors**
- 75 STRAIGHT TIME BASE
- 76 Hours

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**Factors**
- 75 STRAIGHT TIME BASE
- 76 Hours

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**Factors**
- 75 STRAIGHT TIME BASE
- 76 Hours

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**Factors**
- 75 STRAIGHT TIME BASE
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- 75 STRAIGHT TIME BASE
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**Factors**
- 0000 SUBCONTRACTED SRVS

### Line Item 02000 - training

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:** Conduct perform Training in support of source removal action.

**Breakdown of Cost Data:**

**Item:** Training Site Labor. Assumed that 16 site employees would require training at 16 hours each. 6 will be steel workers, 4 will be RCTs, 6 will be Env Engineers.

- **Units:** hours
- **Unit Cost:** 256 Hours
- **Unit Cost Adjustment Factor:** none
- **Revised Unit:** 256 hours

6 env engineers * 16 hrs = 96 hrs
6 steelworkers * 16 = 96 hrs
4 RCTs * 16 = 64 hrs

**Item:** Subcontractor costs to perform above individual tasks

- **Units:** 1 lot
- **Unit Cost:** $36,000
- **Unit Cost Adjustment Factor:** 1/3
- **Revised Unit:** $12,000

**Basis for adjustment.** The primary personnel utilized will be onsite steelworkers and RCTs who are current on their training.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
**Rocky Flats Closure Project**

**Baseline Cost and Basis of Estimate**

**WBS No:** 1GAC0003  
**Activity ID:** 1G00030240  
**Activity Filter:** *  
**WBS Filter:** 1GAC  
**Starts In FY:** *  

### Line Item 03000 - pre-evolution meeting

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:** Conduct Pre-Evolution Meeting in support of source removal action

**Breakdown of Cost Data:**

**Units:** Site Labor to perform above individual tasks  
**Unit Cost:** 192 hours - not differentiated, all assumed to be E050

**Item:** Subcontractors costs to perform above individual tasks  
**Units:** 1 lot  
**Unit Cost:** $14.4K

**Factors**

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### Line Item SYS - Contingency And Escalation

**BOE**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Resources**

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### Line Item 01000 - Description: Remedial Action - IHSS Group 000-3

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### Rocky Flats Closure Project

#### Baseline Cost and Basis of Estimate

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**Line Item 01000 - mobilization**

**BOE**

- Estimator's Experience based generally on historical data for T-3/T4 Remediation.
- Item Desc: Mobilization in support of remediation.
- Breakdown of Cost Data:
  - Item: Site Labor to perform above individual tasks for T-3/T-4.
  - It was estimated that mobilization would take 1 week. Two environmental engineers or similar people would take 50 hours each for these tasks, 40 hours plus 10 hours overtime. In addition it was estimated that an industrial hygienist and a radiological engineer would spend 20 hours each. Project management is full time, 40 hours, RCT support for baseline surveys is 80 hours (2 RCTs) Mobilization will include the baseline surveys for the equipment and trailer installation. Steelworkers will not be used for mobilization because contaminated media is not involved.

**Units:**
- hours
- Unit Cost: 260
- Unit Cost Adjustment Factor: 3
- Revised Unit: 780

- Hours were assumed to be divided as follows:
  - E050 750 = 240 hrs regular 60 hrs ot
  - M040 750 = 120
  - T050 750 = 240
  - P080 750 = 60
  - E120 750 = 60

- Item: Subcontractor costs to perform above individual tasks for T-3/T-4. The subcontractor mobilization costs are based on the burdened costs for the T-3/T-4 project and consists mainly of setting up the thermal desorption treatment system. Because this project will not use thermal desorption, the costs were reduced to 25%. No further reduction was taken because contractor-supplied heavy equipment will be required for this project along with field trailer installation.

**Units:**
- 1 lot
- Unit Cost: 184k
- Unit Cost Adjustment Factor: 0.5
- Revised Unit: 92,000

Basis for adjustment: This was the cost of mobilization for the T3/T4 project. Most of the cost was for mobilization of the thermal desorption treatment unit. It is assumed that the thermal desorption unit will be mobilized for another project and the soil from this project will be treated there. No mobilization costs for the TDU are included in this task. Mobilization of one field crew with heavy equipment is estimated to take 25% of $184K or $46K. To accomplish this task in a reasonable timeframe, 2 crews with heavy equipment must be mobilized for a cost of 2*$46K or $92K in subcontract costs.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### Rocky Flats Closure Project

#### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0003  | **Activity ID:** 1G00030250  | **Project:** Baseline Devel  | **WBS Filter:** 1GAC  | **Activity Filter:** *  | **Starts In FY:** *

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<tr>
<td><strong>Estimator's Experience based generally on historical data for T-3/T4 Remediation.</strong></td>
</tr>
<tr>
<td><strong>Item Desc:</strong> Site Preparation including setting up fencing, trailer, etc. Based on T3/T4, it was assumed that average project site preparation costs were about $30,000 subcontract costs and would take 3 weeks. No RCT support will be required because there are no intrusive activities. No steelworker support will be required based on no handling of contaminated media.</td>
</tr>
<tr>
<td><strong>Breakdown of Historical Data:</strong></td>
</tr>
<tr>
<td><strong>Item:</strong> Site Labor to perform site preparation activities.</td>
</tr>
<tr>
<td><strong>Units:</strong></td>
</tr>
<tr>
<td>3 weeks for two Env Engineers 40 hrs + 10 hrs overtime each</td>
</tr>
<tr>
<td>3 weeks for an Industrial Hygienist/Safety Engineer</td>
</tr>
<tr>
<td>Unit Cost: 240 hrs + 60 hrs overtime R050</td>
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<tr>
<td>120 hrs R090</td>
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<tr>
<td>120 hrs M040 project management support</td>
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<tr>
<td>Revised Unit: na</td>
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<tr>
<td><strong>Item:</strong> Subcontractor costs.</td>
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<tr>
<td><strong>Units:</strong> Site prep costs</td>
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<tr>
<td>Unit Cost: $30,000</td>
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<td><strong>This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.</strong></td>
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<table>
<thead>
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<tbody>
<tr>
<td><strong>Estimator's Experience based generally on historical data for T-3/T4 Remediation.</strong></td>
</tr>
<tr>
<td><strong>Item Desc:</strong> Excavation includes overburden and contaminated soils, and potentially some infrastructure removal. Based on an excavation rate of 1,000 cubic yards per month, and using 2 crews, this project will take approximately 4 months when time is added for weather delays and plant or project shut downs. A 12 hour day will be worked 5 days a week to remain on the working schedule.</td>
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<tr>
<td><strong>Breakdown of Historical Data:</strong></td>
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<tr>
<td><strong>Item:</strong> Site Labor to perform above individual tasks. There will be two crews and each crew will consist of 3 Environmental Engineers, 3 RCTs, 7 steelworkers. An additional RCT is added per plant guidance to account for plant training requirements. Rad engineers, health and safety, and project management are included in a separate line item.</td>
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<table>
<thead>
<tr>
<th>Cost Element</th>
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<th>Curve</th>
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**Page 39 of 1121**  |  **6/23/00 9:20:12 AM**  | **OFFICIAL USE ONLY**
### Rocky Flats Closure Project

#### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0003  
**Activity ID:** 1G00030250

**Project:** Baseline Devl  
**WBS Filter:** 1GAC  
**Activity Filter:** *  
**Starts In FY:** *

**Activity Filter**

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RMRS Salaried | Linear | 3,840.00 | Hours |
| Factors | 3840  
hrs |
| 750  
STRAIGHT TIME BASE | T050  
radiation control technologist | KG10H  
Remediation Steelworkers | Linear | 4,480.00 | Hours |
| Factors | 4480  
hrs |
| 750  
STRAIGHT TIME BASE | T060  
D&D haz reduc tech / risk red | KG10H  
Remediation Steelworkers | Linear | 8,960.00 | Hours |
| Factors | 8960  
hrs |
| 751  
OVERTIME BASE & PRE. | E050  
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RMRS Salaried | Linear | 1,920.00 | Hours |
| Factors | 1920  
hrs |
| 751  
OVERTIME BASE & PRE. | T050  
radiation control technologist | KG10H  
Remediation Steelworkers | Linear | 2,240.00 | Hours |
| Factors | 2240  
hrs |
| 751  
OVERTIME BASE & PRE. | T060  
D&D haz reduc tech / risk red | KG10H  
Remediation Steelworkers | Linear | 4,480.00 | Hours |
| Factors | 4480  
hrs |

**BOE**

#### Breakdown of Historical Data:

**Item:** Subcontractor costs to perform excavate soils  
Units: 6,155 cubic yards  
Unit Cost: $45/cubic yard = $276,975  
Unit Cost Adjustment Factor: 2  
Revised Unit: $553,950

**Basis for adjustment:** Based on the amount of other utilities, the tight working areas, the length of the project site, the excavation rate was doubled.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Resources**

<table>
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<tr>
<th>Cost Element</th>
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<th>Curve</th>
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SUBCONTRACTED SRVS | 0000  
none | K265S  
ER programs | Linear | 468,508.80 | Dollars |
| Factors | 553950  
$ |

**Item:** Subcontractor costs to perform excavate soils  
Units: 6,155 cubic yards  
Unit Cost: $45/cubic yard = $276,975  
Unit Cost Adjustment Factor: 2  
Revised Unit: $553,950

**Basis for adjustment:** Based on the amount of other utilities, the tight working areas, the length of the project site, the excavation rate was doubled.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Item:** Subcontractor costs to remove and clean debris  
Units: 308 cubic yards  
Unit Cost: $1,000 per cubic yard * 308 cubic yards = $308,000  
Unit Cost Adjustment Factor: none  
Revised Unit: none

**Basis for adjustment:** None

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
Line Item 06000 - remediation sampling

BOE

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc: Confirmation and waste samples. Subcontractor costs to perform confirmation and waste acceptance sampling are included in the excavation costs. Analytical costs only are included here.

The recent characterization samples will be used to make most remedial action decisions including waste acceptance decisions. 50% additional samples will be collected during the remedial action, 603 samples each of rad screens, isotopics and metals. 60 samples will be collected for VOC analysis. These samples will be used both for waste characterization and for confirmation samples and also include the QA/QC samples for this project. These will only be analyzed for the following analytes:

- 603 rad screens to determine the appropriate sample shipment offsite to analytical labs
- 603 isotopic analysis
- 603 metals.
- 60 VOCs

Vendor Name - KH ASD
Vendor Quote - costs provided during baseline development
Quote Received by - A. Primrose
Date Received - 4/28/00
Item being quoted - sample costs

1869 sample bottles at $7 each = $13,083
Shipping at $42 for 10 bottles. There will be 1,263/10 = 127 groups of 10 bottles times $42 = $5,334 (DOT Rad screens are not shipped)
603 rad screens at $32 each = $19,296
603 isotopics at $590 each = $355,770
603 metals at $345 each = $208,035
60 VOCs at $280 each = $16,800
Data validation will be done for as sets of 20 samples each
31 metals Data validation cost for > 11 samples at $335 each = $10,385
31 rad data validation costs for >11 samples at $312 each = $9,672
3 VOC data validation cost for >11 samples at $346 each = $1,038

Total Cost $639,413
Basis for adjustment. None

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

 Resources

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Factors 0.84576  [SYS 061400] .84576000 - System

Line Item 07000 - prepare waste acceptance forms

BOE

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc: Prepare Waste Acceptance Forms

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks
Units: 480 hours
Unit Cost: Based on T3/T4, it will take an environmental engineer 12 weeks to fill out all of these forms.
Unit Cost Adjustment Factor: Additional 60 hours to perform all of the waste generator functions also required for this project. This is based on the T-1 project where full-time waste generators were required.
Revised Unit: 640 hours

 Resources

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Factors 640 hrs

Line Item 09000 - field oversight & project mgmt

BOE

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc: Field Oversight and Project Management. The project is expected to take 4 months = 4 months * 20 days/month * 8 hrs/day = 640 hrs regular time and 4 months * 4 hrs/day = 20 days/month = 320 hrs overtime for a 12 hour day. The following support personnel will be needed as verified by other projects.
### Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

**WBS Filter**: 1GAC  
**Activity Filter**: 

**WBS No:** 1GAC0003  
**Activity ID:** 1G00030250

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**Supplies $5,000 per month for 4 months = $20,000**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

**Trade Publication**

*Means 1995, Site Work & Landscape Cost Data (page 34, 42, and 34)*

**Item Desc**: Backfill.

Breakdown of Historical Data: Backfill costs were taken form Means (1995) Site Work & Landscape Cost Data as follows:

- **Cost Reference**
  - Common Fill: $4.77/cubic yard (page 34 Borrow Bank Measure)
  - Hauling: $3.98/cubic yard (page 42 2-mile round-trip, 6 cubic yard dump truck)
  - Backfilling: $1.69/cubic yard (page 34)
  - Burden (43%): $4.49/cubic yard
  - Total: $14.93/cubic yard or about $15/cubic yard

**Item**: Subcontractor costs to perform above individual tasks

- Units: 6,155 cubic yards will be disposed off site and will require replacement
- Unit Cost: $15 cubic yard delivered and placed for $92,325
- Revised Unit:

**Item**: Site Labor to backfill excavation

---

**Line Item 10000 - backfill**
**Rocky Flats Closure Project**

**Baseline Cost and Basis of Estimate**

<table>
<thead>
<tr>
<th>Resources</th>
<th>Cost Element</th>
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<th>Quantity</th>
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**Line Item 11000 - demobilization**

**BOE**

Estimators Experience based generally on historical data for T-3/T4 Remediation.

Item Desc: The subcontractor cost for demobilization for the T-3/T-4 project was approximately $95,000 and required the following site support.

- Environmental Engineer 100 hours 5 people 2.5 weeks
- Health Physicist 100 hours 1 person 2.5 weeks to write PREs, etc.
- Industrial Hygiene 100 hours 1 person 2.5 weeks to supervise demobilization activities full time.

Because there are 2 teams to be demobilized the costs were multiplied by 2.

Breakdown of Historical Data:

Item:

- E050 500 hrs * 2 = 1,000 hrs
- P080 100 hrs * 2 = 200 hrs
- P090 100 hrs * 2 = 200 hrs
- ASH $95,000 * 2 = $190,000

In addition 7 steelworkers and 5 RCTs will be required for 2.5 weeks per team to break down site, and survey all equipment and materials for free release.

7 steelworkers * 100 hrs * 2 teams = 1,400

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Line Item 12000 - storm drain structure removal**

**BOE**

Estimators Experience - Craig Cowdery, based on similar projects.
Experience Item Desc - Storm Drain Structure Removal along with the lines there are other structures associated with these systems. For the sanitary sewer system it was assumed that there are approximately 25 valve vaults, pump vaults or similar structures. For the storm sewer system, there are 132 structures listed in the Stormwater Pollution Prevention Plan Dated June 2, 1993. Only 20% of these, or 26, require removal and none of these would be considered to contain hazardous or low-level waste. Each structure, valve vaults and pump vaults will have a volume equivalent to a 10' x 10' x 10' volume of soil and debris. It was assumed that removal of valve vaults would not require any more effort than pipeline removal for a given amount of contaminated soil. These structures will be about 30% debris and 70% soil.

Breakdown of Cost Data:
- Item - 51 structures will require removal
- Subcontract costs = $45/cubic yard
- Each structure = 1,000 cubic feet * 51 structures = 51,000 cubic ft or 1,889 cubic yards at $45/cubic yard = $85,005

Steelworkers will need 4 hrs per structure to remove each = 204 hrs
- Waste management requires 40 hours to disposition the lot
- Env Engineer supervision is 3 weeks/120 hrs
- Project Management 3 weeks/120 hrs
- Trucking is 3 weeks at 120 hours
- Supplies are estimated at $250/structure = $12,750

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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Line Item 1300 - sanitary sewer foaming
BOE

Experience Item Desc - Assume foaming is subcontracted

Breakdown of Cost Data:
- Item - Foaming tanks and process waste lines. This assumes that foam can be pushed down any length of pipe
- Unit Cost - Unit Cost of $1.04 is based on the CERCLA Tanks Project
- Units - Pipelines = 36,840 linear feet * .7 sq ft pipe area = 25,788 cubic foot * 7.48052 gal/cft = 192,907 gallon capacity * .7 gallons of foam per gallon pipe = 135,035 gallons foam
- Manholes will be foamed in place. The average manhole is six feet deep and three feet in diameter. Based on the HRR, it was assumed that 90 manholes would be foamed. 90 * (pi r squared) = 90 * 3.14159 (1.5*1.5) * 6 = 3,817 cubic feet * 7.48052 gal/cft * .7 gallons foam/gallon = 19,987 gallons of foam
- Total foam quantity is 155,022 gallons at $1.04/gallon = $161,223

Miscellaneous Equipment $73,680 based on $200 per 100 feet of line
- Health and Safety Equipment $18,420 Assume .50 per 100 feet of line
- Subcontractor Project Manager 1,105 hours at 3 hours per 100 feet/line * $65/hr = $71,825
- Subcontractor Field Supervisor 1,105 hours at 3 hours per 100 feet/line * $55/hr = $60,775
- Subcontractor Health and Safety 1,105 hours at 3 hours per 100 feet/line * $55/hr = $60,775
- Total Subcontract costs = $446,698

Unit Cost Adjustment factor - na
Revised Unit Cost - na
Basis for adjustment - na

Site Labor to access lines, flush and foam 36,840 feet of line, excavation is not required. Flushing out the lines will be performed under this task. The water will be sent to the present Sewage Treatment Facility through the existing pipelines. No additional treatment costs will be needed.

TO60 Steelworker Labor Hours 4421 hours at 12 hours per 100 feet of line
PO90 Industrial Hygienist 1105 hours at 3 hours per 100 feet of line
P080 Health Physicist-RMRS (Rad Eng.) 1105 hours at 3 hours per 100 feet of line
TO50 Radiological Control Technicians 2210 hours Assume 6 hours per 100 feet of line
E050 Environmental Engineer - RMRS 1105 hours at 3 hours per 100 feet of line
MO40 Project Manager - 1105 hours at 3 hours per 100 feet of line. A separate project manager is needed for this task.
E120 Safety Engineer 1105 hours at 3 hours per 100 feet of line

Total 12,156 hours

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### Project Baseline Devl WBS Filter 1GAC Activity Filter 1G00030250

**Rocky Flats Closure Project**  
Baseline Cost and Basis of Estimate

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#### WBS Filter 1GAC

- **WBS No:** 1GAC0003
- **Activity ID:** 1G00030250

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- **Factors:** 54000 dollars

#### Resource Details

- **Factors:** 54000 dollars

### Breakdown of Cost Data:

- **Item Desc:** Regrading
- **Breakdown of Cost Data:**
  - **Concrete Slab Demolition 20 cubic yards**
  - **Concrete Curb Demolition 20 feet**
  - **Asphalt Demolition 30 cubic yards**
  - **Fence Demolition 20 feet**

#### Line Item 16000 - infrastructure removal (linear feet)

- **Factors:** 61817 dollars

### Breakdown of Cost Data:

- **Item Desc:** Infrastructure removal
- **Details:** Removal of 100 feet of pipe requires the following:
  - **Concrete Slab Demolition 20 cubic yards**
  - **Concrete Curb Demolition 20 feet**
  - **Asphalt Demolition 30 cubic yards**
  - **Fence Demolition 20 feet**

#### Line Item 17000 - soil bioavailability

- **Factors:** 54000 dollars

### Breakdown of Cost Data:

- **Item Desc:** Soil bioavailability
- **Details:** Removal of soil presents the following:
  - **Concrete Slab Demolition 20 cubic yards**
  - **Concrete Curb Demolition 20 feet**
  - **Asphalt Demolition 30 cubic yards**
  - **Fence Demolition 20 feet**

#### Line Item 18000 - site remediation

- **Factors:** 61817 dollars

### Breakdown of Cost Data:

- **Item Desc:** Site remediation
- **Details:** Remediation of site requires the following:
  - **Concrete Slab Demolition 20 cubic yards**
  - **Concrete Curb Demolition 20 feet**
  - **Asphalt Demolition 30 cubic yards**
  - **Fence Demolition 20 feet**

#### Line Item 19000 - site closure

- **Factors:** 61817 dollars

### Breakdown of Cost Data:

- **Item Desc:** Site closure
- **Details:** Closure of site requires the following:
  - **Concrete Slab Demolition 20 cubic yards**
  - **Concrete Curb Demolition 20 feet**
  - **Asphalt Demolition 30 cubic yards**
  - **Fence Demolition 20 feet**

---

**Basis for adjustment -**

- **9,254 cubic feet * $6.68/cubic foot = $61,817**

**Time required for Site Personnel**

- **131 storm sewers and 65 culverts = 196 pipes * 2 plugs each = 392 plugs**
- **at 8 plugs per day = 49 days * 8 hours per day * 3 steelworkers + 1 RCT per crew =**
  - **T050 RCTs 49 days * 8 hrs/day = 392 hrs**
  - **T060 Steelworkers 49 days * 8 hrs/day * 3 people = 1,176 hrs**
  - **E050 Field supervision 49 days * 8 hrs/day = 392 hrs**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
Asphalt Demolition 30' x 20' = 600 square yard at $2.45 = $1,470 1995 Means Heavy Construction - Bituminous, 4-6" thick, (page 24)
Fence Demolition 20' x 20' = 400 linear foot at $8.42 lf = $3,368 1995 Means Heavy Construction - Chain Link Fence 8' to 10' high, Remove and Reset
Concrete Curb Demolition 20' x 20' = 400 linear foot at $1.81 lf = $724 1995 Means Heavy Construction - rod reinforced (page 24)

Total $ The above costs have been adjusted with a 4% escalation factor

The work will be performed by subcontractors as no contaminated materials will be encountered. Project supervision hours are provided in other tasks.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
## Rocky Flats Closure Project
### Baseline Cost and Basis of Estimate

#### WBS Filter
1GAC

#### Activity Filter
* Starts In FY

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**WBS Filter**

**1GAC**

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**Rocky Flats Closure Project**

**Baseline Cost and Basis of Estimate**

**WBS No:** 1GAC0003

**Activity ID:** 1G00030270

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**Line Item 02000 - develop NFA documentation**

**BOE**

**Estimator's Experience:**

This estimate was constructed based on actual hours required to complete previous NFA Reports (obtained from actual author) and professional judgement of level of effort required for remaining reports.

**Item Desc:**

Perform Data Analysis including GIS representation of data, Characterization Report, and associated project management.

**Breakdown of Cost Data:**

**Item:** Develop Documentation  
**Units:** Hours  
**Unit Cost:** 138

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**Factors**

- Environmental Engineer: 45 hrs (Evaluate & assemble existing data, Draft Report).
- SWD Technician: 10 hrs (Identify & pull existing data from database).
- GIS Technician: 15 hrs (Develop maps for Report, Print multiple copies).
- Technical Editor: 15 hrs (Complete initial and revised tech edits of Report).
- Technical Reviews
  - QA: 4 hrs (Review and comment per area of expertise).
  - Peer (2): 8 hrs (Review and comment per area of expertise).
  - Compliance: 4 hrs (Review and comment per area of expertise).
  - Environmental: 4 hrs (Review and comment per area of expertise).
  - Management (2): 8 hrs (Review and comment per area of expertise).
  - Legal: 4 hrs (Review and comment per area of expertise).
- Environmental Engineer: 15 hrs (Disposition comments and finalize document).

**Unit Cost Adjustment Factor:** None

**Revised Unit Hours:** 138

**Basis for adjustment:** N/A

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Date: 6/23/00 9:20:14 AM

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### Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

**WBS No:** 1GAC0003
**Activity ID:** 1G00030270

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#### Line Item SYS - Contingency And Escalation

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Total for Activity 1G00040100:

- **340** hours
- **10,305** Labor Hours
- **1,421** Total Labor
- **4,282** Contingency & Escalation
- **19,573** Total Cost

#### Breakdown of Cost Data for Line Item 01000 - SAP/HASP Addenda

- **E050 Environmental Engineer** 3 Weeks for document development 120 hrs
- **M040 Project Management** 40 hrs oversight of project
- **P090 Industrial Hygienist** 60 hrs 1 week for HASP development
- **P080 Health Physicist** 40 hrs 1 week for ALARA review and RWP
- **G040 Administrative** 30 hours Secretarial support for document prep and distribution
- **E110 Quality Control Engineers** 10 hours for document review and comment resolution
- **P070 Project Controls** 40 hours planning and scheduling support based on similar projects.
- **P060 GIS Support** 40 hrs GIS Support for maps and figures.

**Total = 380 hours**

**Basis for adjustment:** None

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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### Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

**WBS No:** 1GAC0004

**Activity ID:** 1G00040100

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#### Activity ID: 1G00040120

**Description:** Procurement and Field Prep - HSS Group 000-4

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#### Line Item 1000 - procurement & field prep

**BOE**

Estimator's Experience: the following estimates are based on the recent (FY00) experience from the horizontal drilling project for Building 886.


- **E050** Environmental Engineer 80 hours to develop Statement of Work, technical review of proposals and additional procurement activities.
- **M040** Project Management 80 hours to develop Statement of Work, technical review of proposals and additional procurement activities.
- **P080** Health Physicist 20 hours to perform ALARA review, assist with RWP development and evaluate radiological concerns, review and comment on subcontractor HASP.
- **P090** Industrial Hygienist 20 hrs to address health and safety concerns, review and comment.
- **P070** Project Controls 40 hours for budget and project control support.
- **P030** Procurement Support 80 hours for procurement activities.
- **T050** RCT 40 hours to develop RWP.
- **$5,000** Ecology Support Based on most project requirements.

Total = 380 hours, $5,000 A5H

Basis for adjustment. None

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

#### Resources

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### Rocky Flats Closure Project Baseline Cost and Basis of Estimate

#### Activity 1G00040140: Readiness Assessment - IHSS Group 000-4

**Description:** Evaluate readiness of the field characterization team and plans.

#### Breakdown of Cost Data:

- **Item:** Perform readiness evaluation
- **Units:** hours
- **Unit Cost:** 444 hours and $3,600 dollars

**Unit Cost Adjustment Factor:**

- None

**Revised Unit Hours:**

- E050 Environmental Engineer: 2 people fulltime for 9 days = 144 hours
- M040 Project Management: fulltime for 9 days = 72 hours
- G010 Secretarial support: 40 hours
- P080 Health Physicist: 50% support for 9 days = 36 hours
- P090 Industrial Hygienist: 50% support for 9 days = 36 hours
- T050 RCTs: 50% support for 9 days = 36 hours
- P050 Compliance Inspectors: 40 hours to assist with readiness determination
- E110 Quality assurance Sup. 40 hours to assist with readiness determination
- A58 Subcontract Support: 1 person for 9 days = 72 hrs @ $50/hr = $3,600

**Basis for adjustment:** None

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

#### Resources

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**Total for Activity 1G00040140:**

- Labor Hours Total: 444
- Labor Cost Total: 13,233
- Materials/Sub Cost: 3,045
- Contingency & Escalation: 0
- Total Prime Cost: 5,840
- Burden Cost: 0
- Total Cost: 26,905

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### Rocky Flats Closure Project Baseline Devi

#### WBS Filter: 1GAC

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**Resources**

- **Cost Element:** Contingency And Escalation
- **Skill:** ENVIRONMENTAL ENGINEERS
- **Quantity:** 1.00
- **Units:** each
- **BOE Type:** EE
- **Labor Hours/Unit:** 144
- **Labor Hours Total:** 144
- **Labor Cost Total:** 144
- **Materials/Sub Cost:** 0
- **Contingency & Escalation:** 0
- **Total Prime Cost:** 144
- **Burden Cost:** 0
- **Total Cost:** 144

---

**Line Item 1G00040140 - readiness assessment**

**BOE**

Estimator's Experience: Based primarily on the horizontal drilling project for Building 886.

Item Desc: Evaluate readiness of the field characterization team and plans.

Units: hours

Unit Cost: 444 hours and $3,600 dollars

Unit Cost Adjustment Factor: none

Revised Unit Hours:

- E050 Environmental Engineer: 2 people fulltime for 9 days = 144 hours
- M040 Project Management: fulltime for 9 days = 72 hours
- G010 Secretarial support: 40 hours
- P080 Health Physicist: 50% support for 9 days = 36 hours
- P090 Industrial Hygienist: 50% support for 9 days = 36 hours
- T050 RCTs: 50% support for 9 days = 36 hours
- P050 Compliance Inspectors: 40 hours to assist with readiness determination
- E110 Quality assurance Sup.: 40 hours to assist with readiness determination
- A58 Subcontract Support: 1 person for 9 days = 72 hrs @ $50/hr = $3,600

Basis for adjustment: None

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
## Line Item 01000 - collect geoprobe samples

**Item Desc:** All sample collection will be performed by subcontract personnel including drilling the boreholes; logging the core; collect, containerize, package, and ship the samples; prepare field documentation; and enter data into the Site environmental database. Four drill rigs will be used and two site Environmental Engineers will supervise field operations of a full time basis. One Site RCT will be required for each geoprobe rig to monitor operations for health and safety staff will be supplemented by part-time support from Site Industrial Hygienist and Radiological Engineers. Based on experience with the Site Geoprobe, 2 borings per day can be completed. 12 hour days will be worked to minimize project delays and maximize productive time.

Five 10’ borings will be placed for every 100 linear feet of pipeline. The number of geoprobe holes was determined by assuming 5 boreholes per 100 feet of line = 6,300/100 * 5 = 315 boreholes. One sample will be collected for each borehole for 315 samples. An additional 315 samples will be collected for QA/QC samples and as additional samples from intervals of interest for a total of 630 samples.

Each sample suite will consist of:
- DOT Rad Screen
- Metals
- Isotopic Radionuclides (Uranium, Americium, & Plutonium)
- On 10%, Volatile Organic Compound analyses will be run
- PCBs and semivolatiles are assumed not to be present.

It is estimated that two borings per day can be completed per geoprobe rig. 4 geoprobe rigs will be used. 12 hours days will be worked to minimize delays caused by weather or plant/project shutdowns. For 315 boreholes/4 rigs/2 boreholes per rig per day = 45 day project with 5 weather days.

**Breakdown of Cost Data:**
- **Item:** Site Personnel for support of geoprobe operations
  - **Units:** hours
  - **Unit Cost:**
  - **Total Cost:**

### Baseline Devi

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**Line Item SYS - Contingency And Escalation**

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### Line Item 01000 - collect geoprobe samples

**Item Desc:**

- **Estimator's Experience**

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OFFICIAL USE ONLY
1 Project manager full time for 45 12-hour days = 360 straight time/180 overtime hrs
5 RCTs full time for 45 12-hour days = 1800 straight time/900 overtime hrs. 1 additional
1/4 FTE project controls and planning = 45 days * 8 hrs * 25% = 90 hours
1/4 FTE Industrial Hygiene support = 45 days * 8 hrs * 25% = 90 hours
10% QA support = 45 days * 8 hrs * 10% = 36 hours

Unit Cost Adjustment Factor: none
Revised Unit Hours: See above

Item: Subcontract Geoprobe equipment and crew.
Estimated at $1,000 per day for rig * 4 rigs = $4,000 * 45 days = $180,000
2 crew per rig = 2 crew*4 rigs*12 hours/day * 45 days * $20/hour = $86,400
1 Field sampler/data logger per rig* 4 rigs* 12 hrs/day * 45 days * $20/hr = $43,200
1 full time subcontract field manager = 12 hrs/day*45 days*$60/hr = $32,400
2 full time Safety supervisors = 2*12 hrs/day*45 days*50/hr = $54,000
1 full time geologist = 12 hrs/day*45 days*50/hr = $27,000
1 full time data entry person = 10 hrs/day * 15/hr * 45 days = $6,750
Miscellaneous supplies and consumables = $100/rig/day = $100*4*45 = $18,000
Computer for data entry = $5,000
Support vehicles/trucks = 4 @ $2,000/month * 3 months = $24,000
Based on East Trenches Plume, personnel training will require $17,000
Total A5H = $493,750

Item: Site Supplies
Based on similar projects, $5,000 is required to cover health and safety equipment for Site personnel, Site Personnel office supplies, and miscellaneous project supplies not covered under the subcontract.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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0.84576 [SYS 061400] 84576000 - System
### Line Item 02000 - analyze samples

**BOE**

**Item Desc:**

Email quote from average cost from Kaiser-Hill ASD (Pat Preese), received by Susan Serreze on February 22, 1999.

**Cost Element**

- **Line Item 02000 - analyze samples**
- **BOE**

**Resources**

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Breakdown of Cost Data:

- Item: Mgmt oversight
  - Units: hours
  - Unit Cost: 45 days * 8 hrs/day = 360 hours

Activities:

- M040 Project manager 360 hours
- G010 Secretary 90 hrs (1/4 time)
- P070 Planner 90 hrs (1/4 time)
- Unit Cost Adjustment Factor: none
- Revised Unit Hours: none

Basis for adjustment:

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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### Line Item SYS - Contingency And Escalation

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### Activity ID: 1G00040170

**Description:** Prepare Summary/NFA - IHSS Group 000-4

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Total for Activity 1G00040170:

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### Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

**Activity ID:** 1G00040170  
**WSB No:** 1GAC0004

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### Resources

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### Line Item: 1G00040180

**Description:** Prepare Decision Document - IHSS 000-4

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**Total for Activity 1G00040180:**

740 22,244 0 6,418 28,662 7,089 35,751

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### Line Item 1000 - PAM

**Estimator's Experience based generally on historical data for Ryan's Pit**

**Item Desc:** Preparation of PAM in support of source removal of a previously characterized IHSS.

**Breakdown of Cost Data:**
- **Item:** Preparation of PAM for Ryan's Pit source removal action modified to include GIS support.
- **Units:** hours
- **Unit Cost:** 40 hours GIS support, 72 hours project manager technical support, 628 hours for technical staff to write document.
- **Unit Cost Adjustment Factor:** none
- **Revised Unit Hours:** na

**Basis for adjustment:** None

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### Resources

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### Line Item SYS - Contingency And Escalation

**BOE**

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**OFFICIAL USE ONLY**
### Description: Procurement - IHSS Grouping 000-4

**Line Item 1000 - procurement & field prep**

**BOE**

Estimator's Experience: the following estimates are based on the recent (FY00) experience from the horizontal drilling project for Building 886. This is also a project with numerous radiological concerns.


- **E050 Environmental Engineers**
  - 200 hours: 80 hrs to develop Statement of Work, 120 hrs for technical review of proposals and additional procurement activities.

- **M040 Project Management**
  - 160 hours: 80 hrs to develop Statement of Work, 80 hrs for technical review of proposals and additional procurement activities.

- **P080 Health Physicist**
  - 80 hours to perform ALARA review, assist with RWP development and evaluate radiological concerns, review and comment on subcontractor HASP

- **P090 Industrial Hygienist**
  - 80 hours to address health and safety concerns, review and comment

- **P070 Project Controls**
  - 120 hours for budget and project control support

- **T050 RCT**
  - 80 hours to develop RWP

**$5,000 Ecology Support** Based on most project requirements. Not increased for project size due to the absence of pre-existing, non-industrial ecosystems.

Total = 960 hours, $5,000 A5h

Basis for adjustment. None

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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Total for Activity 1G00040230: 760 23,568 23,174 10,691 64,230

Line Item 01000 - HASP

BOE

Historical Data Source - Costs derived from the Ryan's Pit Remedial Action. Costs were not revised because the effort will be the same.

Item Desc - Preparation of Health and Safety Plan (HASP). The HASP from the OPWL will be provided to the subcontractor for information on developing this HASP.

Breakdown of Historical Data:
- Item - HASP development
- Units - each
- Unit Cost - $10,000
- Unit Cost Adjustment factor - none
- Revised Unit Cost - $10,000
- Basis for adjustment - None

Item - Review by Site Personnel. Based on historical costs, it was assumed that the HASP will be reviewed by an Environmental Engineer, Project Manager, QA/QC specialist, Site Health and Safety, and Site Rad Engineer. Each will require 40 hours review time.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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Line Item 02000 - SAP

BOE

Estimator's Experience based generally on historical data for Ryan's Pit. Document assumed to take the same effort as the Ryan's Pit and T3/T4 SAPs.

Item Desc: Preparation of SAP in support of source removal of previously characterized OPWL.

Breakdown of Historical Data:
### Rocky Flats Closure Project
#### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0004  
**Activity ID:** 1G00040230

**Item:** Preparation of SAP for Ryan's Pit source removal action.  
**Units:** hours  
**Unit Cost:** 300

#### Resources

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#### Line Item 03000 - WMP

**Estimator's Experience based generally on historical data for Ryan's Pit**  
**Item Desc:** Preparation of WMP in support of source removal of previously characterized UBC.

**Breakdown of Historical Data:**  
**Item:** Preparation of WMP for Ryan's Pit source removal action.  
**Units:** hours  
**Unit Cost Adjustment Factor:** none  
**Revised Unit Hours:** 80

**Basis for adjustment:** None  

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#### Line Item 04000 - IWCP

**Historical Data Source:** Horizontal Drilling under Building 886  
**Item Desc:** IWCP preparation  
**Breakdown of Historical Data:**  
**Item:** IWCP preparation  
**Units:** 80 hrs  
**Unit Cost:** na  
**Unit Cost Adjustment Factor:** na  
**Revised Unit Cost:** na  
**Basis for adjustment:** The IWCP will mostly consist of the FIP, developed in a separate line item. This item will be for producing some text and obtaining approvals.

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#### Line Item 05000 - FIP

**Historical Data Source:** East Trenches Plume Project  
**Item Desc:** Production of a Field Implementation Plan (FIP). Much of the data will be supplied to the subcontractor in the Decision Document.
Breakdown of Historical Data:
- Item - Preparation of a FIP
  - Units - $17,400 from successful bidder
  - Unit Cost - na
  - Unit Cost Adjustment factor - none
  - Revised Unit Cost - na
  - Basis for adjustment - none

Based on similar projects, the FIP will be reviewed by QA/QC - 20 hrs, environmental engineer 40 hrs, and project manager 40 hrs.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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\*Factors\* 0.84576 [SYS 061400], 84576000 - System

**Line Item 02000 - training**

BOE

Estimator’s Experience based generally on historical data for T-3/T4 Remediation.

Item Desc: Conduct Training in support of source removal action.

Breakdown of Cost Data:

Item: Site Labor to perform above individual tasks

- Unit: hours
- Unit Cost: 256 Hours
- Unit Cost Adjustment Factor: none
- Revised Unit: 256 hours

Item: Subcontractor costs to perform above individual tasks

- Unit: 1 lot
- Unit Cost: $36,000
- Subcontract training costs were based on T3/T4 costs. It was assumed that training the workers would require $1,000 each and there would be 36 workers.
- Unit Cost Adjustment Factor: 1/3
- Revised Unit: $12,000

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Line Item 03000 - pre-evolution meeting**

BOE

Estimator’s Experience based generally on historical data for T-3/T4 Remediation.

Item Desc: Conduct Pre-Evolution Meeting in support of source removal action.

Breakdown of Cost Data:

Item: Site Labor to perform above individual tasks
### Labor

#### Activity ID:
- Line Item SYS - Contingency And Escalation

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Total for Activity 1G00040250:
- 19,387
- 508,839
- 754,212
- 778,079
- 2,041,131
- 177,076
- 2,218,207
Item Desc: Mobilization in support of remediation.

Breakdown of Cost Data:

Item: Site Labor to perform above individual tasks for T-3/T-4.

It was estimated that mobilization would take 1 week. Two environmental engineers or similar people would take 50 hours each for these tasks, 40 hours plus 10 hours overtime. In addition it was estimated that an industrial hygienist and a radiological engineer would spend 20 hours each. Project management is full time, 40 hours, RCT support for baseline surveys is 80 hours (2 RCTs) Mobilization will include the baseline surveys for the equipment and trailer installation. Steelworkers will not be used for mobilization because contaminated media is not involved.

Units: hours
Unit Cost: 260
Unit Cost Adjustment Factor: none
Revised Unit: na

Hours were assumed to be divided as follows:
E050 750 = 80 hrs regular 20 hrs ot
H040 750 = 40
T050 750 = 80
P080 750 = 20
E120 750 = 20

Item: Subcontractor costs to perform above individual tasks for T-3/T-4. The subcontractor mobilization costs are based on the burdened costs for the T-3/T-4 project and consists mainly of setting up the thermal desorption treatment system. Because this project will not use thermal desorption, the costs were reduced to 25%. No further reduction was taken because contractor-supplied heavy equipment will be required for this project along with field trailer installation.

Units: lot
Unit Cost: 184k
Unit Cost Adjustment Factor: 0.25
Revised Unit: $46,000

Basis for adjustment. This was the cost of mobilization for the T3/T4 project. Most of the cost was for mobilization of the thermal desorption treatment unit. It is assumed that the thermal desorption unit will be mobilized for another project and the soil from this project will be treated there. No mobilization costs for the TDU are included in this task. Mobilization of one field crew with heavy equipment is estimated to take 25% of $184K or $46K.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
Based on no handling of contaminated media.

Breakdown of Historical Data:
Item: Site Labor to perform site preparation activities.

Units:
- 3 week for two Env Engineers 40 hrs + 10 hrs overtime each
- 3 week for an Industrial Hygienist/Safety Engineer

Unit Cost:
- 240 hrs + 60 hrs overtime E050
- 120 hrs P090
- 120 hrs M040 project management support

Unit Cost Adjustment Factor: na
Revised Unit: na

Item: Subcontractor costs.

Units: Site prep costs
Unit Cost: $30,000
Unit Cost Adjustment Factor: none
Revised Unit: None

Basis for adjustment. None

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

### Resources

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**Line Item 03000 - excavation**

**BOE**

Estimator's experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:** Excavation includes overburden and contaminated soils, and potentially some infrastructure removal. Based on an excavation rate of 1,000 cubic yards per month this project will take approximately 2 months when time is added for weather delays and plant or project shut downs. A 12 hour day will be worked 5 days a week to remain on the working schedule.

### BREAKDOWN OF HISTORICAL DATA:

Item: Site Labor to perform above individual tasks. The crew will consist of 4 Environmental Engineers, 3 RCTs and 7 steelworkers. An additional RCT is added per plant guidance to account for plant training requirements. Rad engineers, health and safety, and project management are included in a separate line item.

Units: 2 months/320 regular hours (code 750); 160 overtime hours (code 751) per person

Unit Cost:
- E050 4 people at 1,280 750 hrs; 640 751 hrs
- T050 7 people at 2,240 750 hrs; 1,120 751 hrs
- T060 14 people at 4,480 750 hrs; 2,240 751 hrs

Unit Cost Adjustment Factor: see below
Revised Unit: see below

Item: Subcontractor costs to perform excavate soils

Units: 1,750 cubic yards
Unit Cost: $45/cubic yard = $78,750
Unit Cost Adjustment Factor: 2
Revised Unit: $157,500
Basis for adjustment. Based on the amount of other utilities, the tight working areas, the length of the project site, the excavation rate was doubled.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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**Line Item 04000 - remove and clean debris**

BOE

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc: Remove and clean debris. It was assumed that about five cubic yards out of 700 cubic yards would be debris and would be segregated and cleaned. Using T3/T4 as a model, it was estimated that each cubic yard of debris would cost $1,000 per cubic yard. Based on 1,750 cubic yards, this would equal 13 cubic yards of debris that require segregation and cleaning. However, because of all the other conduit and piping expected adjacent to the OPWL, and to account for all of the OPWL pipe itself, 5% or 88 cubic yards of debris are anticipated. All costs are assumed to be subcontract costs as Site labor costs are fully accounted for elsewhere.

Breakdown of Historical Data:

Item: Subcontractor costs to remove and clean debris.
Units: 88 cubic yards
Unit Cost: $1,000 per cubic yard * 88 cubic yards = 88,000
Unit Cost Adjustment Factor: none
Revised Unit: none

Basis for adjustment. None

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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**Line Item 06000 - confirmation sampling**

BOE

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc: Confirmation Sampling.

Breakdown of Historical Data:

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
Units: 1 lot
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Basis for adjustment. Total Contaminated Soil to be removed 1,750 CY
The analytical costs were based on T-3/T-4, which cost $435,574 for 3800 cubic yards of contaminated soil removed. This yielded a rate of about $115/cubic yard. Based on estimator experience the cost of sampling including labor and materials was estimated to be 20% of that rate or about $23/cubic yard.

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 114.62 * 1,750 cyd = $200,585 A5H Subcontracted Srvs (Analytical)
Factor 22.924 * 1,750 cyd = $40,117 - A5H Subcontracted Srvs for sample collection

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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**Line Item 07000 - prepare waste acceptance forms**

- **BOE**
  - Item Desc: Prepare Waste Acceptance Forms and perform other waste generator functions
  - Breakdown of Historical Data:
    - Item: Site Labor to perform above individual tasks
      - Units: hours
      - Unit Cost: 320 hours
      - Unit Cost Adjustment Factor: none
    - Revised Unit: na

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**Line Item 08000 - waste acceptance sampling**

- **BOE**
  - Item Desc: Waste Acceptance Sampling
  - Breakdown of Historical Data:
    - Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
      - Units: 1 lot
      - Unit Cost: see below
      - Unit Cost Adjustment Factor: see below
    - Revised Unit: see below
    - Basis for adjustment:
      - Because the waste acceptance sampling is difficult to predict and could vary significantly from project to project, it was assumed that about $800 worth of additional analysis would be required for 20 cubic yards which is the volume that can be placed in one roll-off. This yielded a unit rate of about $40/cubic yard. This sampling and analysis is in addition to the confirmational samples so the costs are not as great. It was assumed that this sampling would be more labor intensive so the sampling costs were estimated to be about 50% of the analytical costs or about $20/cubic yard.

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### Rocky Flats Closure Project

#### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0004  
**Activity ID:** 1G000040250  
**Project:** Baseline Devi  
**WBS Filter:** 1GAC  
**Activity Filter:** *

### Line Item 09000 - field oversight & project mgmt

**BOE**

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**Factors**

- 35000: sampling cost
- 70000: analytical cost

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### Line Item 10000 - backfill

**BOE**

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**Factors**

- 160: hrs

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**Estimator's Experience based generally on historical data for T-3/74 Remediation.**

**Item Desc:** Field Oversight and Project Management. The project is expected to take 2 months = 2 months * 20 days/month * 8 hrs/day = 320 hrs regular time and 2 months * 4 hrs/day * 20 days/month = 160 hrs overtime for a 12 hour day. The following support personnel will be needed as verified by other projects.

- M040 Project manager full time 320 hrs-750, 160 hrs ot (751)
- E050 Env engineer/asst proj mgr 320 hrs-750, 160 hrs-751
- G010 Secretary full time to order supplies, keep up records, maintain project files: 320 hrs
- E110 QA/QA support 20% 64 hrs
- P030 Procurement support 20% 64 hrs
- P050 Procurement support 100% = 320 hrs
- P080 Rad engineering support 100% = 320 hrs
- P090 Health and safety support 100% = 320 hrs
- Supplies $5,000 per month for 2 months = $10,000

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

- **WBS No:** 1GAC0004
- **Activity ID:** 1G00040250
- **Project:** Baseline Devl
- **WBS Filter:** 1GAC
- **Activity Filter:** *
- **Starts In:** FY *

#### Common Fill
$4.77/cubic yard (page 34 Borrow Bank Measure)

#### Hauling
$3.98/cubic yard (page 42 2-mile round-trip, 6 cubic yard dump truck)

#### Backfilling
$1.69/cubic yard (page 34)

#### Burden (43%)
$4.49/cubic yard

Total: $14.23/cubic yard or about $15/cubic yard

**Item:** Subcontractor costs to perform above individual tasks

- **Units:** 1,750 cubic yards will be disposed off site and will require replacement
- **Unit Cost:** $15 cubic yard delivered and placed for $26,250
- **Unit Cost Adjustment Factor:** none
- **Revised Unit:**

**Basis for adjustment.**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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**Cost Element**

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**OVERTIME BASE & PRE.**

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**Environmental Engineer** 500 hours 5 people 2.5 weeks

**Health Physicist** 100 hours 1 person 2.5 weeks to write PREs, etc.

**Industrial Hygiene** 100 hours 1 person 2.5 weeks to supervise demobilization activities full time.

**Breakdown of Historical Data:**

- **Item:**
  - E050 500 hrs
  - P080 100 hrs
  - P090 100 hrs
  - ASH $95,000

In addition 7 steelworkers and 5 RCTs will be required for 2.5 weeks to break down site, and survey all equipment and materials for free release.

- **Item:**
  - T050 5 * 100 hrs = 500
  - T060 7 * 100 hrs = 700

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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**Cost Element**

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This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
Project: Rocky Flats Closure Project  
Baseline Cost and Basis of Estimate

WBS Filter: 1GAC  
Activity Filter: *  
Starts In FY: *

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- **Activity Filter:**
  - 750 STRAIGHT TIME BASE
  - 750 STRAIGHT TIME BASE
  - ASH SUBCONTRACTED SRVS

- **Factors:**
  - 500 hrs
  - 700 hrs
  - 750 hrs

**Line Item 13000 - NPWL tank and pipeline foaming**

**BOE**

- **Estimators Experience:** Assume foaming is subcontracted
- **Experience Item Desc:** CERCLA Tank project which foamed several process waste tanks.

**Breakdown of Cost Data:**

- **Item:** Foaming 6,300 feet of tanks and process waste lines. This assumes that foam can be pushed down any length of pipe.
- **Unit Cost:** Unit Cost of $1.04 is based on the CERCLA Tanks Project.
- **Units:** Pipelines = 6,300 linear feet * .7 sq ft pipe area = 4,410 cubic foot * 7.48052 gal/cft = 32,989 gallon capacity * .7 gallons of foam per gallon pipe = 23,092 gallons foam

- **Total foam quantity is 23,092 gallons at $1.04/gallon = $24,015**

- **Miscellaneous Equipment $12,600 based on $200 per 100 feet of line**
- **Health and Safety Equipment $3,150 Assume $50 per 100 feet of line**
- **Subcontractor Project Manager 189 hours at 3 hours per 100 feet/line * $65/hr = $12,285**
- **Subcontractor Field Supervisor 189 hours at 3 hours per 100 feet/line * $55/hr = 10,395**
- **Subcontractor Health and Safety 1,105 hours at 3 hours per 100 feet/line * $55/hr = 10,395**

- **Total Subcontract costs = $72,840**

- **Unit Cost Adjustment factor:** na
- **Revised Unit Cost:** na
- **Basis for adjustment:** na

- **Site Labor to access lines, flush and foam 6,300 feet of line, excavation is not required. Flushing out the lines will be performed under this task. The water will be sent to the present Sewage Treatment Facility through the existing pipelines. No additional treatment costs will be needed.**

- **T060 Steelworker Labor Hours 756 hours at 12 hours per 100 feet of line**
- **P090 Industrial Hygienist 189 hours at 3 hours per 100 feet of line**
- **P080 Health Physicist - RMRS (Rad Eng.) 189 hours at 3 hours per 100 feet of line**
- **T050 Radiological Control Technicians 378 hours Assume 6 hours per 100 feet of line**
- **E050 Environmental Engineer - RMRS 189 hours at 3 hours per 100 feet of line**
- **M040 Project Manager - 189 hours at 3 hours per 100 feet of line. A separate project manager is needed for this task.**
- **E120 Safety Engineer 189 hours at 3 hours per 100 feet of line**

- **This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.**

**Resources**

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### Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

**Project**: Rocky Flats Closure Project  
**Baseline Dev**: Baseline_Devil  
**WBS Filter**: 1GAC  
**Activity Filter**: 1G00040250  
**WBS No**: 1GAC0004  
**Activity ID**: 1G00040250  
**Starts In FY**: 756.00 Hours

#### Line Item 15000 - regrade

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#### Line Item 16000 - infrastructure removal

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- **BOE**: 9:20:19 AM

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**Note**: This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
**Rocky Flats Closure Project**  
*Baseline Cost and Basis of Estimate*

**WBS No:** 1GAC0004  
**Activity ID:** 1G00040250  
**Project:** Rocky Flats Closure Project  
**Baseline Deviation:** WBS Filter - 1GAC  
**Activity Filter:** *  
**Starts In FY:** *

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**Activity ID:** 1G00040270  
**Description:** Prepare Closeout Report - IHSS Group 000-4  
**Factors:** 223098 Dollars

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**Total for Activity 1G00040270:** 786 22,801 2,842 17,961 43,604 7,935 51,538

**Line Item 01000 - develop closeout report**

**BOE**

Estimator's Experience on similar projects

**Item Desc:** Perform Data Analysis including GIS representation of data, Characterization Report, and associated project management.

**Breakdown of Cost Data:**

| Item: Develop Characterization Report | Units: 648 hours |
| 2 Environmental Engineers full time for 2 weeks to develop draft | 160 hrs |
| 2 Environmental Engineer full time 1 week for comment response | 80 hrs |
| 1 Project Manager full time for 4 weeks | 160 hrs |
| 1 Secretary 1/2 time for 4 weeks to format and copy | 80 hrs |
| 1 QA person 8 hours for review | 8 hrs |
| 2 GIS individuals 2 weeks to create/revise maps | 160 hrs |
| 1 project planner 1/2 time for 4 weeks. | 80 hrs |

Unit Cost Adjustment Factor: none  
Revised Unit Hours:

Basis for adjustment. None

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Resources**

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**Line Item 02000 - develop NFA documentation**

**BOE**

Estimator's Experience:

This estimate was constructed based on actual hours required to complete previous NFA Reports (obtained from actual author) and professional judgement of level of effort required for remaining reports.

**Item Desc:**  
Perform Data Analysis including GIS representation of data, Characterization Report, and associated project management.

**Breakdown of Cost Data:**

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**Line Item 02000**

**BOE**

Estimator's Experience:

This estimate was constructed based on actual hours required to complete previous NFA Reports (obtained from actual author) and professional judgement of level of effort required for remaining reports.

**Item Desc:**  
Perform Data Analysis including GIS representation of data, Characterization Report, and associated project management.

**Breakdown of Cost Data:**

| Item: Develop Documentation | Units: Hours |

---

**Resources**

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<td>K285S ER Programs</td>
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<td>2,841.75</td>
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</table>
### Cost Element Details

**Unit:** 138

- **Environmental Engineer:** 45 hrs - Evaluate & assemble existing data. Draft Report.
- **SMD Technician:** 10 hrs - Identify & pull existing data from database.
- **GIS Technician:** 15 hrs - Develop maps for Report. Print multiple copies.
- **Technical Editor:** 15 hrs - Complete initial and revised tech ed of Report.
- **Technical Reviews:**
  - QA: 4 hrs - Review and comment per area of expertise.
  - Peer (2): 8 hrs - Review and comment per area of expertise.
  - Compliance: 4 hrs - Review and comment per area of expertise.
  - Environmental: 4 hrs - Review and comment per area of expertise.
  - Management (2): 8 hrs - Review and comment per area of expertise.
  - Legal: 4 hrs - Review and comment per area of expertise.
- **Environmental Engineer:** 15 hrs - Disposition comments and finalize document.
- **Administrative Support:** 6 hrs - Copy & assemble final documents, submit to records.

**Unit Cost Adjustment Factor:** none

**Revised Unit Hours:** 138

**Basis for adjustment:** N/A

### Resource Breakdown

#### Cost Elements

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**Line Item:** SYS - Contingency And Escalation

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**WBS No:** 1GAC0004

**Activity ID:** 1G00040270

**Project:** Rocky Flats Closure Project

**Baseline Devi:** Baseline Cost and Basis of Estimate

**WBS Filter:** 1GAC

**Activity Filter:** * Suits In FY *

---

**Line Item:** 1GHC016100

**Description:** SAP Preparation - IHSS Group 100-1 (B122)

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**Total for Activity 1GHC016100:**

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### Line Item 01000 - SAP/HASP Addenda

**Estimator's Experience** 10 years of experience planning, estimating and conducting projects of similar scope.

**Item Desc:** Preparation of SAP Addenda to Industrial Area Characterization Plan.

**Breakdown of Cost Data:**
- **Item:** Prepare SAP and HASP addenda. Address KH, DOE and regulatory agency comments on SAP.
  - **Units:** hours
  - **Unit Cost:** 380
  - **Unit Cost Adjustment Factor:** none
  - **Revised Unit Hours:** 380

- **E050 Environmental Engineer** 3 Weeks for document development 120 hrs
- **M040 Project Management** 40 hrs oversight of project
- **P090 Industrial Hygienist** 60 hrs 1 week for HASP development
- **P080 Health Physicist** 40 hrs 1 week for ALARA review and RWP
- **G040 Administrative** 30 hours Secretarial support for document prep and distribution
- **E110 Quality Control Engineers** 10 hours for document review and comment resolution
- **P070 Project Controls** 40 hours planning and scheduling support based on similar projects.
- **P060 GIS Support** 40 hrs GIS Support for maps and figures.

**Total = 380 hours**

Basis for adjustment: None

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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**Line Item SYS - Contingency And Escalation**

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**Activity ID:** 1GH0C016120

**Description:** Procurement and Field Prep - IHSS Group 100-1

**Cost Risk:** 1

**Schedule Risk:** 1

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## BOE

**Estimator's Experience:** The following estimates are based on the recent (FY00) experience from the horizontal drilling project for Building 886.


- **E050** Environmental Engineer 80 hours to develop Statement of Work, technical review of proposals and additional procurement activities.
- **M040** Project Management 80 hours to develop Statement of Work, technical review of proposals and additional procurement activities.
- **P080** Health Physicist 20 hours to perform ALARA review, assist with RWP development and evaluate radiological concerns, review and comment on subcontractor HASP.
- **P090** Industrial Hygienist 20 hrs to address health and safety concerns, review and comment.
- **T050** RCT 40 hours to develop RWP.

5,000 Ecology Support  Based on most project requirements.

Total = 380 hours, $5,000 A5H

Basis for adjustment: None

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

## Resources

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## Line Item SYS - Contingency And Escalation

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**Activity ID:** 1GHC016140  **Description:** Readiness Assessment - IHSS Group 100-1  **Cost Risk:** 2 **Schedule Risk:** 2
## Rocky Flats Closure Project

### Baseline Cost and Basis of Estimate

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#### WBS No: 1GAC0101

**Activity ID:** 1GHC016140

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**Total for Activity 1GHC016140:**

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**Cost Element:** 01000 - readiness assessment

- **Resource:** Estimator's Experience; Based primarily on the horizontal drilling project for Building 886.

- **Item Desc:** Evaluate readiness of the field characterization team and plans.

- **Breakdown of Cost Data:**
  - **Item:** Perform readiness evaluation
  - **Units:** hours
  - **Unit Cost:** 444 hours and $3,600 dollars
  - **Unit Cost Adjustment Factor:** none
  - **Revised Unit Hours:**
    - E050 Environmental Engineer 2 people fulltime for 9 days = 144 hours
    - M040 Project Management fulltime for 9 days = 72 hours
    - G010 Secretarial support 40 hours
    - P080 Health Physicist 50% support for 9 days = 36 hours
    - P090 Industrial Hygienist 50% support for 9 days = 36 hours
    - T050 RCTs 50% support for 9 days = 36 hours
    - P050 Compliance Inspectors 40 hours to assist with readiness determination
    - E110 Quality assurance Sup. 40 hours to assist with readiness determination
    - A5H Subcontract Support 1 person for 9 days @ $50/hr = $3,600

- **Basis for adjustment:** None

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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### Line Item SYS - Contingency And Escalation

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Rocky Flats Closure Project

Baseline Cost and Basis of Estimate

WBS No: 1GAC0101
Activity ID: 1GHC016150

Description: Field Sampling, Lab Analysis - IHSS Group 100-1

Activity ID: 1GHC016150

Line Item 01000 - collect geoprobe samples

Description: All sample collection will be performed by subcontract personnel including drilling the boreholes; logging the core; collect, containerize, package, and ship the samples; prepare field documentation; and enter data into the Site environmental database. One drill rig will be used and a site Environmental Engineers will supervise field operations of a full time basis. One Site RCT will be required for each geoprobe rig to monitor operations for radiological contamination on a full time basis. Subcontract health and safety staff will be supplemented by part-time support from Site Industrial Hygienist and Radiological Engineers.

Building 122 is located in the central portion of the 100 area. The building footprint is approximately 12,620 ft2. The soil beneath the building is potentially affected by nitrates and radionuclides. No characterization has been performed of the soils underlying the building.

Tank 1 (T1) was removed in January 1984. The former tank area is approximately 20’ x 25’, or 500 ft2. The soils underneath and around the tank area are potentially affected by nitrates and trace radionuclides.

The scope of this action is to characterize the soils underlying Building 122 and the associated tank area T1 for contamination, compare the characterization data to site action levels, and perform a source removal action.

One 20’ boring will be placed per 500 SF of building footprint (same as Bldg. 123 characterization) with 5 samples per 20’ boring. The five samples includes QA/QC samples. The total square footage to be investigated is 500 sq ft from Tank 1 plus 12,620 sq ft from B122 or 13,120 sq ft. At one boring per 500 sq ft, this equals 26 geoprobe holes.

Each sample suite will consist of:
- DOT Rad Screen
- Metals
- Isotopic Radionuclides (Uranium, Americium, & Plutonium)
- Volatile Organic Compound
- Nitrates
- PCBs, and Semivolatiles are assumed not to be present.

Breakdown of Cost Data:
- Item: Site Personnel for support of geoprobe operations
  - Unit Cost:
    - 1 Environmental Engineers fulltime for 26 12-hour days = 208 hrs straight time/104 OT hrs
    - 1 Project manager full time for 26 12-hour days = 208 straight time/104 overtime hrs
    - 2 RCTs full time for 26 12-hour days = 416 straight time/208 overtime hrs. 1 additional RCT is budgeted as per plant guidance to fund their required training.
    - 1/4 FTE Industrial Hygiene support = 26 days * 8 hrs * 25% = 52 hours
    - 1/4 FTE project controls and planning = 26 days * 8 hrs * 25% = 52 hours
    - 1/4 FTE secretarial support = 26 days * 8 hrs * 25% = 52 hours
    - 10% Rad Engineering support = 26 days * 8 hrs * 10 % = 21 hours
    - 10% QA support = 26 days * 8 hrs * 10 % = 21 hours
  - Revised Unit Hours: See above
- Unit Cost Adjustment Factor: none

- Item: Subcontract Geoprobe equipment and crew.
  - Estimated at $1,000 per day for rig * 26 days = $26,000
  - 2 crew per rig * 12 hours/day * 26 days * $20/hour = $12,480
  - 1 field sampler/data logger * 12 hrs/day * 26 days * $20/hr = $6,240
  - 1 full time subcontract field manager = 12 hrs/day*26 days*$60/hr = $18,720
  - 1 full time Safety supervisors * 12 hrs/day*26 days*50/hr = $15,600
  - 1 full time geologist = 12 hrs/day*26 days*$50/hr = $15,600

Total for Activity 1GHC016150:

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Total: 1,654 Labor Hours, 48,246 Labor Cost, 270,715 Total Prime Cost, 13,605 Burden Cost, 380,416 Total Cost.
## Rocky Flats Closure Project
### Baseline Cost and Basis of Estimate

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<td>E050</td>
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**Item: Site Supplies**

Based on similar projects, $5,000 is required to cover health and safety equipment for Site personnel, Site Personnel office supplies, and miscellaneous project supplies not covered under the subcontract.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

<table>
<thead>
<tr>
<th>Item:  Site Supplies</th>
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</thead>
<tbody>
<tr>
<td>$5,000 is required to cover health and safety equipment for Site personnel, Site Personnel office supplies, and miscellaneous project supplies not covered under the subcontract. This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.</td>
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</table>

**Line Item 02000 - Analyze samples**

Vendor Quote Average cost provided from Kaiser-Hill ASD for the 2000 rebaseline.

**Item Desc:** Analyze samples produced from geoprobe borings. 130 samples will be collected. The samples will be analyzed as follows with costs from the KH ASD guidance provided for the FY00 rebaseline effort:

- **Rad Screens** = 130 at $32/sample
- **Metals** = 130 at $345/sample
- **Rad isotopes** = 130 at $590/sample
- **VOCs** = 130 at $280/sample
- **Other RH (Nitrate)** = 130 at $199 per sample
- **Shipping charge** = $42/10 bottles * $42 * (520 bottles/10 bottles per shipment = 52 shipments)
- **Note:** Rad screens are not shipped.

**Estimated Costs**

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<th>Item</th>
<th>Quantity</th>
<th>Unit Cost</th>
<th>Total Cost</th>
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<tr>
<td>Rad Screens</td>
<td>130</td>
<td>$32</td>
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<tr>
<td>Metals</td>
<td>130</td>
<td>$345</td>
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<tr>
<td>Rad isotopes</td>
<td>130</td>
<td>$590</td>
<td>$76,700</td>
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<tr>
<td>VOCs</td>
<td>130</td>
<td>$280</td>
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<tr>
<td>Other RH (Nitrate)</td>
<td>130</td>
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<tr>
<td>Shipping charge</td>
<td>520 bottles</td>
<td>$42</td>
<td>$21,840</td>
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</table>

**Total Estimated Cost for Analyze samples**: $234,750
VOC validation = 7 sets of 20 samples * $346/set

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

<table>
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<tr>
<th>Resources</th>
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<th>Department</th>
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<tr>
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<td>ASH</td>
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Line Item 03000 - project mgmt oversight

BOE

Estimator's Experience

Item Desc: Project Management/Oversight. Based on full time for a Project Manager and 25% support from a Secretary and a Cost Estimator/Scheduler

Breakdown of Cost Data:
- Item: Mgmt oversight
- Units: hours
- Unit Cost: 26 days * 8 hrs/day = 208 hours
- M040 Project manager 208 hours
- G910 Secretary 52 hrs (1/4 time)
- P070 Planner 52 hrs (1/4 time)
- Unit Cost Adjustment Factor: none
- Revised Unit Hours: none

Basis for adjustment:

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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<tr>
<th>Resources</th>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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<tr>
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<td>G010</td>
<td>ADMINISTRATIVE ASSISTANTS</td>
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<td>Hours</td>
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### Rocky Flats Closure Project

#### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0101  
**Activity ID:** 1GHC016150

**Starts In FY:**

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<th>Description</th>
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<th>Burden Cost</th>
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<td>2,842</td>
<td>3,859</td>
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</table>

#### Estimator's Experience on similar projects

**Item Desc:** Perform Data Analysis including GIS representation of data, Characterization Report, and associated project management.

**Breakdown of Cost Data:**

- **Item:** Develop Characterization Report  
  **Units:** 728 hours

1. Environmental Engineers full time for 2 weeks to develop draft 160 hrs
2. Project Manager full time for 4 weeks 160 hrs
3. Secretary 1/2 time for 4 weeks to format and copy 80 hrs
4. QA person 8 hours for review 8 hrs
5. GIS individuals 2 weeks to create/revise maps 160 hrs
6. Environmental Engineer full time 1 week for comment response 80 hrs
7. Project planner 1/2 time for 4 weeks 80 hrs

**Unit Cost Adjustment Factor:** none
**Revised Unit Hours:**

**Basis for adjustment:** None

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

#### Resources

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<th>Quantity</th>
<th>Units</th>
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<th>Materials/ Sub</th>
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**Total for Activity 1GHC016170:**

- **Labor Cost:** 2,842 dollars
- **Materials/Sub:** 3,859 dollars
- **Total Cost:** 30,676 dollars

---

**Note:** The content provided includes detailed cost estimates for various activities, with specific line items and factors applied to each component. The breakdown of costs, including labor, materials, and overhead, is clearly outlined to ensure comprehensive estimation.
### Line Item SYS - Contingency And Escalation

<table>
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<th>Skill</th>
<th>Department</th>
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| Line Item | Description | Quantity | Units | BOE Type | Labor Hours/Unit | Labor Hours Total | Labor Cost Total | Materials/ Sub Cost | Contingency & Escalation | Total Prime Cost | Burden Cost | Total Cost |
|-----------|-------------|----------|-------|----------|-----------------|-------------------|------------------|----------------------|---------------------|----------------|------------|
| 1000      | PAM         | 1.00     | each  | EE       | 176             | 176               | 5,336            | 0                    | 0                   | 5,336          | 1,505      | 6,841      |
| SYS       | Contingency And Escalation | 1.00     | ka    | EE       | 0               | 0                 | 0                | 984                  | 984                 | 0              | 984        |

Total for Activity 1GHC016190:

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| Line Item | Description | Quantity | Units | BOE Type | Labor Hours/Unit | Labor Hours Total | Labor Cost Total | Materials/ Sub Cost | Contingency & Escalation | Total Prime Cost | Burden Cost | Total Cost |
|-----------|-------------|----------|-------|----------|-----------------|-------------------|------------------|----------------------|---------------------|----------------|------------|
| 2000      | procurement & field prep | 0.25     | each  | EE       | 840             | 210               | 6,177            | 2,123                | 0                   | 8,300          | 2,150      | 10,450      |
| SYS       | Contingency And Escalation | 1.00     | ka    | EE       | 0               | 0                 | 0                | 5,990                | 5,990               | 0              | 5,990      |

Total for Activity 1GHC016210:

Line Item 2000 - PAM

- **BOE**
  - **Cost Element**: 750 STRAIGHT TIME BASE
  - **Skill**: E050 ENVIRONMENTAL ENGINEERS
  - **Department**: R100S RMRS Salaried
  - **Curve**: Linear
  - **Quantity**: 156 hours
  - **Units Cost**: 18.00 Hours

### Line Item SYS - Contingency And Escalation

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<th>Resources</th>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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<tr>
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<td>ZDEPT</td>
<td>No Department</td>
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| Line Item | Description | Quantity | Units | BOE Type | Labor Hours/Unit | Labor Hours Total | Labor Cost Total | Materials/ Sub Cost | Contingency &Escalation | Total Prime Cost | Burden Cost | Total Cost |
|-----------|-------------|----------|-------|----------|-----------------|-------------------|------------------|----------------------|---------------------|----------------|------------|
| 2000      | procurement & field prep | 0.25     | each  | EE       | 840             | 210               | 6,177            | 2,123                | 0                   | 8,300          | 2,150      | 10,450      |
| SYS       | Contingency And Escalation | 1.00     | ka    | EE       | 0               | 0                 | 0                | 5,990                | 5,990               | 0              | 5,990      |

Total for Activity 1GHC016210:

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| Line Item | Description | Quantity | Units | BOE Type | Labor Hours/Unit | Labor Hours Total | Labor Cost Total | Materials/ Sub Cost | Contingency & Escalation | Total Prime Cost | Burden Cost | Total Cost |
|-----------|-------------|----------|-------|----------|-----------------|-------------------|------------------|----------------------|---------------------|----------------|------------|
| 2000      | procurement & field prep | 0.25     | each  | EE       | 840             | 210               | 6,177            | 2,123                | 0                   | 8,300          | 2,150      | 10,450      |
| SYS       | Contingency And Escalation | 1.00     | ka    | EE       | 0               | 0                 | 0                | 5,990                | 5,990               | 0              | 5,990      |

Total for Activity 1GHC016210:

**Line Item 1000 - PAM**

- **BOE**
  - **EOE**: Estimator's Experience based generally on historical data for Ryan's Pit
  - **Item Desc:** Preparation of PAM in support of source removal of previously characterized UBC
  - **Breakdown of Cost Data:**
    - **Item**: Preparation of PAM for Ryan's Pit source removal action.
    - **Units**: hours
    - **Unit Cost**: 700
    - **Unit Cost Adjustment Factor**: 0.25
    - **Revised Unit Hours**: 176
  - **Basis for adjustment**: Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

**Line Item SYS - Contingency And Escalation**

- **BOE**
  - **EOE**: Estimator's Experience based generally on historical data for Ryan's Pit

**Cost Element**

- **Skill**: CON CONTINGENCY
- **Quantity**: 0000
- **Units**: ZDEPT
- **Units Cost**: 1,283.57 Dollars

**Cost Element**

- **Skill**: ESC ESCALATION
- **Quantity**: 0000
- **Units**: ZDEPT
- **Units Cost**: 2,574.95 Dollars

**Cost Element**

- **Skill**: CON CONTINGENCY
- **Quantity**: 0000
- **Units**: ZDEPT
- **Units Cost**: 327.44 Dollars

**Cost Element**

- **Skill**: ESC ESCALATION
- **Quantity**: 0000
- **Units**: ZDEPT
- **Units Cost**: 656.88 Dollars
### Resources

#### Cost Element | Skill | Department | Curve | Quantity | Units
--- | --- | --- | --- | --- | ---
750 | STRAIGHT TIME BASE | E050 | ENVIRONMENTAL ENGINEERS | R100S | PMRS Salaried | Linear | 200.00 | Hours
Factors | 200 | hrs
750 | STRAIGHT TIME BASE | G010 | ADMINISTRATIVE ASSISTANTS | R100S | PMRS Salaried | Linear | 80.00 | Hours
Factors | 80 | hrs
750 | STRAIGHT TIME BASE | M040 | MANAGERS (GRADE 64 - 68) | R100S | PMRS Salaried | Linear | 160.00 | Hours
Factors | 160 | hrs
750 | STRAIGHT TIME BASE | P030 | BUYERS PROCUREMENT AND CON | K216S | Subcontracts Management | Linear | 160.00 | Hours
Factors | 160 | hrs
750 | STRAIGHT TIME BASE | P080 | HEALTH PHYSICISTS | R100S | PMRS Salaried | Linear | 80.00 | Hours
Factors | 80 | hrs
750 | STRAIGHT TIME BASE | P090 | INDUSTRIAL HYGIENISTS | R100S | PMRS Salaried | Linear | 80.00 | Hours
Factors | 80 | hrs
750 | STRAIGHT TIME BASE | T050 | RADIATION CONTROL TECHNOLOGI | KG10H | Remediation Steelworkers | Linear | 80.00 | Hours
Factors | 80 | hrs
ASH | SUBCONTRACTED SRVS | P070 | COST ESTIMATORS PLANNERS AN | K265S | ER Programs | Linear | 4,262.63 | Dollars
Factors | 42 | estimated $/hr
ASH | SUBCONTRACTED SRVS | S090 | OTHER SCIENTISTS | K253S | Remediation, Industrial & Site Serv | Linear | 4,422.80 | Dollars
Factors | 5000 | $

#### Line Item SYS - Contingency And Escalation

| Cost Element | Skill | Department | Curve | Quantity | Units |
--- | --- | --- | --- | --- | ---
CON | CONTINGENCY | 0000 | NONE | ZDEPT | No Department | Linear | 3,971.03 | Dollars
Factors | 3,971.03 | Dollars
ESC | ESCALATION | 0000 | NONE | ZDEPT | No Department | Linear | 1,618.82 | Dollars
Factors | 1,618.82 | Dollars

**Activity ID:** 1GHC016225  
**Description:** Field Document Preparation - IHSS Group 100-1

---

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

Basis for adjustment. This line item has a factor of .25 to account for the fact that 4 IHSS Groups will be remediated together reducing these costs.

Total = 960 hours, $5,000 ASh

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Rocky Flats Closure Project
Baseline Cost and Basis of Estimate

WBS No: 1GAC0101
Activity ID: 1GHC016225

Historical Data Source - Costs derived from the Ryan's Pit Remedial Action. Costs were not revised because the effort will be the same.

Item Desc - Preparation of Health and Safety Plan (HASP). The HASP from the OPWL will be provided to the subcontractor for information on developing this HASP.

Breakdown of Historical Data:
- Item - HASP development
  - Units: each
  - Unit Cost: $10,000
  - Unit Cost Adjustment factor - .25
  - Revised Unit Cost -
  - Basis for adjustment - The line item has a factor of 0.25 as 4 UBCs will be remediated at once and the document preparation costs are split 4 ways.

Item - Review by Site Personnel. Based on historical costs, it was assumed that the HASP will be reviewed by an Environmental Engineer, Project Manager, QA/QC specialist, Site Health and Safety, and Site Rad Engineer. Each will require 40 hours review time. The line item has a factor of 0.25 as 4 UBCs will be remediated at once and the document preparation costs are split 4 ways.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

Line Item 3100 - HASP

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
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<tr>
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Line Item 3200 - SAP

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<td>Linear</td>
<td>20.00</td>
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</table>

Estimator's Experience based generally on historical data for Ryan's Pit. Document assumed to take the same effort as the Ryan's Pit and T3/T4 SAPs.

Item Desc: Preparation of SAP in support of source removal of previously characterized OPWL.

Breakdown of Historical Data:
- Item: Preparation of SAP for Ryan's Pit source removal action.
  - Units: hours
  - Unit Cost: 300
  - Project management 1/2 time = 40 hours
  - 2 Environmental Engineers full time = 160 hours
  - GIS support for Maps = 40 hours
  - Secretarial support for document = 40 hours
  - QA/QC support for prep and review = 20 hours

  - Unit Cost Adjustment Factor: .25
  - Revised Unit Hours:

  Basis for adjustment: The line item has a factor of 0.25 as 4 UBCs will be remediated at once and the document preparation costs are split 4 ways.
## Baseline Cost and Basis of Estimate

### Rocky Flats Closure Project

#### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0101  
**Activity ID:** 1GHC016225  
**Project:** 1GAC  
**Baseline Devl:** *  
**WBS Filter:** 1GAC  
**Activity Filter:** *

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<td>1GAC0101</td>
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### 750 - STRAIGHT TIME BASE  
**G010** ADMINISTRATIVE ASSISTANTS  
**R100S** RMRS Salaried  
**Linear**

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### 750 - STRAIGHT TIME BASE  
**M040** MANAGERS (GRADE 64 - 68)  
**R100S** RMRS Salaried  
**Linear**

<table>
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<th>Hours</th>
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### 750 - STRAIGHT TIME BASE  
**P060** COMPUTER SYSTEMS ANALYSTS  
**R100S** RMRS Salaried  
**Linear**

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### Line Item 3300 - WMP

**BOE**  
**Skill**  
**Quantity**  
**Curve**  
**Units**

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<tr>
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**Factors:** 80 hrs

**Estimator's Experience based generally on historical data for Ryan's Pit**

**Item Desc:** Preparation of WMP in support of source removal of previously characterized UBC.

**Breakdown of Historical Data:**
- **Item:** Preparation of WMP for Ryan's Pit source removal action.  
  **Units:** hours  
  **Unit Cost:** 80  
  **Unit Cost Adjustment Factor:** .25  
  **Revised Unit Hours:**

Basis for adjustment. The line item has a factor of 0.25 as 4 UBCs will be remediated at once and the document preparation costs are split 4 ways.

### Resources

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<th>Curve</th>
<th>Quantity</th>
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**Factors:** 80 hrs

**Line Item 3400 - IWCP**

**BOE**  
**Skill**  
**Quantity**  
**Curve**  
**Units**

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<th>Skill</th>
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<th>Curve</th>
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<td>E050</td>
<td>ENVIRONMENTAL ENGINEERS</td>
<td>Linear</td>
<td>80.00</td>
<td>Hours</td>
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</table>

**Factors:** 80 hrs

**Historical Data Source - Horizontal Drilling under Building 886**

**Item Desc:** IWCP preparation  
**Breakdown of Historical Data:**  
- **Item:** IWCP preparation  
  - **Units:** 80 hrs  
  - **Unit Cost:** na  
  - **Unit Cost Adjustment factor:** .25  
  - **Revised Unit Cost:**

**Basis for adjustment - The IWCP will mostly consist of the FIP, developed in a separate line item. This item will be for producing some text and obtaining approvals. The line item has a factor of 0.25 as 4 UBCs will be remediated at once and the document preparation costs are split 4 ways.**

### Resources

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<th>Skill</th>
<th>Department</th>
<th>Curve</th>
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<td>Hours</td>
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**Factors:** 80 hrs

**Line Item 3500 - FIP**

**BOE**  
**Skill**  
**Quantity**  
**Curve**  
**Units**

<table>
<thead>
<tr>
<th>Cost Element</th>
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**Factors:** 40 hrs

**Historical Data Source - East Trenches Plume Project**

**Item Desc:** Production of a Field Implementation Plan (FIP). Much of the data will be supplied to the subcontractor in the Decision Document.

**Breakdown of Historical Data:**  
- **Item:** Preparation of a FIP  
  - **Units:** $17,400 from sucessful bidder  
  - **Unit Cost:** na  
  - **Unit Cost Adjustment factor:** .25  
  - **Revised Unit Cost:** na

**Basis for adjustment - The line item has a factor of 0.25 as 4 UBCs will be remediated at once and the document preparation costs are split 4 ways.**

**Based on similar projects, the FIP will be reviewed by QA/QC - 20 hrs, environmental engineer 40 hrs, and project manager 40 hrs.**

**This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.**

### Resources

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<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
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**Factors:** 40 hrs

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**Factors:** 20 hrs

---

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### Rocky Flats Closure Project

#### Baseline Cost and Basis of Estimate

**Project**

- Baseline Devl

**WBS Filter**

- 1GAC

**Activity Filter**

- * Starts In FY

---

**RMC Salaried MANAGERS (GRADE 64 - 68)**

- **Linear**
- **40.00 Hours**

**ASH SUBCONTRACTED SRVS**

- **0000**
- **K26S**
- **ER Programs**

- **Linear**
- **14,716.22 Dollars**

---

### Line Item SYS - Contingency And Escalation

**BOE Resources**

- **Cost Element**
- **Skill**
- **Quantity**
- **Units**
- **Curve**
- **Contingency & Escalation**
- **Total Prime Cost**
- **Burden Cost**
- **Total Cost**

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<tr>
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<th>Contingency &amp; Escalation</th>
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**Total for Activity 1GHC016230:**

- **95**
- **2,873**
- **4,821**
- **4,651**
- **12,345**
- **1,000**
- **13,345**

---

### Activity ID: 1GHC016230

**Description:** Readiness Assessment - IHSS Group 100-1

**BOE**

- **Estimator's Experience based generally on historical data for T-3/T4 Remediation.**

**Item Desc:** Conduct Readiness Assessment in support of source removal action.

**Breakdown of Cost Data:**

- It was estimated that subcontractor involvement would require 80 hours at $60/hour = $4,800. It was assumed that about 3 weeks of time was required for an environmental engineer or similar person in addition to 12 hours of project management, which yielded 132 hours. An additional 11 hours was added for management oversight. It was estimated that a radiological engineer (QA) and an industrial hygienist would be needed for 2.5 days each (22 hours).

- **Item: Site Labor to perform Readiness Assessment for T-3/T-4.**
  - **Units:** hours
  - **Unit Cost:** $187
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** 47

- **Item: Subcontractor costs to perform Readiness Assessment for T-3/T-4.**
  - **Units:** 1 lot
  - **Unit Cost:** $4.8K
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** $1.2K

**Basis for adjustment:** Costs for each UBC are divided by 4 to account for the fact that 4 UBCs will be remediated at once and only one Readiness Assessment is needed for the group.

- **25% of 132 hrs - Environmental Engineer 33 Hours**
- **25% of 22 hrs - Health Physicists 5.5 Hours**
- **25% of 11 hrs - Manager 3 Hours**
- **25% of 22 hrs - Industrial Hygienist 5.5 Hours**
- **25% of $4,800 - A5H Subcontracted Srvs 1,200 Dollars**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

### Resources

**Cost Element**

- **Skill**
- **Quantity**
- **Units**
- **Curve**
- **Contingency & Escalation**
- **Total Prime Cost**
- **Burden Cost**
- **Total Cost**

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<tr>
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<th>Description</th>
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## Rocky Flats Closure Project
### Baseline Cost and Basis of Estimate

#### WBS Filter
- **WBS No:** 1GAC0101
- **Activity ID:** 1GHC016230

#### Activity Filter
- **Activity ID:** 1GHC016230
- **WBS Filter:** 1GAC
- **Starts In FY:** *

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#### Breakdown of Cost Data:
- **Item Desc:** Conduct Training in support of source removal action.
- **Breakdown of Cost Data:**
  - **Item:** Site Labor to perform above individual tasks for T-3/T-4.
    - **Units:** hours
    - **Unit Cost:** 132 Hours
    - **Unit Cost Adjustment Factor:** 0.25
    - **Revised Unit:** 33 hours
  - **Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
    - **Units:** 1 lot
    - **Unit Cost:** $12K
    - **Unit Cost Adjustment Factor:** 0.25
    - **Revised Unit:** $3K

#### Resources
- Estimator's Experience based generally on historical data for T-3/T4 Remediation.
- **Item Desc:** Conduct Training in support of source removal action.

#### Line Item 4200 - training
- **BOE 0.84576 [SYS 061400] .84576000 - System**

#### Breakdown of Cost Data:
- **Item:** Site Labor to perform above individual tasks for T-3/T-4.
  - **Units:** hours
  - **Unit Cost:** 60 hours
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** 15 hours

#### Basis for adjustment.
- Costs for each UBC are divided by 4 to account for the fact that 4 UBCs will be remediated at once and only one Training is needed for the group.
- **25% of 132 hrs - Onsite employees 33 Hours**
- **25% of $12,000 hrs- Subcontractor employees 3,000 dollars**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

#### Line Item 4300 - pre-evolution meeting
- **BOE 0.84576 [SYS 061400] .84576000 - System**

#### Breakdown of Cost Data:
- **Item:** Site Labor to perform above individual tasks for T-3/T-4.
  - **Units:** hours
  - **Unit Cost:** 60 hours
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** 15 hours

#### Basis for adjustment.
- Costs for each UBC are divided by 4 to account for the fact that 4 UBCs will be remediated at once and only one Pre-Evolution Meeting is needed.
It was assumed that the Pre-Evolution Meeting would be limited to five hours. Assuming that 20 subcontract employees would attend at an average cost of $60/hour burdened yields a cost of $6,000. It was assumed that 12 onsite contractor employees would attend to yield another 60 hours.

\[
\begin{align*}
25\% \text{ of } 60 \text{ hrs} & \rightarrow 15 \text{ Hours} \\
25\% \text{ of } $6,000 & \rightarrow 1,500 \text{ Dollars}
\end{align*}
\]

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

**Resources**

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**Factors**

- 15 hrs
- 1500 sub/c support

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**Line Item**

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**Total for Activity 1GHC016240:**

- Labor Total: 63,404
- Labor Cost Total: 101,013
- Total Prime Cost: 100,753
- Burden Cost: 287,234
- Total Cost: 401,287

---

**Line Item 5100 - mobilization**

*Estimator's experience based generally on historical data for T-3/T4 Remediation.*

**Item Desc:** Mobilization in support of remediation.

**Breakdown of Cost Data:**

- **Item:** Site Labor to perform above individual tasks for T-3/T-4.
  - **Units:** hours
  - **Unit Cost:** 1,100
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** 275

- **Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
  - **Units:** 1 lot
  - **Unit Cost:** 184k
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** see below

**Basis for adjustment:** 4 UBCs will be remediated at once and only one mobilization charge is needed for the group.
Cost Element | Skill | Department | Curve | Quantity | Units
--- | --- | --- | --- | --- | ---
T3/T4 = 110 hrs Health Physicists 25% = 27 Hours | E050 | ENVIRONMENTAL ENGINEERS | Linear | 27.00 | Hours
T3/T4 = 330 hrs Manager 25% = 83 Hours | M020 | MANAGERS (GRADE 69 - 72) | Linear | 83.00 | Hours
T3/T4 = 550 hrs Environmental Engineer 25% = 138 Hours | P080 | HEALTH PHYSICISTS | Linear | 138.00 | Hours
T3/T4 = 110 hrs Industrial Hygienist 25% = 27 Hours | P090 | INDUSTRIAL HYGIENISTS | Linear | 27.00 | Hours
T3/T4 subcontractor dollars $184,000 25% = $46,000 | K265S | ER Programs | Linear | 38,904.96 | Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

**Line Item 5200 - site prep**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc: Site Preparation including setting up fencing, trailer, etc.

Breakdown of Historical Data:

<table>
<thead>
<tr>
<th>Item</th>
<th>Task Description</th>
<th>Breakdown of Historical Data</th>
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<tr>
<td>Site Labor to perform above individual tasks for T-3/T-4.</td>
<td>Unit Cost: 120 hours</td>
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<td>Subcontractor costs to perform above individual tasks for T-3/T-4.</td>
<td>Unit Cost: $30k</td>
<td>Revised Unit: $7,500</td>
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The BOE provides one environmental engineer 120 hours for site prep and $30k for subcontract dollars for installation of fencing and trailers. Because of the small size of this remedial action, the costs were reduced by 4 using the assumption that 4 such sites will be remediated together. Work will be done by subcontract staff because no contamination will be encountered during project setup.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

**Line Item 5300 - excavation**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc: Excavation.

Breakdown of Historical Data:

The percentage of the building footprint area assumed contaminated for the source removal estimate is 5% of the building footprint. 12,620 ft² x 5% = 631 ft². The contaminated soil thickness is assumed to be 5 feet for all categories. 631 ft² x 5 ft = 3,155 ft³, or 117 yd³. The footprint of the former tank...
The contaminated area is assumed to have 5% of the area contaminated, so 500 ft² x 5% = 25 ft². The contaminated soil thickness is assumed to be 5 feet under the former tank bottom, so 25 ft² x 5 ft = 125 ft³, or approximately 5 yd³. The total contaminated soil volume is 122 cubic yards.

Total Contaminated Soil to be removed 122CY

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 1.09 - Environmental Engineer 133 Hours
Factor 0.47 - Health Physicists 57 Hours
Factor 0.31 - Project Manager 38 Hours
Factor 0.31 - Industrial Hygienists 38 Hours
Factor 1.00 - Radiological Control Technician 122 Hours
Factor 2.00 - Steelworker 244 Hours
Factor 45.23 - A5H Subcontracted Srvs $5,518 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

<table>
<thead>
<tr>
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<th>Cost Element</th>
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<th>Department</th>
<th>Curve</th>
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</table>

**Line Item 5600 - confirmation sampling**

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:** Confirmation Sampling.

**Breakdown of Historical Data:**

The analytical costs were based on T-3/T-4, which cost $435,574 for 3800 cubic yards of contaminated soil removed. This yielded a unit rate of about $115/cubic yard. Based on estimator experience the cost of sampling including labor and materials was estimated to be 20% of that rate or about $23/ cubic yard.

122 cubic yards * $115/cyd = $14,030 Analytical costs
122 cyd * $23/cyd = $2,806 Sampling costs

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

<table>
<thead>
<tr>
<th>Resources</th>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
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**Line Item 5700 - prepare waste acceptance forms**

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.
Baseline Cost and Basis of Estimate

**Item Desc: Prepare Waste Acceptance Forms**

**Breakdown of Historical Data:**
- **Item:** Site Labor to perform above individual tasks for T-3/T-4.
- **Units:** 80 environmental engineer hours
- **Unit Cost:**
- **Unit Cost Adjustment Factor:** 25%
- **Revised Unit:** 20 hours

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**Line Item 5800 - waste acceptance sampling**

**BOE**

**Item Desc:** Waste Acceptance Sampling

**Breakdown of Historical Data:**
Because the waste acceptance sampling is difficult to predict and could vary significantly from project to project, it was assumed that about $800 worth of additional analysis would be required for 20 cubic yards which is the volume that can be placed in one roll-off. This yielded a unit rate of about $40/cubic yard. This sampling and analysis is in addition to the confirmational samples so the costs are not as great. It was assumed that this sampling would be more labor intensive so the sampling costs were estimated to be about 50% of the analytical costs or about $20/cubic yard.

**Total Contaminated Soil to be removed 122 CY**

**Offsite Waste Volume 122 cy**

122 cyd × $40/cyd = A5H Analytical 4,880 Dollars
122 cyd × $20/cyd = A5H Subcontracted Srvs 2,440 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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<th>Curve</th>
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**Line Item 5900 - field oversight & project mgmt**

**BOE**

**Item Desc:** Field Oversight and Project Management

**Breakdown of Historical Data:**
- **Item:** Site Labor
  - **Units:** Full time support for 20 days = 160 hrs 750 + 80 hrs 751 for project manager, env engineer. Full time support (160 hrs) for a secretary, rad engineer (Health Physicist) and Industrial Hygienist with 25% support from a project planner.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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**Factors**

160 hrs

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6/23/00 9:20:24 AM OFFICIAL USE ONLY
### Rocky Flats Closure Project

#### Baseline Cost and Basis of Estimate

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**Line Item 6000 - backfill**

**BOE**

**Line Item 6100 - regrade**

**BOE**

---

**Trade Publication**

- Means 1995, Site Work & Landscape Cost Data (page 34, 42, and 34)

**Item Desc:** Backfill.

Breakdown of Historical Data:
- **Item:** Site Labor to perform above individual tasks for T-3/T-4.
  - **Units:** hours
- **Unit Cost:** see below
  - **Unit Cost Adjustment Factor:** see below
  - **Revised Unit:** see below

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
- **Units:** 1 lot
- **Unit Cost:** see below
  - **Unit Cost Adjustment Factor:** see below
  - **Revised Unit:** see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Means (1995) Site Work & Landscape Cost Data as follows:

- Common Fill $ 4.77/cubic yard (page 34 Borrow Bank Measure)
- Hauling $ 3.98/cubic yard (page 42 2-mile round-trip, 6 cubic yard dump truck)
- Backfilling $ 1.69/cubic yard (page 34)
- Burden (43%) $ 4.49/cubic yard (page 34)
- Total $14.93/cubic yard or about $15/cubic yard

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

**Factor** $15/cyd * 122 cyds - A5H Subcontracted Srvs

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

**Resources**

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**Factors** 15 units per yard in crates

---

**Line Item 6100 - regrade**

**BOE**

Estimators Experience - The cost for regrading is based on $1.50/square yard from Barrow Source Evaluation for Closure of the OU 5 and OU 7 Landfills 11/17/93. For a 60 yard by 100 yard area (1.24 acres) this yields about $9,000.

Experience Item Desc - Regrading

Breakdown of Cost Data:
- **Item:** 1 regrade effort
  - **Units:** 1 area will require regrading
  - **Unit Cost:** at $9,000 each $9,000
All work will be performed using subcontract labor because no contamination is involved. No RCT support will be required. Site personnel are covered elsewhere.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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### Line Item 6200 - demobilization

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc: Demobilization.

Breakdown of Historical Data: Demobilization: Based on the T-3/T-4 project. The subcontractor cost for demobilization was about $95,000 for 3,800 cubic yards at the T-3/T-4 project. In addition it was estimated that the following hours were necessary:

- Environmental Engineer 300 hours
- Health Physicist 100 hours
- Manager 200 hours
- Industrial Hygienist 100 hours

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

- 25% of 300 hrs - Environmental Engineer 75 Hours
- 25% of 100 hrs - Health Physicist 25 Hours
- 25% of 200 hrs - Manager 50 Hours
- 25% of 100 hrs - Industrial Hygienists 25 Hours

25% of $95,000 - ASH Subcontracted Srvs 23,750 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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### Line Item SYS - Contingency And Escalation

**BOE**

Contingency and escalation are included in fixed costs.

### Resources

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Rocky Flats Closure Project
Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0101

**Activity ID:** 1GH016260

**Baseline Devl:**

**Project:**

**WBS Filter:** 1GAC

**Activity Filter:** *

**Starts In FY:** *

<table>
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</tr>
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<tbody>
<tr>
<td>Activity ID:</td>
<td>1GH016260</td>
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</table>

### Line Item 0100 - develop report

**BOE**

Estimator's Experience on similar projects

Item Desc: Perform Data Analysis including GIS representation of data, Characterization Report, and associated project management.

Breakdown of Cost Data:
- **Units:** hours
- **Unit Cost:** 320
- **Unit Cost Adjustment Factor:** none
- **Revised Unit Hours:** 320

Basis for adjustment: None

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
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<tbody>
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<td>RMRS Salaried</td>
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<td>750 STRAIGHT TIME BASE</td>
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<td>RMRS Salaried</td>
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<td>Hours</td>
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### Line Item 01000 - develop NFA documentation

**BOE**

Estimator's Experience:

This estimate was constructed based on actual hours required to complete previous NFA Reports (obtained from actual author) and professional judgement of level of effort required for remaining reports.

Item Desc: Perform Data Analysis including GIS representation of data, Characterization Report, and associated project management.

Breakdown of Cost Data:
- **Units:** hours
- **Unit Cost:** 138
- **Unit Cost Adjustment Factor:** none

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<tr>
<td>GISTechnician</td>
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<tr>
<td>Technical Editor</td>
<td>Complete initial and revised tech edits of Report.</td>
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<tr>
<td>QA</td>
<td>Review and comment per area of expertise.</td>
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<tr>
<td>Peer (2)</td>
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<td>8 hrs</td>
<td>Hours</td>
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<tr>
<td>Compliance</td>
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<td>Hours</td>
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<td>Environmental</td>
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<tr>
<td>Management (2)</td>
<td>Review and comment per area of expertise.</td>
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<td>Legal</td>
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<tr>
<td>Environmental Engineer</td>
<td>Disposition comments and finalize document.</td>
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<td>Hours</td>
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<tr>
<td>Administrative Support</td>
<td>Copy &amp; assemble final documents, submit to records.</td>
<td>6 hrs</td>
<td>Hours</td>
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### Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

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#### Resources

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<td>STRAIGHT TIME BASE</td>
<td>E110 QUALITY CONTROL ENGINEERS</td>
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#### Line Item SYS - Contingency And Escalation

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<th>Quantity</th>
<th>Units</th>
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#### WBS No: 1GAC0102

| Title: | Group 100-2 (B125) |
| Activity ID: | 1GFB160100 |
| Description: | SAP Preparation - IHSS Group 100-2 (B125) |
| Cost Risk | 2 Schedule Risk | 3 |

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<th>Labor Cost Total</th>
<th>Material/Sub Cost</th>
<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
<th>Burden Cost</th>
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Total for Activity 1GFB160100:

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<th>Material/Sub Cost</th>
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<th>Burden Cost</th>
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<td>4,282</td>
<td>16,007</td>
<td>3,565</td>
<td>19,573</td>
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#### Line Item 01000 - SAP/HASP Addenda

**BOE**

Estimator's Experience 10 years of experience planning, estimating and conducting projects of similar scope.

**Item Desc:** Preparation of SAP Addenda to Industrial Area Characterization Plan

**Breakdown of Cost Data:**

- **Item:** Prepare SAP and HASP addenda. Address KH, DOE and regulatory agency comments on SAP.
  - **Units:** hours
  - **Unit Cost:** 380
  - **Unit Cost Adjustment Factor:** none
  - **Revised Unit Hours:** 380

- **E050 Environmental Engineer 3 Weeks for document development 120 hrs**

- **M040 Project Management 40 hrs oversight of project**
Project: Rocky Flats Closure Project  
Baseline Cost and Basis of Estimate

WBS No: 1GAC0102  
Activity ID: 1GFB160100

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<td>QUALITY CONTROL ENGINEERS</td>
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<td>SECRETARIES</td>
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<td><strong>750</strong></td>
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<td>MANAGERS (GRADE 64 - 68)</td>
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**Line Item SYS - Contingency And Escalation**

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**Activity ID: 1GFB160120**  
Description: Procurement and Field Prep - IHSS Group 100-2

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<th>Description</th>
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<th>Material/ Sub Cost</th>
<th>Contingency &amp; Escalation</th>
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<th>Total Cost</th>
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<tr>
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<td>procurement &amp; field prep</td>
<td>1.00</td>
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<td>10,093</td>
<td>5,650</td>
<td>15,743</td>
<td>2,846</td>
<td>18,589</td>
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<td>2,846</td>
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Total for Activity 1GFB160120:  
340 | 10,093 | 5,650 | 2,846 | 18,397 | 2,654 | 0 | 2,654 | 2,846 | 21,244

**Line Item 1000 - procurement & field prep**

**BOE**  
Estimator's Experience: the following estimates are based on the recent (FY00) experience from the horizontal drilling project for Building 886.


- E050 Environmental Engineer 80 hours to develop Statement of Work, technical review of proposals and additional procurement activities.
- M040 Project Management 80 hours to develop Statement of Work, technical review of proposals and additional procurement activities.
- G040 Administrative 20 hours Secretarial support for document prep and distribution.
- P080 Health Physicist 20 hours to perform ALARA review, assist with RWP development and evaluate radiological concerns, review and comment on subcontractor HASP.
- P090 Industrial Hygienist 20 hrs to address health and safety concerns, review and comment.
Project: Rocky Flats Closure Project
Baseline Cost and Basis of Estimate

WBS No: 1GAC0102
Activity ID: 1GFB160120

P070 Project Controls 40 hours for budget and project control support
P030 Procurement Support 80 hours for procurement activities.
T050 RCT 40 hours to develop RWP
$5,000 Ecology Support Based on most project requirements.

Total = 380 hours, $5,000 A5H

Basis for adjustment. None

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Cost Element** | **Skill** | **Department** | **Curve** | **Quantity** | **Units** | **Contingency & Escalation** |
--- | --- | --- | --- | --- | --- | --- |
750 | STRAIGHT TIME BASE | E050 | ENVIRONMENTAL ENGINEERS | R100S | RMRS Salaried | Linear | Hours | 80.00 |
Factors | 80 hrs |

750 | STRAIGHT TIME BASE | G010 | ADMINISTRATIVE ASSISTANTS | R100S | RMRS Salaried | Linear | Hours | 20.00 |
Factors | 20 hrs |

750 | STRAIGHT TIME BASE | M040 | MANAGERS (GRADE 64 - 68) | R100S | RMRS Salaried | Linear | Hours | 80.00 |
Factors | 80 hrs |

750 | STRAIGHT TIME BASE | P030 | BUYERS PROCUREMENT AND CON | K216S | Subcontracts Management | Linear | Hours | 80.00 |
Factors | 80 hrs |

750 | STRAIGHT TIME BASE | P080 | HEALTH PHYSICIANS | R100S | RMRS Salaried | Linear | Hours | 20.00 |
Factors | 20 hrs |

750 | STRAIGHT TIME BASE | P090 | INDUSTRIAL HYGIENISTS | R100S | RMRS Salaried | Linear | Hours | 20.00 |
Factors | 20 hrs |

750 | STRAIGHT TIME BASE | T050 | RADIATION CONTROL TECHNOLOGI | KG10H | Remediation Steelworkers | Linear | Hours | 40.00 |
Factors | 40 hrs |

ASH | SUBCONTRACTED SRVS | P070 | COST ESTIMATORS PLANNERS AN | K266S | ER Programs | Linear | Dollars | 1,420.88 |
Factors | 40 sub/c support - mrrs corp | 42 estimated $/hr | 0.84576 [SYS 061400] .84576000 - System |

ASH | SUBCONTRACTED SRVS | S090 | OTHER SCIENTISTS | K253S | Remediation, Industrial & Site Serv | Linear | Dollars | 4,228.80 |
Factors | 5000 $ |

**Line Item SYS - Contingency And Escalation**

**BOE**

**Activity ID:** 1GFB160140
**Description:** Readiness Assessment - IHSS Group 100-2

**Resources**

**Cost Element** | **Skill** | **Department** | **Curve** | **Quantity** | **Units** | **Contingency & Escalation** |
--- | --- | --- | --- | --- | --- | --- |
CON | CONTINGENCY | 0000 | NONE | ZDEPT | No Department | Linear | Dollars | 869.44 |
Factors | 869.446 Dollars |

ESC | ESCALATION | 0000 | NONE | ZDEPT | No Department | Linear | Dollars | 1,784.89 |
Factors | 1,784.89 Dollars |

**Line Item 01000 - readiness assessment**

**BOE**

**Activity ID:** 1GFB160140
**Description:** Readiness Assessment - IHSS Group 100-2
**Cost Risk:** 1
**Schedule Risk:** 1

**Line Item** | **Description** | **Quantity** | **Units** | **BOE Type** | **Labor Hours/Unit** | **Labor Hours Total** | **Labor Cost Total** | **Material/ Sub Cost** | **Contingency & Escalation** | **Total Prime Cost** | **Burden Cost** | **Total Cost** |
--- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
01000 | readiness assessment | 1.00 | each | EE | 444 | 444 | 13,233 | 3,045 | 0 | 16,278 | 20,010 |

SYS Contingency And Escalation | 1.00 | ea | EE | 0 | 0 | 444 | 0 | 0 | 2,857 | 2,857 | 0 | 2,857 |

Total for Activity 1GFB160140: | 444 | 13,233 | 3,045 | 2,857 | 19,135 | 3,732 | 22,867 |

**Item Desc:** Evaluate readiness of the field characterization team and plans.

**Breakdown of Cost Data:**

- **Item:** Perform readiness evaluation
  - **Units:** hours
  - **Unit Cost:** 444 hours and $3,600 dollars
  - **Unit Cost Adjustment Factor:** none
  - **Revised Unit Hours:**
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**This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.**

---

### Line Item 01000 - collect geoprobe samples

- **BOE Type:** CONTINGENCY
- **Quantity:** 1.00 kach
- **Units:** EE
- **Labor Hours/Unit:** 1.706
- **Labor Hours Total:** 1.706
- **Labor Cost Total:** 47,932
- **Materials/Sub Total:** 120,419
- **Contingency & Escalation:** 0
- **Total Prime Cost:** 168,351
- **Burden Cost:** 181,868
- **Total Cost:** 364,230

---

### Line Item 02000 - analyze samples

- **BOE Type:** ESCALATION
- **Quantity:** 1.00 batch
- **Units:** VQ
- **Labor Hours/Unit:** 0
- **Labor Hours Total:** 0
- **Labor Cost Total:** 0
- **Materials/Sub Total:** 0
- **Contingency & Escalation:** 0
- **Total Prime Cost:** 0
- **Burden Cost:** 0
- **Total Cost:** 0

---

### Line Item 03000 - project mgmt oversight

- **BOE Type:** CON
- **Quantity:** 1.00 batch
- **Units:** EE
- **Labor Hours/Unit:** 0
- **Labor Hours Total:** 0
- **Labor Cost Total:** 0
- **Materials/Sub Total:** 8,806
- **Contingency & Escalation:** 2,042
- **Total Prime Cost:** 10,848
- **Burden Cost:** 10,848
- **Total Cost:** 0

---

**Total for Activity 1GFB160150:**

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<th>Materials/Sub Total</th>
<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
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**Line Item 01000 - collect geoprobe samples**

- **BOE Type:** CON
- **Quantity:** 1.00 kach
- **Units:** EE
- **Labor Hours/Unit:** 1.706
- **Labor Hours Total:** 1.706
- **Labor Cost Total:** 47,932
- **Materials/Sub Total:** 120,419
- **Contingency & Escalation:** 0
- **Total Prime Cost:** 168,351
- **Burden Cost:** 181,868
- **Total Cost:** 364,230

---

**Reserve for adjustment: None**

---

**Estimator's Experience based on similar projects.**

- Item Desc: Field Characterization using Geoprobe. All sample collection will be performed by subcontract personnel including drilling the boreholes; logging the cores; collect, containerize, package, and ship the samples; prepare field documentation; and enter data into the Site environmental database.
- Two drill rigs will be used and two Site Environmental Engineers will supervise field operations of a full time basis. One Site RCT will be required for.

---

**OFFICIAL USE ONLY**
Each geoprobe rig to monitor operations for radiological contamination on a full time basis. Subcontract health and safety staff will be supplemented by part-time support from Site Industrial Hygienist and Radiological Engineers.

The characterization will consist of one geoprobe boring per 400 square feet (same as Bldg. 123 characterization). The building 125 footprint is approximately 17,272 square feet. This equals 43 geoprobe boreholes. The boreholes will be 10 feet deep and 5 samples will be collected per borehole. The 5 samples per borehole includes the QA/QC samples. A total of 215 samples will be collected. One geoprobe holes per day can be safely completed by each rig for a project duration of 22 days.

Each sample suite will consist of:
- DOT Rad Screen
- Metals
- Isotopic Radionuclides (Uranium, Americium, & Plutonium)
- Volatile Organic Compound
- Semi Volatile Organic Compounds

PCBs are assumed not to be present.

Breakdown of Cost Data:
- Item: Site Personnel for support of geoprobe operations
  Units: hours
  Unit Cost:
  - 2 Environmental Engineers fulltime for 22 12-hour days = 352 hrs straight time/176 OT hrs
  - 1 Project manager full time for 22 12-hour days = 176 straight time/88 overtime hrs
  - 3 RCTs full time for 22 12-hour days = 528 straight time/264 overtime hrs. 1 additional
  RCT is budgeted as per plant guidance to fund their required training.
  - 1/4 FTE Industrial Hygiene support = 22 days * 8 hrs * 25% = 44 hours
  - 1/4 FTE project controls and planning = 22 days * 8 hrs * 25% = 44 hours
  - 1/4 FTE secretarial support = 22 days * 8 hrs * 25% = 44 hour
  - 10% Rad Engineering support = 22 days * 8 hrs * 10 % = 17 hours
  - 10% QA support = 22 days * 8 hrs * 10 % = 17 hours
  Unit Cost Adjustment Factor: none
  Revised Unit Hours: See above

- Item: Subcontract Geoprobe equipment and crew.
  Estimated at 2 rigs at $1,000 per day for rig * 22 days = $44,000
  - 2 crew per rig * 12 hours/day * 22 days * $20/hour = $21,120
  - 2 field sampler/data logger * 12 hrs/day * 22 days * $20/hr = $10,560
  - full time subcontract field manager = 12 hrs/day*22 days* $60/hr = $15,840
  - full time Safety supervisors * 12 hrs/day*22 days* $50/hr = $13,200
  - full time geologist = 12 hrs/day*22 days* $50/hr = $13,200
  - full time data entry person = 10 hrs/day * 15/hr * 22 days = $3,300
  Miscellaneous supplies and consumables = $100/raig/day = $100*22*2 = $4,400
  - Computer for data entry = $5,000
  - Support vehicles/trucks = 2 @ $2,000/month * 1 months = $4,000

  Total A5H = $134,620

- Item: Site Supplies
  Based on similar projects, $5,000 is required to cover health and safety equipment for Site personnel, Site Personnel office supplies, and miscellaneous project supplies not covered under the subcontract.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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<th>Cost Element</th>
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<th>Department</th>
<th>Curve</th>
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<th>Units</th>
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### Rocky Flats Closure Project

#### Baseline Cost and Basis of Estimate

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#### WBS No: 1GAC0102

### Resources

#### Cost Element

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#### Factors

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### Line Item 02000 - Analyze Samples

**BOE**

**Vendor Quote**

Average cost provided from Kaiser-Hill ASD for the 2000 rebaseline.

**Item Desc:** Analyze samples produced from geoprobe borings. 130 samples will be collected. The samples will be analyzed as follows with costs from the KH ASD guidance provided for the FY00 rebaseline effort:

- Rad Screens = 215 at $32/sample
- Metals = 215 at $345/sample
- Rad isotopes = 215 at $590/sample
- VOCs = 215 at $280/sample
- SemiVOCs = 215 at $440 per sample
- Bottle charge = $7 per bottle * 1075 bottles
- Shipping charge = $42/10 bottles = $42 * (860 bottles/10 bottles per shipment = 86 shipments)
- Note: rad screens are not shipped
- Metals validation = 11 sets of 20 samples * $335/set
- Rad validation = 11 sets of 20 samples * $312/set
- VOC validation = 11 sets of 20 samples * $346/set
- SVOC validation = 11 sets of 20 samples * $385/set

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
# Rocky Flats Closure Project

## Baseline Cost and Basis of Estimate

### Line Item 03000 - Project Mgmt Oversight

**BOE**

**Item Description:**
Project Management/Oversight. Based on full time for a Project Manager and 25% support from a Secretary and a Cost Estimator/Scheduler.

**Breakdown of Cost Data:**
- **Item:** Mgmt oversight
- **Units:** hours
  - **Unit Cost:** 22 days * 8 hrs/day = 176 hours
- **M040 Project manager 176 hours**
- **G010 Secretary 44 hrs (1/4 time)**
- **P070 Planner 44 hrs (1/4 time)**

**Unit Cost Adjustment Factor:** none

**Revised Unit Hours:** none

**Basis for adjustment:**
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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### Line Item 03000 - Project Mgmt Oversight

**BOE**

- **Description:** Prepare Summary/NFA - IHSS Group 100-2

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### Line Item 01000 - Develop Characterization Report

**BOE**

Estimator's Experience on similar projects

Item Desc: Perform Data Analysis including GIS representation of data, Characterization Report, and associated project management.

Breakdown of Cost Data:

- 2 Environmental Engineers full time for 2 weeks to develop draft
- 1 Project Manager full time for 4 weeks
- 1 Secretary 1/2 time for 4 weeks to format and copy
- 1 GIS individual 2 weeks to create/revise maps
- 2 Environmental Engineer full time 1 week for comment response
- 1 project planner 1/2 time for 4 weeks

Unit Cost Adjustment Factor: none

Revised Unit Hours: none

Basis for adjustment: None

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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### Line Item SYS - Contingency And Escalation

**BOE**

Estimator's Experience based generally on historical data for Ryan's Pit

Item Desc: Prepare Decision Document - IHSS 100-2

### Activity ID: 1GFB160190

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Total for Activity 1GFB160190:

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<th>Contingency &amp; Escalation</th>
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Total for Activity 1GFB160190:

- PAM
- Contingency And Escalation
Preparation of PAM in support of source removal of previously characterized UBC.

Breakdown of Cost Data:
Item: Preparation of PAM for Ryan's Pit source removal action.

Units: hours
Unit Cost: 700
Unit Cost Adjustment Factor: 0.25
Revised Unit Hours: 176

Basis for adjustment. Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

Preparation of PAM in support of source removal of previously characterized UBC.

Breakdown of Cost Data:
Item: Preparation of PAM for Ryan's Pit source removal action.

Units: hours
Unit Cost: 700
Unit Cost Adjustment Factor: 0.25
Revised Unit Hours: 176

Basis for adjustment. Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

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Breakdown of Cost Data:
Item: Preparation of PAM for Ryan's Pit source removal action.

Units: hours
Unit Cost: 700
Unit Cost Adjustment Factor: 0.25
Revised Unit Hours: 176

Basis for adjustment. Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

Preparation of PAM in support of source removal of previously characterized UBC.

Breakdown of Cost Data:
Item: Preparation of PAM for Ryan's Pit source removal action.

Units: hours
Unit Cost: 700
Unit Cost Adjustment Factor: 0.25
Revised Unit Hours: 176

Basis for adjustment. Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

Preparation of PAM in support of source removal of previously characterized UBC.

Breakdown of Cost Data:
Item: Preparation of PAM for Ryan's Pit source removal action.

Units: hours
Unit Cost: 700
Unit Cost Adjustment Factor: 0.25
Revised Unit Hours: 176

Basis for adjustment. Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

Preparation of PAM in support of source removal of previously characterized UBC.

Breakdown of Cost Data:
Item: Preparation of PAM for Ryan's Pit source removal action.

Units: hours
Unit Cost: 700
Unit Cost Adjustment Factor: 0.25
Revised Unit Hours: 176

Basis for adjustment. Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

Preparation of PAM in support of source removal of previously characterized UBC.

Breakdown of Cost Data:
Item: Preparation of PAM for Ryan's Pit source removal action.

Units: hours
Unit Cost: 700
Unit Cost Adjustment Factor: 0.25
Revised Unit Hours: 176

Basis for adjustment. Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

Preparation of PAM in support of source removal of previously characterized UBC.

Breakdown of Cost Data:
Item: Preparation of PAM for Ryan's Pit source removal action.

Units: hours
Unit Cost: 700
Unit Cost Adjustment Factor: 0.25
Revised Unit Hours: 176

Basis for adjustment. Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

Preparation of PAM in support of source removal of previously characterized UBC.

Breakdown of Cost Data:
Item: Preparation of PAM for Ryan's Pit source removal action.

Units: hours
Unit Cost: 700
Unit Cost Adjustment Factor: 0.25
Revised Unit Hours: 176

Basis for adjustment. Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

Preparation of PAM in support of source removal of previously characterized UBC.

Breakdown of Cost Data:
Item: Preparation of PAM for Ryan's Pit source removal action.

Units: hours
Unit Cost: 700
Unit Cost Adjustment Factor: 0.25
Revised Unit Hours: 176

Basis for adjustment. Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

Preparation of PAM in support of source removal of previously characterized UBC.

Breakdown of Cost Data:
Item: Preparation of PAM for Ryan's Pit source removal action.

Units: hours
Unit Cost: 700
Unit Cost Adjustment Factor: 0.25
Revised Unit Hours: 176

Basis for adjustment. Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

Preparation of PAM in support of source removal of previously characterized UBC.

Breakdown of Cost Data:
Item: Preparation of PAM for Ryan's Pit source removal action.

Units: hours
Unit Cost: 700
Unit Cost Adjustment Factor: 0.25
Revised Unit Hours: 176

Basis for adjustment. Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

Preparation of PAM in support of source removal of previously characterized UBC.

Breakdown of Cost Data:
Item: Preparation of PAM for Ryan's Pit source removal action.

Units: hours
Unit Cost: 700
Unit Cost Adjustment Factor: 0.25
Revised Unit Hours: 176

Basis for adjustment. Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

Preparation of PAM in support of source removal of previously characterized UBC.

Breakdown of Cost Data:
Item: Preparation of PAM for Ryan's Pit source removal action.

Units: hours
Unit Cost: 700
Unit Cost Adjustment Factor: 0.25
Revised Unit Hours: 176

Basis for adjustment. Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

Preparation of PAM in support of source removal of previously characterized UBC.

Breakdown of Cost Data:
Item: Preparation of PAM for Ryan's Pit source removal action.

Units: hours
Unit Cost: 700
Unit Cost Adjustment Factor: 0.25
Revised Unit Hours: 176

Basis for adjustment. Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

Preparation of PAM in support of source removal of previously characterized UBC.

Breakdown of Cost Data:
Item: Preparation of PAM for Ryan's Pit source removal action.

Units: hours
Unit Cost: 700
Unit Cost Adjustment Factor: 0.25
Revised Unit Hours: 176

Basis for adjustment. Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.
### Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

**WBS Filter:** 1GAC

### Activity 1GFB160210: Field Document Preparation - IHSS Group 100-2

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#### Line Item 01000 - HASP

**BOE Data Source:** Costs derived from the Ryan's Pit Remedial Action. Costs were not revised because the effort will be the same.

- **Item Description:** Preparation of Health and Safety Plan (HASP). The HASP from the OPWL will be provided to the subcontractor for information on developing this HASP.

- **Breakdown of Historical Data:**
  1. **Item - HASP development**
  2. **Units - each**
  3. **Unit Cost - $10,000**
  4. **Unit Cost Adjustment factor - None.**
  5. **Revised Unit Cost - N/A**
  6. **Basis for adjustment - None.**

- **Item - Review by Site Personnel.** Based on historical costs, it was assumed that the HASP will be reviewed by an Environmental Engineer, Project Manager, QA/QC specialist, Site Health and Safety, and Site Rad Engineer. Each will require 40 review hours time.

- **This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.**
**Rocky Flats Closure Project**

Baseline Cost and Basis of Estimate

**WBS Filter:** 1GAC

**Activity Filter:** *

**Starts In FY:** *

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**Line Item 02000 - SAP**

**BOE**

Estimator's Experience based generally on historical data for Ryan's Pit. Document assumed to take the same effort as the Ryan's Pit and T3/T4 SAPs.

**Item Desc:** Preparation of SAP in support of source removal of previously characterized OPWL.

**Breakdown of Historical Data:**

- **Item:** Preparation of SAP for Ryan's Pit source removal action.
- **Units:** hours
- **Unit Cost:** 1200
- **Unit Cost Adjustment Factor:** .25
- **Revised Unit Hours:** 300

**Project management 1/2 time** = 40 hours
**Environmental Engineers full time** = 160 hours
**GIS support for Maps** = 40 hours
**Secretarial support for document** = 40 hours
**QA/QC support for prep and review** = 20 hours

**Basis for adjustment**: The line item has a factor of 0.25 as 4 UBCs will be remediated at once and the document preparation costs are split 4 ways.

**Line Item 03000 - WMP**

**BOE**

Estimator's Experience based generally on historical data for Ryan's Pit.

**Item Desc:** Preparation of WMP in support of source removal of previously characterized UBC.

**Breakdown of Historical Data:**

- **Item:** Preparation of WMP for Ryan's Pit source removal action.
- **Units:** hours
- **Unit Cost:** 80
- **Unit Cost Adjustment Factor:** .25
- **Revised Unit Hours:**

**Basis for adjustment**: The line item has a factor of 0.25 as 4 UBCs will be remediated at once and the document preparation costs are split 4 ways.
### Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

**Activity Filter**: 1GAC

**Baseline Devl**: WBS Filter

---

**WBS No:** 1GAC0102

**Activity ID:** 1GFB160225

**WBS Filter:** 1GAC

**Starts By FY:** *

---

#### Historical Data Source - Horizontal Drilling under Building 886

- **Item Desc**: IWCP preparation
- **Breakdown of Historical Data**:
  - **Item**: IWCP preparation
  - **Units**: 80 hrs
  - **Unit Cost**: na
  - **Unit Cost Adjustment factor**: .25
  - **Revised Unit Cost**: na

**Factors**: 80 hours

#### Historical Data Source - East Trenches Plume Project

- **Item Desc**: Production of a Field Implementation Plan (FIP). Much of the data will be supplied to the subcontractor in the Decision Document.

**Factors**: 80 hours

#### Based on similar projects, the FIP will be reviewed by QA/QC - 20 hrs, environmental engineer 40 hrs, and project manager 40 hrs.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

#### Line Item 04000 - IWCP

**BOE**

- **Cost Element**: Line Item 04000 - IWCP
- **Resources**:
  - **Cost Element**: Line Item 04000 - IWCP
  - **Skill**: E050 ENVIRONMENTAL ENGINEERS
  - **Department**: R100S PMRS Salaried
  - **Quantity**: 80
  - **Unit**: Hours
  - **Curve**: Linear
  - **Factors**: 80 hours

#### Breakdown of Historical Data:

- **Item**: IWCP preparation
- **Units**: 80 hrs
- **Unit Cost**: na
- **Unit Cost Adjustment factor**: .25
- **Revised Unit Cost**: na

**Factors**: 80 hours

---

#### Line Item 05000 - FIP

**BOE**

- **Cost Element**: Line Item 05000 - FIP
- **Resources**:
  - **Cost Element**: Line Item 05000 - FIP
  - **Skill**: E110 QUALITY CONTROL ENGINEERS
  - **Department**: R100S PMRS Salaried
  - **Quantity**: 20
  - **Unit**: Hours
  - **Curve**: Linear
  - **Factors**: 20 hours

**Factors**: 20 hours

---

#### Line Item SYS - Contingency And Escalation

**BOE**

- **Cost Element**: Line Item SYS - Contingency And Escalation
- **Resources**:
  - **Cost Element**: Line Item SYS - Contingency And Escalation
  - **Skill**: K26S ER Programs
  - **Department**: CON D000 COND
  - **Quantity**: 14,716.22
  - **Unit**: Dollars
  - **Curve**: Linear
  - **Factors**: 17,400 days

**Factors**: 17,400 days

---

#### Activity ID: 1GFB160230

**Description**: Readiness Assessment - IHSS Group 100-2

**Cost Risk**: 1

**Schedule Risk**: 1

**Activity ID**: 1GFB160230

**Description**: Readiness Assessment - IHSS Group 100-2

**Line Item** | **Description** | **Quantity** | **Units** | **BOE Type** | **Labor Hours/Unit** | **Labor Hours Total** | **Labor Cost Total** | **Material/ Sub Cost** | **Contingency & Escalation** | **Total Prime Cost** | **Burden Cost** | **Total Cost** |
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### Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

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**Line Item 0100 - readiness assessment**

**BOE**

**Estimator's Experience based generally on historical data for T-3/T4 Remediation.**

**Item Desc:** Conduct Readiness Assessment in support of source removal action.

**Breakdown of Cost Data:**

It was estimated that subcontractor involvement would require 80 hours at $60/hour = $4,800. It was assumed that about 3 weeks of time was required for an environmental engineer or similar person in addition to 12 hours of project management, which yielded 132 hours. An additional 11 hours was added for management oversight. It was estimated that a radiological engineer (QA) and an industrial hygienist would be needed for 2.5 days each (22 hours).

**Item:** Site Labor to perform Readiness Assessment for T-3/T-4.

- **Units:** hours
  - **Unit Cost:** 187
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** 47

**Item:** Subcontractor costs to perform Readiness Assessment for T-3/T-4.

- **Units:** 1 lot
  - **Unit Cost:** $4,800
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** $1,200

**Basis for adjustment. Costs for each UBC are divided by 4 to account for the fact that 4 UBCs will be remediated at once and only one Readiness Assessment is needed for the group.**

- 25% of 132 hrs - Environmental Engineer 33 Hours
- 25% of 22 hrs - Health Physicists 5.5 Hours
- 25% of 11 hrs - Manager 3 Hours
- 25% of 22 hrs - Industrial Hygienist 5.5 Hours
- 25% of $4,800 - ASH Subcontracted Svrs 1,200 Dollars

**This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.**

**Resources**

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**Line Item 0200 - training**

**BOE**

**Estimator's Experience based generally on historical data for T-3/T4 Remediation.**

**Item Desc:** Conduct perform Training in support of source removal action.

**Breakdown of Cost Data:**

**Item:** Site Labor to perform above individual tasks for T-3/T-4.

- **Units:** hours
  - **Unit Cost:** 132 Hours
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** 33 hours

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.

- **Units:** 1 lot
  - **Unit Cost:** $12K
Basis for adjustment. Costs for each UBC are divided by 4 to account for the fact that 4 UBCs will be remediated at once and only one Training is needed for the group.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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<tr>
<th>Cost Element</th>
<th>Skill</th>
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<th>Quantity</th>
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<tr>
<td>Line Item 0300 - pre-evolution meeting</td>
<td>BOE</td>
<td>Estimator's Experience based generally on historical data for T-3/T4 Remediation.</td>
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<tr>
<td>Item Desc:</td>
<td>Conduct Pre-Evolution Meeting in support of source removal action</td>
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<td>Breakdown of Cost Data:</td>
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<td>Item: Site Labor to perform above individual tasks for T-3/T-4.</td>
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Basis for adjustment. Costs for each UBC are divided by 4 to account for the fact that 4 UBCs will be remediated at once and only one Pre-Evolution Meeting is needed for the group.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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<td>Item: Excavation</td>
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<td>Item: Remove and Clean Debris</td>
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Rocky Flats Closure Project

Baseline Cost and Basis of Estimate

Project: Baseline Deviation
WBS Filter: 1GAC
Activity Filter: 1G
Years In FY: *

WBS No: 1GAC0102
Activity ID: 1GFB160240

Baseline Cost and Basis of Estimate

**WBS Filter 1GAC**

- **Project:** Rocky Flats Closure Project
- **Baseline Cost and Basis of Estimate**
- **Activity ID:** 1GFB160240
- **Activity Filter:** *
- **Years In FY:** *

### Line Item 01000 - mobilization

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:** Mobilization in support of remediation.

**Breakdown of Cost Data:**

**Item:** Site Labor to perform above individual tasks for T-3/T-4.
- **Units:** hours
- **Unit Cost:** 1,100
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** 275

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
- **Units:** 1 lot
- **Unit Cost:** 184k
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** see below

**Basis for adjustment:** 4 UBCs will be remediated at once and only one mobilization charge is needed for the group.

**T3/T4** = 110 hrs Health Physicists 25% = 27 Hours
**T3/T4** = 330 hrs Manager 25% = 83 Hours
**T3/T4** = 550 hrs Environmental Engineer 25% = 138 Hours
**T3/T4** = 110 hrs Industrial Hygienist 25% = 27 Hours
**T3/T4** subcontractor dollars $184,000 25% = $46,000

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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### Line Item 02000 - site prep

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:** Site Preparation including setting up fencing, trailer, etc.

**Breakdown of Historical Data:**

**Item:** Site Labor to perform above individual tasks for T-3/T-4.
- **Units:** hours
- **Unit Cost:** 120 hours
- **Unit Cost Adjustment Factor:** 1/4

### Line Item 061400 - System

**SYS**

Contingency And Escalation

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:** Mobilization in support of remediation.

**Breakdown of Cost Data:**

**Item:** Site Labor to perform above individual tasks for T-3/T-4.
- **Units:** hours
- **Unit Cost:** 1,100
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** 275

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
- **Units:** 1 lot
- **Unit Cost:** 184k
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** see below

**Basis for adjustment:** 4 UBCs will be remediated at once and only one mobilization charge is needed for the group.

**T3/T4** = 110 hrs Health Physicists 25% = 27 Hours
**T3/T4** = 330 hrs Manager 25% = 83 Hours
**T3/T4** = 550 hrs Environmental Engineer 25% = 138 Hours
**T3/T4** = 110 hrs Industrial Hygienist 25% = 27 Hours
**T3/T4** subcontractor dollars $184,000 25% = $46,000

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
Revised Unit: 30

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
Units: Dollars
Unit Cost: $30k
Unit Cost Adjustment Factor: 1/4
Revised Unit: $7,500
Basis for adjustment:

The BOE provides one environmental engineer 120 hours for site prep and $30k for subcontract dollars for installation of fencing and trailers. Because of the small size of this remedial action, the costs were reduced by 4 using the assumption that 4 such sites will be remediated together. Work will be done by subcontract staff because no contamination will be encountered during project setup.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

<table>
<thead>
<tr>
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<th>Skill</th>
<th>Department</th>
<th>Curve</th>
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</table>

Line Item 03000 - excavation

BOE

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc: Excavation.

Breakdown of Historical Data: The building footprint is approximately 17,272 square feet 5% is assumed contaminated to a depth of 5 feet. 17,272 * .05 * 5 = 863.6 cubic feet. At 27 cubic yards per cubic foot = 863.6/27 = 160 cubic yards.

Total Contaminated Soil to be removed 160 CY

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 1.09 - Environmental Engineer 174 Hours
Factor 0.47 - Health Physicists 75 Hours
Factor 0.31 - Project Manager 50 Hours
Factor 0.31 - Industrial Hygienists 50 Hours
Factor 1.00 - Radiological Control Technician 160 Hours
Factor 2.00 - Steelworker 320 Hours
Factor 45.23 - * 160 CYD = ASH Subcontracted Srvs $7,236 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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<th>Cost Element</th>
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Line Item 04000 - remove and clean debris

BOE
Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc: Remove and clean debris.

Breakdown of Historical Data:
Total Contaminated Soil to be removed is 160 CY

For the base case, it was assumed that about five cubic yards out of 700 cubic yards would be debris and would be segregated and cleaned. It was estimated that each cubic yard of debris would cost $1,000 or $5,000 total for 700 cubic yards. This yields a rate of $7.14 per cubic yard.

160 cubic yards * $7.14 per cubic yard = $1,142

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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### Line Item 06000 - confirmation sampling

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc: Confirmation Sampling.

Breakdown of Historical Data:
The analytical costs were based on T-3/T-4, which cost $435,574 for 3800 cubic yards of contaminated soil removed. This yielded a unit rate of about $115/cubic yard. Based on estimator experience the cost of sampling including labor and materials was estimated to be 20% of that rate or about $23/ cubic yard.

160 cubic yards * $115/cyd = $18,400 Analytical costs

160 cyd * $23/cyd = $3,680 Sampling costs

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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### Line Item 07000 - prepare waste acceptance forms

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc: Prepare Waste Acceptance Forms

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
Units: 80 environmental engineer hours
Unit Cost: Unit Cost Adjustment Factor: 25%
Revised Unit: 20 hours

### Resources

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### Line Item 08000 - waste acceptance sampling

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc: Waste Acceptance Sampling
### Breakdown of Historical Data:

Because the waste acceptance sampling is difficult to predict and could vary significantly from project to project, it was assumed that about $800 worth of additional analysis would be required for 20 cubic yards which is the volume that can be placed in one roll-off. This yielded a unit rate of about $40/cubic yard. This sampling and analysis is in addition to the confirmational samples so the costs are not as great. It was assumed that this sampling would be more labor intensive so the sampling costs were estimated to be about 50% of the analytical costs or about $20/cubic yard.

Total Contaminated Soil to be removed 160 CY
Offsite Waste Volume 160 cy
160 cyd * $40/cyd - A5H Analytical 6,400 Dollars
160 cyd * $20/cyd - A5H Subcontracted Srvs 3,200 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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### Line Item 09000 - field oversight & project mgmt

**BOE**

Estimator's Experience based generally on historical data for T-3/T-4 Remediation.

Item Desc: Field Oversight and Project Management

Breakdown of Historical Data:

**Item:** Site Labor

Unit: Full time support for 20 days = 160 hrs 750 + 80 hrs 751 for project manager and env engineer. Full time support (160 hrs) for a secretary, rad engineer (Health Physicist) and Industrial Hygienist with 25% support from a project planner.

<table>
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### Line Item 10000 - backfill

**BOE**

Trade Publication

Means 1995, Site Work & Landscape Cost Data (page 34, 42, and 34)

Item Desc: Backfill.

Breakdown of Historical Data:

**Item:** Site Labor to perform above individual tasks for T-3/T-4.

Units: hours
Unit Cost: see below
### Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

**WBS No:** 1GAC0102  
**Activity ID:** 1GFB160240

#### Project

**Baseline Devl**

**WBS Filter** 1GAC  
**Activity Filter** *

#### Unit Cost Adjustment Factor

- **Revised Unit:** see below
- **Unit Cost:** see below
- **Unit Cost Adjustment Factor:** see below
- **Revised Unit:** see below

#### Basis for Adjustment

The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Means (1995) Site Work & Landscape Cost Data as follows:

- **Common Fill $ 4.77/cubic yard** (page 34 Borrow Bank Measure)
- **Hauling $ 3.98/cubic yard** (page 42 2-mile round-trip, 6 cubic yard dump truck)
- **Backfilling $ 1.69/cubic yard** (page 34)
- **Burden (43%) $ 4.49/cubic yard**
- **Total $14.93/cubic yard or about $15/cubic yard**

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

#### Resources

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### Line Item 11000 - regrade

**BOE**

Estimators Experience - The cost for regrading is based on $1.50/square yard from Barrow Source Evaluation for Closure of the OU 5 and OU 7 Landfills 11/17/93. For a 60 yard by 100 yard area (1.24 acres) this yields about $9,000.

**Experience Item Desc - Rerading**

**Breakdown of Cost Data:**

- **Item - 1 regrade effort**
- **Units - 1 area will require regrading**
- **Unit Cost - 1 at $9,000 each = $9,000**
- **Unit Cost Adjustment factor - none**
- **Revised Unit Cost - na**
- **Basis for adjustment - na**

All work will be performed using subcontract labor because no contamination is involved. No RCT support will be required. Site personnel are covered elsewhere.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Line Item 12000 - demobilization

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:** Demobilization.

**Breakdown of Historical Data:** Demobilization: Based on the T-3/T-4 project. The subcontractor cost for demobilization was about $95,000 for 3,800 cubic yards at the T-3/T-4 project. In addition it was estimated that the following hours were necessary:
Environmental Engineer 300 hours  
Health Physicist 100 hours  
Manager 250 hours  
Industrial Hygiene 100 hours  

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.  
25% of 300 hrs - Environmental Engineer 75 Hours  
25% of 100 hrs - Health Physicists 25 Hours  
25% of 200 hrs - Manager 50 Hours  
25% of 100 hrs - Industrial Hygienists 25 Hours  
25% of $95,000 - A5H Subcontracted Srvs 23,750 Dollars  

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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### Line Item SYS - Contingency And Escalation

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### Activity ID: 1GFB160260

**Description:** Prepare Closeout Report - IHSS Group 100-2  

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<th>Burden Cost</th>
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| 0100      | develop NFA documentation | 1.00 | each | EE | 138 | 138 | 4,099 | 0 | 4,099 | 1,426 | 5,525  
| 01000     | develop report | 1.00 | each | EE | 300 | 300 | 8,146 | 710 | 8,857 | 2,835 | 11,692  
| SYS       | Contingency And Escalation | 1.00 | each | EE | 0 | 0 | 0 | 0 | 9,302 | 9,302 | 0 | 9,302 |
| Total for Activity 1GFB160260: | | | | | 438 | 12,245 | 710 | 9,302 | 22,257 | 4,261 | 26,518 |

**Estimator's Experience:**  
This estimate was constructed based on actual hours required to complete previous NFA Reports (obtained from actual author) and professional judgement of level of effort required for remaining reports.

**Item Desc:**  
Perform Data Analysis including GIS representation of data, Characterization Report, and associated project management.

**Breakdown of Cost Data:**  
Item: Develop Documentation  
Units: Hours  
Unit Cost: 138  
Environmental Engineer 45 hrs Evaluate & assemble existing data. Draft Report.  
SMD Technician 10 hrs Identify & pull existing data from database.  
Technical Editor 15 hrs Complete initial and revised tech edits of Report.
### Rocky Flats Closure Project
#### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0102  
**Activity ID:** 1GF160260

### Technical Reviews
- **QA**
  - 4 hrs Review and comment per area of expertise.
- **Peer (2)**
  - 8 hrs Review and comment per area of expertise.
- **Compliance**
  - 4 hrs Review and comment per area of expertise.
- **Environmental**
  - 4 hrs Review and comment per area of expertise.
- **Management (2)**
  - 8 hrs Review and comment per area of expertise.
- **Legal**
  - 4 hrs Review and comment per area of expertise.
- **Environmental Engineer**
  - 15 hrs Disposition comments and finalize document.
- **Administrative Support**
  - 6 hrs Copy & assemble final documents, submit to records.

**Unit Cost Adjustment Factor:** none

**Revised Unit Hours:** 138

**Basis for adjustment:** N/A

### Resources

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**Line Item 01000 - develop report**

**BOE**

Estimator's Experience on similar projects

**Item Desc:**
Perform Data Analysis including GIS representation of data, Characterization Report, and associated project management.

**Breakdown of Cost Data:**
- **Item:** Develop Documentation
- **Units:** hours
- **Unit Cost:** 320
- **Unit Cost Adjustment Factor:** none
- **Revised Unit Hours:** 320

**Basis for adjustment:**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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### Rocky Flats Closure Project
#### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0102  
**Activity ID:** 1GFB160260

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**Line Item 01000 - SAP/HASP Addenda**

Estimator's Experience 10 years of experience planning, estimating and conducting projects of similar scope.

**Item Desc:** Preparation of SAP Addenda to Industrial Area Characterization Plan.

**Breakdown of Cost Data:**
- **Item:** Prepare SAP addenda. Address KN, DOE and regulatory agency comments on SAP.
  - Units: hours
  - Unit Cost: 380
  - Unit Cost Adjustment Factor: .5
  - Revised Unit Hours: 190

- E050 Environmental Engineer 1.5 Weeks for document development 60 hrs
- M040 Project Management 40 hrs oversight of project
- G040 Administrative 20 hours Secretarial support for document prep and distribution
- E110 Quality Control Engineers 10 hours for document review and comment resolution
- P070 Project Controls 40 hours planning and scheduling support based on similar projects.
- P060 GIS Support 20 hrs GIS Support for maps and figures.

**Total = 190 hours**

**Basis for adjustment:** Hours for each UBC are multiplied by 0.5 to account for the fact that 2 UBCs will be characterized at once.

**This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.**

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### Rocky Flats Closure Project

#### Baseline Cost and Basis of Estimate

- **WBS No:** 1GAC0103
- **Activity ID:** 1GHF100300

### Baseline Devl

- **WBS Filter:** 1GAC

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### Activity ID: 1GHF100320

- **Description:** Procurement & Field Preparation - Group 100-3

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**Total for Activity 1GHF100320:**
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- 2,141
- 0
- 433
- 433
- 756
- 2,897
- 3,330

### Activity ID: 1GHF100340

- **Description:** Readiness Review - Group 100-3

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**Total for Activity 1GHF100340:**
- 228
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- 0
- 1,448
- 1,448
- 8,607
- 2,527
- 11,134
### Line Item 3000 - readiness assessment

**BOE**

*Estimator's Experience: Based on similar little projects.*

**Item Desc:** Evaluate readiness of the field characterization team and plans.

#### Breakdown of Cost Data:
- **Item:** Perform readiness evaluation
- **Units:** hours
- **Unit Cost:** 228 hours
- **Unit Cost Adjustment Factor:
  - **Revised Unit Hours:**

  - **E050 Environmental Engineer 1 person fulltime for 9 days = 72 hours**
  - **G010 Secretarial support 10 hours**
  - **P080 Health Physicist 25% support for 9 days = 18 hours**
  - **T050 RCTs 25% support for 9 days = 18 hours**
  - **P050 Compliance Inspectors 10 hours to assist with readiness determination**
  - **E110 Quality assurance Sup. 10 hours to assist with readiness determination**

**Basis for adjustment- None**

---

### Resources

- **Cost Element**
- **Skill**
- **Department**
- **Curve**
- **Quantity**
- **Units**

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### Line Item SYS - Contingency And Escalation

**BOE**

- **Cost Element**
- **Skill**
- **Department**
- **Curve**
- **Quantity**
- **Units**

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### Activity: 1GHF100350

**Description:** Field Characterization - Group 100-3

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Total for Activity 1GHF100350: 160 | 4,438 | 4,932 | 1,652 | 11,052 | 1,567 | 12,589
**Line Item 4100 - collect surficial soil samples**

**BOE**

Item Desc: Collection of surficial soil samples. A site Environmental Engineer will direct the sample collection, containerize, package, and ship the samples; prepare field QC documentation, and prepare field notes on a full time basis. A site RCT will monitor the site for radiological contamination on a full time basis. A site Industrial Hygienist will implement the field portion of the HASP on a full time basis. 2 samples per day will be collected at 4 hrs each.

Breakdown of Cost Data:
- Item: Site Personnel for support of sample collection
- Units: hours
- Unit Cost: 10 samples * 4 hrs each = 40 hrs for each individual.
- Unit Cost Adjustment Factor: none

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**Line Item 4200 - analyze samples**

**BOE**

Vendor Quote From Kaiser-Hill ASD provided for the FY00 rebaseline for analytical, bottles, rad screen and sample collection team.

Item Desc: Analyze samples, they will be analyzed for PCBs. This item is priced on a per sample basis. 10 samples will be collected. This will include the QA/QC samples.

Breakdown of Cost Data:
- Item: Analyze samples at an offsite laboratory.
- Units: analysis
- Unit Cost:
- PCBs $199 each
- Rad Screens $32 each
- Sampling - Non-Rad (base cost per day) $500.00 * 5 days
- Bottles $7 each
- Shipping $42 each

Unit Cost Adjustment Factor: none

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This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Resources**

**Cost Element**

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6/23/00 9:20:30 AM OFFICIAL USE ONLY
Project: Rocky Flats Closure Project
Baseline Cost and Basis of Estimate

WBS No: 1GAC0103
Activity ID: 1GHF100350

Baseline Deviation:
WBS Filter: 1GAC
Activity Filter: *
Starts In FY: *

ASH SUBCONTRATED SRVS 0000 NONE K267S Analytical Laboratory Services
Factors 42 Dollars/shipment 1 Shipments of 10 bottles each 35.52 Dollars

Line Item 4300 - project mgmt oversight

Estimator's Experience

Item Desc:
Project Management/Oversight. Based on half time for a Project Manager, Administrative staff, and Cost Estimator/Scheduler for one week.

Breakdown of Cost Data:
Item: Mgmt oversight
Units: hours
Unit Cost: 60
Unit Cost Adjustment Factor: none
Revised Unit Hours: 60

Basis for adjustment.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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Factors 20 hrs

ASH SUBCONTRATED SRVS P070 COST ESTIMATORS PLANNERS AN K265S ER Programs
Factors 20 hrs 42 estimated $/hr

Line Item SYS - Contingency And Escalation

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Factors 1140.46 Dollars
Factors 511.12 Dollars

Activity ID: 1GHF100370 Description: Prepare NFA - Group 100-3

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Total for Activity 1GHF100370:

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Line Item 5000 - develop NFA documentation

Estimator's Experience:
This estimate was constructed based on actual hours required to complete previous NFA Reports (obtained from actual author) and professional judgement of level of effort required for remaining reports.

Item Desc:
Perform Data Analysis including GIS representation of data, Characterization Report, and associated project management.

Breakdown of Cost Data:
Item: Develop Documentation
Units: Hours
Unit Cost: 138

Environmental Engineer 45 hrs Evaluate & assemble existing data. Draft Report.
SMD Technician 10 hrs Identify & pull existing data from database.
Technical Editor 15 hrs Complete initial and revised tech edits of Report.
Technical Reviews 4 hrs Review and comment per area of expertise.
Peer (2) 8 hrs Review and comment per area of expertise.
Compliance 4 hrs Review and comment per area of expertise.
Environmental 4 hrs Review and comment per area of expertise.
Management (2) 8 hrs Review and comment per area of expertise.
Legal 4 hrs Review and comment per area of expertise.
Environmental Engineer 15 hrs Disposition comments and finalize document.
Administrative Support 6 hrs Copy & assemble final documents, submit to records.

Unit Cost Adjustment Factor: none
Revised Unit Hours: 138

Basis for adjustment: N/A

Cost Element | Skill | Department | Curve | Quantity | Units |
--- | --- | --- | --- | --- | --- |
**Line Item SYS - Contingency And Escalation**

**BOE Resources**

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**WBS No:** 1GAC0104  
**Title:** Group 100-4 (B123)  
**Activity ID:** 1GHE614100  
**Description:** SAP Preparation - IHSS Group 100-4 (Non D&D)

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Total for Activity 1GHE614100:

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Item Desc: Preparation of SAP Addenda to Industrial Area Characterization Plan.

Breakdown of Cost Data:

Item: Prepare SAP and HASP addenda. Address KH, DOE and regulatory agency comments on SAP.
**Resources**

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**Line Item SYS - Contingency And Escalation**

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**Activity ID:** 1GHE614120  
**Description:** Procurement and Field Prep - IHSS Group 100-4

<table>
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<th>Description</th>
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<th>Units</th>
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<th>Labor Hours/Unit</th>
<th>Labor Total</th>
<th>Labor Cost</th>
<th>Total Materials/Sub Cost</th>
<th>Contingency &amp; Escalation</th>
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<th>Burden Cost</th>
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<tbody>
<tr>
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<td>1.00</td>
<td>each</td>
<td>EE</td>
<td>340</td>
<td>340</td>
<td>10,093</td>
<td>5,650</td>
<td>0</td>
<td>15,743</td>
<td>3,492</td>
<td>19,235</td>
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<th>Total Materials/Sub Cost</th>
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<td>EE</td>
<td>340</td>
<td>340</td>
<td>10,093</td>
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<td>0</td>
<td>15,743</td>
<td>3,492</td>
<td>19,235</td>
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Total for Activity 1GHE614120: 340 | 10,093 | 5,650 | 5,333 | 21,076 | 3,492 | 24,568 |
and Utility Clearance/Soil Disturbance Permit.

- 050 Environmental Engineer: 80 hours to develop Statement of Work, technical review of proposals, and additional procurement activities.
- 0640 Project Management: 80 hours to develop Statement of Work, technical review of proposals, and additional procurement activities.
- 040 Administrative: 20 hours Secretarial support for document prep and distribution.
- 080 Health Physicist: 20 hours to perform ALARA review, assist with RWP development and evaluate radiological concerns, review and comment on subcontractor HASP.
- 090 Industrial Hygienist: 20 hours to address health and safety concerns, review and comment.
- 030 Procurement Support: 80 hours for procurement activities.
- T050 RCT: 40 hours to develop RWP.
- $5,000 Ecology Support: Based on most project requirements.

Total = 380 hours, $5,000 ASH

Basis for adjustment: None

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

### Resources

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### Line Item SYS - Contingency And Escalation

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### Activity ID: 1GHE614140

**Description:** Readiness Assessment - IHSS Group 100-4

**Cost Risk:** 2  **Schedule Risk:** 2

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<th>Materials/Sub Cost</th>
<th>Contingency &amp; Escalation</th>
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**Total for Activity 1GHE614140:**

- 444
- 13,233
- 3,045
- 5,840
- 22,118
- 4,579
- 26,697

**BOE**

Estimator's Experience; Based primarily on the horizontal drilling project for Building 886.
### Breakdown of Cost Data:

- **Item:** Perform readiness evaluation
- **Units:** hours
- **Unit Cost:** 444 hours and $3,600 dollars
- **Unit Cost Adjustment Factor:** none
  
#### Revised Unit Hours:

- **E050 Environmental Engineer:** 2 people fulltime for 9 days = 144 hours
- **M040 Project Management:** fulltime for 9 days = 72 hours
- **G010 Secretarial support:** 40 hours
- **P080 Health Physicist:** 50% support for 9 days = 36 hours
- **P090 Industrial Hygienist:** 50% support for 9 days = 36 hours
- **T050 RCTs:** 50% support for 9 days = 36 hours
- **E110 Quality assurance Sup.:** 40 hours to assist with readiness determination
- **A58 Subcontract Support:** 1 person for 9 days = 72 hrs @ $50/hr = $3,600

#### Basis for adjustment:
- None

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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#### Line Item SYS - Contingency And Escalation

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#### Activity ID: 1GHE614150

**Description:** Field Sampling, Lab Analysis - IHSS Group 100-4

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<td>1.232</td>
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This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
Line Item 01000 - collect geoprobe samples

Estimator's Experience

Item Desc: All sample collection will be performed by subcontract personnel including drilling the boreholes; logging the core; collect, containerize, package, and ship the samples; prepare field documentation; and enter data into the Site environmental database. One drill rig will be used and a site Environmental Engineers will supervise field operations of a full time basis. One Site RCT will be required for each geoprobe rig to monitor operations for radiological contamination on a full time basis. Subcontract health and safety staff will be supplemented by part-time support from Site Industrial Hygienist and Radiological Engineers.

Building 123 footprint is approximately 18,444 ft2. An additional 100 sq ft will be investigated for PAC 100-603 for a total of 18,544 sq ft requiring investigation. At 1 borehole per 400 SF of building footprint, there is a total of 46 boreholes. With 5 samples per borehole, this equals 230 samples. The five samples includes QA/QC samples. The soil is potentially contaminated by nitrates, metals, vocs and radionuclides.

Each sample suite will consist of:
- DOT Rad Screen
- Metals
- Isotopic Radionuclides (Uranium, Americium, & Plutonium)
- Volatile Organic Compound
- Nitrates
- PCBs and semivolatiles are assumed not to be present.

Breakdown of Cost Data:

- Item: Site Personnel for support of geoprobe operations
  - Units: hours
  - 1 Environmental Engineers fulltime for 23 12-hour days = 184 hrs straight time/92 OT hrs
  - 1 Project manager full time for 23 12-hour days = 184 straight time/92 overtime hrs
  - 2 RCTs full time for 23 12-hour days = 368 straight time/184 overtime hrs. 1 additional RCT is budgeted as per plant guidance to fund their required training.
  - 1/4 FTE Industrial Hygiene support = 23 days * 8 hrs * 25% = 46 hours
  - 1/4 FTE project controls and planning = 23 days * 8 hrs * 25% = 46 hours
  - 1/4 FTE secretarial support = 23 days * 8 hrs * 25% = 46 hours
  - 10% Rad Engineering support = 23 days * 8 hrs * 10 % = 18 hours
  - 10% QA support = 23 days * 8 hrs * 10 % = 18 hours

- Unit Cost Adjustment Factor: none
  - Revised Unit Hours: See above

- Item: Subcontract Geoprobe equipment and crew.
  - Estimated at $1,000 per day for rig * 23 days = $23,000
  - 2 crew per rig * 12 hours/day * 23 days = $20/hour = $11,040
  - 1 full time subcontract field manager = 12 hrs/day * 23 days * $20/hr = $5,250
  - 1 full time safety supervisors = 12 hrs/day*23 days*$30/hr = $13,800
  - 1 full time data entry person = 10 hrs/day * 15/hr * 23 days = $3,450
  - Miscellaneous supplies and consumables = $100/day = $230
  - Computer for data entry = $5,000
  - Support vehicles/trucks = $2,000/month * 1 months = $2,000

- Total ASH = $96,470

- Item: Site Supplies
  - Based on similar projects, $5,000 is required to cover health and safety equipment for Site personnel, Site Personnel office supplies, and miscellaneous project supplies not covered under the subcontract.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
**Line Item 02000 - Analyze samples**

**BOE**

*Vendor Quote Average cost provided from Kaiser-Hill ASD for the 2000 rebaseline.*

**Item Desc:** Analyze samples produced from geoprobe borings. 230 samples will be collected. The samples will be analyzed as follows with costs from the KH ASD guidance provided for the FY00 rebaseline effort:

- **Rad Screens** = 230 at $32/sample
- **Metals** = 230 at $345/sample
- **Rad isotopes** = 230 at $590/sample
- **VOCs** = 230 at $280/sample
- **Other IH (Nitrate)** = 230 at $199 per sample

**Bottle charge** = $7 per bottle *(230 * 5 analytes) = $7 * 1,150 bottles

**Shipping charge** = $42/10 bottles = $42 * (920 bottles/10 bottles per shipment = 92 shipments) Note: rad screens are not shipped

**Rad validation** = 12 sets of 20 samples * $335/set
**Metals validation** = 12 sets of 20 samples * $335/set
**VOC validation** = 12 sets of 20 samples * $346/set

*This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.*

---

**Resources**

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<th>Skill</th>
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### Rocky Flats Closure Project

#### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0104  
**Activity ID:** 1GHE614150

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### Line Item 03000 - project mgmt oversight

**BOE**

- **Estimator's Experience**
  - **Item Desc:** Project Management/Oversight. Based on full time for a Project Manager and 25% support from a Secretary and a Cost Estimator/Scheduler

**Breakdown of Cost Data:**
- **Item:** Mgmt oversight
  - **Units:** hours
  - **Unit Cost:** 23 days * 8 hrs/day = 184 hours
  - **M040 Project manager 184 hours**
  - **G010 Secretary 46 hrs (1/4 time)**
  - **P070 Planner 46 hrs (1/4 time)**
  - **Unit Cost Adjustment Factor:** none
  - **Revised Unit Hours:** none

**Basis for adjustment:**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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### Line Item SYS - Contingency And Escalation

**BOE**

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| ESC ESCALATION | 0000 | NONE | ZDEPT No Department | Linear | 34,399.2 | Dollars |
| Factors | 34399.2 | Dollars |

**Activity ID:** 1GHE614170  
**Description:** Prepare Summary/NFA - IHSS Group 100-4

---

**6/23/00 9:20:32 AM**

**OFFICIAL USE ONLY**
### Line Item 01000 - develop characterization report

**BOE**

**Description**
Estimator's Experience on similar projects

**Item Desc:** Perform Data Analysis including GIS representation of data, Characterization Report, and associated project management.

**Breakdown of Cost Data:**
- 2 Environmental Engineers full time for 2 weeks to develop draft: 160 hrs
- 1 Project Manager full time for 4 weeks: 160 hrs
- 1 Secretary 1/2 time for 4 weeks to format and copy: 80 hrs
- 1 QA person 8 hours for review: 8 hrs
- 2 GIS individuals 2 weeks to create/revise maps: 160 hrs
- 1 Environmental Engineer full time 1 week for comment response: 80 hrs
- 1 project planner 1/2 time for 4 weeks: 80 hrs

**Unit Cost Adjustment Factor:** None

**Revised Unit Hours:**

**This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.**

### Resources

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### Line Item SYS - Contingency And Escalation

**BOE**

**Description**

**Cost Risk** 2  
**Schedule Risk** 3

### Resources

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### Activity ID: 1GHE614180   Description: Prepare Decision Document - IHSS 100-4

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<th>Materials/ Sub Cost</th>
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<th>Total Prime Cost</th>
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**Total for Activity 1GHE614180:**

| 176 | 5,336 | 0 | 1,536 | 6,873 | 1,699 | 8,572 |
### Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

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<tr>
<td>Estimator's Experience based generally on historical data for Ryan's Pit</td>
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<tr>
<td>Item Desc: Preparation of PAM in support of source removal of previously characterized UBC.</td>
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Breakdown of Cost Data:
- **Item**: Preparation of PAM for Ryan's Pit source removal action.
- **Units**: hours
- **Unit Cost**: 700
- **Unit Cost Adjustment Factor**: 0.25
- **Revised Unit Hours**: 176

Basis for adjustment: Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

### Resources

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<tr>
<th>Cost Element</th>
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### Line Item SYS - Contingency And Escalation

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### Activity ID: 1GHE614210

**Description:** Procurement - IHSS Grouping 100-4

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**Total for Activity 1GHE614210:**

- Labor Hours: 210
- Labor Cost: 6,177
- Materials/Sub Cost: 2,123
- Contingency & Escalation: 2,025
- Total Prime Cost: 10,325
- Burden Cost: 12,109

**Line Item 2000 - procurement & field prep**

Estimator's Experience: the following estimates are based on the recent (FY00) experience from the horizontal drilling project for Building 886. This is also a project with numerous radiological concerns.


- **E050** Environmental Engineers: 200 hours; 80 hrs to develop Statement of Work. 120 hrs for technical review of proposals and additional procurement activities.
- **M040** Project Management: 160 hours; 80 hours to develop Statement of Work. 80 hours for technical review of proposals and additional procurement activities.
- **G040** Administrative: 80 hours Secretarial support for document prep and distribution.
- **P080** Health Physicist: 80 hours to perform ALARA review, assist with RWP development and evaluate radiological concerns, review and comment on subcontractor HASP.
- **P090** Industrial Hygienist: 80 hrs to address health and safety concerns, review and comment.
- **P070** Project Controls: 120 hours for budget and project control support.
- **P030** Procurement Support: 160 hours for procurement activities.
- **T050** RCT: 80 hours to develop RWP.
- **$5,000 Ecology Support**: Based on most project requirements. Not increased for project size due to the absence of pre-existing, non-industrial ecosystems.

**Total = 960 hours, $5,000 A5h**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
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**Line Item 3100 - HASP**

Historical Data Source - Costs derived from the Ryan's Pit Remedial Action. Costs were not revised because the effort will be the same.

Item Desc - Preparation of Health and Safety Plan (HASP). The HASP from the OPWL will be provided to the subcontractor for information on developing this HASP.

Breakdown of Historical Data:
- Item - HASP development
- Units - each
- Unit Cost - $10,000
- Unit Cost Adjustment factor - None.
- Revised Unit Cost - N/A
- Basis for adjustment - None.

Item - Review by Site Personnel. Based on historical costs, it was assumed that the HASP will be reviewed by an Environmental Engineer, Project Manager, QA/QC specialist, Site Health and Safety, and Site Rad Engineer. Each will require 40 hours review time.
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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Line Item 3200 - SAP

BOE

Estimator's Experience based generally on historical data for Ryan’s Pit. Document assumed to take the same effort as the Ryan’s Pit and T3/T4 SAPs.

Item Desc: Preparation of SAP in support of source removal of previously characterized OPWL.

Breakdown of Historical Data:
- Item: Preparation of SAP for Ryan’s Pit source removal action.
  - Units: hours
  - Unit Cost: 1200
  - Unit Cost Adjustment Factor: .25
  - Revised Unit Hours: 300

Project management 1/2 time = 40 hours
2 Environmental Engineers full time = 160 hours
GIS support for Maps = 40 hours
Secretarial support for document = 40 hours
QA/QC support for prep and review = 20 hours

Basis for adjustment: The line item has a factor of 0.25 as 4 UBCs will be remediated at once and the document preparation costs are split 4 ways.

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Line Item 3300 - WMP

BOE

Estimator's Experience based generally on historical data for Ryan’s Pit

Item Desc: Preparation of WMP in support of source removal of previously characterized UBC.

Breakdown of Historical Data:
- Item: Preparation of WMP for Ryan’s Pit source removal action.
  - Units: hours
  - Unit Cost: 320
  - Unit Cost Adjustment Factor: .25
  - Revised Unit Hours: 80
**Rocky Flats Closure Project**

**Baseline Cost and Basis of Estimate**

**WBS No:** 1GAC0104  
**Activity ID:** 1GHE614230  
**Baseline Deviation:** 1GAC

---

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**Line Item 3400 - IWCP**

Historical Data Source - Horizontal Drilling under Building 886

Item Desc - IWCP preparation

Breakdown of Historical Data:
- Item - IWCP preparation
- Units - 320 hrs
- Unit Cost - na
- Unit Cost Adjustment factor - .25
- Revised Unit Cost - 80 hrs

Basis for adjustment - The IWCP will mostly consist of the FIP, developed in a separate line item. This item will be for producing some text and obtaining approvals. The line item has a factor of 0.25 as 4 UBCs will be remediated at once and the document preparation costs are split 4 ways.

**Resources**

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**Line Item 3500 - FIP**

Historical Data Source - East Trenches Plume Project

Item Desc - Production of a Field Implementation Plan (FIP). Much of the data will be supplied to the subcontractor in the Decision Document.

Breakdown of Historical Data:
- Item - Preparation of a FIP
- Units - $17,400 from successful bidder
- Unit Cost - na
- Unit Cost Adjustment factor - None.
- Revised Unit Cost - na

Basis for adjustment - None.

Based on similar projects, the FIP will be reviewed by QA/QC - 20 hrs, environmental engineer 40 hrs, and project manager 40 hrs.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Resources**

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**Line Item SYS - Contingency And Escalation**

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**Activity ID:** 1GHE614240  
**Description:** Readiness Assessment - IHSS Group 100-4  
**Cost Risk:** 1  
**Schedule Risk:** 1

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6/23/00 9:20:34 AM  
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**Line Item 4100 - readiness assessment**

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc: Conduct Readiness Assessment in support of source removal action.

Breakdown of Cost Data:

- It was estimated that subcontractor involvement would require 80 hours at $60/hour = $4,800. It was assumed that about 3 weeks of time was required for an environmental engineer or similar person in addition to 12 hours of project management, which yielded 132 hours. An additional 11 hours was added for management oversight. It was estimated that a radiological engineer (QA) and an industrial hygienist would be needed for 2.5 days each (22 hours).

  - Units: hours
  - Unit Cost: 187
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit: 47

  - Units: lot
  - Unit Cost: $4.8K
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit: $1.2K

Basis for adjustment. Costs for each UBC are divided by 4 to account for the fact that 4 UBCs will be remediated at once and only one Readiness Assessment is needed for the group.

- 25% of 132 hrs - Environmental Engineer 33 Hours
- 25% of 22 hrs - Health Physicists 5.5 Hours
- 25% of 11 hrs - Manager 3 Hours
- 25% of 22 hrs - Industrial Hygienist 5.5 Hours
- 25% of $4,800 - A5H Subcontracted Srvs 1,200 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Line Item 4200 - training**

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc: Conduct Training in support of source removal action.

Breakdown of Cost Data:

- Item: Site Labor to perform above individual tasks for T-3/T-4.
  - Units: hours
  - Unit Cost: 132 Hours
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit: 33 hours

---

**Line Item 4100 - readiness assessment**

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc: Conduct Readiness Assessment in support of source removal action.

Breakdown of Cost Data:

  - Units: hours
  - Unit Cost: 187
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit: 47

  - Units: lot
  - Unit Cost: $4.8K
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit: $1.2K

Basis for adjustment. Costs for each UBC are divided by 4 to account for the fact that 4 UBCs will be remediated at once and only one Readiness Assessment is needed for the group.

- 25% of 132 hrs - Environmental Engineer 33 Hours
- 25% of 22 hrs - Health Physicists 5.5 Hours
- 25% of 11 hrs - Manager 3 Hours
- 25% of 22 hrs - Industrial Hygienist 5.5 Hours
- 25% of $4,800 - A5H Subcontracted Srvs 1,200 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Line Item 4200 - training**

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc: Conduct Training in support of source removal action.

Breakdown of Cost Data:

- Item: Site Labor to perform above individual tasks for T-3/T-4.
  - Units: hours
  - Unit Cost: 132 Hours
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit: 33 hours

---

**Line Item 4100 - readiness assessment**

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc: Conduct Readiness Assessment in support of source removal action.

Breakdown of Cost Data:

  - Units: hours
  - Unit Cost: 187
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit: 47

  - Units: lot
  - Unit Cost: $4.8K
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit: $1.2K

Basis for adjustment. Costs for each UBC are divided by 4 to account for the fact that 4 UBCs will be remediated at once and only one Readiness Assessment is needed for the group.

- 25% of 132 hrs - Environmental Engineer 33 Hours
- 25% of 22 hrs - Health Physicists 5.5 Hours
- 25% of 11 hrs - Manager 3 Hours
- 25% of 22 hrs - Industrial Hygienist 5.5 Hours
- 25% of $4,800 - A5H Subcontracted Srvs 1,200 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Line Item 4200 - training**

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc: Conduct Training in support of source removal action.

Breakdown of Cost Data:

- Item: Site Labor to perform above individual tasks for T-3/T-4.
  - Units: hours
  - Unit Cost: 132 Hours
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit: 33 hours
### Rocky Flats Closure Project
#### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0104  
**Activity ID:** 1GHE614240

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.  
**Units:** 1 lot  
**Unit Cost:** $12K  
**Unit Cost Adjustment Factor:** 0.25  
**Revised Unit:** $3K

Basis for adjustment. Costs for each UBC are divided by 4 to account for the fact that 4 UBCs will be remediated at once and only one Training is needed for the group.

It was estimated training would cost $1,000 per subcontractor worker and that 12 subcontractor employees would require training. It was estimated that onsite contractor employees would require the equivalent of 15 hours of training including instructor time and that eight onsite employees would be trained.

- 25% of 132 hrs - Onsite employees 33 Hours
- 25% of $12,000 hrs - Subcontractor employees 3,000 dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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<thead>
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<th>Cost Element</th>
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**Item:** Site Labor to perform above individual tasks for T-3/T-4.  
**Units:** hours  
**Unit Cost:** 60 hours  
**Unit Cost Adjustment Factor:** 0.25  
**Revised Unit:** 15 hours

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.  
**Units:** 1 lot  
**Unit Cost:** $6K  
**Unit Cost Adjustment Factor:** 0.25  
**Revised Unit:** $1.5K

Basis for adjustment. Costs for each UBC are divided by 4 to account for the fact that 4 UBCs will be remediated at once and only one Pre-Evolution Meeting is needed for the group.

It was assumed that the Pre-Evolution Meeting would be limited to five hours. Assuming that 20 subcontract employees would attend at an average cost of $60/hour burdened yields a cost of $6,000. It was assumed that 12 onsite contractor employees would attend to yield another 60 hours.

- 25% of 60 hrs - Onsite employees 15 Hours
- 25% of $6,000 - Subcontractor employees 1,500 dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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**Line Item SYS - Contingency And Escalation**

**BOE**

**Item Desc:** Conduct Pre-Evolution Meeting in support of source removal action

Breakdown of Cost Data:

- **Item:** Site Labor to perform above individual tasks for T-3/T-4.  
  **Units:** hours  
  **Unit Cost:** 60 hours  
  **Unit Cost Adjustment Factor:** 0.25  
  **Revised Unit:** 15 hours

- **Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.  
  **Units:** 1 lot  
  **Unit Cost:** $6K  
  **Unit Cost Adjustment Factor:** 0.25  
  **Revised Unit:** $1.5K

Basis for adjustment. Costs for each UBC are divided by 4 to account for the fact that 4 UBCs will be remediated at once and only one Pre-Evolution Meeting is needed for the group.

It was assumed that the Pre-Evolution Meeting would be limited to five hours. Assuming that 20 subcontract employees would attend at an average cost of $60/hour burdened yields a cost of $6,000. It was assumed that 12 onsite contractor employees would attend to yield another 60 hours.

- 25% of 60 hrs - Onsite employees 15 Hours
- 25% of $6,000 - Subcontractor employees 1,500 dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### Rocky Flats Closure Project

#### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0104  
**Activity ID:** 1GHE614240

| Activity ID: | 1GHE614250 | Description: | Remedial Action - IHSS Group 100-4 |

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Total for Activity 1GHE614250: 1,856, 58,100, 88,407, 90,079, 236,586, 20,219, 256,804

### Resources

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**Estimator's Experience: Based generally on historical data for T-3/T4 Remediation.**

**Breakdown of Cost Data:**

**Item: Site Labor to perform above individual tasks for T-3/T4.**

- Units: hours  
- Unit Cost: 1,100  
- Unit Cost Adjustment Factor: 0.25  
- Revised Unit: 275

**Item: Subcontractor costs to perform above individual tasks for T-3/T4.**

- Units: 1 lot  
- Unit Cost: 184k  
- Unit Cost Adjustment Factor: 0.25  
- Revised Unit: see below

**Basis for adjustment:** 4 UBCs will be remediated at once and only one mobilization charge is needed for the group.

- T3/T4 = 110 hrs Health Physicists 25% = 27 Hours  
- T3/T4 = 330 hrs Manager 25% = 83 Hours  
- T3/T4 = 550 hrs Environmental Engineer 25% = 138 Hours  
- T3/T4 = 110 hrs Industrial Hygienist 25% = 27 Hours  
- T3/T4 subcontractor dollars $184,000 25% = $46,000

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
**Rocky Flats Closure Project**

**Baseline Cost and Basis of Estimate**

**Activity Filter**

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**WBS No:** 1GAC0104

**Baseline Devl:** 1GAC

---

**Line Item 5200 - site prep**

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:** Site Preparation including setting up fencing, trailer, etc.

Breakdown of Historical Data:

**Item:** Site Labor to perform above individual tasks for T-3/T-4.

- **Units:** hours
- **Unit Cost:** 120 hours
- **Unit Cost Adjustment Factor:** 1/4
- **Revised Unit:** 30

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.

- **Units:** Dollars
- **Unit Cost:** $30k
- **Unit Cost Adjustment Factor:** 1/4
- **Revised Unit:** $7,500

Basis for adjustment:

The BOE provides one environmental engineer 120 hours for site prep and $30k for subcontract dollars for installation of fencing and trailers. Because of the small size of this remedial action, the costs were reduced by 4 using the assumption that 4 such sites will be remediated together. Work will be done by subcontract staff because no contamination will be encountered during project setup.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

**Line Item 5300 - excavation**

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:** Excavation.

The percentage of the building footprint area assumed contaminated for the source removal estimate is based on the anticipated contamination category (1, 2, 3, or 4) as determined by the ER Group based on process knowledge and historical releases. Category 1 is expected to be the least contaminated category and 4 the most contaminated. This building is categorized as a facility type 1, which typically corresponds to an assumed 5% of the building footprint having contamination. Because of the data available from the previous characterization effort, this building is assumed to have a contaminated area of 2% of the building footprint. The contaminated soil thickness is assumed to be 5 feet for all categories. Building 123 footprint is approximately 18,444 ft². An additional 100 sq ft will be investigated for PAC 100-603 for a total of 18,544 sq ft requiring investigation. Assuming that the contamination is 5 feet thick and that 2% of the area is contaminated, the soil volume requiring remediation is 69 cubic yards.

Breakdown of Historical Data:

- **Total Contaminated Soil to be removed:** 69 CY
- **Total Soil for Thermal Desorption:** 0 CY
- **Offsite Waste Volume:** 69 CY

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

**Factors**

- **Factor 1.09 - Environmental Engineer:** 75 Hours
- **Factor 0.47 - Health Physicists:** 32 Hours
- **Factor 0.31 - Manager:** 21 Hours
- **Factor 0.31 - Industrial Hygienists:** 21 Hours
- **Factor 1.00 - Radiological Control Technician:** 69 Hours
- **Factor 2.00 - Steelworkers:** 138 Hours
- **Factor 45.23 - ASH Subcontracted Srvs:** 3121 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### Rocky Flats Closure Project

#### Baseline Cost and Basis of Estimate

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**Line Item 5400 - remove and clean debris**

Item Desc: Remove and clean debris.

Breakdown of Historical Data:
- Total Contaminated Soil to be removed 69 CY
- For the base case, it was assumed that about five cubic yards out of 700 cubic yards would be debris and would be segregated and cleaned. It was estimated that each cubic yard of debris would cost $1,000 or $5,000 total for 700 cubic yards. This yields a rate of $7.14 per cubic yard.
- 69 cubic yards * $7.14 per cubic yard = $493 ASH Subcontracted Svrs

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Line Item 5600 - confirmation sampling**

Item Desc: Confirmation Sampling.

Breakdown of Historical Data:
- Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
  - Units: 1 lot
  - Unit Cost: see below
  - Unit Cost Adjustment Factor: see below
  - Revised Unit: see below

The analytical costs were based on T-3/T-4, which cost $435,574 for 3800 cubic yards of contaminated soil removed. This yielded a unit rate of about $115/cubic yard. Based on estimator experience the cost of sampling including labor and materials was estimated to be 20% of that rate or about $23/ cubic yard.
- 69 cubic yards * $115/cyd Analytical costs 
- 69 cyd * $23/cyd Sampling costs

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
**Line Item 5700 - prepare waste acceptance forms**

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc: Prepare Waste Acceptance Forms

Breakdown of Historical Data:

Item: Site Labor to perform above individual tasks for T-3/T-4.
Units: 80 environmental engineer hours
Unit Cost:
Unit Cost Adjustment Factor: 25%
Revised Unit: 20 hours

Because the waste acceptance sampling is difficult to predict and could vary significantly from project to project, it was assumed that about $800 worth of additional analysis would be required for 20 cubic yards which is the volume that can be placed in one roll-off. This yielded a unit rate of about $40/cubic yard. This sampling and analysis is in addition to the confirmational samples so the costs are not as great. It was assumed that this sampling would be more labor intensive so the sampling costs were estimated to be about 50% of the analytical costs or about $20/cubic yard.

Total Contaminated Soil to be removed 69 CY
Offsite Waste Volume 62 cy (69 cubic yards total excavated minus 7 cubic yards thermally treated and returned to excavation).

62 cyd * $40/cyd = ASH Analytical

62 cyd * $20/cyd = ASH Subcontracted Srvs

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Resources**

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**Line Item 5800 - waste acceptance sampling**

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc: Waste Acceptance Sampling

Breakdown of Historical Data:

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
Units: 1 lot
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Because the waste acceptance sampling is difficult to predict and could vary significantly from project to project, it was assumed that about $800 worth of additional analysis would be required for 20 cubic yards which is the volume that can be placed in one roll-off. This yielded a unit rate of about $40/cubic yard. This sampling and analysis is in addition to the confirmational samples so the costs are not as great. It was assumed that this sampling would be more labor intensive so the sampling costs were estimated to be about 50% of the analytical costs or about $20/cubic yard.

Total Contaminated Soil to be removed 69 CY
Offsite Waste Volume 62 cy (69 cubic yards total excavated minus 7 cubic yards thermally treated and returned to excavation).

62 cyd * $40/cyd = ASH Analytical
62 cyd * $20/cyd = ASH Subcontracted Srvs

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Resources**

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**Line Item 5900 - field oversight & project mgmt**

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc: Field Oversight and Project Management
Breakdown of Historical Data:
Item: Site Labor
Units: Full time support for 20 days = 160 hrs 750 + 80 hrs 751 for project manager, env engineer. Full time support (160 hrs) for a secretary, rad engineer (Health Physicist) and Industrial Hygienist with 25% support from a project planner.

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Breakdown of Historical Data:
Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
Units: 1 lot
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Means (1995) Site Work & Landscape Cost Data as follows:
Common Fill $ 4.77/cubic yard (page 34 Borrow Bank Measure)
Hauling $ 3.98/cubic yard (page 42 2-mile round-trip, 6 cubic yard dump truck)
Backfilling $ 1.69/cubic yard (page 34)
Burden (43%) $ 4.49/cubic yard
Total $14.23/cubic yard or about $15/cubic yard
$15/cubic yard * 69 cubic yards

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

Breakdown of Cost Data:
Item - 1 regrade effort

Estimators Experience - The cost for regrading is based on $1.50/square yard from Barrow Source Evaluation for Closure of the OU 5 and OU 7 Landfills 11/17/93. For a 60 yard by 100 yard area (1.24 acres) this yields about $9,000.
## Resources

### Activity ID: 1GHE614250

### Description: Prepare Closeout Report - IHSS Group 100-4

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### Line Item 6200 - Demobilization

**Item Desc:** Demobilization.

**Breakdown of Historical Data:** Demobilization: Based on the T-3/T-4 project. The subcontractor cost for demobilization was about $95,000 for 3,800 cubic yards at the T-3/T-4 project. In addition it was estimated that the following hours were necessary:

- **Environmental Engineer:** 300 hours
- **Health Physicist:** 100 hours
- **Manager:** 200 hours
- **Industrial Hygienist:** 100 hours

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

- **25% of 300 hrs - Environmental Engineer:** 75 Hours
- **25% of 100 hrs - Health Physicist:** 25 Hours
- **25% of 200 hrs - Manager:** 50 Hours
- **25% of 100 hrs - Industrial Hygienist:** 25 Hours

**Boe Characteristics:**

- **Estimator's Experience:** Based generally on historical data for T-3/T4 Remediation.

### Resources

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### Line Item SYS - Contingency And Escalation

**Item Desc:**

- **Contingency And Escalation**

  **Boe Characteristics:**

  - **Estimator's Experience:**
  - **Breakdown of Historical Data:**
  - **Cost Risk:** 3
  - **Schedule Risk:** 3

**Factors:**

- **CON CONTINGENCY:** 64250.8 Dollars
- **ESC ESCALATION:** 25828.3 Dollars

**Activity ID:** 1GHE614270

**Description:** Prepare Closeout Report - IHSS Group 100-4

---

All work will be performed using subcontract labor because no contamination is involved. No RCT support will be required. Site personnel are covered elsewhere.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### Rocky Flats Closure Project

#### Baseline Cost and Basis of Estimate

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#### WBS Filter

| 1GAC |

### Baseline Cost and Basis of Estimate

**Project:** Rocky Flats Closure Project  
**Baseline Deviation:**

**WBS No:**

| WBS No: | 1GAC0104 |

**Activity ID:**

| 1GHE614270 |

**WBS Filter:**

| 1GAC |

**Starts In FY:**

| * |

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### Line Item 0100 - develop NFA documentation

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#### Estimator's Experience:

This estimate was constructed based on actual hours required to complete previous NFA Reports (obtained from actual author) and professional judgement of level of effort required for remaining reports.

#### Item Desc:

Perform Data Analysis including GIS representation of data, Characterization Report, and associated project management.

#### Breakdown of Cost Data:

**Item:** Develop Documentation  
**Units:** Hours  
**Unit Cost:** 138

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<td>ENVIRONMENTAL SCIENTISTS</td>
<td>K253S</td>
<td>Remediation, Industrial &amp; Site Serv</td>
</tr>
<tr>
<td>Factors</td>
<td>4 hrs</td>
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<td>750</td>
<td>STRAIGHT TIME BASE</td>
<td>S020</td>
<td>ENVIRONMENTAL SCIENTISTS</td>
<td>R100S</td>
<td>RMRS Salaried</td>
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<td>Factors</td>
<td>8 hrs</td>
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**Total for Activity 1GHE614270:**

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<th>Total Prime Cost</th>
<th>Burden Cost</th>
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<tr>
<td>438</td>
<td>12,245</td>
<td>710</td>
<td>9,400</td>
<td>22,355</td>
<td>26,616</td>
<td>9,400</td>
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</table>
Line Item 01000 - develop report

Estimator’s Experience on similar projects

Item Desc:
Perform Data Analysis including GIS representation of data, Characterization Report, and associated project management.

Breakdown of Cost Data:

Item: Develop Documentation
Units: hours
Unit Cost: 320
Unit Cost Adjustment Factor: none
Revised Unit Hours: 320

Basis for adjustment:

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

Resources

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<th>Units</th>
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<td>BOE</td>
<td>1G1HE614270</td>
<td>WBS Filter: 1GAC</td>
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</table>

| BOE | 1GHE614270 | Activity Filter: * |

Line Item 01000 - SAP/HASP Addenda

Item Desc:
Preparation of SAP Addenda to Industrial Area Characterization Plan.

Breakdown of Cost Data:

Item: Prepare SAP addenda. Address KH, DOE and regulatory agency comments on SAP.

Units: hours
Unit Cost: 380
Unit Cost Adjustment Factor: .5
Revised Unit Hours: 190

Total for Activity 1G10050000:

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<th>WBS No: 1GAC0105</th>
<th>Title: Group 100-5 (Non D&amp;D)</th>
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<tr>
<td>Activity ID: 1G10050000</td>
<td>Description: Planning HSS - Group 100-5 (Non D&amp;D)</td>
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<th>BOE</th>
<th>Type</th>
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<th>Labor Cost Total</th>
<th>Materials/Sub Cost</th>
<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
<th>Burden Cost</th>
<th>Total Cost</th>
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<td>SAP/HASP Addenda</td>
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<td>EE</td>
<td>150</td>
<td>4,491</td>
<td>1,421</td>
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<td>5,912</td>
<td>1,585</td>
<td>7,497</td>
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<tr>
<td>SYS</td>
<td>Contingency And Escalation</td>
<td>1.00 each</td>
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<td>0</td>
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</table>

Total for Activity 1G10050000:

| 150 | 4,491 | 1,421 | 1,132 | 7,044 | 1,585 | 8,629 |

Line Item 01000 - SAP/HASP Addenda

Estimator’s Experience 10 years of experience planning, estimating and conducting projects of similar scope.

Item Desc:
Preparation of SAP Addenda to Industrial Area Characterization Plan.

Breakdown of Cost Data:

Item: Prepare SAP addenda. Address KH, DOE and regulatory agency comments on SAP.

Units: hours
Unit Cost: 380
Unit Cost Adjustment Factor: .5
Revised Unit Hours: 190

Total for Activity 1G10050000:

| 150 | 4,491 | 1,421 | 1,132 | 7,044 | 1,585 | 8,629 |
**Rocky Flats Closure Project**

**Baseline Cost and Basis of Estimate**

- **WBS No:** 1GAC0105
- **Activity ID:** 1G10050000

### Resources

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<th>Quantity</th>
<th>Units</th>
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<tr>
<td>E050</td>
<td>Environmental Engineer</td>
<td>1.5 Weeks for document development</td>
<td>60 hrs</td>
<td>Linear</td>
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</tr>
<tr>
<td>M040</td>
<td>Project Management</td>
<td>40 hrs oversight of project</td>
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<tr>
<td>G040</td>
<td>Administrative</td>
<td>20 hours Secretarial support for document prep and distribution</td>
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<tr>
<td>E110</td>
<td>Quality Control Engineers</td>
<td>10 hours for document review and comment resolution</td>
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<tr>
<td>P070</td>
<td>Project Controls</td>
<td>40 hours planning and scheduling support based on similar projects.</td>
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<tr>
<td>P060</td>
<td>GIS Support</td>
<td>20 hrs GIS Support for maps and figures.</td>
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</tbody>
</table>

Total = 190 hours

**Baseline Cost and Basis of Estimate**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Resources**

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**Total = 190 hours**

**Basis for adjustment:** None

**Activity ID:** 1G10050020

**Description:** Procurement & Field Preparation - Group 100-5

<table>
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<tr>
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<th>BOE Type</th>
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<tbody>
<tr>
<td>1.00</td>
<td>EE</td>
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<td>2,141</td>
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<td>756</td>
<td>2,897</td>
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</table>

**Total for Activity 1G10050020:**

68  2,141  0  433 756  2,897

**BOE**

- **Estimator's Experience:** the following estimates are based on the recent very small projects.
- **Item Desc:** Field Preparation including JHA preparation, and Utility Clearance/Soil Disturbance Permit.

- **E050** Environmental Engineer 20 hours
- **M040** Project Management 20 hours
- **G040** Administrative 8 hours Secretarial support for document prep and distribution
- **P070** Project Controls 20 hrs to address health and safety concerns and develop a JHA

**Basis for adjustment:** None
### Rocky Flats Closure Project

#### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0105  
**Activity ID:** 1G10050020  
**Baseline Devl:** WBS Filter 1GAC  
**Activity Filter:** *

#### WBS Filter 1GAC

- **Activity ID:** 1G10050020
- **Description:** Baseline Cost and Basis of Estimate

#### Activity Filter *

- **Starts In FY:** *

### Line Item SYS - Contingency And Escalation

#### BOE Resources

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<th>BOE Type</th>
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<th>Labor Cost Total</th>
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<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
<th>Burden Cost</th>
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</thead>
<tbody>
<tr>
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#### Activity ID: 1G10050040

- **Description:** Readiness Review - Group 100-5

#### Cost Element: 3000 readiness assessment

- **Quantity:** 1.00 each  
- **Labor Hours:** 228 hours  
- **Total Labor Cost:** 7,159 dollars  
- **Materials/ Sub Cost:** 0 dollars  
- **Total Prime Cost:** 7,159 dollars  
- **Burden Cost:** 1,448 dollars  
- **Total Cost:** 8,607 dollars  

Total for Activity 1G10050040:  
- **Labor Hours:** 228  
- **Total Labor Cost:** 7,159  
- **Materials/ Sub Cost:** 0  
- **Total Prime Cost:** 7,159  
- **Contingency & Escalation:** 0  
- **Burden Cost:** 1,448  
- **Total Cost:** 8,607

### Line Item 3000 - readiness assessment

- **Description:** Evaluating readiness of the field characterization team and plans.

- **Item:** Perform readiness evaluation
- **Units:** hours
- **Unit Cost:** 228 hours
- **Unit Cost Adjustment Factor:** Revised Unit Hours

#### BOE Resources

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<tr>
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<th>Quantity</th>
<th>Units</th>
<th>BOE Type</th>
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<tbody>
<tr>
<td>E050 Environmental Engineer 1 people fulltime for 9 days = 72 hours</td>
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<td>P010 Secretarial support 10 hours</td>
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<td>P080 Health Physicist 25% support for 9 days = 18 hours</td>
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<td>P090 Industrial Hygienist 25% support for 9 days = 18 hours</td>
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<td>P050 Compliance Inspectors 10 hours to assist with readiness determination</td>
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<td>E110 Quality assurance Sup. 10 hours to assist with readiness determination</td>
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- **Basis for adjustment:** None

### Activity ID: 1G10050040

- **Description:** Readiness Review - Group 100-5

#### Activity Filter *

- **Starts In FY:** *

### Line Item 3000 - readiness assessment

- **Description:** Evaluating readiness of the field characterization team and plans.

- **Item:** Perform readiness evaluation
- **Units:** hours
- **Unit Cost:** 228 hours
- **Unit Cost Adjustment Factor:** Revised Unit Hours

#### BOE Resources

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- **Basis for adjustment:** None

#### Activity ID: 1G10050040

- **Description:** Readiness Review - Group 100-5

#### Activity Filter *

- **Starts In FY:** *

### Line Item 3000 - readiness assessment

- **Description:** Evaluating readiness of the field characterization team and plans.

- **Item:** Perform readiness evaluation
- **Units:** hours
- **Unit Cost:** 228 hours
- **Unit Cost Adjustment Factor:** Revised Unit Hours

#### BOE Resources

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- **Basis for adjustment:** None

#### Activity ID: 1G10050040

- **Description:** Readiness Review - Group 100-5

#### Activity Filter *

- **Starts In FY:** *
**Rocky Flats Closure Project**  
**Baseline Cost and Basis of Estimate**

### Activity Filter
- **WBS Filter:** 1GAC  
- **Activity Filter:** 
- **Starts In FY:** *

#### WBS Filter 1GAC

**WBS No:** 1GAC0105  
**Activity ID:** 1G10050040  
**Baseline Devi**

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#### Line Item SYS - Contingency And Escalation

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<thead>
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<td>1.00 each</td>
<td>EE</td>
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<td>Contingency And Escalation</td>
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**Total for Activity 1G10050050:**  
320 hours  
8,876 dollars  
16,976 dollars  
4,377 dollars  
30,229 dollars  
3,133 dollars  
4,377 dollars  
33,363 dollars

#### Line Item 4100 - collect surficial soil samples

**BOE**

**Estimator's Experience** - Based on very small projects.

**Item Desc:** Collection of surficial soil samples. A site Environmental Engineer will direct the sample collection, containerize, package, and ship the samples; prepare field QC documentation, and prepare field notes on a full time basis. A site RCT will monitor the site for radiological contamination on a full time basis. A site Industrial Hygienist will implement the field portion of the HASP on a full time basis. 2 samples per day will be collected at 4 hrs each. Samples will be collected by the ASD sample team. Their cost is in the analyze samples line item #4200 in this activity.

**Breakdown of Cost Data:**

**Item:** Site Personnel for support of sample collection  
**Units:** hours  
**Unit Cost:** 20 samples * 4 hrs each = 80 hrs for each individual.  
**Unit Cost Adjustment Factor:** none  
**Revised Unit Hours:**

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<tr>
<th>Line Item</th>
<th>BOE Type</th>
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<th>Labor Hours Total</th>
<th>Labor Cost Total</th>
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<td>NONE</td>
<td>ZDEPT No Department</td>
<td>Linear</td>
<td>452.66 Dollars</td>
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#### Line Item 4200 - analyze samples

**BOE**

**Vendor Quote From Kaiser-Hill ASD provided for the FY00 rebaseline for analytical, bottles, rad screen and sample collection team.**

**Item Desc:** Analyze samples, they will be analyzed for PCBs. This item is priced on a per sample basis. 20 surface soil samples will be collected. This will include the QA/QC samples.

**Breakdown of Cost Data:**

**Item:** Analyze samples at an offsite laboratory.  
**Units:** analysis  
**Unit Cost:**  
PCBs $199 each  
Dioxins $199 each  
Furans $199 each  
Rad Screens $12 each  
Sampling - Non-Rad (base cost per day) $500.00 * 10 days  

**Resources**

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<td>LINE ITEM 4200</td>
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<td>LINE ITEM 4200</td>
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<td>RADIATION CONTROL TECHNOLOGI</td>
<td>KG10H</td>
<td>Remediation Steelworkers</td>
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**Resources**

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**Resources**

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<td>E0000</td>
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<tr>
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<td>NONE</td>
<td>ZDEPT No Department</td>
<td>Linear</td>
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</table>
Bottles $7 each  
Shipping $42 each

- Unit Cost Adjustment Factor:  
- Revised Unit:  

Basis for adjustment:

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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<tr>
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<td>20 PCB (Other IH) samples</td>
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<td>Dollars</td>
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<tr>
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<td>20 Furan (Other IH) samples</td>
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### Line Item 4300 - project mgmt oversight

Estimator's Experience -10 years on similar projects

Item Desc: Project Management/Oversight. Based on half time for a Project Manager, Administrative staff, and Cost Estimator/Scheduler for two weeks.

Breakdown of Cost Data:
- Item: Mgmt oversight  
- Units: hours  
- Unit Cost: 120  
- Unit Cost Adjustment Factor: none  
- Revised Unit Hours: 120

Basis for adjustment:

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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<th>Department</th>
<th>Curve</th>
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<td>M040 MANAGERS (GRADE 64 - 68)</td>
<td>R100S PMRS Salaried</td>
<td>Linear</td>
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<td>Factors</td>
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## Rocky Flats Closure Project
### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0105  
**Activity ID:** 1G10050050  
**Project:** Baseline Deviation  
**WBS Filter:** 1GAC  
**Activity Filter:** *  
**Starts In FY:** *

### Resources

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### Line Item 5000 - develop NFA documentation

**BOE**

- **Estimator's Experience:**
  - This estimate was constructed based on actual hours required to complete previous NFA Reports (obtained from actual author) and professional judgement of level of effort required for remaining reports.

**Item Description:**
- Perform Data Analysis including GIS representation of data, Characterization Report, and associated project management.

**Breakdown of Cost Data:**
- **Item:** Develop Documentation  
- **Units:** Hours  
- **Unit Cost:** $138  
- **Environmental Engineer**
- **SMD Technician**
  - 10 hrs Identify & pull existing data from database.  
- **GIS Technician**
- **Technical Editor**
  - 15 hrs Complete initial and revised tech edits of Report.  
- **Technical Reviews**
  - QA
    - 4 hrs Review and comment per area of expertise.  
  - Peer (2)
    - 8 hrs Review and comment per area of expertise.  
  - Compliance
    - 4 hrs Review and comment per area of expertise.  
  - Environmental
    - 4 hrs Review and comment per area of expertise.  
  - Management (2)
    - 8 hrs Review and comment per area of expertise.  
  - Legal
    - 4 hrs Review and comment per area of expertise.  
  - **Environmental Engineer**
    - 15 hrs Disposition comments and finalize document.

**Administrative Support**
- 6 hrs Copy & assemble final documents, submit to records.

**Unit Cost Adjustment Factor:** none  
**Revised Unit Hours:** 138  
**Basis for adjustment. N/A**

### Resources

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<th>Activity ID</th>
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**Line Item 5000 - develop NFA documentation**

**BOE**

- **Estimator's Experience:**
  - This estimate was constructed based on actual hours required to complete previous NFA Reports (obtained from actual author) and professional judgement of level of effort required for remaining reports.

**Item Description:**
- Perform Data Analysis including GIS representation of data, Characterization Report, and associated project management.
### Activity ID: 1GFG631100
**Description:** SAP Preparation - IHSS Group 300-1 (B335)

**Schedule Risk:** 2

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<th>Description</th>
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**Total for Activity 1GFG631100:**

- 280
- 9,034
- 1,421
- 3,803
- 14,257
- 17,383

### BOE

**Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.**

**Item Desc:**
Preparation of SAP Addenda to Industrial Area Characterization Plan.

**Breakdown of Cost Data:**
- Item: Preparation of SAP addenda
- Units: Site Labor Hours, Subcontract Dollars
- Unit Cost: 100 hours, $840 Dollars
- Unit Cost Adjustment Factor:
- Revised Unit Hours:
- Basis for adjustment:

This BOE provides an environmental engineer 80 hours and an manager 20 hours for preparation of the SAP Addenda. It also provides a subcontractor 20 hours for the preparation of the SAP Addenda.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
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### Line Item 0200 - HASP Addenda

**Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.**

**Item Desc:**
Preparation of HASP addenda to Industrial Area Characterization Plan

**Breakdown of Cost Data:**

### Resources

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<thead>
<tr>
<th>Cost Element</th>
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<th>Curve</th>
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0.84576 [SYS 061400] 84576000 - System
### Project baseline development - WBS Filter

**WBS No:** 1GAC0301  
**WBS Filter:** 1GAC  
**Activity ID:** 1GF0631100  
**Activity Filter:** *

#### Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

- **WBS No:** 1GAC0301
- **Activity ID:** 1GF0631100
- **Project:** Baseline Dev
- **WBS Filter:** 1GAC
- **Activity Filter:** *
- **Starts In FY:** *

**Resources**

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<td><strong>R100S</strong> RMRS Salaried</td>
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**Line Item 0300 - QAP Addenda**

**BOE**

- **Description:** Preparation of SAP Addenda to Industrial Area Characterization Plan.

**Breakdown of Cost Data:**

- **Item:** Preparation of QAP addenda
- **Units:** site labor hours, subcontract dollars
- **Unit Cost:** 40 hours, $840 Dollars
- **Unit Cost Adjustment Factor:**
- **Revised Unit Hours:**

**Basis for adjustment.**

This BOE provides an environmental engineer 40 hours for preparation of the QAP Addenda. It also provides a subcontractor 20 hours for the preparation of the QAP Addenda.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Resources**

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**Line Item SYS - Contingency And Escalation**

**BOE**

- **Cost Risk:** 2
- **Schedule Risk:** 2

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Page 147 of 1121  
6/23/00 9:20:38 AM  
**OFFICIAL USE ONLY**
### Activity ID: 1GFG631140

**Description:** Readiness Assessment - IHSS Group 300-1

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## Line Item 0100 - readiness assessment

**BOE**

Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation

**Item Desc:**
Evaluate readiness of the field characterization team and plans.

**Breakdown of Cost Data:**
- **Item:** Perform readiness evaluation
  - **Units:** hours, subcontract dollars
  - **Unit Cost:** 280 hours, $840 subcontract dollars
  - **Unit Cost Adjustment Factor:**
    - **Basis for adjustment:**
      - This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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### Line Item SYS - Contingency And Escalation

**BOE Resources**

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### Activity ID: 1FG631150

**Description:** Field Sampling, Lab Analysis - IHSS Group 300-1

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**Total for Activity 1FG631150:**
- 1,568
- 43,494
- 441,314
- 139,971
- 624,779
- 15,049
- 639,828

### Line Item 0100 - collect geoprobe samples

**BOE**

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Item Desc:**
Collection of Geoprobe samples with the site Geoprobe with two technicians. A site Environmental Engineer will direct the boring placement, log the borings; collect, containerize, package, and ship the samples; prepare field QC documentation, and prepare field notes on a full time basis. A site RCT will monitor the site for radiological contamination on a full time basis. A site Industrial Hygienist will implement the field portion of the HASP on a full time basis. Decon Operations staff will decon the vehicle and equipment when it leaves the work area on a half time basis. It is estimated that one 10' boring will be place per 500 SF of building footprint (same as Bldg. 123 characterization) with 5 samples per 10' boring. It is estimated that one boring per eight hours can be completed.

---

**Page 149 of 1121**

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Breakdown of Cost Data:

Item: Site Personnel for support of Geoprobe samples
Units: hours per borehole
Unit Cost: 24 hours
Unit Cost Adjustment Factor:
Revised Unit Hours:

Item: Kaiser-Hill/RMRS Geoprobe unit with 2 Technician crew. Item costs $100 per hour or $800 per 8-hour day.
Units: dollars per day (one borehole per day)
Unit Cost: 800
Unit Cost Adjustment Factor:
Revised Unit Hours:

Basis for adjustment.

BOE also provides for one subcontract FTE for 8 hours a day at $60 per hour.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

Line Item 0200 - analyze samples

Vendor Quote
Laboratory analysis costs provided by K-H @ http://rfetshp/PlanAndInteg/Guidance/planninginfo.htm

Analyze samples produced from geoprobe borings. It is anticipated that 5 samples from each boring will be collected. They will be analyzed for Metals, VOCs, SVOCs, PCBs, and radionuclides (est. 3 isotopes) with a 30 day TAT. This item is priced on a per sample basis.

Breakdown of Cost Data:

Item: Analyze samples at an offsite laboratory.
Units: dollars
Unit Cost: $1,811
Unit Cost Adjustment Factor:
Revised Unit Hours:
Basis for adjustment.

Analysis/Service Type Routine Cost
Volatile Organics $280.00
Semi-volatile organics $440.00
Inorganics - metals $345.00
Isotopics (Pu, Am, & U) $590.00
Bottles $28.00
DOT Radscreen $32.00
Shipping 2 @ $48 $96.00
TOTAL per Sample $1811.00

Laboratory analysis costs provided by K-H @ http://rfetshp/PlanAndInteg/Guidance/planninginfo.htm

Routine Analysis is a 31 day Turn Around Time (TAT) in the laboratory except for Asbestos, beryllium, and Industrial Hygiene which are 5 days.
Rocky Flats Closure Project
Baseline Cost and Basis of Estimate

WBS No: 1GAC0301
Activity ID: 1GFG631150

1GAC

Baseline_Devl
WBS Filter

Suits In FY

Priority Analysis is <31 day and >7 days TAT except for Asbestos, beryllium and Industrial Hygiene which are 3 days.
Rush Analysis is <7 days TAT except for Asbestos, beryllium and Industrial Hygiene which are 24 hours.
Routine DOT rad screen is a 24 hour TAT.

One borehole per 400 square feet of building footprint (19,452 sq feet) equals 49 boreholes.
Boreholes drilled to 10 feet in depth and samples collected at two foot intervals equals 5 samples per borehole.

Rush Analysis is <7 days TAT except for Asbestos, beryllium and Industrial Hygiene which are 24 hours.

Routine DOT rad screen is a 24 hour TAT.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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Factors 1811 dollars per sample

### Line Item 0300 - project mgmt oversight

**BOE**

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Item Desc:**

Project Management/Oversight. Based on half time for a Project Manager, Administrative staff, and Cost Estimator/Scheduler

**Breakdown of Cost Data:**

**Item: Mgmt oversight**

- **Units:** hours
- **Unit Cost:** 12
- **Unit Cost Adjustment Factor:** none
- **Revised Unit Hours:** 12

**Basis for adjustment:**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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Factors 4 hrs

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Factors 4 hrs

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Factors 4 hrs

### Line Item SYS - Contingency And Escalation

**BOE**

**Cost Risk** 2 **Schedule Risk** 2

### Activity ID: 1GFG631170

**Description:** Prepare Summary/NFA - IHSS Group 300-1

**Line Item 01000 - develop characterization report**

**BOE**

Estimator's Experience on similar projects

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Item Desc: Perform Data Analysis including GIS representation of data, Characterization Report, and associated project management.

Breakdown of Cost Data:
- Item: Develop Characterization Report
  - 3 Environmental Engineers full time for 2 weeks to develop draft: 240 hrs
  - 1 Project Manager full time for 4 weeks: 160 hrs
  - 1 Secretary 1/2 time for 4 weeks to format and copy: 80 hrs
  - 1 QA person 8 hours for review: 8 hrs
  - 2 GIS individuals 2 weeks to create/review maps: 160 hrs
  - 1 Environmental Engineer full time 1 week for comment response: 80 hrs
  - 1 project planner 1/2 time for 4 weeks: 80 hrs

  Unit Cost Adjustment Factor: none

  Revised Unit Hours:

  Basis for adjustment: None

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
**Rocky Flats Closure Project**  
**Baseline Cost and Basis of Estimate**

**Baseline Devl**  
**WBS Filter**  
**1GAC**  
**Activity Filter**  

**WBS No:** 1GAC0301  
**Activity ID:** 1GF0631180  

---

**Item: Preparation of PAM for Ryan's Pit source removal action.**  
**Units:** hours  
**Unit Cost:** 700  
**Unit Cost Adjustment Factor:** 0.25  
**Revised Unit Hours:** 176

Basis for adjustment. Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

### Resources

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**Line Item SYS - Contingency And Escalation**

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**Activity ID:** 1GF0631210  
**Description:** Procurement - IHSS Grouping 300-1  
**Cost Risk:** 2  
**Schedule Risk:** 2

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<th>Labor Cost Total</th>
<th>Materials/ Sub Cost</th>
<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
<th>Burden Cost</th>
<th>Total Cost</th>
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**Total for Activity 1GF0631210:**  
| | | 324 | 9,788 | 2,114 | 3,424 | 15,326 | 2,882 | 18,208 |

---

**Line Item 0100 - procurement & field prep**  
**BOE**

Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation

**Item Desc:**  

**Breakdown of Cost Data:**

**Item:** Site Labor to perform above individual tasks for either Ryan's Pit or T-3/T-4.  
**Units:** hours  
**Unit Cost:** 1292  
**Unit Cost Adjustment Factor:** 0.25  
**Revised Unit:** 324 hours

**Item:** Subcontractor costs to perform above individual tasks for either Ryan's Pit or T-3/T-4.  
**Units:** 1 lot  
**Unit Cost:** $10K  
**Unit Cost Adjustment Factor:** 0.25  
**Revised Unit:** $2.5K

Basis for adjustment. Hours and costs for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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### Rocky Flats Closure Project
#### Baseline Cost and Basis of Estimate

**Activity ID:** 1GFG631210

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**Project:** Baseline Devl  
**WBS Filter:** 1GAC  
**Activity Filter:** *  
**Starts In FY:** *

**WBS Filter:** 1GAC

#### Activity 1GFG631210

**Description:** Field Document Preparation - IHSS Group 300-1

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<th>Materials/ Sub Cost</th>
<th>Contingency &amp; Escalation</th>
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Total for Activity 1GFG631210: 96 2,897 0 2,897 4,986 1,008 2,089 5,995

---

**Line Item 0200 - SAP**

**BOE:** Estimator's Experience based generally on historical data for Ryan's Pit  
**Item Desc:** Preparation of SAP in support of source removal of previously characterized UBC.

**Breakdown of Historical Data:**

- **Item:** Preparation of SAP for Ryan's Pit source removal action.  
  **Units:** hours  
  **Unit Cost:** 300  
  **Unit Cost Adjustment Factor:** 0.25  
  **Revised Unit Hours:** 76  

**Basis for adjustment:** Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

**Resources**

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**Line Item 0300 - WMP**

**BOE:** Estimator's Experience based generally on historical data for Ryan's Pit  
**Item Desc:** Preparation of WMP in support of source removal of previously characterized UBC.

**Breakdown of Historical Data:**

- **Item:** Preparation of WMP for Ryan's Pit source removal action.

---

**Factors**

- **750 STRAIGHT TIME BASE | M040 MANAGERS (GRADE 64 - 68):** 13.00 Hours
- **750 STRAIGHT TIME BASE | P080 HEALTH PHYSICISTS:** 10.00 Hours
- **750 STRAIGHT TIME BASE | P090 INDUSTRIAL HYGIENISTS:** 10.00 Hours
- **750 STRAIGHT TIME BASE | S020 ENVIRONMENTAL SCIENTISTS:** 10.00 Hours
- **750 STRAIGHT TIME BASE | T050 RADIATION CONTROL TECHNOLOGISTS:** 5.00 Hours
- **ASH SUBCONTRACTED SRVS:** 2,114.40 Dollars
- **0200 SAP:** 0.84576 [SYS 061400], 84576000 - System
- **0300 WMP:** 1,834.56 Dollars
- **SYS:** 1,589.11 Dollars
- **Contingency:** 1834.56 Dollars
- **ESC:** 1589.11 Dollars

---

**Resources**

- **CON CONTINGENCY:** 0.00 None
- **ESC ESCALATION:** 0.00 None

---

**Activity ID:** 1GFG631230

**Description:** Field Document Preparation - IHSS Group 300-1
## Resources

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### Line Item SYS - Contingency And Escalation

**BOE**

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### Activity ID: 1GFG631240

**Description:** Readiness Assessment - IHSS Group 300-1

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**Total for Activity 1GFG631240:**

- **468** Hours
- **15,149** Labor Cost
- **19,283** Total Prime Cost
- **5,272** Burden Cost
- **61,155** Total Cost

### Line Item 0100 - Readiness assessment

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

- **Item Desc:**
  Conduct Readiness Assessment in support of source removal action.

- **Breakdown of Cost Data:**
  - **Item:** Site Labor to perform Readiness Assessment for T-3/T-4.
    - **Units:** site labor hours
    - **Unit Cost:** 276
    - **Unit Cost Adjustment Factor:**
    - **Revised Unit:**

- **Item:** Subcontractor costs to perform Readiness Assessment for T-3/T-4.
  - **Units:** 1 lot
  - **Unit Cost:** $4.8K
  - **Unit Cost Adjustment Factor:**
  - **Revised Unit:**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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<td>R100S RMRS Salaried</td>
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### Activity ID: 1GAC0301

**Description:** Rocky Flats Closure Project

- **WBS No:** 1GAC0301
- **Activity ID:** 1GFG631230

**Baseline Cost and Basis of Estimate**

- **Baseline Devl WBS Filter:** 1GAC
- **Fitler:** * 
- **Suits In FY:** *

### Table

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</table>
**Rocky Flats Closure Project**  
**Baseline Cost and Basis of Estimate**

**WBS No:** 1GAC0301  
**Activity ID:** 1GFG631240

**Line Item 0200 - training**

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:**
Conduct perform Training in support of source removal action.

**Breakdown of Cost Data:**
- **Item:** Site Labor to perform above individual tasks for T-3/T-4.  
  **Units:** hours  
  **Unit Cost:** 132 Hours  
  **Unit Cost Adjustment Factor:** Revised Unit:
- **Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.  
  **Units:** 1 lot  
  **Unit Cost:** $12K  
  **Unit Cost Adjustment Factor:** Revised Unit:

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Resources**

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<td>ENVIRONMENTAL ENGINEERS</td>
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**Line Item 0300 - pre-evolution meeting**

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:**
Conduct Pre-Evolution Meeting in support of source removal action.

**Breakdown of Cost Data:**
- **Item:** Site Labor to perform above individual tasks for T-3/T-4.  
  **Units:** hours  
  **Unit Cost:** 60 hours  
  **Unit Cost Adjustment Factor:** Revised Unit:
- **Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.  
  **Units:** 1 lot  
  **Unit Cost:** $6K  
  **Unit Cost Adjustment Factor:** Revised Unit:

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Resources**

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### Line Item SYS - Contingency And Escalation

#### BOE Resources

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#### Activity ID: 1GFG631250

**Description:** Remedial Action - IHSS Group 300-1

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**Total for Activity 1GFG631250:**

- Total: 5,315
- Total Labor: 159,516
- Total Cost: 199,924
- Total Contingency: 236,973
- Total Burden: 596,413
- Total Escalation: 651,924

---

**BOE: Estimator's Experience based generally on historical data for T-3/T4 Remediation.**

**Item Desc:** Mobilization in support of remediation.

**Breakdown of Cost Data:**

- **Item:** Site Labor to perform above individual tasks for T-3/T4.
  - Units: hours
  - Unit Cost: 275
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit: 70

- **Item:** Subcontractor costs to perform above individual tasks for T-3/T4.
  - Units: 1 lot
  - Unit Cost: 184K
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit: 46K

**Basis for adjustment:** The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs. This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
**Project**: Baseline Dev  
**WBS Filter**: 1GAC  
**Activity Filter**: *  
**Starts In FY**: *

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<td>1GAC0301</td>
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### Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

**Line Item 0200 - site prep**

**BOE**

- **Estimator's Experience**: Based generally on historical data for T-3/T4 Remediation.
- **Item Desc:** Site Preparation including setting up fencing, trailer, etc.
- **Breakdown of Historical Data:***
  - **Item**: Site Labor to perform above individual tasks for T-3/T-4.
    - **Units**: hours
    - **Unit Cost**: 120 hours
    - **Unit Cost Adjustment Factor**: Revised Unit:
  - **Item**: Subcontractor costs to perform above individual tasks for T-3/T-4.
    - **Units**: Dollars
    - **Unit Cost**: $30k
    - **Unit Cost Adjustment Factor**: Revised Unit:

**Factors**

- **ASC** SUPPLIES: 0000 NONE
  - **Factors**: 7 hrs
  - **Linear** 7.00 Hours
- **ASH** SUBCONTRACTED SRVS: 0000 NONE
  - **Factors**: 380 dollars each 90 7.4 m³ soft side waste packages
  - **Linear** 34,200.00 Dollars
- **ASH** SUBCONTRACTED SRVS: 0000 NONE
  - **Factors**: 46000 sub/c support
  - **Linear** 38,904.96 Dollars

**Factors**

- **Direct Labor**: 120 hrs
- **Indirect Labor**: 750 hrs
- **Supplies**: 0000
- **Subcontracted Services**: 30000 sub/c support

**Line Item 0300 - excavation**

**BOE**

- **Estimator's Experience**: Based generally on historical data for T-3/T4 Remediation.
- **Item Desc:** Excavation.
- **Breakdown of Historical Data:***
  - **Item**: Site Labor to perform above individual tasks for T-3/T-4.
    - **Units**: hours
    - **Unit Cost**: see below
    - **Unit Cost Adjustment Factor**: see below
    - **Revised Unit**: see below
  - **Item**: Subcontractor costs to perform above individual tasks for T-3/T-4.
    - **Units**: 1 lot
    - **Unit Cost**: see below
    - **Unit Cost Adjustment Factor**: see below
    - **Revised Unit**: see below

**Factors**

- **Direct Labor**: 120 hrs
- **Indirect Labor**: 750 hrs
- **Supplies**: 0000
- **Subcontracted Services**: 30000 sub/c support

**Resources**

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**Line Item 0400 - uncollectible costs**

**BOE**

- **Estimator's Experience**: Based generally on historical data for T-3/T4 Remediation.
- **Item Desc:** Wastewater Line Installation.
- **Breakdown of Historical Data:***
  - **Item**: Site Labor to perform above individual tasks for T-3/T-4.
    - **Units**: hours
    - **Unit Cost**: see below
    - **Unit Cost Adjustment Factor**: see below
    - **Revised Unit**: see below
  - **Item**: Subcontractor costs to perform above individual tasks for T-3/T-4.
    - **Units**: Dollars
    - **Unit Cost**: see below
    - **Unit Cost Adjustment Factor**: see below
    - **Revised Unit**: see below

**Factors**

- **Direct Labor**: 120 hrs
- **Indirect Labor**: 750 hrs
- **Supplies**: 0000
- **Subcontracted Services**: 30000 sub/c support

**Resources**

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**Factors**

- **Direct Labor**: 120 hrs
- **Indirect Labor**: 750 hrs
- **Supplies**: 0000
- **Subcontracted Services**: 30000 sub/c support

**Notes**

- The BOE provides one environmental engineer 120 hours for site prep and $30k for subcontract dollars for installation of fencing and trailers.
- This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
- The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.5 factor to account for the fact that 2 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.
Assumes 720 cubic yards excavated becomes 900 cubic yards assuming 20% waste growth (688 cubic meters). Waste is placed in 7.4 cubic meter soft side waste packages for a total of 93 waste packages.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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Line Item 0400 - remove and clean debris

Estimator's Experience based generally on a base case of 700 cy.

Item Desc:
Remove and clean debris.

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
Units: hours
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
Units: 1 lot
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

For the base case, it was assumed that about five cubic yards out of 700 cubic yards would be debris and would be segregated and cleaned. It was estimated that each cubic yard of debris would cost $1,000 or $5,000 total for 700 cubic yards. This yields a rate of $7.14 per cubic yard.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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Line Item 0600 - confirmation sampling

Area of concern has a foot print of 19452 sq feet, assuming 20% exceeds action levels and requires remediation. BOE based on 3,890 square feet contaminated and requiring remedial action. Assume SAF will require one confirmation sample collected for every 1,000 square feet (100 ft x 100 ft) area of excavation. 4 confirmation samples will be required plus 20% for QA samples for a total of 5 confirmation samples.
Item:  Subcontractor costs to perform above individual tasks for T-3/T-4.

Units:  dollars per sample
Unit Cost:  $730
Unit Cost Adjustment Factor:  Revised Unit:
Basis for adjustment.

The project will generate 900 cubic yards (720 x 1.25 = 900 cy to accommodate for growth).  900 cubic yards (688 cubic meters) will require 93 7.4-cubic meter soft-side waste packages for disposal.  Ten percent (10%) of the waste packages will require sampling plus 20% for QA purposes so 12 samples will be generated. Waste will be LLM.

The BOE provides for the following analysis for meeting EnviroCare's WAC:

Vendor Name - K-H Analytical Services
Vendor Quote -
Date Received -
Item being quoted -
Other Info - http://rfetshp/PlanAndInteg/Guidance/planninginfo.htm

Analysis/Service Type  Routine Cost
Volatile Organics  $280.00
Semi-volatile organics  $440.00
Inorganics - metals  $345.00
Isotopics (Pu, Am, & U)  $590.00
DOT Radscreen  $32.00
Bottles  $28.00
Shipping 2 @ 42  $84.00

Total per sample  $1,799.00

Routine Analysis is a 31 day Turn Around Time (TAT) in the laboratory except for Asbestos, beryllium, and Industrial Hygiene which are 5 days.  Routine DOT radscreeen is a 24 hour TAT.

Subcontractor costs:
2 subcontractor FTEs 5 hours each sample (27 samples) at $73/hour.
2 FTEs X 5 hrs X $73 = $730 per sample
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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### Line Item 0700 - prepare waste acceptance forms

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc:
Prepare Waste Acceptance Forms

Page 160 of 1121  6/23/00 9:20:41 AM  OFFICIAL USE ONLY
Breakdown of Historical Data:

Item: Site Labor to perform above individual tasks for T-3/T-4.
  - Units: hours
  - Unit Cost: see below
  - Unit Cost Adjustment Factor: see below
  - Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
  - Units: 1 lot
  - Unit Cost: see below
  - Unit Cost Adjustment Factor: see below
  - Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.5 factor to account for the fact that 2 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

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### Resources

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**Line Item 0800 - waste acceptance sampling**

BOE

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc: Waste Acceptance Sampling

Breakdown of Historical Data:

Item: Analytical Costs
  - Units: sample
  - Unit Cost: $2,190
  - Unit Cost Adjustment Factor: see below
  - Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
  - Units: dollars per sample
  - Unit Cost: $730
  - Unit Cost Adjustment Factor: see below
  - Revised Unit: see below

Basis for adjustment.

The project will generate 900 cubic yards (720 x 1.25 = 900 cy to accommodate for growth). 900 cubic yards (688 cubic meters) will require 93 7.4-cubic meter soft-sided waste packages for disposal. Ten percent (10%) of the waste packages will require sampling plus 20% for QA purposes so 12 samples will be generated. Waste will be LLM.

The BOE provides for the following analysis for meeting Envirocars WAC:

- DOT Shipping: $32.00
- gross alph/beta: $133.00
- VOA: $280.00
- SVOA: $440.00
- Isotopic: $590.00
- total metals: $345.00
- Bottles: $28.00
- Shipping: $42.00
- Sample Team: $300.00
- TOTAL: $2,190.00

Subcontractor costs:

2 subcontractor FTEs 5 hours each sample (27 samples) at $73/hour.
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
**Rocky Flats Closure Project**  
*Baseline Cost and Basis of Estimate*

### WBS No: 1GAC0301  
**Activity ID:** 1GF0631250  
**Baseline Devl:**  
**WBS Filter:** 1GAC  
**Activity Filter:** *  
**Starts In FY:** *

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#### Line Item 1000 - backfill
**BOE**  
**Trade Publication**  
Means 1995, Site Work & Landscape Cost Data (page 34, 42, and 34)

**Item Desc:** Backfill - $15 per cubic yard includes material, machinery, and labor to place backfill in excavation.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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**Factors:**
- 15 dollars per cubic yard

#### Line Item 1100 - demobilization
**BOE**  
**Estimator's Experience based generally on historical data for T-3/T4 Remediation.**

**Item Desc:** Demobilization.

**Breakdown of Historical Data:**
- **Item:** Site Labor to perform above individual tasks for T-3/T-4.
  - Units: hours
  - Unit Cost: see below
  - Unit Cost Adjustment Factor: see below
  - Revised Unit: see below

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
- Units: 1 lot
- Unit Cost: see below
- Unit Cost Adjustment Factor: see below
- Revised Unit: see below

**Basis for adjustment.** The costs were divided into fixed costs and variable costs. The fixed costs are: Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are: Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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**Factors:**
- 75 hrs
- 50 hrs
- 25 hrs
- 25 hrs
- 23750 sub/c support

#### Line Item SYS - Contingency And Escalation
**BOE**  
**Resources**

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**Factors:**
- 172691 Dollars

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*6/23/00 9:20:41 AM OFFICIAL USE ONLY*
Project: Rocky Flats Closure Project

Baseline Cost and Basis of Estimate

WBS No: 1GAC0301
Activity ID: 1GFGE31250

Baseline Devl
WBS Filter: 1GAC
Activity Filter: *
Starts In FY: *

EESC: ESCALATION 0000 NONE
ZDEPT: No Department
Linear: 64,282.29 Dollars

Factors: 64282.3 Dollars

Activity ID: 1GFGE631270
Description: Prepare Closeout Report - IHSS Group 300-1

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Total for Activity 1GFGE631270: 438 12,640 710 9,186 27,338

Line Item 0100 - develop report

- **BOE**
- Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Item Desc:**
Perform Data Analysis including GIS representation of data, Characterization Report, and associated project management.

**Breakdown of Cost Data:**
- **Item:** Develop Documentation
- **Units:** site labor hours, subcontract dollars
- **Unit Cost:** 300 hours, $840 dollars
- **Unit Cost Adjustment Factor:**
- **Basis for adjustment:**
The BOE provides 20 hours for an environmental scientist, manager, and administrative assistant, 80 hours for an environmental engineer, and 160 hours for a computer systems analyst (GIS). It also provides for 20 hours of subcontractor time.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Resources**

- **Cost Element:** STRAIGHT TIME BASE
- **Skill:** ENVIRONMENTAL ENGINEERS
- **Department:** RMRS Salaried
- **Curve:** Linear
- **Quantity:** 80.00
- **Units:** Hours

- **Factors:** 80 hours

- **Cost Element:** STRAIGHT TIME BASE
- **Skill:** ADMINISTRATIVE ASSISTANTS
- **Department:** RMRS Salaried
- **Curve:** Linear
- **Quantity:** 20.00
- **Units:** Hours

- **Factors:** 20 hours

- **Cost Element:** STRAIGHT TIME BASE
- **Skill:** MANAGERS (GRADE 69 - 72)
- **Department:** RMRS Salaried
- **Curve:** Linear
- **Quantity:** 20.00
- **Units:** Hours

- **Factors:** 20 hours

- **Cost Element:** STRAIGHT TIME BASE
- **Skill:** COMPUTER SYSTEMS ANALYSTS
- **Department:** RMRS Salaried
- **Curve:** Linear
- **Quantity:** 160.00
- **Units:** Hours

- **Factors:** 160 hours

- **Cost Element:** SUBCONTRACTED SRVS
- **Skill:** ENVIRONMENTAL SCIENTISTS
- **Department:** RMRS Salaried
- **Curve:** Linear
- **Quantity:** 20.00
- **Units:** Hours

- **Factors:** 20 hours

**Line Item 01000 - develop NFA documentation**

- **BOE**
- This estimate was constructed based on actual hours required to complete previous NFA Reports (obtained from actual author) and professional judgement of level of effort required for remaining reports.

**Item Desc:**
Perform Data Analysis including GIS representation of data, Characterization Report, and associated project management.

**Breakdown of Cost Data:**
- **Item:** Develop Documentation
- **Units:** Hours
- **Unit Cost:** 138
- **Environmental Engineer**: 45 hrs Evaluate & assemble existing data. Draft Report.
- **SMD Technician**: 10 hrs Identify & pull existing data from database.
- **GIS Technician**: 15 hrs Develop maps for Report. Print multiple copies.
- **Technical Editor**: 15 hrs Complete initial and revised tech edits of Report.

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6/23/00 9:20:41 AM OFFICIAL USE ONLY
### Technical Reviews
- QA 4 hrs Review and comment per area of expertise.
- Peer (2) 8 hrs Review and comment per area of expertise.
- Compliance 4 hrs Review and comment per area of expertise.
- Environmental 4 hrs Review and comment per area of expertise.
- Management (2) 8 hrs Review and comment per area of expertise.
- Legal 4 hrs Review and comment per area of expertise.
- Environmental Engineer 15 hrs Disposition comments and finalize document.
- Administrative Support 6 hrs Copy & assemble final documents, submit to records.

Unit Cost Adjustment Factor: none
Revised Unit Hours: 138

### Basis for adjustment. N/A

### Resources

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### Line Item SYS - Contingency And Escalation

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### Line Item 0100 - SAP/HASP Addenda

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Total for Activity 1G30020100:

- Labor Hours Total: 300
- Labor Cost Total: 9,066
- Materials/Sub Cost: 1,421
- Contingency & Escalation: 1,877
- Total Prime Cost: 12,364
- Burden Cost: 2,557
- Total Cost: 14,921

### Breakdown of Cost Data:

- Estimator's Experience: 15 years of experience planning, estimating and conducting projects of similar scope and size. (S. Serreze)
- Item Desc: Preparation of SAP Addendums
Project: Rocky Flats Closure Project  
Baseline Deviation: Baseline Cost and Basis of Estimate  
WBS No: 1GAC0302  
Activity ID: 1G30020100

**Cost Element**  
**Skill**  
**Department**  
**Curve**  
**Quantity**  
**Units**

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**Line Item SYS - Contingency And Escalation**

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**Cost Element**  
**Skill**  
**Department**  
**Curve**  
**Quantity**  
**Units**

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**Activity ID:** 1G30020120  
**Description:** Procurement & Field Preparation - Group 300-2  

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Total for Activity 1G30020120:  

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**Line Item 0100 - field prep**

**BOE**  
**Description:** Procurement & Field Preparation - Group 300-2  

**Cost Element**  
**Skill**  
**Department**  
**Curve**  
**Quantity**  
**Units**

**Item Descriptions:**  

**Breakdown of Cost Data:**  
**Item:** Prepare field permits, purchase equip, identify utilities, training  
Units: hours  
Unit Cost: 400  
Unit Cost Adjustment Factor: none  
Revised Unit: hours

This BOE provides a project productivity/efficiency factor for committed but as yet undefined cost reductions.
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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#### Line Item SYS - Contingency And Escalation

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### Activity ID: 1G30020140

**Description:** Readiness Review - Group 300-2

**Cost Risk:** 2

**Schedule Risk:** 2

#### Line Item 0100 - readiness assessment

Estimator's Experience based on 15 years of experience planning, estimating and conducting projects of similar scope and size.

**Item Desc:**
Evaluate readiness of the field characterization team and plans.

Breakdown of Cost Data:
- **Item:** Perform readiness evaluation
  - Units: hours
  - Unit Cost: 280
  - Unit Cost Adjustment Factor:
  - Revised Unit Hours:
  - Basis for adjustment.

This BOE provides a Environmental Engineer for 80 hours and a Admin. Assistant, manager, Health Physicist, and Industrial Safety person for 40 hours for the duration of the activity. It also provides for 40 hours for a subcontractor for project controls support.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### Rocky Flats Closure Project
#### Baseline Cost and Basis of Estimate

**Project:** Rocky Flats Closure Project  
**Baseline Cost and Basis of Estimate**  
**WBS Filter:** 1GAC  
**Activity Filter:** *  
**Starts In FY:** *

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**Line Item 0100 - collect geoprobe samples**

Estimator's experience based on 15 years of experience planning, estimating and conducting projects of similar scope and size.

**Item Desc:**
Collection of Geoprobe samples with the site-owned Geoprobe provided with two technicians. A site Environmental Engineer will direct the boring placement, log the borings; collect, containerize, package, and ship the samples; prepare field QC documentation, and prepare field notes on a full time basis. A site RCT will monitor the site for radiological contamination on a full time basis. A site Industrial Hygienist will implement the field portion of the HASP on a full time basis. Decon Operations staff will decon the vehicle and equipment when it leaves the work area on a half time basis. It is estimated that one 10' boring will be placed per 500 SF of building footprint (same as Bldg. 123 characterization) with 5 samples per 10' boring. It is estimated that one boring per eight hours can be completed.

**Breakdown of Cost Data:**
- **Item:** Site Personnel for support of Geoprobe samples  
  **Units:** site personnel hours/per borehole  
  **Unit Cost:** $28  
  **Unit Cost Adjustment Factor:**  
  **Revised Unit Hours:**

- **Item:** Kaiser-Hill/RMRS Geoprobe unit with 2 Technician crew. Item costs $100 per hour or $800 per 8-hour day.
  **Units:** dollars per borehole
  **Unit Cost:** $800
  **Unit Cost Adjustment Factor:** none
  **Revised Unit Hours:** Basis for adjustment.

**Resources**

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Project Baseline Devl
Baseline Cost and Basis of Estimate

WBS No: 1GAC0302
Activity ID: 1G30020150

Project: Rocky Flats Closure Project
WBS Filter: 1GAC
Activity Filter: *
Starts In FY: *

---

### Line Item 0200 - analyze samples

**BOE**

**Vender Quote**

**Item Desc:**
Analyze samples produced from geoprobe borings. It is anticipated that 5 samples from each boring will be collected. They will be analyzed for Metals, VOCs, SVOCs, PCBs, and radionuclides (est. 3 isotopes) with a 30 day TAT. This item is priced on a per sample basis.

**Breakdown of Cost Data:**
- **Item:** Analyze samples at an offsite laboratory.
  - **Units:** Dollars per analysis
  - **Unit Cost:** $1,806
  - **Unit Cost Adjustment Factor:** none
  - **Revised Unit Hours:**
    - **Basis for adjustment:**

**Analysis/Service Type** | **Routine Cost**
--- | ---
Volatile Organics | $280.00
Inorganics - metals | $345.00
Isotopics (Pu, Am, & U) | $590.00
Semi-volatile organics | $440.00
DOT Radscreen | $32.00
Bottles 5 @ $7 | $35.00
Shipping 2 @ $42 | $84.00
**Total per sample** | $1,806.00

Routine DOT radscreen is a 24 hour TAT.
Routine Analysis is a 31 day Turn Around Time (TAT) in the laboratory except for Asbestos, beryllium, and Industrial Hygiene which are 5 days.
Priority Analysis is <31 day and >7 days TAT except for Asbestos, beryllium and Industrial Hygiene which are 3 days.
Rush Analysis is <7 days TAT except for Asbestos, beryllium and Industrial Hygiene which are 24 hours.
Routine DOT radscreen is a 24 hour TAT.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

### Resources

**Cost Element** | **Skill** | **Department** | **Curve** | **Quantity** | **Units**
--- | --- | --- | --- | --- | ---
ASH | SUBCONTRACTED SRVS | 0000 | NONE | K267S | Analytical Laboratory Services | Linear | 1,527.44 | Dollars

Factors 1806 dollars

---

### Line Item 0300 - project mgmt oversight

**BOE**

**Estimator's Experience** based on 15 years of experience planning, estimating and conducting projects of similar scope and size.

**Item Desc:**
Project Management/Oversight. Based on half time for a Project Manager, Administrative staff, and Cost Estimator/Scheduler.

**Breakdown of Cost Data:**
- **Item:** Mgmt oversight
  - **Units:** hours per borehole
  - **Unit Cost:** 12
  - **Unit Cost Adjustment Factor:** none
  - **Revised Unit Hours:**
    - **Basis for adjustment:**

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This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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<td>4,164</td>
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<td>1,449</td>
<td>5,613</td>
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### Line Item 01000 - develop characterization report

### Line Item SYS - Contingency And Escalation

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<th>Labor Hours Total</th>
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### Activity 1G30020170 - Prepare NFA - Group 300-2

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<td>EE</td>
<td>138</td>
<td>138</td>
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<td>Contingency And Escalation</td>
<td>1.00</td>
<td>each</td>
<td>E</td>
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<td>20,121</td>
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Total for Activity 1G30020170: 866 25,231 2,842 20,121 48,194 8,780 56,975

---

**Item Desc:** Perform Data Analysis including GIS representation of data, Characterization Report, and associated project management.

**Breakdown of Cost Data:**

**Item: Develop Documentation**
- **Units:** Hours
- **Unit Cost:** 138

**Environmental Engineer** 45 hrs Evaluate & assemble existing data. Draft Report.
- **SMD Technician** 10 hrs Identify & pull existing data from database.
- **GIS Technician** 15 hrs Develop maps for Report. Print multiple copies.
- **Technical Editor** 15 hrs Complete initial and revised tech edits of Report.
- **Technical Reviews**
  - QA 4 hrs Review and comment per area of expertise.
  - Peer (2) 8 hrs Review and comment per area of expertise.
  - Compliance 4 hrs Review and comment per area of expertise.
  - Environmental 4 hrs Review and comment per area of expertise.
  - Management (2) 8 hrs Review and comment per area of expertise.
  - Legal 4 hrs Review and comment per area of expertise.
- **Environmental Engineer** 15 hrs Disposition comments and finalize document.
- **Administrative Support** 6 hrs Copy & assemble final documents, submit to records.

**Unit Cost Adjustment Factor:** none
**Revised Unit Hours:** 138

**Basis for adjustment:** N/A

---

**Resources**

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<tr>
<th>Cost Element</th>
<th>Skill</th>
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<th>Curve</th>
<th>Quantity</th>
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<td>E050 ENVIRONMENTAL ENGINEERS</td>
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**Factors** 80 hrs
### Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

### WBS Filter
- **WBS No:** 1GAC0302
- **Activity ID:** 1G30020170

**Baseline Devl**
- **Project:** WBS Filter
- **WBS Filter:** 1GAC

## Line Item 01000 - develop characterization report

**BOE**

Estimator's Experience on similar projects

Item Desc: Perform Data Analysis including GIS representation of data, Characterization Report, and associated project management.

**Breakdown of Cost Data:**

- **Item:** Develop Characterization Report
- **Units:** 728 hours

<table>
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<tr>
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<td>ENVIRONMENTAL ENGINEERS</td>
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<td>Hours</td>
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<td>80</td>
<td>hrs</td>
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<tr>
<td>750</td>
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<td>M040</td>
<td>MANAGERS (GRADE 64 - 68)</td>
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<td>160</td>
<td>hrs</td>
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*This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.*
### Rocky Flats Closure Project

#### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0303  
**Title:** Group 300-3 (B371)  
**Activity ID:** 1GER030100

**Description:** SAP Preparation - IHSS Group 300-3 (B371)

**Schedule Risk:** 3  
**Cost Risk:** 3

**Factors: 80 hrs**  
**Estimated $/hr:** 42

**Line Item 0100 - SAP Addenda**

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<tr>
<th>BOE</th>
<th>Description</th>
<th>Quantity</th>
<th>Units</th>
<th>Labor Hours/Unit</th>
<th>Labor Hours Total</th>
<th>Labor Cost Total</th>
<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
<th>Burden Cost</th>
<th>Total Cost</th>
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<tbody>
<tr>
<td></td>
<td>SAP Addenda</td>
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**Total for Activity 1GER030100:**  
- **Total Labor:** 280 hours  
- **Total Labor Cost:** $9,034  
- **Total Contingency & Escalation:** $1,421  
- **Total Prime Cost:** $10,455  
- **Total Cost:** $12,276

---

**BOE Resources**

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
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<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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<tbody>
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<td>ZDEPT: No Department</td>
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**Line Item 0200 - HASP Addenda**

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<th>BOE</th>
<th>Description</th>
<th>Quantity</th>
<th>Units</th>
<th>Labor Hours/Unit</th>
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<th>Labor Cost Total</th>
<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
<th>Burden Cost</th>
<th>Total Cost</th>
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</table>

**Total for Activity 1GER030100:**  
- **Total Labor:** 280 hours  
- **Total Labor Cost:** $9,034  
- **Total Contingency & Escalation:** $1,421  
- **Total Prime Cost:** $10,455  
- **Total Cost:** $12,276

---

**BOE Resources**

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<tr>
<th>Cost Element</th>
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<th>Quantity</th>
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<td>MANAGERS (GRADE 64 - 68)</td>
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**BOE Resources**

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<td>COST ESTIMATORS PLANNERS AN</td>
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**Line Item 0300 - QAP Addenda**

**Estimator's Experience based on similar environmental restoration work scope**

**Item Desc:** Preparation of SAP Addenda

**Breakdown of Cost Data:**

- Item: Preparation Labor for SAP addenda  
  - Units: 1 Lot  
  - Unit Cost: 100 Hours  
  - Unit Cost Adjustment Factor:  
    - Revised Unit Hours: Basis for adjustment:

**BOE provides 80 hours for an environmental engineer and 20 hours for a manager**

**Breakdown of Cost Data:**

- Item: Subcontracted Labor for SAP addenda  
  - Units: 1 Lot  
  - Unit Cost: $840  
  - Unit Cost Adjustment Factor: none  
  - Revised Unit Hours: N/A  
  - Basis for adjustment: N/A

**BOE provides 20 hours for a subcontract project controls specialist**

**This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.**

---

**BOE Resources**

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
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<th>Curve</th>
<th>Quantity</th>
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<td>RMRS Salaried</td>
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**BOE Resources**

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<td>SUBCONTRACTED SRVS</td>
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<td>COST ESTIMATORS PLANNERS AN</td>
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**BOE Resources**

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<td>STRAIGHT TIME BASE</td>
<td>M040</td>
<td>MANAGERS (GRADE 64 - 68)</td>
<td>Linear</td>
<td>20.00 Hours</td>
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**BOE Resources**

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<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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</thead>
<tbody>
<tr>
<td>SUBCONTRACTED SRVS</td>
<td>P070</td>
<td>COST ESTIMATORS PLANNERS AN</td>
<td>Linear</td>
<td>710.44 Dollars</td>
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This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
Item Desc:
Preparation of HASP addenda
Breakdown of Cost Data:
- Item: Preparation Labor for addenda for HASP.
  - Units: 1 Lot
  - Unit Cost: 140 Hours
  - Revised Unit Hours:
  - Basis for adjustment:

BOE provides 20 hours for an environmental engineer and 40 hours each for an Industrial Hygienist, Manager, and a Health Physicist.

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<th>Cost Element</th>
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<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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<tr>
<td>750</td>
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<td>E050 ENVIROMENTAL ENGINEERS</td>
<td>R100S RMRS Salaried</td>
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<td>750</td>
<td>STRAIGHT TIME BASE</td>
<td>M040 MANAGERS (GRADE 64 - 68)</td>
<td>R100S RMRS Salaried</td>
<td>Linear</td>
<td>40.00</td>
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<td>Factors</td>
<td>40 hours</td>
<td>M</td>
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</tr>
<tr>
<td>750</td>
<td>STRAIGHT TIME BASE</td>
<td>P080 HEALTH PHYSICISTS</td>
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**Line Item 0300 - QAP Addenda**

BOE Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

Item Desc:
Preparation of SAP Addenda to Industrial Area Characterization Plan.

Breakdown of Cost Data:
- Item: Preparation of QAP addenda
  - Units: hours
  - Unit Cost: 40
  - Unit Cost Adjustment Factor:
  - Revised Unit Hours:
  - Basis for adjustment

The BOE provies 40 hours for a site environmental engineer and 20 hours for a cost estimator/planner.

This estimate includes a project productivity/eficiency factor for committed but as yet undefined cost reductions.

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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<tr>
<td>750</td>
<td>STRAIGHT TIME BASE</td>
<td>E050 ENVIROMENTAL ENGINEERS</td>
<td>R100S RMRS Salaried</td>
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**Line Item SYS - Contingency And Escalation**

BOE Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

Item Desc:
Preparation of SAP Addenda to Industrial Area Characterization Plan.

Breakdown of Cost Data:
- Item: Preparation of QAP addenda
  - Units: hours
  - Unit Cost: 40
  - Unit Cost Adjustment Factor:
  - Revised Unit Hours:
  - Basis for adjustment

The BOE provies 40 hours for a site environmental engineer and 20 hours for a cost estimator/planner.

This estimate includes a project productivity/eficiency factor for committed but as yet undefined cost reductions.

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
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<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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<td>ESC ESCALATION</td>
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</table>
### Rocky Flats Closure Project
#### Baseline Cost and Basis of Estimate

**Line Item 0100 - procurement & field prep**

**BOE**

Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation

**Item Desc:**

**Breakdown of Cost Data:**
- **Items:** Site Labor to perform above individual tasks for either Ryan's Pit or T-3/T-4.
  - **Units:** hours
  - **Unit Cost:** 1,292
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** 324 hours
- **Items:** Subcontractor costs to perform above individual tasks for either Ryan's Pit or T-3/T-4.
  - **Units:** 1 lot
  - **Unit Cost:** $10K
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** $2.5K

**Basis for adjustment. Hours and costs for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be characterized at once.**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

#### Resources

**Cost Element** | **Skill** | **Department** | **Curve** | **Quantity** | **Units**
---|---|---|---|---|---
750 **STRAIGHT TIME BASE** | E050 ENVIRONMENTAL ENGINEERS | R100S BMRS Salaried | Linear | 266.00 | Hours
Factors 266 hrs
750 **STRAIGHT TIME BASE** | E120 SAFETY ENGINEERS | R100S BMRS Salaried | Linear | 10.00 | Hours
Factors 10 hrs
750 **STRAIGHT TIME BASE** | M040 MANAGERS (GRADE 64 - 68) | R100S BMRS Salaried | Linear | 13.00 | Hours
Factors 13 hrs
750 **STRAIGHT TIME BASE** | P080 HEALTH PHYSICISTS | R100S BMRS Salaried | Linear | 10.00 | Hours
Factors 10 hrs
750 **STRAIGHT TIME BASE** | P090 INDUSTRIAL HYGIENISTS | R100S BMRS Salaried | Linear | 10.00 | Hours
Factors 10 hrs
750 **STRAIGHT TIME BASE** | S020 ENVIRONMENTAL SCIENTISTS | R100S BMRS Salaried | Linear | 10.00 | Hours
Factors 10 hrs
750 **STRAIGHT TIME BASE** | T050 RADIATION CONTROL TECHNOLOGI | KG10H Remediation Steelworkers | Linear | 5.00 | Hours
Factors 5 hrs
ASH **SUBLICONTRACTED SRVS** | 0000 NONE | K265S ER Programs | Linear | 2,114.40 | Dollars
Factors 2500 sub/c support

**Line Item SYS - Contingency And Escalation**

**BOE**

0.84576 (SYS 061400)_84576000 - System

**Factors**

**Cost Element** | **Skill** | **Department** | **Curve** | **Quantity** | **Units**
---|---|---|---|---|---
CON **CONTINGENCY** | 0000 NONE | ZDEPT No Department | Linear | 3,108.93 | Dollars
Factors 3,108.93 Dollars
ESC **ESCALATION** | 0000 NONE | ZDEPT No Department | Linear | 1,172.49 | Dollars
Factors 1,172.49 Dollars

**Activity ID:** 1GER030140 **Description:** Readiness Assessment - IHSS Group 300-3

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<th>Description</th>
<th>Quantity</th>
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<th>Material/ Sub Cost</th>
<th>Contingency &amp; Escalation</th>
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<td>3,352</td>
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Total for Activity 1GER030140:

| 280 | 8,367 | 710 | 3,352 | 12,430 | 2,895 | 15,325 |
Line Item 0100 - readiness assessment

BOE

Estimator's Experience

Item Desc:
Evaluate readiness of the field characterization team and plans.

Breakdown of Cost Data:
Item: Perform readiness evaluation
Units: site personnel hours
Unit Cost: 280
Unit Cost Adjustment Factor:
Revised Unit Hours:
Basis for adjustment:

The BOE provides for an administrative assistant, industrial hygienist, health physicist, and a manager a total of 40 hours each and 120 hours for an environmental engineer for this task.

It also provides 20 hours for a project planning professional for a total of $840 for this activity.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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<tr>
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<td>Linear</td>
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<td>Hours</td>
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Line Item SYS - Contingency And Escalation

BOE

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Activity ID: 1GER030150
Description: Field Sampling, Lab Analysis - IHSS Group 300-3

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Total for Activity 1GER030150:

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BOE

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

Item Desc: Collection of geoprobe samples with the site goeprobe with two technicians. A site Environmental Engineer will direct the boring placement, log the borings; collect, containerize, package, and ship the samples; prepare field QC documentation, and prepare field notes on a full time basis. A site RCT will monitor the site for radiological contamination on a full time basis. A site Industrial Hygienist will implement the field portion of the HASP on a full time basis. Decon Operations staff will decon the vehicle and equipment when it leaves the work area on a half time basis. It is estimated that one...
10' boring will be place per 500 SF of building footprint (same as Bldg. 123 characterization) with 5 samples per 10' boring. It is estimated that one boring per eight hours can be completed.

Breakdown of Cost Data:
- Item: Site Personnel for support of geoprobe samples
  - Units: hours
  - Unit Cost: 24
  - Unit Cost Adjustment Factor:
  - Revised Unit Hours:
- Item: Kaiser-Hill/RMRS Geoprobe unit with 2 Technician crew. Item costs $100 per hour or $800 per 8-hour day.
  - Units: dollars
  - Unit Cost: 800
  - Unit Cost Adjustment Factor:
  - Basis for adjustment:

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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Factors 8 hrs

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Factors 8 hrs

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Factors 8 hrs

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Factors 800 geoprobe

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Factors 8 hrs

| 60          | Decon estimated $/hr   | 0.5 | reduction |       |

Line Item 0200 - analyze samples

Vendor Quote

Item Desc:
Analyze samples produced from geoprobe borings. It is anticipated that 5 samples from each boring will be collected. They will be analyzed for Metals, VOCs, SVOCs, PCBs, and radionuclides (est. 3 isotopes) with a 30 day TAT. This item is priced on a per sample basis.

Breakdown of Cost Data:
- Item: Analyze samples at an offsite laboratory.
  - Units: Dollars per analysis
  - Unit Cost: 1806
  - Unit Cost Adjustment Factor:
  - Revised Unit Hours:
  - Basis for adjustment:

Analysis/Service Type | Routine Cost
--- | ---
Volatile Organics | $280.00
Inorganics - metals | $345.00
Isotopics (Pu, Am, & U) | $590.00
Semi-volatile organics | $440.00
DOT Radscreen | $32.00
Bottles 5 @ $7 | $35.00
Shipping 2 @ $42 | $84.00
Total per sample | $1806.00

Routine DOT radscren is a 24 hour TAT.
Routine Analysis is a 31 day Turn Around Time (TAT) in the laboratory except for Asbestos, beryllium, and Industrial Hygiene which are 5 days.
Priority Analysis is <=31 days and >7 days TAT except for Asbestos, beryllium and Industrial Hygiene which are 5 days.
Rush Analysis is <7 days TAT except for Asbestos, beryllium and Industrial Hygiene which are 24 hours.
Routine DOT radscren is a 24 hour TAT.
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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<tr>
<th>Cost Element</th>
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<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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**Factors** 1806 dollars

0.84576 [SYS 061400].84576000 - System

### Line Item 0300 - project mgmt oversight

**BOE**

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Item Desc:**

Project Management/Oversight. Based on half time for a Project Manager, Administrative staff, and Cost Estimator/Scheduler

**Breakdown of Cost Data:**

- **Item:** Mgmt oversight
- **Units:** person hours per borehole, planner subcontract dollars
- **Unit Cost:** 8 hours, $84 subcontract dollars
- **Unit Cost Adjustment Factor:**
  - Revised Unit Hours:
  - Basis for adjustment:

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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<th>Skill</th>
<th>Department</th>
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<th>Quantity</th>
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**Factors** 4 hrs

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**Factors** 4 hrs 42 estimated $/hr 0.5 reduction

0.84576 [SYS 061400].84576000 - System

### Line Item SYS - Contingency And Escalation

**BOE**

**Cost Risk** 3 **Schedule Risk** 3

**Activity ID:** 1GER030170 **Description:** Prepare Summary/NFA - IHSS Group 300-3

**Line Item 01000**

**Description**

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<th>Line Item</th>
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Total for Activity 1GER030170:

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### Line Item 01000 - develop characterization report

**BOE**

Estimator's Experience on similar projects

**Item Desc:** Perform Data Analysis including GIS representation of data, Characterization Report, and associated project management.

**Breakdown of Cost Data:**

- **Item:** Develop Characterization Report
  - **Units:** 728 hours
- 2 Environmental Engineers full time for 2 weeks to develop draft 160 hrs
- 1 Project Manager full time for 4 weeks 160 hrs
- 1 Secretary 1/2 time for 4 weeks to format and copy 80 hrs
- 1 QA person 8 hours for review 8 hrs
- 2 GIS individuals 2 weeks to create/revise maps 160 hrs
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
## Rocky Flats Closure Project

### Baseline Cost and Basis of Estimate

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<td>Description: Procurement - IHSS Grouping 300-3</td>
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</table>

### Line Item 0100 - procurement & field prep


#### Breakdown of Cost Data:

**Item:** Site Labor to perform above individual tasks for either Ryan's Pit or T-3/T-4.
- **Units:** hours
- **Unit Cost:** $1292
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** 324 hours

**Item:** Subcontractor costs to perform above individual tasks for either Ryan's Pit or T-3/T-4.
- **Units:** 1 lot
- **Unit Cost:** $10K
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** $2.5K

**Basis for adjustment:** Hours and costs for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once.

- **This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.**

### Resources

#### BOE

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<td>5.00</td>
<td>Hours</td>
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6/23/00 9:20:45 AM

OFFICIAL USE ONLY
### Rocky Flats Closure Project

#### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0303  
**Activity ID:** 1GER030210  
**Project:** Rocky Flats Closure Project  
**Baseline Devi:**  
**WBS Filter:** 1GAC  
**Activity Filter:**  
**Starts By FY:**  

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<th>BOE Type</th>
<th>Labor Hours/Unit</th>
<th>Labor Hours Total</th>
<th>Labor Cost Total</th>
<th>Materials/Sub Cost</th>
<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
<th>Burden Cost</th>
<th>Total Cost</th>
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**Cost Element:**  
- Contingency And Escalation

**Total for Activity 1GER030230:**

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**Resources**

- **BOE:**
  - **SAP:**  
    - Item Desc: Preparation of SAP in support of source removal of previously characterized UBC.
    - Breakdown of Historical Data:
      - Item: Preparation of SAP for Ryan's Pit source removal action.
      - Units: hours
      - Unit Cost: 300
      - Unit Cost Adjustment Factor: 0.25
      - Revised Unit Hours: 76
      - Basis for adjustment. Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

- **WMP:**  
  - Item Desc: Preparation of WMP in support of source removal of previously characterized UBC.
  - Breakdown of Historical Data:
    - Item: Preparation of WMP for Ryan's Pit source removal action.
    - Units: hours
    - Unit Cost: 80
    - Unit Cost Adjustment Factor: 0.25
    - Revised Unit Hours: 50
    - Basis for adjustment. Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.
## Rocky Flats Closure Project
### Baseline Cost and Basis of Estimate

#### WBS No: 1GAC0303
#### Activity ID: 1GER030230

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<th>Activity ID</th>
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<th>Contingency &amp; Escalation</th>
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<td>276</td>
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<td>3,297</td>
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<tr>
<td>0200</td>
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<tr>
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<td>pre-evolution meeting</td>
<td>1.00 each</td>
<td>EE</td>
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<td>60</td>
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<td>9,473</td>
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<td>1.00 each</td>
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Total for Activity 1GER030240: 468, 15,149, 19,283, 21,451, 55,883, 5,272, 61,155

---

**Notes:**
- Estimator's experience based generally on historical data for T-3/T4 Remediation.

---

### Additional Information

**BOE 0400 - FIP/IWCPs**

- **Estimators Experience** - Experience Item Desc:
  - Item - Site Labor Hours
  - Unit - hours
  - Unit Cost - 280
  - Unit Cost Adjustment factor - Revised Unit Cost - Basis for adjustment -

This BOE provides one planner 120 hours for completing the necessary IWCPs and an environmental engineer 160 hours for preparing the field implementation plan.

**BOE 0500 - HASP**

- **Estimators Experience** - Experience Item Desc:
  - Item - Site Personnel Hours
  - Unit - hours
  - Unit Cost - 200
  - Unit Cost Adjustment factor - Basis for adjustment -

The BOE provides one industrial hygienist 160 hours and one safety engineer 40 hours to complete the preparation of the HASP.

---

**BOE 5000 - Contingency And Escalation**

- **CON Contingency**
  - 9500.26 Dollars
- **ESC Escalation**
  - 3,819.03 Dollars
**Rocky Flats Closure Project**  
Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0303  
**Activity ID:** 1GER030240

| Item Desc: | Conduct Readiness Assessment in support of source removal action. |
| Breakdown of Cost Data: | |
| Item: Site Labor to perform Readiness Assessment for T-3/T-4. | |
| Units: hours | |
| Unit Cost: 276 | |
| Unit Cost Adjustment Factor: | |
| Revised Unit: | |
| Units: 1 lot | |
| Unit Cost: $4.8K | |
| Unit Cost Adjustment Factor: | |
| Revised Unit: $4.8K | |

**Basis for adjustment:**  
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

## Resources

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<tr>
<th>Cost Element</th>
<th>Skill</th>
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<th>Curve</th>
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**Factors:** 132 hrs

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## Resources

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**Factors:** 24 hrs

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## Resources

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<th>Units</th>
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**Factors:** 80 hrs

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**Factors:** 24 hrs

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## Resources

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**Factors:** 16 hrs

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**Factors:** 4800 sub/c support

---

**Line Item 0200 - training**

**BOE**  
Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:**  
Conduct perform Training in support of source removal action.

**Breakdown of Cost Data:**  
Item: Site Labor to perform above individual tasks for T-3/T-4.  
Units: hours  
Unit Cost: 132 Hours  
Unit Cost Adjustment Factor:  
Revised Unit:

**Item:**  
Subcontractor costs to perform above individual tasks for T-3/T-4.  
Units: 1 lot  
Unit Cost: $12K  
Unit Cost Adjustment Factor:  
Revised Unit:

**Basis for adjustment:**  
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

## Resources

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**Factors:** 132 hrs
### ASH - SUBCONTACTED SRVS

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#### Line Item 0300 - pre-evolution meeting

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:**

Conduct Pre-Evolution Meeting in support of source removal action

**Breakdown of Cost Data:**

- **Item:** Site Labor to perform above individual tasks for T-3/T-4.
  - **Units:** hours
  - **Unit Cost:** $60 hours
  - **Unit Cost Adjustment Factor:** Revised Unit:

- **Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
  - **Units:** 1 lot
  - **Unit Cost:** $6K
  - **Unit Cost Adjustment Factor:** Revised Unit: $6K

**Factors**

- **0.84576** [SYS 061400] .84576000 - System

#### Resources

**Cost Element**

- **750** STRAIGHT TIME BASE
- **E050** ENVIRONMENTAL ENGINEERS

**Department**

- **R100S** PMRS Salaried

**Curve**

- Linear

**Quantity**

- 60.00 hours

**Unit**

- Hours

**Factors**

- **0.84576** [SYS 061400] .84576000 - System

#### Line Item SYS - Contingency And Escalation

**BOE**

**Cost Element**

- **15000.6** DOLLARS

**Department**

- ZDEPT

**Curve**

- Linear

**Quantity**

- 15,300.64 Dollars

**Unit**

- Dollars

**Factors**

- **6150.73** DOLLARS

#### Activity ID: 1GER030250

**Description:** Remedial Action - IHSS Group 300-3

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**Total for Activity 1GER030250:**

- **7,743**
- **232,084**
- **251,141**
- **805,306**
- **886,071**
**Item Desc:** Mobilization in support of remediation.

**Breakdown of Cost Data:**

**Item:** Site Labor to perform above individual tasks for T-3/T-4.
- **Units:** hours
- **Unit Cost:** 277
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** 70

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
- **Units:** 1 lot
- **Unit Cost:** 184k
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** 46k

Basis for adjustment: The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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<tr>
<td>750 STRAIGHT TIME BASE</td>
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**Line Item 0200 - site prep**

**BOE** Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:** Site Preparation including setting up fencing, trailer, etc.

**Breakdown of Historical Data:**
- **Units:** hours
- **Unit Cost:** 120 hours
- **Unit Cost Adjustment Factor:**
- **Revised Unit:**

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
- **Units:** Dollars
- **Unit Cost:** $30k
- **Unit Cost Adjustment Factor:**
- **Revised Unit:**

Basis for adjustment: The BOE provides one environmental engineer 120 hours for site prep and $30k for subcontract dollars for installation of fencing and trailers.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
## Rocky Flats Closure Project

### Baseline Cost and Basis of Estimate

#### WBS Filter: 1GAC

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**Line Item 0300 - excavation**

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:** Excavation.

**Breakdown of Historical Data:**
- Item: Site Labor to perform above individual tasks for T-3/T-4.
  - Units: hours per cubic yard of soil excavated
  - Unit Cost: see below
  - Unit Cost Adjustment Factor: see below
  - Revised Unit: see below
- Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
  - Units: Subcontract dollars per cubic yard of soil excavated
  - Unit Cost: see below
  - Unit Cost Adjustment Factor: see below
  - Revised Unit: see below

**Basis for adjustment:** The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.5 factor to account for the fact that 2 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Line Item 0400 - remove and clean debris**

**BOE**

Estimator's Experience based generally on a base case of 700 cy.

**Item Desc:** Remove and clean debris.

**Breakdown of Historical Data:**
- Item: Site Labor to perform above individual tasks for T-3/T-4.
  - Units: hours
  - Unit Cost: see below
  - Unit Cost Adjustment Factor: see below
  - Revised Unit: see below

---

*Page 185 of 1121*
Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
Units: 1 lot
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.5 factor to account for the fact that 2 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

For the base case, it was assumed that about five cubic yards out of 700 cubic yards would be debris and would be segregated and cleaned. It was estimated that each cubic yard of debris would cost $1,000 or $5,000 total for 700 cubic yards. This yields a rate of $7.14 per cubic yard.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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### Line Item 0600 - confirmation sampling

BOE

Vendor Name - Various Laboratory
Vendor Quote - K-H ASD
Quote Received By - Annette Primrose/Sherry Lopez
Date Received -
Item being quoted - Spreadsheet provided by K-H ER Projects in ER Share folder
Other Info -
Availability -

BOE based on the assumption that 5% of the 116,260 square foot building is contaminated and requires excavation. 5,813 sq. feet will require confirmation sampling. Assuming the SAP will require one confirmation sample collected for every 1,000 square feet (100 ft x 100 ft) area of excavation. 6 confirmation samples will be required plus 20% for QA samples for a total of 7 confirmation samples.

Analyze samples produced from geoprobe borings. It is anticipated that 5 samples from each boring will be collected. They will be analyzed for Metals, VOCs, SVOCs, PCBs, and radionuclides (est. 3 isotopes) with a 30 day TAT. This item is priced on a per sample basis.

Breakdown of Cost Data:
Item: Analyze samples at an offsite laboratory.
Units: Dollars per analysis
Unit Cost: $1,799
Unit Cost Adjustment Factor:
Revised Unit Hours: 
Basis for adjustment:

Analysis/Service Type | Routine Cost
--- | ---
Volatile Organics | $280.00
Inorganics - metals | $345.00
Isotopics (Pu, Am, & U) | $590.00
Semi-volatile organics | $440.00
DOT Radscreen | $32.00
Bottles 5 @ $7 | $28.00
Shipping 2 @ $42 | $84.00
Total per sample | $1799.00

Routine DOT radscreen is a 24 hour TAT.
Routine Analysis is a 31 day Turn Around Time (TAT) in the laboratory except for Asbestos, beryllium, and Industrial Hygiene which are 5 days.
Priority Analysis is<31 day and >7 days TAT except for Asbestos, beryllium and Industrial Hygiene which are 3 days.
Rush Analysis is <7 days TAT except for Asbestos, beryllium and Industrial Hygiene which are 24 hours.
Routine DOT radscreen is a 24 hour TAT.
**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.

**Units:** dollars per sample

**Unit Cost:** $730

**Unit Cost Adjustment Factor:** see below

**Revised Unit:** see below

Subcontractor costs:

2 subcontractor FTEs 5 hours each sample (7 Samples) at $73/hour.

2 FTEs X 5 hrs X $73 = $730 per sample

**Vendor Quote**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

**Line Item 0700 - prepare waste acceptance forms**

**BOE**

**Estimator's Experience based generally on historical data for T-3/T4 Remediation.**

**Item Desc:** Prepare Waste Acceptance Forms

**Breakdown of Historical Data:**

**Item:** Site Labor to perform above individual tasks for T-3/T-4.

**Units:** hours

**Unit Cost:** see below

**Unit Cost Adjustment Factor:** see below

**Revised Unit:** see below

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.

**Units:** 1 lot

**Unit Cost:** see below

**Unit Cost Adjustment Factor:** see below

**Revised Unit:** see below

**Basis for adjustment.** The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.5 factor to account for the fact that 2 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

---

**Line Item 0800 - waste acceptance sampling**

**BOE**

**Estimator's Experience based generally on historical data for T-3/T4 Remediation.**

**Item Desc:** Waste Acceptance Sampling

**Breakdown of Historical Data:**

**Item:** Analytical Costs

**Units:** sample

**Unit Cost:** $2,190

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**Line Item 0700 - prepare waste acceptance forms**

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**6/23/00 9:20:47 AM OFFICIAL USE ONLY**
Baselines

The project will generate 1,076 cubic yards (1076 x 1.25 = 1,345 cy to accommodate for growth). 1,345 cubic yards (1,028 cubic meters) will require 139 7.4-cubic meter soft-sided waste packages for disposal. Ten percent (10%) of the waste packages will require sampling plus 20% for QA purposes so 17 samples will be generated.

The BOE provides for the following analysis for meeting Envirocares WAC:

- DOT Shipping: $32.00
- gross alph/beta: $133.00
- VOA: $280.00
- SVOA: $440.00
- Isotopic: $590.00
- Total metals: $345.00
- Bottles: $28.00
- Shipping: $42.00
- TOTAL: $1,890.00

Subcontractor costs:

- 2 subcontractor FTEs 5 hours each sample (17 Samples) at $73/hour.
- 2 FTEs X 5 hrs X $73 = $730 per sample

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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**Line Item 0900 - field oversight & project mgmt**

Estimator's experience based generally on a base case of 700 cy.

**Item Desc:**

Field Oversight and Project Management

**Breakdown of Historical Data:**

- Item: Site Labor to perform above individual tasks for T-3/T-4.
  - Units: hours per cubic yard
  - Unit Cost: see below
  - Unit Cost Adjustment Factor: see below
  - Revised Unit: see below

- Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
  - Units: 1 lot
  - Unit Cost: see below
  - Unit Cost Adjustment Factor: see below
  - Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste
Acceptance Sampling, Field Oversight, and Backfill. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

It was assumed that a field manager would be needed for 150 nine-hour working days or about 33 weeks. This work breaks down as follows:

- Preparation Activities 50 working days
- Field Activities – 80 working days
- Demobilization – 20 working days
- Total 150 nine-hour working days or 1350 hours

In addition it was estimated that technical staff, quality assurance, and project management would be required for the equivalent of ten additional weeks, which is 400 hours each.

Based on the base case of a 700 cubic yard removal project, these values yielded unit rates as follows:

- Hours Per Cubic Yard Of Contaminated Soil
- Field Manager $1.93
- Technical Staff $0.57
- Quality Assurance $0.57
- Project Management $0.57

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

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| This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs. This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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Total for Activity 1GER030270: 438 12,245 710 9,400 22,355 4,261 26,616

Item Desc: Estimate Based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

Breakdown of Cost Data:
- Item: Develop Documentation
- Units: Site labor hours, subcontract dollars
- Unit Cost: $840 subcontract dollars
- Unit Cost Adjustment Factor:
- Revised Unit Hours: Basis for adjustment -

This BOE provides 80 hours for a environmental engineer, and twenty hours each for an administrative assistant, environmental scientist, and a manager. It also provides 160 hours for a computer analyst (GIS) and 20 hours of subcontractor support. This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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<th>Quantity</th>
<th>Units</th>
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Rocky Flats Closure Project
Baseline Cost and Basis of Estimate

WBS No: 1GAC0303
Activity ID: 1GER030270

Baselined Devl
1GAC

WBS Filter
1GAC

Activity Filter
*

Starts In FY
*

Boe

S P

Cost Element
Skill
Department
Curve
Quantity
Units

60.00 Hours

4.00 Hours

6.00 Hours

4.00 Hours

4.00 Hours

4.00 Hours

25.00 Hours

15.00 Hours

Environmental Engineer 45 hrs Evaluate & assemble existing data. Draft Report.
SMD Technician 10 hrs Identify & pull existing data from database.
Technical Editor 15 hrs Complete initial and revised tech edits of Report.
Technical Reviews
QA 4 hrs Review and comment per area of expertise.
Peer (2) 8 hrs Review and comment per area of expertise.
Compliance 4 hrs Review and comment per area of expertise.
Environmental 4 hrs Review and comment per area of expertise.
Management (2) 8 hrs Review and comment per area of expertise.
Legal 4 hrs Review and comment per area of expertise.
Environmental Engineer 15 hrs Disposition comments and finalize document.
Administrative Support 6 hrs Copy & assemble final documents, submit to records.

Unit Cost Adjustment Factor:

Revised Unit Hours:

Basis for adjustment:

---

Boe

Line item 01000 - Develop NFA documentation

Estimator's Experience:
This estimate was constructed based on actual hours required to complete previous NFA Reports (obtained from actual author) and professional judgement of level of effort required for remaining reports.

Item Desc:
Perform Data Analysis including GIS representation of data, Characterization Report, and associated project management.

Breakdown of Cost Data:
Item: Develop Documentation
Units: Hours
Unit Cost: 138

Environmental Engineer 45 hrs Evaluate & assemble existing data. Draft Report.
SMD Technician 10 hrs Identify & pull existing data from database.
Technical Editor 15 hrs Complete initial and revised tech edits of Report.

Technical Reviews
QA 4 hrs Review and comment per area of expertise.
Peer (2) 8 hrs Review and comment per area of expertise.
Compliance 4 hrs Review and comment per area of expertise.
Environmental 4 hrs Review and comment per area of expertise.
Management (2) 8 hrs Review and comment per area of expertise.
Legal 4 hrs Review and comment per area of expertise.

Environmental Engineer 15 hrs Disposition comments and finalize document.

Administrative Support 6 hrs Copy & assemble final documents, submit to records.

Unit Cost Adjustment Factor:

Revised Unit Hours:

Basis for adjustment:
### Rocky Flats Closure Project
#### Baseline Cost and Basis of Estimate

**WBS Filter:** 1GAC

**Project:** Baseline Devi

**Activity Filter:** 1GAC

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#### Baseline_Devl

**WBS Filter:** 1GAC

**Starts In FY:** *

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#### General Counsel

**Skill:** OTHER ADMINISTRATIVE & PROFE

**Quantity:** 4.00 Hours

**K101S**

**Factors:**

**Remediation, Industrial & Site Serv**

**Skill:** ENVIRONMENTAL SCIENTISTS

**Quantity:** 4.00 Hours

**K253S**

**Factors:**

**RMRS Salaried**

**Skill:** ENVIRONMENTAL SCIENTISTS

**Quantity:** 8.00 Hours

**R100S**

**Factors:**

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**Total for Activity 1GER040100:**

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#### SAP Addenda

**Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.**

**Item Desc:**
Preparation of SAP Addenda to Industrial Area Characterization Plan.

**Breakdown of Cost Data:**

- **Item:** Preparation of SAP addenda
- **Units:** Site Labor Hours, Subcontract Dollars
- **Unit Cost:** 100 hours, $840 Dollars
- **Unit Cost Adjustment Factor:**

  **Revised Unit Hours:**
  - Basis for adjustment:

  This BOE provides an environmental engineer 80 hours and a manager 20 hours for preparation of the SAP Addenda. It also provides a subcontractor 20 hours for the preparation of the SAP Addenda.

  This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

#### HASP Addenda

**Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.**

**Item Desc:**
Preparation of HASP addenda to Industrial Area Characterization Plan.

**Breakdown of Cost Data:**

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#### QAP Addenda

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#### Contingency And Escalation

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#### Resources

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## Line Item 0200 - HASP Addenda

**Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.**

**Item Desc:**
Preparation of HASP addenda to Industrial Area Characterization Plan.

**Breakdown of Cost Data:**
## Rocky Flats Closure Project
### Baseline Cost and Basis of Estimate

#### WBS Filter: 1GAC

**Activity ID:** 1GER040100

**Description:** Preparation of addenda for HASP.

**Units:** Hours

**Unit Cost:** 140

**Unit Cost Adjustment Factor:**

**Revised Unit Hours:**

**Basis for adjustment:**

This BOE provides an environmental engineer 20 hours and a manager, industrial hygienist, and a health physicist 40 hours each for preparation of the HASP Addenda.

### Resources

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**Line Item 0300 - QAP Addenda**

**BOE**

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Item Desc:**

Preparation of SAP Addenda to Industrial Area Characterization Plan.

**Breakdown of Cost Data:**

- **Item:** Preparation of QAP addenda
- **Units:** 40 hours, subcontract dollars
- **Unit Cost:** 40 hours, $840 Dollars

**Unit Cost Adjustment Factor:**

**Revised Unit Hours:**

**Basis for adjustment:**

This BOE provides an environmental engineer 40 for preparation of the SAP Addenda. It also provides a subcontractor 20 hours for the preparation of the SAP Addenda.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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<th>Cost Element</th>
<th>Skill</th>
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**Line Item SYS - Contingency And Escalation**

**BOE**

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Item Desc:**

Preparation of SAP Addenda to Industrial Area Characterization Plan.

**Breakdown of Cost Data:**

- **Item:** Preparation of QAP addenda
- **Units:** 40 hours, subcontract dollars
- **Unit Cost:** 40 hours, $840 Dollars

**Unit Cost Adjustment Factor:**

**Revised Unit Hours:**

**Basis for adjustment:**

This BOE provides an environmental engineer 40 for preparation of the SAP Addenda. It also provides a subcontractor 20 hours for the preparation of the SAP Addenda.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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**Activity ID:** 1GER040120

**Description:** Procurement and Field Prep - IHSS Group 300-4

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<th>Quantity</th>
<th>Units</th>
<th>BOE Type</th>
<th>Labor Hours/Unit</th>
<th>Labor Hours Total</th>
<th>Labor Cost Total</th>
<th>Materials/Sub Cost</th>
<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
<th>Burden Cost</th>
<th>Total Cost</th>
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<tbody>
<tr>
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<td>1.00</td>
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<td>2,114</td>
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# Rocky Flats Closure Project
## Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0304  
**Activity ID:** 1GER040120  
**Project:** Baseline Devi  
**WBS Filter:** 1GAC  
**Starts In FY:** *  

### Total for Activity 1GER040120:

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### Line Item 0100 - procurement & field prep

#### BOE

**Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation**

**Item Desc:**

**Breakdown of Cost Data:**
- **Items:** Site Labor to perform above individual tasks for either Ryan's Pit or T-3/T-4.
  - **Units:** hours
  - **Unit Cost:** $1292
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** 324 hours
- **Items:** Subcontractor costs to perform above individual tasks for either Ryan's Pit or T-3/T-4.
  - **Units:** 1 lot
  - **Unit Cost:** $10K
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** $2.5K

**Basis for adjustment.** Hours and costs for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be characterized at once.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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<td>E050 ENVIRONMENTAL ENGINEERS</td>
<td>R100S RMRS Salaried</td>
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**0.85576** (SYS 061400).84576000 - System

### Line Item SYS - Contingency And Escalation

#### BOE

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**Activity ID:** 1GER040140  
**Description:** Readiness Assessment - IHSS Group 300-4  
**Cost Risk:** 2  
**Schedule Risk:** 2

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<th>Contingency &amp; Escalation</th>
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<td>each</td>
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**Total for Activity 1GER040140:**

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Page 194 of 1121  
6/23/00 9:20:48 AM  
OFFICIAL USE ONLY
Line Item 0100 - readiness assessment

BoE

Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation.

Item Desc:
Evaluate readiness of the field characterization team and plans.

Breakdown of Cost Data:
Item: Perform readiness evaluation
Units: site labor hours, subcontract dollars
Unit Cost: 280 hours, $840 dollars
Unit Cost Adjustment Factor:
Revised Unit Hours:
Basis for adjustment:

This BoE provides an environmental engineer for 120 hours and an administrative assistant, manager, industrial hygienist, and health physicist 40 hours each. The BoE also provides a subcontractor 20 hours.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
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<td>Hours</td>
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<td>750 STRAIGHT TIME BASE</td>
<td>M040 MANAGERS (GRADE 64 - 68)</td>
<td>R100S RMRS Salaried</td>
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<td>Hours</td>
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<tr>
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<td>P080 HEALTH PHYSICISTS</td>
<td>R100S RMRS Salaried</td>
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<td>Hours</td>
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<td>P090 INDUSTRIAL HYGIENISTS</td>
<td>R100S RMRS Salaried</td>
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<td>40.00</td>
<td>Hours</td>
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<td>P170 OTHER ADMINISTRATIVE &amp; PROFE</td>
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Line Item SYS - Contingency And Escalation

BoE

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Activity ID: 1GER040150
Description: Field Sampling, Lab Analysis - IHSS Group 300-4

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<th>Line Item</th>
<th>Description</th>
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<td>886</td>
<td>24,908</td>
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<td>222.00 each</td>
<td>VQ</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>339,092</td>
<td>0</td>
<td>339,092</td>
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<td>0300</td>
<td>project mgmt oversight</td>
<td>37.00 each</td>
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<td>Contingency And Escalation</td>
<td>1.00 ea</td>
<td>EE</td>
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Total for Activity 1GER040150: 1,184 32,843 386,342 61,644 480,829 9,262 490,090

Line Item 0100 - collect geoprobe samples
BoE

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

Item Desc:
Collection of geoprobe samples with the site geoprobe with two technicians. A site Environmental Engineer will direct the boring placement, log the borings; collect, containerize, package, and ship the samples; prepare field QC documentation, and prepare field notes on a full time basis. A site RCT will monitor the site for radiological contamination on a full time basis. A site Industrial Hygeniist will implement the field portion of the HASP on a full time basis. Decon Operations staff will decon the vehicle and equipment when it leaves the work area on a half time basis. It is estimated that one 10' boring will be place per 400 SF of building footprint (same as Bldg. 123 characterization) with 5 samples per 10' boring. It is estimated that one boring per eight...
Breakdown of Cost Data:

Item: Site Personnel for support of geoprobe samples

- Units: hours
- Unit Cost: 24
- Revised Unit Hours:
- Unit Cost Adjustment Factor:

Item: Kaiser-Hill/RMRS Geoprobe unit with 2 Technician crew. Item costs $100 per hour or $800 per 8-hour day.

- Units: dollars
- Unit Cost: 800
- Revised Unit Hours:

Basis for adjustment.

A 50% reduction in the number of geoprosbes is based on process history and building knowledge which indicates that characterization to the extent required for Building 123 is not required at this location. Coverage for 800 sq feet compared to 400 sq feet at B123.

29,637 sq feet / 800 = 37 boreholes

37 boreholes X 5 samples per borehole = 185 x 1.2 (QA samples) = 222 samples total

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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<th>Cost Element</th>
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<td>ENVIRONMENTAL ENGINEERS</td>
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<tr>
<td>750</td>
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<td>Hours</td>
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<td>hrs</td>
<td></td>
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<td>Hours</td>
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<td>hrs</td>
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Breakdown of Cost Data:

Item: Analyze samples at an offsite laboratory.

- Units: Dollars per analysis
- Unit Cost: 1806
- Revised Unit Hours:

Basis for adjustment.

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<th>Analysis/Service Type</th>
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<td>Inorganics - metals</td>
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<td>Isotopics (Pu, Am, &amp; U)</td>
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<td>Semi-volatile organic</td>
<td>$440.00</td>
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<td>DOT Radscreen</td>
<td>$32.00</td>
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<tr>
<td>Bottles 5 @ $7</td>
<td>$35.00</td>
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<tr>
<td>Shipping 2 @ $42</td>
<td>$84.00</td>
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</table>
Routine DOT radscreen is a 24 hour TAT.
Routine Analysis is a 31 day Turn Around Time (TAT) in the laboratory except for Asbestos, beryllium, and Industrial Hygiene which are 5 days.
Priority Analysis is <7 days TAT except for Asbestos, beryllium and Industrial Hygiene which are 3 days.
Rush Analysis is <7 days TAT except for Asbestos, beryllium and Industrial Hygiene which are 24 hours.
Routine DOT radscreen is a 24 hour TAT.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Breakdown of Cost Data:**
- **Item:** Mgmt oversight
  - **Units:** site labor hours, subcontract dollars per borehole
  - **Unit Cost:** 8 hours, $84 subcontractor dollars
  - **Unit Cost Adjustment Factor:**
    - Revised Unit Hours: 0.84576

**Breakdown of Cost Data:**
- **Item:** SYS - Contingency And Escalation
  - **Factors:** 41137.8 Dollars

**Line Item 01000 - develop characterization report**
- **Description:** Prepare Summary/NFA - IHSS Group 300-4
- **Quantity:** 1.00
- **Units:** EE
- **Labor Hours/Unit:** 728
- **Labor Hours Total:** 21067
- **Labor Cost Total:** 2842
- **Materials/Sub Cost:** 0
- **Contingency & Escalation:** 23009
- **Total Prime Cost:** 5941
- **Burden Cost:** 29849
- **Total Cost:** 34144

**Line Item SYS - Contingency And Escalation**
- **Factors:** 41137.8 Dollars

**Activity ID:** 1GER040170
- **Description:** Prepare Summary/NFA - IHSS Group 300-4
- **Cost Risk:** 2
- **Schedule Risk:** 3

**Line Item 01000 - develop characterization report**
- **Description:** Perform Data Analysis including GIS representation of data, Characterization Report, and associated project management.
- **Breakdown of Cost Data:***
## Rocky Flats Closure Project
### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0304  
**Activity ID:** 1GER040170

#### Activity Details

- **Project:** Baseline Devl
- **WBS Filter:** 1GAC
- **Activity Filter:** *
- **Starts In FY:** *

#### Resources

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<th>Curve</th>
<th>Quantity</th>
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<td>Hours</td>
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<td>750 STRAIGHT TIME BASE</td>
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<td>R100S RMRS Salaried</td>
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<td>R100S RMRS Salaried</td>
<td>Linear</td>
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#### Line Item SYS - Contingency And Escalation

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<tr>
<th>BOE</th>
<th>Estimator's Experience based generally on historical data for Ryan's Pit</th>
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</table>

**Line Item 0100 - PAM**

- **Description:** Preparation of PAM in support of source removal of previously characterized UBC.

**Line Item 0100 - Contingency And Escalation**

- **Description:** Prepare Decision Document - IHSS Grp 300-4

**Activity ID:** 1GER040190

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<th>Materials/ Sub Cost</th>
<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
<th>Burden Cost</th>
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<tbody>
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<td></td>
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<td>176</td>
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<td>ka</td>
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**Total for Activity 1GER040190:**

176  5,338  0  1,000  1,000  0  1,000

---

Basis for adjustment. None

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

Unit Cost Adjustment Factor: none

Revised Unit Hours:

Basis for adjustment. None

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

Unit Cost Adjustment Factor: none

Revised Unit Hours:

Basis for adjustment. None

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

- **Activity ID:** 1GER040190
- **WBS No:** 1GAC0304

#### Resources

<table>
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<th>Department</th>
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<th>Units</th>
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<td>158.00</td>
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**Factors**

- Hours: 158

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<tr>
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<td>18.00</td>
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**Factors**

- Hours: 18

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### Line Item SYS - Contingency And Escalation

**BOE**

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<th>Quantity</th>
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**Factors**

- Dollars: 343.31

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**Factors**

- Dollars: 656.88

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### Activity ID: 1GER040210

**Description:** Procurement - IHSS Grouping 300-4

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<th>Line Item</th>
<th>Description</th>
<th>Quantity</th>
<th>Units</th>
<th>BOE Type</th>
<th>Labor Hours/Unit</th>
<th>Labor Hours Total</th>
<th>Labor Cost Total</th>
<th>Materials/Sub Cost</th>
<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
<th>Burden Cost</th>
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<tr>
<td>0100</td>
<td>procurement &amp; field prep</td>
<td>1.00</td>
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**Total for Activity 1GER040210:**

|                |                      |         |       |          |                  |                  |                  |                    |                        |                |            |            |
|----------------|----------------------|---------|-------|----------|------------------|------------------|------------------|--------------------|-----------------------|-------------------|------------|
|                |                      | 324     | 9,788 | 2,114    | 8,271            | 8,271            | 3,406            | 20,174             | 23,580                |                  |            |

---

#### Estimator's Experience

Based generally on historical data for Ryan's Pit and T-3/T4 Remediation

**Item Description:**

- Breakdown of Cost Data:
  - **Item:** Site Labor to perform above individual tasks for either Ryan's Pit or T-3/T-4.
    - Units: hours
    - Unit Cost: 1292
    - Unit Cost Adjustment Factor: 0.25
    - Revised Unit: 324 hours
  - **Item:** Subcontractor costs to perform above individual tasks for either Ryan's Pit or T-3/T-4.
    - Units: lot
    - Unit Cost: $10K
    - Unit Cost Adjustment Factor: 0.25
    - Revised Unit: $2.5K

Basis for adjustment. Hours and costs for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once. This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

### Resources

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<th>Units</th>
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**Factors**

- Hours: 266

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**Factors**

- Hours: 10

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<th>Units</th>
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<tr>
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<td>STRAIGHT TIME BASE</td>
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<td>13.00</td>
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**Factors**

- Hours: 13

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**Factors**

- Hours: 10
## Rocky Flats Closure Project

### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0304  
**Activity ID:** 1GER040210

**Project:** Baseline Devi  
**WBS Filter:** 1GAC  
**Activity Filter:** *  
**Starts In FY:** *

### Activity ID: 1GER040230
**Description:** Field Document Preparation - IHSS Group 300-4

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<th>Description</th>
<th>Quantity</th>
<th>Units</th>
<th>BOE Type</th>
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<th>Labor Hours Total</th>
<th>Labor Cost Total</th>
<th>Materials/Sub Cost</th>
<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
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<td>0300</td>
<td>WMP</td>
<td>1.00</td>
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<td>20</td>
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<td>2,110</td>
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**Total for Activity 1GER040230:** 96 hrs, 2,307, 0, 2,110, 5,007, 1,008, 6,016.

### Line Item 0200 - SAP

**BOE**
- Estimator's Experience based generally on historical data for Ryan's Pit

**Item Desc:** Preparation of SAP in support of source removal of previously characterized UBC.

**Breakdown of Historical Data:**
- Item: Preparation of SAP for Ryan's Pit source removal action.
  - Units: hours
  - Unit Cost: 300
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit Hours: 76

**Basis for adjustment:** Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

### Resources

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<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Quantity</th>
<th>Units</th>
<th>Curve</th>
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<tr>
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### Line Item 0300 - WMP

**BOE**
- Estimator's Experience based generally on historical data for Ryan's Pit

**Item Desc:** Preparation of WMP in support of source removal of previously characterized UBC.

**Breakdown of Historical Data:**
- Item: Preparation of WMP for Ryan's Pit source removal action.
  - Units: hours
  - Unit Cost: 80
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit Hours: 20
Project WBS Filter Activity Filter
Rocky Flats Closure Project 1GAC Baseline Devi * Start In FY *
Baseline Cost and Basis of Estimate 1GAC

WBS No: 1GAC0304
Activity ID: 1GER040230

**Basis for adjustment. Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.**

### Resources

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<tr>
<th>Cost Element</th>
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<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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<td>R100S</td>
<td>RMRS Salaried</td>
<td>Linear</td>
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Factors: 20 hrs

**Line Item SYS - Contingency And Escalation**

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<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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Factors: 605.028 Dollars

**Activity ID: 1GER040240**

**Description:** Readiness Assessment - IHSS Group 300-4

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<th>Line Item</th>
<th>Description</th>
<th>Quantity</th>
<th>Units</th>
<th>BOE Type</th>
<th>Labor Hours/Unit</th>
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<th>Materials/Sub Cost</th>
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<tbody>
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<tr>
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**SYS** Contingency And Escalation

| 0100 readiness assessment | 1.00 ea | EE | 0 | 0 | 0 | 0 | 21,451 | 21,451 | 0 | 21,451 |

**Total for Activity 1GER040240:**

468 15,149 19,283 21,451 55,883 5,272 61,155

**Line Item 0100 - readiness assessment**

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc:

Conduct Readiness Assessment in support of source removal action.

Breakdown of Cost Data:

- **Item:** Site Labor to perform Readiness Assessment for T-3/T-4.
  - Units: site labor hours
  - Unit Cost: 276
  - Unit Cost Adjustment Factor:
    - Revised Unit:

- **Item:** Subcontractor costs to perform Readiness Assessment for T-3/T-4.
  - Units: 1 lot
  - Unit Cost: $4.8K
  - Unit Cost Adjustment Factor:
    - Revised Unit:
    - Basis for adjustment

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
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<tr>
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<td>R100S</td>
<td>RMRS Salaried</td>
<td>Linear</td>
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Factors: 132 hrs

| 7SO          | STRAIGHT TIME BASE | M020 MANAGERS (GRADE 69-72) | R100S | RMRS Salaried | Linear | 24.00 Hours |

Factors: 24 hrs

| 7SO          | STRAIGHT TIME BASE | M040 MANAGERS (GRADE 64-68) | R100S | RMRS Salaried | Linear | 80.00 Hours |

Factors: 80 hrs

| 7SO          | STRAIGHT TIME BASE | P090 INDUSTRIAL HYGIENISTS | R100S | RMRS Salaried | Linear | 24.00 Hours |

Factors: 24 hrs

| 7SO          | STRAIGHT TIME BASE | S020 ENVIRONMENTAL SCIENTISTS | R100S | RMRS Salaried | Linear | 16.00 Hours |

Factors: 16 hrs

| ASH SUBCONTRACTED SRVS | 0000 None | K256 Waste | Linear | 4,059.68 Dollars |

Factors: 4800 sub/c support
Line Item 0200 - training

BOE

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc:
Conduct perform Training in support of source removal action.

Breakdown of Cost Data:
Item: Site Labor to perform above individual tasks for T-3/T4.
   Units: hours
   Unit Cost: 132 Hours
   Unit Cost Adjustment Factor: Revised Unit:

Item: Subcontractor costs to perform above individual tasks for T-3/T4.
   Units: 1 lot
   Unit Cost: $12K
   Unit Cost Adjustment Factor: Revised Unit:
   Basis for adjustment

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
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Line Item 0300 - pre-evolution meeting

BOE

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc:
Conduct Pre-Evolution Meeting in support of source removal action

Breakdown of Cost Data:
Item: Site Labor to perform above individual tasks for T-3/T4.
   Units: hours
   Unit Cost: 60 hours
   Unit Cost Adjustment Factor: Revised Unit:

Item: Subcontractor costs to perform above individual tasks for T-3/T4.
   Units: 1 lot
   Unit Cost: $6K
   Unit Cost Adjustment Factor: Revised Unit:
   Basis for adjustment:

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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<td>hrs</td>
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<td>SUBCONTRACTED SRVS</td>
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Line Item SYS - Contingency And Escalation

BOE

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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### Rocky Flats Closure Project

#### Baseline Cost and Basis of Estimate

**Project:** Baseline Devi  
**WBS Filter:** 1GAC  
**Activity Filter:** *  
**Starts In FY:** *

<table>
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#### Activity Filter: 1GER040250

**Cost Risk:** 5  
**Schedule Risk:** 5

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**Total for Activity 1GER040250:**

- **Labor Cost:** $68,601
- **Burden Cost:** $23,873
- **Total Cost:** $330,129
- **Total Prime Cost:** $2274

---

**BoE:**

- Mobilization in support of remediation.
- Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Breakdown of Cost Data:**

**Item:** Site Labor to perform above individual tasks for T-3/T4.

- **Units:** hours
- **Unit Cost:** 275
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** 70

**Item:** Subcontractor costs to perform above individual tasks for T-3/T4.

- **Units:** 1 lot
- **Unit Cost:** 184k
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** 46K

**Resources**

- **Cost Element:** STRAIGHT TIME BASE
- **Department:** ENVIRONMENTAL ENGINEERS
- **Unit:** Linear
- **Quantity:** 35.00
- **Units:** Hours

---

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
**Rocky Flats Closure Project**

**Baseline Cost and Basis of Estimate**

**WBS Filter**

1GAC

**Activity Filter**

*  

**WBS No:** 1GAC0304

**Activity ID:** 1GER040250

---

**Line Item 0200 - site prep**

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:**

Site Preparation including setting up fencing, trailer, etc.

**Breakdown of Historical Data:**

**Item:** Site Labor to perform above individual tasks for T-3/T-4.

- **Units:** hours
- **Unit Cost:** 120 hours
- **Unit Cost Adjustment Factor:** see below
- **Revised Unit:** see below

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.

- **Units:** Dollars
- **Unit Cost:** $30k
- **Unit Cost Adjustment Factor:** see below
- **Revised Unit:** see below

**Basis for adjustment:**

The BOE provides one environmental engineer 120 hours for site prep and $30k for subcontract dollars for installation of fencing and trailers.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

**Resources**

<table>
<thead>
<tr>
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<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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</table>

**Line Item 0300 - excavation**

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:**

Excavation.

**Breakdown of Historical Data:**

**Item:** Site Labor to perform above individual tasks for T-3/T-4.

- **Units:** hours
- **Unit Cost:** see below
- **Unit Cost Adjustment Factor:** see below
- **Revised Unit:** see below

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.

- **Units:** 1 lot
- **Unit Cost:** see below
- **Unit Cost Adjustment Factor:** see below
- **Revised Unit:** see below

**Basis for adjustment:**

The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.5 factor to account for the fact that 2 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

**Resources**

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<tr>
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<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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</table>
### Rocky Flats Closure Project

#### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0304  
**Activity ID:** 1GER040250  
**Project:** Baseline Devl  
**WBS Filter:** 1GAC  
**Activity Filter:** -  
**Starts In FY:** *

<table>
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<th>Line Item 0400 - remove and clean debris</th>
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<tr>
<td><strong>Cost Element:</strong></td>
<td><strong>Skill</strong></td>
</tr>
<tr>
<td>ASH SUBCONTRACTED SRVS</td>
<td>0000</td>
</tr>
<tr>
<td><strong>K265S</strong> Waste</td>
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</tr>
</tbody>
</table>

**Factors**: 45.23 sub/c support - units per yard  
**Unit Cost**: 38.25 Dollars  
**Unit Cost Adjustment Factor**: see below  
**Revised Unit**: see below

**Item Desc:**  
Remove and clean debris.

**Breakdown of Historical Data:**  
**Item**: Site Labor to perform above individual tasks for T-3/T-4.  
**Unit**: hours  
**Unit Cost**: see below  
**Unit Cost Adjustment Factor**: see below  
**Revised Unit**: see below

**Item**: Subcontractor costs to perform above individual tasks for T-3/T-4.  
**Unit**: 1 lot  
**Unit Cost**: see below  
**Unit Cost Adjustment Factor**: see below  
**Revised Unit**: see below

**Basis for adjustment.** The costs were divided into fixed costs and variable costs. The fixed costs include Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs include Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.5 factor to account for the fact that 2 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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<tr>
<th>Cost Element</th>
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<td>K265S ER Programs</td>
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**Factors**: 7.14 sub/c support - units per yard

**Line Item 0600 - confirmation sampling**  
**BOE**  
**Vendor Name**: Various Laboratory  
**Vendor Quote**: K-H ASD  
**Date Received**: 6/23/00 9:20:51 AM  
**Other Info**: Spreadsheet provided by K-H ER Projects in ER Share folder

**BOE based on the assumption that 5% of the 29,637 square foot building is contaminated and requires excavation. 1,481 sq. feet will require confirmation sampling. Assuming the SAP will require one confirmation sample collected for every 1,000 square feet (100 ft x 100 ft) area of excavation. 2 confirmation samples will be required plus 20% for QA samples for a total of 3 confirmation samples.**

**Breakdown of Historical Data:**  
**Item**: Analytical Costs
The BOE provides for the following analysis:

- DOT Shipping $32.00
- VOA $280.00
- VSOA $440.00
- Isotopic $590.00
- total metals $345.00
- Bottles $28.00
- Shipping $84.00

TOTAL per sample $1,799.00

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.

- Units: dollars per sample
- Unit Cost: $730
- Revised Unit: see below

Subcontractor costs:

2 subcontractor FTEs 5 hours each sample (27 Samples) at $73/hour.

2 FTEs X 5 hrs X $73 = $730 per sample

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Resources**

<table>
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<tr>
<th>Cost Element</th>
<th>Skill</th>
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<th>Curve</th>
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**Line Item 0700 - prepare waste acceptance forms**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:**
Prepare Waste Acceptance Forms

**Breakdown of Historical Data:**

- Item: Site Labor to perform above individual tasks for T-3/T-4.
  - Units: hours
  - Unit Cost: see below
  - Revised Unit: see below

- Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
  - Units: 1 lot
  - Unit Cost: see below
  - Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.5 factor to account for the fact that 2 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.
### Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

**WBS No:** 1GAC0304  
**Activity ID:** 1GER040250  
**Baseline Devl:**  
**WBS Filter:** 1GAC  
**Activity Filter:** -  
**Starts In FY:** -  

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#### Line Item 0800 - waste acceptance sampling

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:** Waste Acceptance Sampling

- **Breakdown of Historical Data:**
  - **Item:** Analytical Costs
    - **Units:** sample
    - **Unit Cost:** $1,932
  - **Unit Cost Adjustment Factor:**
  - **Revised Unit:**

The BOE provides for the following analysis for meeting Envirocare's WAC:

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<tr>
<td>Isotopic</td>
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<td>$590.00</td>
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<tr>
<td>Bottles</td>
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<tr>
<td>Shipping</td>
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<td>$1,932.00</td>
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**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.

- **Units:** dollars per sample
- **Unit Cost:** $730
- **Unit Cost Adjustment Factor:**
- **Revised Unit:**

Subcontractor costs:

- 2 subcontractor FTEs 5 hours each sample (27 Samples) at $73/hour.
- Total: $730 x 27 = $1,932

The project will generate 900 cubic yards (274 x 1.25 = 342 cy to accommodate for growth). 342 cubic yards (262 cubic meters) will require 36 7.4-cubic meter soft-sied waste packages for disposal. Ten percent (10%) of the waste packages will require sampling plus 20% for QA purposes so 5 samples will be generated. Waste will be LLM.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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#### Line Item 0900 - field oversight & project mgmt

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:** Field Oversight and Project Management

**Breakdown of Historical Data:**

- **Item:** Site Labor to perform above individual tasks for T-3/T-4.
  - **Units:** hours
**Cost Element** | **Skill** | **Department** | **Curve** | **Quantity** | **Units**
--- | --- | --- | --- | --- | ---
750 | STRAIGHT TIME BASE | E050 | ENVIRONMENTAL ENGINEERS | R100S | PMRS Salaried | Linear | 2.50 | Hours

**Factors**: 2.5 units per yard

**BOE**

**Trade Publication**

Means 1995, Site Work & Landscape Cost Data (page 34, 42, and 34)

**Item Desc**: Backfill - $15 per cubic yard includes material, machinery, and labor to place backfill in excavation.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Cost Element** | **Skill** | **Department** | **Curve** | **Quantity** | **Units**
--- | --- | --- | --- | --- | ---
ASH | SUBCONTRACTED SRVS | 0000 | NONE | K265S | ER Programs | Linear | 12.69 | Dollars

**Factors**: 15 dollars per cubic yard

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc**: Demobilization.

**Breakdown of Historical Data**:

**Item**: Site Labor to perform above individual tasks for T-3/T-4.

- **Units**: hours
- **Unit Cost**: see below
- **Unit Cost Adjustment Factor**: see below
- **Revised Unit**: see below

**Item**: Subcontractor costs to perform above individual tasks for T-3/T-4.

- **Units**: 1 lot
- **Unit Cost**: see below
- **Unit Cost Adjustment Factor**: see below
- **Revised Unit**: see below

**Basis for adjustment**:

The costs were divided into fixed costs and variable costs. The fixed costs include Mobilization, Site Preparation, Site Labor to perform above individual tasks for T-3/T-4, Site Labor to perform above individual tasks for T-3/T-4, and Demobilization. The variable costs include Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
**Rocky Flats Closure Project**

**Baseline Cost and Basis of Estimate**

**WBS No:** 1GAC0304

**Activity ID:** 1GER040250

**Baseline Deviation 1GAC**

**WBS Filter:** 1GAC

**Activity Filter:** *

**Starts In FY:** *

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<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
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**Total for Activity 1GER040270:**

438 12,311 710 9,350 22,371 4,284 26,655

---

### Line Item 0100 - develop report

**BOE**

**Description:** Prepare Closeout Report - IHSS Group 300-4

**Cost Risk:** 2

**Schedule Risk:** 2

**Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.**

**Item Desc:**

Perform Data Analysis including GIS representation of data, Characterization Report, and associated project management.

**Breakdown of Cost Data:**

**Item:** Develop Documentation

**Units:** site labor hours, subcontract dollars

**Unit Cost:** 300 hours, $840 dollars

**Unit Cost Adjustment Factor:**

**Revised Unit Hours:**

**Basis for adjustment:**

This BOE provides one manager, administrative asssistant, and an environmental scientist 20 hours each for development of the report. It also provides 80 hours for an environmental engineer and 160 hours for a computer systems analyst (GIS). The BOE provides a subcontract planner 20 hours for this activity.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

### Resources

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<tr>
<th>Line Item</th>
<th>Description</th>
<th>Quantity</th>
<th>Units</th>
<th>BOE Type</th>
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<th>Materials/Sub Cost Total</th>
<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
<th>Burden Cost</th>
<th>Total Cost</th>
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</thead>
<tbody>
<tr>
<td>750</td>
<td>STRAIGHT TIME BASE</td>
<td>1.00 each</td>
<td>EE</td>
<td>300</td>
<td>300</td>
<td>8,146</td>
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<td>8,857</td>
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**Total for Activity 1GER040270:**

438 12,311 710 9,350 22,371 4,284 26,655

---

**Page 209 of 1121**

6/23/00 9:20:51 AM

**OFFICIAL USE ONLY**
Line Item 01000 - develop NFA documentation

BOE

Estimator's Experience:
This estimate was constructed based on actual hours required to complete previous NFA Reports (obtained from actual author) and professional judgement of level of effort required for remaining reports.

Item Desc:
Perform Data Analysis including GIS representation of data, Characterization Report, and associated project management.

Breakdown of Cost Data:
Item: Develop Documentation
Units: Hours
Unit Cost: 138

Environmental Engineer 45 hrs Evaluate & assemble existing data. Draft Report.
SWD Technician 10 hrs Identify & pull existing data from database.
Technical Editor 15 hrs Complete initial and revised tech edits of Report.
Technical Reviews
QA 4 hrs Review and comment per area of expertise.
Peer (2) 8 hrs Review and comment per area of expertise.
Compliance 4 hrs Review and comment per area of expertise.
Environmental 4 hrs Review and comment per area of expertise.
Management (2) 8 hrs Review and comment per area of expertise.
Legal 4 hrs Review and comment per area of expertise.
Environmental Engineer 15 hrs Disposition comments and finalize document.
Administrative Support 6 hrs Copy & assemble final documents, submit to records.

Unit Cost Adjustment Factor: none
Revised Unit Hours: 138
Basis for adjustment. N/A
### Rocky Flats Closure Project

#### Baseline Cost and Basis of Estimate

**Project:** Baseline Devl  
**WBS Filter:** 1GAC  
**Activity Filter:** *  

**WBS No:** 1GAC0304  
**Activity ID:** 1GER04270  
**Title:** Rocky Flats Closure Project  
**Baseline Cost and Basis of Estimate**

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<tr>
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**WBS No:** 1GAC0305  
**Activity ID:** 1G30050100  
**Title:** Group 300-5 (Non D&D)  
**Description:** Planning - IHSS Group 300-5 (Non D&D)  
**Schedule Risk:** 2  
**Cost Risk:** 2  

<table>
<thead>
<tr>
<th>Line Item</th>
<th>Description</th>
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<tbody>
<tr>
<td>0100</td>
<td>SAP/HASP/QAP Addenda</td>
</tr>
<tr>
<td>SYS</td>
<td>Contingency And Escalation</td>
</tr>
</tbody>
</table>

**Line Item 0100 - SAP/HASP/QAP Addenda**

- **BOE:**  
  - **Department:** RMRS Salaried  
  - **Skill:** ENVIRONMENTAL ENGINEERS  
  - **Quantity:** 1.00 each  
  - **Units:** EE  
  - **Labor Hours/Unit:** 300  
  - **Labor Hours Total:** 300  
  - **Labor Cost Total:** 9,066  
  - **Materials/Sub Cost:** 1,421  
  - **Contingency & Escalation:** 0  
  - **Total Prime Cost:** 10,487  
  - **Total Cost:** 13,688

**Line Item SYS - Contingency And Escalation**

- **BOE:**  
  - **Department:** RMRS Salaried  
  - **Skill:** ADMINISTRATIVE ASSISTANTS  
  - **Quantity:** 1.00 ea  
  - **Units:** EE  
  - **Labor Hours Total:** 0  
  - **Labor Cost Total:** 0  
  - **Materials/Sub Cost:** 0  
  - **Contingency & Escalation:** 0  
  - **Total Prime Cost:** 0  
  - **Total Cost:** 0

**Total for Activity 1G30050100:**

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<tr>
<th>Description</th>
<th>Quantity</th>
<th>Units</th>
<th>Labor Hours</th>
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<tr>
<td>SAP/HASP/QAP Addenda</td>
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<td>300</td>
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<td>1,421</td>
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<td>Contingency And Escalation</td>
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**Total for Activity 1G30050100:**

- **Quantity:** 300  
- **Units:** 9,066  
- **Labor Hours Total:** 1,421  
- **Total Prime Cost:** 12,554  
- **Burden Cost:** 15,755

---

**Resources**

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<th>Curve</th>
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<th>Units</th>
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</thead>
<tbody>
<tr>
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<td>STRAIGHT TIME BASE</td>
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<td>R100S RMRS Salaried</td>
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<tr>
<td>750</td>
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<td>G010 ADMINISTRATIVE ASSISTANTS</td>
<td>R100S RMRS Salaried</td>
<td>Linear</td>
<td>40.00</td>
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<tr>
<td>750</td>
<td>STRAIGHT TIME BASE</td>
<td>M040 MANAGERS (GRADE 64 - 68)</td>
<td>R100S RMRS Salaried</td>
<td>Linear</td>
<td>40.00</td>
</tr>
<tr>
<td>750</td>
<td>STRAIGHT TIME BASE</td>
<td>P080 HEALTH PHYSICIANS</td>
<td>R100S RMRS Salaried</td>
<td>Linear</td>
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<td>750</td>
<td>STRAIGHT TIME BASE</td>
<td>P090 INDUSTRIAL HYGIENISTS</td>
<td>R100S RMRS Salaried</td>
<td>Linear</td>
<td>40.00</td>
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<td>750</td>
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<td>K265S ER Programs</td>
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</table>

**Factors:** 639.647 Dollars

**Activity ID:** 1G30050120  
**Description:** Field Preparation - Group 300-5  
**WBS Filter:** 1GAC  
**Activity Filter:** *  
**Factors:** 639.647 Dollars  
**Start By FY:** *  

**Cost Risk:** 2  
**Schedule Risk:** 2

---

**Notes:**

- **Item Desc:** Preparation of SAP Addendums
- **Breakdown of Cost Data:**
  - **Item:** Prepare SAP, HASP and QAP addendum. Address KH, DOE and regulatory agency comments.
  - **Units:** site labor hours, subcontract dollars
  - **Unit Cost:** 300 hours, $1680 subcontract dollars
  - **Unit Cost Adjustment Factor:**
  - **Basis for adjustment:**
  - This BOE provides for one environmental engineer 100 hours, and additional support personnel including Admin support, Project Manager, Health Physics, Industrial Hygienist and an environmental scientist for 40 hours each for the duration of the activity. It also provides for a subcontract cost estimator/planner for 40 hours.
  - This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### Activity ID: 1G30050120

#### Description:
**Baseline Cost and Basis of Estimate**

<table>
<thead>
<tr>
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<tbody>
<tr>
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<td>1G30050120</td>
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#### WBS No: 1GAC0305

**Activity ID:** 1G30050120

**Description:**
Rocky Flats Closure Project Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0305

**Activity ID:** 1G30050120

**Description:**

#### WBS Filter: 1GAC

**Starts In FY:**

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#### Activity Filter: 1GAC

**Starts In FY:**

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</thead>
<tbody>
<tr>
<td>1G30050120</td>
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</tbody>
</table>

### Line Item 0100 - field prep

**BOE**

Estimator's Experience based on 15 years of experience planning, estimating, and conducting projects of similar scope and size.

**Item Desc:**

**Breakdown of Cost Data:**
- **Units:** hours
- **Unit Cost:** 480

**Unit Cost Adjustment Factor:** Revised Unit

This BOE provides an environmental engineer for 120 hours and a safety engineer, administrative assistant, manager, and Health Physicist for 80 hours each for the duration of the activity. It also provides 80 hours for project controls support.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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<tbody>
<tr>
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<td>E050 ENVIRONMENTAL ENGINEERS</td>
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<td>R100S RMRS Salaried</td>
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<td>Hours</td>
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<td>750 STRAIGHT TIME BASE</td>
<td>G010 ADMINISTRATIVE ASSISTANTS</td>
<td>R100S RMRS Salaried</td>
<td>Linear</td>
<td>40.00</td>
<td>Hours</td>
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<tr>
<td>750 STRAIGHT TIME BASE</td>
<td>M040 MANAGERS (GRADE 64-68)</td>
<td>R100S RMRS Salaried</td>
<td>Linear</td>
<td>80.00</td>
<td>Hours</td>
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<td>ASH SUBCONTRACTED SRVS</td>
<td>P070 COST ESTIMATORS PLANNERS AN</td>
<td>K26SS ER Programs</td>
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#### Line Item SYS - Contingency And Escalation

**BOE**

**Cost Element:** CONTINGENCY

**Department:** ZDEPT

**Type:** No Department

**Curve:** Linear

**Quantity:** 1,852.87 Dollars

**Factors:** Estimated $/hr - RMRS Corp

**Factors:** 0.84576 [SYS 061400].84576000 - System

**Factors:** 830.399 Dollars

### Activity ID: 1G30050140

**Description:** Readiness Review - Group 300-5

#### Cost Risk: 2

### Schedule Risk: 2

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<th>Units</th>
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<th>Labor Cost</th>
<th>Materials/Sub Cost</th>
<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
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<th>Total Cost</th>
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<tr>
<td>0100</td>
<td>readiness assessment</td>
<td>1.00 each</td>
<td>EE</td>
<td>1.00</td>
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<td>7,184</td>
<td>1,421</td>
<td>8,005</td>
<td>2,536</td>
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<td>Contingency And Escalation</td>
<td>1.00</td>
<td>EE</td>
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**Total for Activity 1G30050140:**

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<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
<th>Burden Cost</th>
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<tr>
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<td>1.00 each</td>
<td>EE</td>
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<td>240</td>
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<td>8,005</td>
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**Total for Activity 1G30050140:**

**BOE**

Estimator's Experience based on 15 years of experience planning, estimating, and conducting projects of similar scope and size.

**Item Desc:**
Evaluate readiness of the field characterization team and plans.

**Breakdown of Cost Data:**
- **Units:** hours
- **Unit Cost:** 480

**Unit Cost Adjustment Factor:** Revised Unit
**Rocky Flats Closure Project**

**Baseline Cost and Basis of Estimate**

### WBS Filter

- 1GAC

### Activity Filter

- 1G30050140

---

**WBS No:** 1GAC0305

**Activity ID:** 1G30050140

#### Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

- **Activity ID:** 1G30050140

---

**WBS Filter**

- 1GAC

**Baseline Devi**

- 1GAC

---

**Activity Filter**

- 1G30050140

---

**Units:** hours

**Unit Cost:** 280

**Unit Cost Adjustment Factor:**

**Revised Unit Hours:** Basis for adjustment:

---

This BOE provides a Environmental Engineer for 80 hours and an Adminis. Assistant, manager, Health Physicist, and Industrial Safety person for 40 hours for the duration of the activity. It also provides for 40 hours for a subcontractor for project controls support.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

**Resources**

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<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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<tr>
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<td>E050 ENVIRONMENTAL ENGINEERS</td>
<td>R100S PMRS Salaried</td>
<td>Linear</td>
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<tr>
<td>750 STRAIGHT TIME BASE</td>
<td>G010 ADMINISTRATIVE ASSISTANTS</td>
<td>R100S PMRS Salaried</td>
<td>Linear</td>
<td>40.00</td>
<td>Hours</td>
</tr>
<tr>
<td>750 STRAIGHT TIME BASE</td>
<td>M040 MANAGERS (GRADE 64 - 68)</td>
<td>R100S PMRS Salaried</td>
<td>Linear</td>
<td>40.00</td>
<td>Hours</td>
</tr>
<tr>
<td>750 STRAIGHT TIME BASE</td>
<td>P080 HEALTH PHYSICISTS</td>
<td>R100S PMRS Salaried</td>
<td>Linear</td>
<td>40.00</td>
<td>Hours</td>
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<tr>
<td>750 STRAIGHT TIME BASE</td>
<td>P090 INDUSTRIAL HYGIENISTS</td>
<td>R100S PMRS Salaried</td>
<td>Linear</td>
<td>40.00</td>
<td>Hours</td>
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#### Line Item SYS - Contingency And Escalation

**BOE**

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**Activity ID:** 1G30050150

**Description:** Field Characterization - Group 300-5

**Cost Risk:** 2

**Schedule Risk:** 2

---

**Line Item 0100 - collect surficial soil samples**

**BOE**

- **Description:** Collect soil samples at a sample collection location.

**Item Desc:**

Collection of surficial soil samples. A site Environmental Engineer will direct the sample collection, containerize, package, and ship the samples; prepare field QC documentation, and prepare field notes on a full time basis. A site RCT will monitor the site for radiological contamination on a full time basis. A site Industrial Hygienist will implement the field portion of the HASP on a full time basis.

**Breakdown of Cost Data:**

- **Item:** Site Personnel for support of sample collection
  - Units: hours per borehole
  - Unit Cost: 24
  - Unit Cost Adjustment Factor:
  - Revised Unit Hours:

---

**Cost Element**

<table>
<thead>
<tr>
<th>BOE Type</th>
<th>Labor Hours/Unit</th>
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<th>Material/ Sub Cost</th>
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<td>Contingency &amp; Escalation</td>
<td>Total Prime Cost</td>
<td>Burden Cost</td>
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</table>

Total for Activity 1G30050150:

- 640 hours
- 17,753 hours
- 14,192 hours
- 5,770 hours
- 30,718 hours
- 6,267 hours
- 45,991 dollars

---

**Resources**

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<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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</table>
Line Item 0200 - Analyze samples (radionuclides)

**BOE**

Vendor Quote (http://rfetshp/PlanAndInteg/Guidance/planninginfo.htm)

**Item Desc:**

Analyze samples produced from Geoprobe borings. It is anticipated that five samples from each location will be collected. They will be analyzed for Metals, VOCs, SVOCs, PCBs, and radionuclides (est. 3 isotopes) with a 30 day TAT. This item is priced on a per sample basis.

**Breakdown of Cost Data:**

- **Item:** Analyze samples at an offsite laboratory.
- **Units:** Dollars per analysis
- **Unit Cost:** $671
- **Unit Cost Adjustment Factor:** Revised Unit Hours: Basis for adjustment.

<table>
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<th>Routine Cost</th>
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<tr>
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<tr>
<td>DOT Radscreen</td>
<td>$32.00</td>
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<tr>
<td>Bottles 1 @ $7</td>
<td>$7.00</td>
</tr>
<tr>
<td>Shipping 1 @ $42</td>
<td>$42.00</td>
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</table>

**Total per sample:** $671.00

Routine DOT radscreen is a 24 hour TAT. Routine Analysis is a 31 day Turn Around Time (TAT) in the laboratory except for Asbestos, beryllium, and Industrial Hygiene which are 5 days. Priority Analysis is <31 day and >7 days TAT except for Asbestos, beryllium and Industrial Hygiene which are 3 days. Rush Analysis is <7 days TAT except for Asbestos, beryllium and Industrial Hygiene which are 24 hours. Routine DOT radscreen is a 24 hour TAT.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

**Line Item 0300 - Project Mgmt Oversight**

**BOE**

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Item Desc:**

Project Management/Oversight. Based on half time for a Project Manager, Administrative staff, and Cost Estimator/Scheduler

**Breakdown of Cost Data:**

- **Item:** Mgmt oversight
- **Units:** site labor hours, subcontract dollars (per borehole)
- **Unit Cost:** 8 hours, $84 dollars
- **Unit Cost Adjustment Factor:** Revised Unit Hours:

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
**Rocky Flats Closure Project**

**Baseline Cost and Basis of Estimate**

**WBS No:** 1GAC0305

**Activity ID:** 1G30050170

**Description:** Prepare NFA - Group 300-5

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**Total for Activity 1G30050170:**

866 25,231 2,842 6,905 34,978 8,844 43,822

**Breakdown of Cost Data:**

- **Item Desc:** Perform Data Analysis including GIS representation of data, Characterization Report, and associated project management.

**Environmental Engineer**

- 10 hrs Develop maps for Report. Print multiple copies.
- 15 hrs Complete initial and revised tech edits of Report.
- 4 hrs Review and comment per area of expertise.
- 8 hrs Review and comment per area of expertise.
- Disposition comments and finalize document.

**Administrative Support**

- 6 hrs Copy & assemble final documents, submit to records.

**Unit Cost:** 138

**Burden Cost:** 6/23/00 9:20:53 AM

**Page 215 of 1121**
### Rocky Flats Closure Project

#### Baseline Cost and Basis of Estimate

**Project WBS Filter**
- 1GAC

**Activity Filter**
- *

**Starts In FY**
- *

| Line Item 01000 - develop characterization report |
|--------------------------------------------------|---|
| **BOE** Estimate's Experience on similar projects |
| **Item Desc:** Perform Data Analysis including GIS representation of data, Characterization Report, and associated project management. |
| **Breakdown of Cost Data:** |
| **Units:** 728 hours |
| 2 Environmental Engineers full time for 2 weeks to develop draft 160 hrs |
| 1 Project Manager full time for 4 weeks 160 hrs |
| 1 Secretary 1/2 time for 4 weeks to format and copy 80 hrs |
| 1 QA person 8 hours for review 8 hrs |
| 2 GIS individuals 2 weeks to create/revise maps 160 hrs |
| 2 Environmental Engineer full time 1 week for comment response 80 hrs |
| 1 project planner 1/2 time for 4 weeks 80 hrs |
| **Unit Cost Adjustment Factor:** none |
| **Revised Unit Hours:** |
| **Basis for adjustment:** None |

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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<tr>
<td>STRAIGHT TIME BASE</td>
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<tr>
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**Factors**
- 80 hours
- 240 hours
- 8 hours
- 80 hours
- 160 hours
- 160 hours
- 80 hours
- 42 estimated $/hr

**Cost Element**
- 1GAC0305

**Activity ID:**
- 1G30050170

**WBS No:**
- 1GAC0305

**BOE** 6/23/00 9:20:53 AM

---

**OFFICIAL USE ONLY**
## Rocky Flats Closure Project
### Baseline Cost and Basis of Estimate

**Project**: Baseline Devi  
**WBS Filter**: 1GAC  
**Activity Filter**: Starts In FY  

### WBS Filter 1GAC

#### Activity ID: 1G30050170

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<th>Materials/Sub Cost</th>
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**Line Item 0100 - SAP/HASP/QAP Addenda**

**BOE**

Estimator's Experience: 15 years of experience planning, estimating and conducting projects of similar scope and size. (S. Serreze)

Item Desc: Preparation of SAP Addendum.

Breakdown of Cost Data:
- Item: Prepare SAP, HASP and QAP addendum. Address KH, DOE and regulatory agency comments.
- Units: Total site hours
- Unit Cost: $300
- Unit Cost Adjustment Factor:
  - Revised Unit Hours: Basis for adjustment:

This BOE provides for one environmental engineer 100 hours, and additional support personnel including Admin support, Project Manager, Health Physics, Industrial Hygienist and an environmental scientist for 40 hours each for the duration of the activity. It also provides or a subcontract cost estimator/planner for 40 hours.

This estimate includes a project productivity/effectiveness factor for committed but as yet undefined cost reductions.

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### Line Item SYS - Contingency And Escalation

**BOE Resources**

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### Line Item SYS - Contingency And Escalation

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## Rocky Flats Closure Project

### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0306  
**Activity ID:** 1G30060120  
**Description:** Procurement & Field Preparation - Group 300-6

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**Total for Activity 1G30060120:**  
400 12,608 710 2,683 16,002 4,451 20,453

### Resources

**BOE Cost Element**  
- **Cost Element:** STRAIGHT TIME BASE  
- **Skill:** ENVIRONMENTAL ENGINEERS  
- **Department:** RMRS Salaried  
- **Curve:** Linear  
- **Quantity:** 120.00 Hours  
- **Unit:** Hours

**BOE Cost Element**  
- **Cost Element:** STRAIGHT TIME BASE  
- **Skill:** SAFETY ENGINEERS  
- **Department:** RMRS Salaried  
- **Curve:** Linear  
- **Quantity:** 80.00 Hours  
- **Unit:** Hours

**BOE Cost Element**  
- **Cost Element:** STRAIGHT TIME BASE  
- **Skill:** ADMINISTRATIVE ASSISTANTS  
- **Department:** RMRS Salaried  
- **Curve:** Linear  
- **Quantity:** 40.00 Hours  
- **Unit:** Hours

**BOE Cost Element**  
- **Cost Element:** STRAIGHT TIME BASE  
- **Skill:** MANAGERS (GRADE 64 - 68)  
- **Department:** RMRS Salaried  
- **Curve:** Linear  
- **Quantity:** 80.00 Hours  
- **Unit:** Hours

**BOE Cost Element**  
- **Cost Element:** STRAIGHT TIME BASE  
- **Skill:** HEALTH PHYSICISTS  
- **Department:** RMRS Salaried  
- **Curve:** Linear  
- **Quantity:** 80.00 Hours  
- **Unit:** Hours

**BOE Cost Element**  
- **Cost Element:** SUBCONTRACTED SRVS  
- **Skill:** COST ESTIMATORS PLANNERS AN  
- **Department:** ER Programs  
- **Curve:** Linear  
- **Quantity:** 710.44 Dollars  
- **Unit:** Dollars

**BOE Cost Element**  
- **Cost Element:** CONTINGENCY  
- **Skill:** NONE  
- **Department:** ZDEPT  
- **Curve:** Linear  
- **Quantity:** 1,852.87 Dollars  
- **Unit:** Dollars

**BOE Cost Element**  
- **Cost Element:** ESCALATION  
- **Skill:** NONE  
- **Department:** ZDEPT  
- **Curve:** Linear  
- **Quantity:** 830.40 Dollars  
- **Unit:** Dollars

### Activity ID: 1G30060140

**Description:** Readiness Review - Group 300-6

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**Total for Activity 1G30060140:**  
240 7,184 1,421 1,682 10,286 2,536 12,824

**Line Item 0100 - readiness assessment**

- **BOE Item Desc:** Estimator's Experience based on 15 years of experience planning, estimating, and conducting projects of similar scope and size.

- **Item Desc:** Prepare Radiological Work Permit, Implementation Plan, Ecology Survey/NEPA Support, and Utility Clearance/Soil Disturbance Permit.

- **Breakdown of Cost Data:**
  - **Unit:** site personnel hours
  - **Unit Cost Adjustment Factor:** none
  - **Revised Unit:** none

- This BOE provides a environmental engineer for 120 hours and a Safety Engineer, administrative assistant, manager and Health Physicist for 80 hours each forth education of the activity. It also provides 80 hours for project controls support.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
Evaluate readiness of the field characterization team and plans.

Breakdown of Cost Data:
- Item: Perform readiness evaluation
- Units: hours
- Unit Cost: 240
- Unit Cost Adjustment Factor:
- Revised Unit Hours:
- Basis for adjustment:

This BOE provides a Environmental Engineer for 80 hours and a Admin. Assistant, manager, Health Physicist, and Industrial Safety person for 40 hours for the duration of the activity. It also provides for 40 hours for a subcontractor for project controls support.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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**Line Item SYS - Contingency And Escalation**

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**Activity ID:** 1G30060150

**Description:** Field Characterization - Group 300-6

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</table>

Total for Activity 1G30060150: 11202 31,067 19,922 9,244 2,128

Line Item 0100 - collect surficial soil samples

**BOE**

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFET and other sites.

**Item Desc:**

Collection of surficial soil samples. A site Environmental Engineer will direct the sample collection, containerize, package, and ship the samples; prepare field QC documentation, and prepare field notes on a full time basis. A site RCT will monitor the site for radiological contamination on a full time basis.

**Breakdown of Cost Data:**

- Item: Site Personnel for support of sample collection
- Units: Site personnel hours per borehole
- Unit Cost: 24
### Resources

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
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<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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<tr>
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<td>E050 ENVIRONMENTAL ENGINEERS</td>
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<td>KG10H Remediation Steelworkers</td>
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<td>8.00</td>
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**Line Item 0200 - analyze samples (pesticide)**

**BOE**
- **Vendor Quote**
- **Email quote from average cost from Kaiser-Hill ASD (Pat Preese), recieved by Susan Serreze on February 22, 1999.**

**Item Desc:**
- Analyze samples, they will be analyzed for pesticides. This item is priced on a per sample basis.

**Breakdown of Cost Data:**
- **Item:** Analyze samples at an offsite laboratory.
  - **Units:** analysis
  - **Unit Cost:** pesticide $150.
  - **Unit Cost Adjustment Factor:** 1.5
  - **Revised Unit Hours:** pesticides $225.

**Basis for adjustment:** 1.5 adjustment to account for QA Samples and data validation.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

**Line Item 0300 - project mgmt oversight**

**BOE**
- **Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.**

**Item Desc:**
- Project Management/Oversight. Based on half time for a Project Manager, Administrative staff, and Cost Estimator/Scheduler

**Breakdown of Cost Data:**
- **Item:** Mgmt oversight
  - **Units:** hours per borehole
  - **Unit Cost:** 12
  - **Unit Cost Adjustment Factor:**
    - **Revised Unit Hours:** Basis for adjustment.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

**Line Item 0400 - analyze samples (herbicide)**

**BOE**
- **Vendor Quote**
- **Email quote from average cost from Kaiser-Hill ASD (Pat Preese), recieved by Susan Serreze on February 22, 1999.**
## Rocky Flats Closure Project
### Baseline Cost and Basis of Estimate

**WBS No:** 1GA00601050  
**Activity ID:** 1G30060170  
**Project:** Rocky Flats Closure Project  
**Baseline Devl:**  
**WBS Filter:** 1GAC  
**Activity Filter:** *  
**Starts In FY:** *

---

### Item Desc:
Analyze samples, they will be analyzed for pesticides. This item is priced on a per sample basis.

### Breakdown of Cost Data:
- **Item:** Analyze samples at an offsite laboratory.
- **Units:** analysis
- **Unit Cost:** herbicide $170.
- **Unit Cost Adjustment Factor:** 1.5
- **Revised Unit Hours:** herbicides $255.

### Basis for adjustment:
1.5 adjustment to account for QA Samples and data validation

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

### Resources

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### Line Item SYS - Contingency And Escalation

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### Activity ID: 1G30060170
**Description:** Prepare NFA - Group 300-6

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<th>Units</th>
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<th>Labor Hours/Unit</th>
<th>Labor Hours Total</th>
<th>Labor Cost Total</th>
<th>Material/Sub Cost</th>
<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
<th>Burden Cost</th>
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**Total for Activity 1G30060170:** 866 25,231 2,842 6,971 35,044 8,841 43,885

### Line Item 0100 - develop NFA documentation

**BOE**
Estimate based on Estimator’s Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

This estimate was constructed based on actual hours required to complete previous NFA Reports (obtained from actual author) and professional judgement of level of effort required for remaining reports.

**Item Desc:**
Perform Data Analysis including GIS representation of data, Characterization Report, and associated project management.

### Breakdown of Cost Data:
- **Item:** Develop Documentation

<table>
<thead>
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<th>Units: Hours</th>
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</thead>
<tbody>
<tr>
<td>Unit Cost: 138</td>
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</table>

- **Environmental Engineer** 45 hrs Evaluate & assemble existing data. Draft Report.
- **SMD Technician** 10 hrs Identify & pull existing data from database.
- **GIS Technician** 15 hrs Develop maps for Report. Print multiple copies.
- **Technical Editor** 15 hrs Complete initial and revised tech edits of Report.
- **Technical Reviews**
  - QA 4 hrs Review and comment per area of expertise.
  - Peer (2) 8 hrs Review and comment per area of expertise.
  - Compliance 4 hrs Review and comment per area of expertise.
  - Environmental 4 hrs Review and comment per area of expertise.
  - Management (2) 8 hrs Review and comment per area of expertise.
  - Legal 4 hrs Review and comment per area of expertise.
- **Environmental Engineer** 15 hrs Disposition comments and finalize document.
- **Administrative Support** 6 hrs Copy & assemble final documents, submit to records.

Unit Cost Adjustment Factor: none
Revised Unit Hours: 138
### Resources

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<td>Hours</td>
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<tr>
<td>Factors 4</td>
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<tr>
<td>750 STRAIGHT TIME BASE</td>
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### Line Item 01000 - Develop Characterization report

**Estimator's Experience on similar projects**

**Item Desc:** Perform Data Analysis including GIS representation of data, Characterization Report, and associated project management.

**Breakdown of Cost Data:**

- Item: Develop Characterization Report
- **Units:** 728 hours

- 2 Environmental Engineers full time for 2 weeks to develop draft: 160 hrs
- 1 Project Manager full time for 4 weeks to format and copy: 160 hrs
- 1 Secretary 1/2 time for 4 weeks to format and copy: 80 hrs
- 1 QA person 8 hours for review: 8 hrs
- 2 GIS individuals 2 weeks to create/revise maps: 160 hrs
- 1 Environmental Engineer full time 1 week for comment response: 80 hrs
- 1 Project planner 1/2 time for 4 weeks: 80 hrs

- **Unit Cost Adjustment Factor:** None
- **Revised Unit Hours:**

**Basis for adjustment:** None

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
## Rocky Flats Closure Project

### Baseline Cost and Basis of Estimate

#### WBS Filter
- 1GAC

#### Activity Filter
- ROCKY FLATS CLOSURE PROJECT

#### Activity ID
- 1G00060107

#### WBS No:
- 1GAC0306

#### Title:
- Group 400 (B439)

### Line Item 0100 - SAP Addenda

**Description:** SAP Preparation - IHSS Group 400-1 (B439)

**Resource Details:**
- Cost Element: BOE
- Skill: Nature: None
- Department: BOE
- Curve: Linear
- Quantity: 1.00
- Units: each
- Total: 100

**Cost Breakdown:**
- Labor Hours/Unit: 100
- Total Labor Cost: 710
- Total Materials/Sub Cost: 0
- Total Contingency and Escalation: 0
- Total Prime Cost: 4,144
- Total Cost: 5,332

**Factors:**
- 160.00 Hours

### Line Item 0200 - HASP Addenda

**Description:** Preparation of HASP addenda to Industrial Area Characterization Plan

**Resource Details:**
- Cost Element: BOE
- Skill: Nature: None
- Department: BOE
- Curve: Linear
- Quantity: 1.00
- Units: each
- Total: 140

**Cost Breakdown:**
- Labor Hours/Unit: 140
- Total Labor Cost: 5,404
- Total Materials/Sub Cost: 0
- Total Contingency and Escalation: 0
- Total Prime Cost: 5,404
- Total Cost: 7,274

**Factors:**
- 80.00 Hours

### Line Item 0300 - QAP Addenda

**Description:** Preparation of QAP addenda to Industrial Area Characterization Plan

**Resource Details:**
- Cost Element: BOE
- Skill: Nature: None
- Department: BOE
- Curve: Linear
- Quantity: 1.00
- Units: each
- Total: 40

**Cost Breakdown:**
- Labor Hours/Unit: 40
- Total Labor Cost: 1,893
- Total Materials/Sub Cost: 710
- Total Contingency and Escalation: 0
- Total Prime Cost: 2,603
- Total Cost: 3,302

**Factors:**
- 20.00 Hours

### Line Item SYS - Contingency And Escalation

**Description:**
- **Resources**
  - Cost Element: 0000
  - Skill: None
  - Department: ZDEPT
  - Curve: Linear
  - Quantity: 0.84576
  - Units: Dollars

**Factors:**
- 4,836.78 Dollars

**Line Item 0100 - SAP Addenda**

- **Resources**
  - Cost Element: 0100
  - Skill: Nature: None
  - Department: ZDEPT
  - Curve: Linear
  - Quantity: 0
  - Units: None

**Factors:**
- 4,133 Dollars

**Schedule Risk:**
- 1

**Cost Risk:**
- 1

**Line Item 0200 - HASP Addenda**

- **Resources**
  - Cost Element: 0200
  - Skill: Nature: None
  - Department: ZDEPT
  - Curve: Linear
  - Quantity: 0
  - Units: None

**Factors:**
- 5,404 Dollars

**Schedule Risk:**
- 1

**Cost Risk:**
- 1

**Line Item 0300 - QAP Addenda**

- **Resources**
  - Cost Element: 0300
  - Skill: Nature: None
  - Department: ZDEPT
  - Curve: Linear
  - Quantity: 0
  - Units: None

**Factors:**
- 4,133 Dollars

**Schedule Risk:**
- 1

**Cost Risk:**
- 1

**Line Item SYS - Contingency And Escalation**

- **Resources**
  - Cost Element: SYS
  - Skill: Nature: None
  - Department: ZDEPT
  - Curve: Linear
  - Quantity: 0
  - Units: None

**Factors:**
- 4,133 Dollars

**Schedule Risk:**
- 1

**Cost Risk:**
- 1

### Line Item 0100 - SAP Addenda

**Description:**
- Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Breakdown of Cost Data:**
- Item: Preparation of SAP addenda
  - Units: hours
  - Unit Cost: 120
  - Unit Cost Adjustment Factor: none
  - Revised Unit Hours: 120

**Total for Activity 1GFK641100:**
- 280
- 10,021
- 1,421
- 4,133
- 15,575
- 19,042

### Line Item 0200 - HASP Addenda

**Description:**
- Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Breakdown of Cost Data:**
- Item: Preparation of addenda for HASP.
  - Units: hours
  - Unit Cost: 140
## Rocky Flats Closure Project
### Baseline Cost and Basis of Estimate

#### WBS No:
1GAC0401

#### Activity ID:
1GFK641100

#### Baseline Devl

---

### Resources

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Factors:
- Activity ID: 1GFK641120
- Description: Procurement and Field Prep - IHSS Group 400-1

Estimated total for Activity 1GFK641120:
- Total Cost: $17,307
- Total Prime Cost: $16,432
- Burden Cost: $2,635

---

### Line Item 0300 - QAP Addenda

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

Item Desc:
Preparation of SAP Addenda to Industrial Area Characterization Plan.

Breakdown of Cost Data:
- Item: Preparation of QAP addenda
- Units: hours
- Unit Cost: 60
- Unit Cost Adjustment Factor: none
- Revised Unit Hours: 60

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Line Item SYS - Contingency And Escalation

**BOE**

### Resources

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Factors:
- Activity ID: 1GFK641120
- Description: Procurement and Field Prep - IHSS Group 400-1

Estimated total for Activity 1GFK641120:
- Total Cost: $17,307
- Total Prime Cost: $16,432
- Burden Cost: $2,635

---

### Activity ID: 1GFK641120

**Description:** Procurement and Field Prep - IHSS Group 400-1

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<th>BOE</th>
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<th>Materials/Sub Cost</th>
<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
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<td>0100 Procurement &amp; Field Prep</td>
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<td>HC</td>
<td>345</td>
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**Total for Activity 1GFK641120:**
- Total Cost: $17,307
- Total Prime Cost: $16,432
- Burden Cost: $2,635

---

### Line Item 0100 - Procurement & Field Prep

**BOE**

**Item Desc:**

---

### Notes

- Unit Cost Adjustment Factor: none
- Revised Unit Hours: 140

---

**6/23/00 9:20:55 AM**
Breakdown of Cost Data:

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<th>Units/Amounts</th>
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<th>Revised Unit</th>
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<tr>
<td>Site Labor to perform above individual tasks for either Ryan's Pit or T-3/T-4.</td>
<td>hours/lot</td>
<td>1380</td>
<td>0.25</td>
<td>345 hours</td>
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<tr>
<td>Subcontractor costs to perform above individual tasks for either Ryan's Pit or T-3/T-4.</td>
<td>lot</td>
<td>$10K</td>
<td>0.25</td>
<td>$2.5K</td>
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Basis for adjustment. Hours and costs for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be characterized at once.

Procurement includes preparation of statement of work, proposal review (technical evaluation), and negotiations. Based on a T-3/T-4 burdened cost of $29,186.52. Assuming it is primarily labor hours (RMRS Environmental Engineer charging at $57.45 per hour) yields 508 hours which rounds to 510 total hours.

Davis Bacon Documentation: It was assumed that it would take an environmental engineer twenty-four hours to prepare a Davis Bacon cost estimate and to support the Davis-Bacon determination.

Subcontractor Health and Safety Plan: Costs for the health and safety plan are based on Ryan's Pit, which cost approximately $10,000. It was assumed that these are A5H dollars. In addition, it was assumed that a safety engineer, an industrial hygienist, and a radiological engineer would each provide one week (40 hours) of support for review and document preparation.

Radiological Work Permit: It was assumed that it would take a radiological control technician two working days (18 hours) to complete counting preparation and review.

Implementation Plan: It was estimated that this activity would take 13 weeks of time for engineers, scientists or equivalent to complete. This would include preparation of an implementation plan as required (Rocky Flats Cleanup Agreement, Appendix 3, Interim Guidance Document, Dated August 1977). In addition this includes all tasks related to documentation for the Integrated Work Control Program and Integrated Safety Management.

Ecology Survey/National Environmental Protection Act (NEPA) Support: It was estimated that this would take 40 hours for an ecologist. The activities include NEPA review and support in document preparation, site surveys to verify compliance with ecological regulations, categorical exclusions, and NEPA evaluations.

Utility Clearance/Soil Disturbance Permits: It was estimated based on experience that it would take the equivalent 2 weeks (80 hours) for technical staff to do utility surveys, prepare and review soil disturbance permits, and prepare authorizing documents for excavation.

The combined resources for procurement and field preparations are

<table>
<thead>
<tr>
<th>Total Procurement and Field Preparation Hours</th>
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<tbody>
<tr>
<td>Environmental Engineer 1134 hours</td>
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<tr>
<td>Safety Engineer 40 hours</td>
</tr>
<tr>
<td>Industrial Hygiene 40 hours</td>
</tr>
<tr>
<td>Radiological Engineering 58 hours</td>
</tr>
<tr>
<td>Radiological Control Technician 18 hours</td>
</tr>
<tr>
<td>Ecologist/Life Scientist 40 hours</td>
</tr>
<tr>
<td>Manager 50 hours</td>
</tr>
<tr>
<td>Quality Assurance* 29 hours</td>
</tr>
<tr>
<td>A5H Total $10,000</td>
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</table>

* On some projects these hours were assumed to be included in other tasks or part of this task under environmental engineer or one of the other job functions.

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

| Factor 1134 – Environmental Engineer 263 Hours |
| Factor 40 – Safety Engineer 10 Hours           |
| Factor 40 – Industrial Hygiene 10 Hours        |
| Factor 58 – Radiological Engineering 14 Hours  |
| Factor 18 – RCT 5 Hours                        |
| Factor 40 – Life Scientist 10 Hours            |
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Resources**

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<tr>
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<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
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**Line Item SYS - Contingency And Escalation**

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**Activity ID: 1GFK641140**

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<th>Labor Cost Total</th>
<th>Materials/Sub Cost</th>
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<td>0</td>
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It was estimated that subcontractor involvement would require 80 hours at $60/hour = $4,800. It was assumed that about 3 weeks of time was required for an environmental engineer or similar person in addition to 12 hours of project management, which yielded 132 hours. An additional 11 hours was added for management oversight. It was estimated that a radiological engineer (QA) and an industrial hygienist would be needed for 2.5 days each (22 hours).
The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 projects will be conducted at once and only one of each fixed cost is needed for the group.

Factor 132 - Environmental Engineer 33 Hours
Factor 22 - Health Physicists 6 Hours
Factor 11 - Manager 3 Hours
Factor 22 - Quality Assurance 6 Hours
Factor 4,800 - A5H Subcontracted Srvs 1,200 Dollars

20 hours of administrative time will also be required.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### Rocky Flats Closure Project

#### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0401  
**Activity ID:** 1GFK641150

**Project:** Baseline_Devl  
**WBS Filter:** 1GAC  
**Activity Filter:** *  
**Status In FY:** *

**Unit Cost:** 32  
**Unit Cost Adjustment Factor:** none  
**Revised Unit Hours:** 32

---

**Item:** Kaiser-Hill/RMRS Geoprobe unit with 2 Technician crew. Item costs $100 per hour or $800 per 8-hour day.  
**Units:** dollars  
**Unit Cost:** $800  
**Unit Cost Adjustment Factor:** none  
**Revised Unit Hours:** 800

**Basis for adjustment.**

An additional 25% reduction was made because future efficiencies are expected to result in reduced cost.

---

### Resources

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<tr>
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**Item:** Geoprobe unit with 2 Technician crew. Item costs $100 per hour or $800 per 8-hour day.

**Units:** dollars  
**Unit Cost:** $800  
**Unit Cost Adjustment Factor:** none  
**Revised Unit Hours:** 800

**Basis for adjustment.**

An additional 25% reduction was made because future efficiencies are expected to result in reduced cost.

---

**BOE**  
**Line Item 0200 - analyze samples**

**Vendor Quote**  
**Email quote:** average cost from Kaiser-Hill ASD (V. Ideker).

**Item Desc:**  
Analyze samples produced from geoprobe borings. It is anticipated that 3 samples from each boring will be collected. They will be analyzed for Metals, VOCs, SVOCs, PC8s, and radionuclides (est. 3 isotopes) with a 30 day TAT. This item is priced on a per sample basis. Per sample costs include DOT rad screen, bottle charge, shipping, and validation.

**Breakdown of Cost Data:**

- **Item:** Analyze samples at an offsite laboratory.  
  - **Units:** analysis  
  - **Unit Cost:** Metals $345, VOCs $280, SVOCs $440, PCBs and other analytes $150, and Radionuclides 3 isotopes $590 per each sample.  
  - **Unit Cost Adjustment Factor:** Must add: DOT rad screen $32/sample, bottle charge $7/sample, shipping $4.2/bottle, and validation per each: $17.30 VOA, $19.25 SVOC, $16.75 Metals, $5.95 PCB, and $15.60 Rad.  
  - **Revised Unit Hours:** Metals $405, VOCs $341, SVOCs $502, PCBs and other analytes $199, and Rad $649.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

**BOE**  
**Line Item 0300 - project mgmt oversight**

**Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.**

**Item Desc:**  
Project Management/Oversight. Based on half time for a Project Manager, Administrative staff, and Cost Estimator/Scheduler.

**Breakdown of Cost Data:**

- **Item:** Mgmt oversight  
  - **Units:** hours  
  - **Unit Cost:** 12  
  - **Unit Cost Adjustment Factor:** none  
  - **Revised Unit Hours:** 12

**Basis for adjustment.**
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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### Line Item SYS - Contingency And Escalation

<p>| BOE |</p>
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### Activity ID: 1GFK641170

**Description:** Prepare Summary/NFA - IHSS Group 400-1

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Total for Activity 1GFK641170:

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### Line Item 01000 - develop documentation

**Estimator's Experience:**

Estimate for summary report based on estimator's 16 years of experience performing and costing projects of similar size and scope.

**Item Desc:**

Perform Data Analysis including GIS representation of data, NFA Summary, Characterization Report, and associated project management. Disposition comments and finalize document.

**Breakdown of Cost Data:**

- **Item:** Develop Documentation
  - **Units:** Hours
  - **Unit Cost:** 656
  - **Unit Cost Adjustment Factor:** none
  - **Revised Unit Hours:** 656
  - **Basis for adjustment:** N/A

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<th>Curve</th>
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### Activity ID: 1GFK641170

**Description:** Prepare Summary/NFA - IHSS Group 400-1
### Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

**Project:** Baseline Deviation

**WBS Filter:** 1GAC

**Activity Filter:** *  
**Starts In FY:** *

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#### Activity Filter

**ER Programs**

**WBS No:** 1GAC0401

**Activity ID:** 1GFK641170

**Description:** Prepare Decision Document - IHSS 400-1

**Schedule Risk:** 1  
**Cost Risk:** 1

### Line Item 0100 - PAM

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**Total for Activity 1GFK641180:** 289  
9,164  
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1,677  
10,841  
2,584  
13,426

#### Estimator's Experience based generally on historical data for Ryan's Pit

**Item Desc:** Preparation of PAM or IM/IRA in support of source removal of previously characterized UBC.

**Proposed Action Memorandum:** A bottoms-up estimate based on historical costs was used as the basis for the estimate. Based on Ryan's Pit (IHSS 108), the cost for the PAM was $50,000 (contractor costs). Assuming that labor rates at this time were approximately $75 (based on a cost center 217). The total labor for a PAM would be approximately 666 hours, which rounds to 700 hours. It was assumed that 10% would be required for managerial hours.

For a PAM the total labor hours are:

- Environmental Engineer 700 Hours
- Manager 70 Hours

**Factor 700 Environmental Engineer 175 hours**  
**Factor 70 Manager 18 hours**

**Breakdown of Cost Data:**
- **Item:** Preparation of PAM for Ryan's Pit source removal action.
  - **Units:** hours
  - **Unit Cost:** 770
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit Hours:** 193

**Basis for adjustment:** Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

**Interim Measure/Interim Remedial Action Decision Document:** It was assumed that an IM/IRA Decision Document would take 75% more effort than a PAM or 1,166 hours, which rounds to 1200 hours. It was assumed that 10% of this labor would be required for managerial hours.

For an IM/IRA the total labor hours are...
Environmental Engineer 1200 Hours
Manager 120 Hours
Factor 120 Environmental Engineer 300 hours
Factor 120 Manager 30 hours

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Line Item 0200 - SAP

Estimator's Experience based generally on historical data for Ryan's Pit

Item Desc:
Preparation of SAP in support of source removal of previously characterized UBC.

Breakdown of Historical Data:
- Item: Preparation of SAP for Ryan's Pit source removal action.
  - Units: hours
  - Unit Cost: 300
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit Hours: 76

Basis for adjustment. Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

Sampling and Analysis Plan: Based on the T-3/T-4 Sampling and Analysis Plan (SAP) it took 300 hours in total preparation time. It was assumed that 10% of this labor was for managerial hours (30 hours) and that the rest of the time, 270 hours, was for technical staff. It was assumed that these hours include all labor including quality assurance, secretarial support, graphics etc.

Original Hours 270 Environmental Engineer 68 hours
Original Hours 30 Manager 8 hours

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<th>Curve</th>
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Line Item 0300 - WMP

Estimator's Experience based generally on historical data for Ryan's Pit

Item Desc:
Preparation of WMP in support of source removal of previously characterized UBC.

Breakdown of Historical Data:
- Item: Preparation of WMP for Ryan's Pit source removal action.
  - Units: hours
  - Unit Cost: 80
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit Hours: 20

Basis for adjustment. Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

Waste Management Plan: It was assumed that a waste management plan would be needed and that it would take no more than two weeks to prepare (80 hours).

Original Hours 80 Environmental Engineer 20 hours
Baseline Cost and Basis of Estimate

Activity ID: 1GFK641180
WBS No: 1GAC0401

**Project:** Rocky Flats Closure Project

### WBS Filter

- B000 STRAIGHT TIME BASE
- E050 ENVIRONMENTAL ENGINEERS
- R100S RMRS Salaried
- "ROL" Roll

#### Activity Filter

- Starts In FY: *

**Activity ID:** 1GFK641180
**WBS No:** 1GAC0401
**Activity Filter:** *

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**BOE**

- Resources
- **Factors:** 20 hours

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**Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation**


**Breakdown of Cost Data:**

- **Item:** Site Labor to perform above individual tasks for either Ryan's Pit or T-3/T-4.
  - Hours: 1380
  - Unit Cost: $1380
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit: 345 hours

- **Item:** Subcontractor costs to perform above individual tasks for either Ryan's Pit or T-3/T-4.
  - Units: 1 lot
  - Unit Cost: $10K
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit: $2.5K

**Basis for adjustment:** Hours and costs for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be characterized at once.

**Procurement includes preparation of statement of work, proposal review (technical evaluation), and negotiations. Based on a T-3/T-4 burdened cost of $29,186.52. Assuming it is primarily labor hours (RMRS Environmental Engineer charging at $57.45 per hour) yields 508 hours which rounds to 510 total hours.**

**Davis Bacon Documentation:** It was assumed that it would take an environmental engineer twenty-four hours to prepare a Davis Bacon cost estimate and to support the Davis-Bacon determination.

**Subcontractor Health and Safety Plan:** Costs for the health and safety plan are based on Ryan's Pit, which cost approximately $10,000. It was assumed that these are A5H dollars. In addition, it was assumed that a safety engineer, an industrial hygienist, and a radiological engineer would each provide one week (40 hours) of support for review and document preparation.

**Radiological Work Permit:** It was assumed that it would take a radiological control technician two working days (18 hours) to complete counting preparation and review.

**Implementation Plan:** It was estimated that this activity would take 13 weeks of time for engineers, scientists or equivalent to complete. This would include preparation of an implementation plan as required (Rocky Flats Cleanup Agreement, Appendix 3, Interim Guidance Document, Dated August 1977). In addition this includes all tasks related to documentation for the Integrated Work Control Program and Integrated Safety Management.

**Ecology Survey/National Environmental Protection Act (NEPA) Support:** It was estimated that this would take 40 hours for an ecologist. The activities include NEPA review and support in document preparation, site surveys to verify compliance with ecological regulations, categorical exclusions, and NEPA evaluations.

**Utility Clearance/Soil Disturbance Permits:** It was estimated based on experience that it would take the equivalent 2 weeks (80 hours) for technical staff to...
do utility surveys, prepare and review soil disturbance permits, and prepare authorizing documents for excavation.

The combined resources for procurement and field preparations are

Total Procurement and Field Preparation Hours

Environmental Engineer 1134 hours
Safety Engineer 40 hours
Industrial Hygiene 40 hours
Radiological Engineering 58 hours
Radiological Control Technician 18 hours
Ecologist/Life Scientist 40 hours
Manager 50 hours
Quality Assurance* 29 hours
A5H Total $10,000

* On some projects these hours were assumed to be included in other tasks or part of this task under environmental engineer or one of the other job functions.

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

Factor 1134 - Environmental Engineer 283 Hours
Factor 40 - Safety Engineer 10 Hours
Factor 40 - Industrial Hygiene 10 Hours
Factor 58 - Radiological Engineering 14 Hours
Factor 18 - RCT 5 Hours
Factor 40 - Life Scientist 10 Hours
Factor 50 - Project Manager 13 Hours
Factor 10000 - A5H Subcontracted Services 2,500 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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| ASH SUBCONTRACTED SRVS | 0000 DAY RATE | KG10H | Remediation Steelworkers | Linear | 2,114.40 | Dollars |
| Factors 2500 sub/c support |

Line Item SYS - Contingency And Escalation

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**Rocky Flats Closure Project**  
**Baseline Cost and Basis of Estimate**

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### Activity 1GFK641240: readiness assessment

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#### Line Item 0100 - readiness assessment

**BOE**  
Estimator's Experience based generally on historical data for Ryan’s Pit and T-3/T4 Remediation

**Item Desc:**  
Evaluate readiness of the field characterization team and plans.

**Breakdown of Cost Data:**  
  - Units: hours
  - Unit Cost: 187
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit: 48

  - Units: 1 lot
  - Unit Cost: $4800
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit: $1200

#### Line Item 0200 - training

**BOE**  
Conduct Training in support of source removal action.

**Item Desc:**

#### Resources

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**Line Item 0200 - training**

**BOE**  
Conduct Training in support of source removal action.

**Item Desc:**

---

6/23/00 9:20:57 AM  
OFFICIAL USE ONLY
Breakdown of Cost Data:

**Item: Site Labor to perform above individual tasks for T-3/T-4.**
- **Units:** hours
- **Unit Cost:** 132 Hours
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** 33 hours

**Item: Subcontractor costs to perform above individual tasks for T-3/T-4.**
- **Units:** 1 lot
- **Unit Cost:** $12K
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** $3K

Basis for adjustment. Costs for each UBC are divided by 4 to account for the fact that 4 UBCs will be remediated at once and only one Training is needed for the group.

It was estimated training would cost $1,000 per subcontractor worker and that 12 subcontractor employees would require training. It was estimated that onsite contractor employees would require the equivalent of 15 hours of training including instructor time and that eight onsite employees would be trained.

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

**Estimator's Experience based generally on historical data for T-3/T4 Remediation.**

**Line Item 0300 - pre-evolution meeting**

**Item Desc:**
Conduct Pre-Evolution Meeting in support of source removal action

Breakdown of Cost Data:

**Item: Site Labor to perform above individual tasks for T-3/T-4.**
- **Units:** hours
- **Unit Cost:** 60 hours
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** 15 hours

**Item: Subcontractor costs to perform above individual tasks for T-3/T-4.**
- **Units:** 1 lot
- **Unit Cost:** $6K
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** $1.5K

Basis for adjustment. Costs for each UBC are divided by 4 to account for the fact that 4 UBCs will be remediated at once and only one Pre-Evolution Meeting is needed for the group.

It was assumed that the Pre-Evolution Meeting would be limited to five hours. Assuming that 20 subcontract employees would attend at an average cost of $60/hour burdened yields a cost of $6,000. It was assumed that 12 onsite contractor employees would attend to yield another 60 hours.

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

**Factor 60 - Onsite employees 15 Hours**
### Rocky Flats Closure Project Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0401  
**Activity ID:** 1GFK641240  
**Baseline Devl**  
**WBS Filter:** 1GAC  
**Activity Filter:**  
**Starts In FY:** *

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This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

#### Line Item SYS - Contingency And Escalation

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**Description:** Remedial Action - IHSS Group 400-1  
**Cost Risk:** 2  
**Schedule Risk:** 3

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Total for Activity 1GFK641250: 884 30,347 75,691 63,092 169,130 10,737 179,868

**Line Item 0100 - mobilization**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:**  
Mobilization in support of remediation.

**Breakdown of Cost Data:**

**Item:** Site Labor to perform above individual tasks for T-3/T-4.  
- Units: hours  
- Unit Cost: 1,100  
- Unit Cost Adjustment Factor: 0.25  
- Revised Unit: 275

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.  
- Units: 1 lot  
- Unit Cost: 144k  
- Unit Cost Adjustment Factor: 0.25  
- Revised Unit: see below

**Basis for adjustment.** The costs were divided into fixed costs and variable costs. The fixed costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated
contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

T3/T4 hours 110 Health Physicists 27 Hours
T3/T4 hours 330 Manager 83 Hours
T3/T4 hours 550 Environmental Engineer 138 Hours
T3/T4 hours 110 Industrial Hygienist 27 Hours
T3/T4 subcontractor dollars 184,000 Subcontractor 46,000

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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<td>STRAIGHT TIME BASE</td>
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For Site Preparation tasks - RCT hours were the same as D&D construction hours.
For all other tasks A5H subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under RG10H department code.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
Rocky Flats Closure Project
Baseline Cost and Basis of Estimate

Baseline Devi: WBS Filter: 1GAC

WBS No: 1GAC0401
Activity ID: 1GFK641250

Resources

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
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<tr>
<td>750 STRAIGHT TIME BASE</td>
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Factors 30 hrs
Factors 23 hrs
Factors 23 hrs
Factors 750 sub/c support

Line Item 03000 - excavation

Item Desc: Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
- Units: hours
- Unit Cost: see below
- Unit Cost Adjustment Factor: see below
- Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
- Units: 1 lot
- Unit Cost: see below
- Unit Cost Adjustment Factor: see below
- Revised Unit: see below

Basis for adjustment: The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.50 factor to account for the fact that 2 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Resources
Total Contaminated Soil to be removed 48CY
Total Soil for Thermal Desorption 0 CY
offsite Waste Volume 48CY

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 1.09 - Environmental Engineer 52 Hours
Factor 0.47 - Health Physicists 23 Hours
Factor 0.31 - Manager 15 Hours
Factor 0.31 - Industrial Hygienists 15 Hours
Factor 1.00 - Radiological Control Technician Linear 48 Hours
Factor 45.23 - A5H Subcontracted Svrs 2,171 Dollars (81% subcontracted services/19% D&D construction workers)

D&D construction trade hours represent 19% of the subcontract dollars and were calculated using the following methodology:

A5H subcontracted dollars were multiplied by .19, the result was divided by $60/hr to determine the number of hours allocated to D&D construction.
The dollar amount calculated for D&D construction workers was subtracted from the subcontractor dollars and the revised A5H dollar amount was entered.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

Resources

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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Factors 52 hrs

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6/23/00 9:20:58 AM OFFICIAL USE ONLY
### Rocky Flats Closure Project

#### Baseline Cost and Basis of Estimate

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<tr>
<th>WBS No:</th>
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<th>Task Description</th>
<th>Estimator's Experience</th>
<th>Item Desc:</th>
<th>Breakdown of Historical Data:</th>
<th>Item: Site Labor to perform above individual tasks for T-3/T-4.</th>
<th>Units:</th>
<th>hours</th>
<th>Unit Cost:</th>
<th>Unit Cost Adjustment Factor: see below</th>
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<tr>
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<th>Task Description</th>
<th>Estimator's Experience</th>
<th>Item Desc:</th>
<th>Breakdown of Historical Data:</th>
<th>Item: Subcontractor costs to perform above individual tasks for T-3/T-4.</th>
<th>Units:</th>
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</tbody>
</table>

**Basis for adjustment.** The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Total Contaminated Soil to be removed 48 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 48 CY

For the base case, it was assumed that about five cubic yards out of 700 cubic yards would be debris and would be segregated and cleaned. It was estimated that each cubic yard of debris would cost $1,000 or $5,000 total for 700 cubic yards. This yields a rate of $7.14 per cubic yard.

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

**Factor 7.14 - ASH Subcontracted Srvs 344 Dollars**

Subcontracted services were adjusted based on professional judgement.

**D&D construction trade hours were calculated using the following methodology:**

ASH subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.

**RCT hours were calculated using the following methodology, unless they were already estimated.**

For Site Preparation tasks - RCT hours were the same as D&D construction hours.

For all other tasks ASH subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under KG10H department code.

The dollars amounts calculated for D&D construction workers and RCTs were subtracted from the subcontractor dollars and the revised ASH dollar amount was entered into Best.
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

<table>
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<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
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**Line Item 0600 - confirmation sampling**

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:**
Confirmation Sampling.

**Breakdown of Historical Data:**

**Item:** Site Labor to perform above individual tasks for T-3/T-4.
- **Units:** hours
- **Unit Cost:** see below
- **Unit Cost Adjustment Factor:** see below
- **Revised Unit:** see below

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
- **Units:** 1 lot
- **Unit Cost:** see below
- **Unit Cost Adjustment Factor:** see below
- **Revised Unit:** see below

**Basis for adjustment.** The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

**Total Contaminated Soil to be removed 48 CY**
**Total Soil for Thermal Desorption 0 CY**
**Offsite Waste Volume 48 CY**

The analytical costs were based on T-3/T-4, which cost $435,574 for 3800 cubic yards of contaminated soil removed. This yielded a unit rate of about $115/cubic yard. Based on estimator experience the cost of sampling including labor and materials was estimated to be 20% of that rate or about $23/ cubic yard.

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

**Factor 114.62 - ASH Subcontracted Srvs (Analytical) 5,502 Dollars**
**Factor 22.924 - ASH Subcontracted Srvs 1,100 Dollars**

D&D construction trade hours were calculated using the following methodology:

ASH subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.

RCT hours were calculated using the following methodology, unless they were already estimated.

For Site Preparation tasks - RCT hours were the same as D&D construction hours.
For all other tasks ASH subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under KG10H department code.

The dollars amounts calculated for D&D construction workers and RCTs were subtracted from the subcontractor dollars and the revised ASH dollar amount was entered into Best.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
Line Item 0700 - prepare waste acceptance forms

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:**

Prepare Waste Acceptance Forms

**Breakdown of Historical Data:**

**Item:** Site Labor to perform above individual tasks for T-3/T-4.

- **Units:** hours
- **Unit Cost:** see below
- **Unit Cost Adjustment Factor:** see below
- **Revised Unit:** see below

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.

- **Units:** 1 lot
- **Unit Cost:** see below
- **Unit Cost Adjustment Factor:** see below
- **Revised Unit:** see below

**Basis for adjustment.** The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

T3/T4 hours 80 environmental engineer 20 hours

**Resources**

**Cost Element** | **Skill** | **Department** | **Curve** | **Quantity** | **Units**
--- | --- | --- | --- | --- | ---
750 | STRAIGHT TIME BASE | E050 ENVIRONMENTAL ENGINEERS | R100S RMRS Salaried | Linear | 20.00 Hours

Line Item 0800 - waste acceptance sampling

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:**

Waste Acceptance Sampling

**Breakdown of Historical Data:**

**Item:** Site Labor to perform above individual tasks for T-3/T-4.

- **Units:** hours
- **Unit Cost:** see below
- **Unit Cost Adjustment Factor:** see below
- **Revised Unit:** see below

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.

- **Units:** 1 lot
- **Unit Cost:** see below
- **Unit Cost Adjustment Factor:** see below
- **Revised Unit:** see below

**Basis for adjustment.** The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Because the waste acceptance sampling is difficult to predict and could vary significantly from project to project, it was assumed that about $800 worth of
additional analysis would be required for 20 cubic yards which is the volume that can be placed in one roll-off. This yielded a unit rate of about $40/cubic yard. This sampling and analysis is in addition to the confirmational samples so the costs are not as great. It was assumed that this sampling would be more labor intensive so the sampling costs were estimated to be about 50% of the analytical costs or about $20/cubic yard.

Total Contaminated Soil to be removed 48 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 48 CY

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 40 - A5H Analytical 1,920 Dollars
Factor 20 - A5H Subcontracted Srvs 960 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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### Line Item 0900 - field oversight & project mgmt

**BOE**

Estimator's Experience based generally on a base case of 700 cy

**Item Desc:**

Field Oversight and Project Management

**Breakdown of Historical Data:**

- **Item:** Site Labor to perform above individual tasks for T-3/T-4.
  - Units: hours
  - Unit Cost: see below
  - Unit Cost Adjustment Factor: see below
  - Revised Unit: see below

- **Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
  - Units: 1 lot
  - Unit Cost: see below
  - Unit Cost Adjustment Factor: see below
  - Revised Unit: see below

**Basis for adjustment.** The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

It was assumed that a field manager would be needed for 150 nine-hour working days or about 33 weeks. This work breaks down as follows:

- **Preparation Activities** 50 working days
- **Field Activities** - 80 working days
- **Demobilization** - 20 working days
- **Total 150 nine-hour working days or 1350 hours**

In addition it was estimated that technical staff, quality assurance, and project management would be required for the equivalent of ten additional weeks, which is 400 hours each.

Based on the base case of a 700 cubic yard removal project, these values yielded unit rates as follows:

- **Hours Per Cubic Yard**
  - Of Contaminated Soil Field Manager 1.93
  - Technical Staff .57
  - Quality Assurance .57
Project: Rocky Flats Closure Project
Baseline Cost and Basis of Estimate

WBS No: 1GAC0401
Activity ID: 1GFK641250

Project Management 0.57
The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

- Factor 1.93 - Environmental Engineer 93 Hours
- Factor 0.57 - Technical Support 28 Hours
- Factor 0.57 - Project Manager 28 Hours
- Factor 0.57 - Quality Assurance 28 Hours

Adjustments to the number of hours is based on professional judgement.

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<th>Resources</th>
</tr>
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<tbody>
<tr>
<td>Cost Element</td>
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<td>STRAIGHT TIME BASE</td>
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Line Item 1000 - backfill
Trade Publication
Means 1995, Site Work & Landscape Cost Data (page 34, 42, and 34)

Item Desc:
Backfill.

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
- Units: hours
- Unit Cost: see below
- Unit Cost Adjustment Factor: see below
- Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
- Units: 1 lot
- Unit Cost: see below
- Unit Cost Adjustment Factor: see below
- Revised Unit: see below

Means (1995) Site Work & Landscape Cost Data as follows:
- Common Fill $ 4.77/cubic yard (page 34 Borrow Bank Measure)
- Hauling $ 3.98/cubic yard (page 42 2-mile round-trip, 6 cubic yard dump truck)
- Backfilling $ 1.69/cubic yard (page 34)
- Burden (43%) $ 4.49/cubic yard
- Total $14.23/cubic yard or about $15/cubic yard

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 15 - A5H Subcontracted Srvs 720 Dollars
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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<tr>
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<tr>
<td>SUBCONTRACTED SRVS</td>
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Line Item 1100 - demobilization
BOE
Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc:
Demobilization.
Breakdown of Historical Data:

Item: Site Labor to perform above individual tasks for T-3/T-4.
- Units: hours
- Unit Cost: see below
- Unit Cost Adjustment Factor: see below
- Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
- Units: 1 lot
- Unit Cost: see below
- Unit Cost Adjustment Factor: see below
- Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Demobilization: Based on the T-3/T-4 project, it was assumed that demobilization costs would cover demobilization for excavation activities also. The subcontractor cost for demobilization was about $95,000 for 3,800 cubic yards at the T-3/T-4 project. In addition it was estimated that the following hours were necessary:

- Environmental Engineer 300 hours
- Health Physicist 100 hours
- Industrial Hygiene 100 hours

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

Factor 300 - Environmental Engineer 75 Hours
Factor 100 - Health Physicists 25 Hours
Factor 200 - Manager 50 Hours
Factor 100 - Industrial Hygienists 25 Hours
Factor 95000 - ASH Subcontracted Svrs 23,750 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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<th>Cost Element</th>
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Page 244 of 1121

6/23/00 9:20:59 AM OFFICIAL USE ONLY
### Line Item 0100 - develop report

**Description:** Develop Report

**Resources:**
- **Skill:** Environmental Engineers
- **Department:** RMRS Salaried
- **Units:** Hours
- **Curve:** Linear
- **Quantity:** 320
- **Units:** Hours
- **Cost:** $9,045

**Required Level of Effort:**
- Environmental Engineer - 80 hours
- Environmental Scientist - 20 hours
- Computer Specialist - 160 hours (GIS, SWD)
- Manager - 20 hours
- Administrative - 20 hours
- Cost Estimators - 20 hours

**Breakdown of Cost Data:**
- **Item:** Develop Documentation
  - **Units:** hours
  - **Unit Cost:** 320
  - **Unit Cost Adjustment Factor:** none
  - **Revised Unit Hours:** 320

**Line Item SYS - Contingency And Escalation**

**Resources:**
- **Skill:** Environmental Scientists
- **Department:** RMRS Salaried
- **Units:** Hours
- **Curve:** Linear
- **Quantity:** 20
- **Units:** Hours
- **Cost:** $1,888.79

**Factors:**
- **Contingency:** 4,633.26
- **Escalation:** 1,888.79

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Total for Activity 1GFK641270:

- **Labor Hours:** 320
- **Labor Cost Total:** $9,045
- **Materials/ Sub Cost:** 0
- **Total Prime Cost:** $6,522
- **Total Cost:** $15,567
- **Burden Cost:** $3,148
- **Total Cost:** $18,714
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Breakdown of Cost Data:
Item: Preparation of QAP addenda
Units: hours
Unit Cost: 60
Unit Cost Adjustment Factor: none
Revised Unit Hours: 60

Basis for adjustment.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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Factors: 20 hrs

### Line Item SYS - Contingency And Escalation

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Factors: 1,143.27 Dollars

### Activity ID: 1GFK642120

**Description:** Procurement and Field Prep - IHSS Group 400-2

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**Total for Activity 1GFK642120:**

- Labor Hours Total: 10,637
- Labor Cost Total: 2,114
- Materials/Sub Cost: 4,556
- Contingency & Escalation: 17,307
- Burden Cost: 3,680
- Total Cost: 20,987

### Line Item 0100 - procurement & field prep

**BOE**

Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation

- Item Desc:

Breakdown of Cost Data:
Item: Site Labor to perform above individual tasks for either Ryan's Pit or T-3/T-4.
Units: hours
Unit Cost: 1380
Unit Cost Adjustment Factor: 0.25
Revised Unit: 345 hours

- Item: Subcontractor costs to perform above individual tasks for either Ryan's Pit or T-3/T-4.
Units: 1 lot
Unit Cost: $10K
Unit Cost Adjustment Factor: 0.25
Revised Unit: $2.5K

Basis for adjustment. Hours and costs for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be characterized at once.

Procurement includes preparation of statement of work, proposal review (technical evaluation), and negotiations. Based on a T-3/T-4 burdened cost of $29,186.52. Assuming it is primarily labor hours (RMRS Environmental Engineer charging at $57.45 per hour) yields 508 hours which rounds to 510 total hours.

Davis Bacon Documentation: It was assumed that it would take an environmental engineer twenty-four hours to prepare a Davis Bacon cost estimate and to
Subcontractor Health and Safety Plan: Costs for the health and safety plan are based on Ryan's Pit, which cost approximately $10,000. It was assumed that these are A5H dollars. In addition, it was assumed that a safety engineer, an industrial hygienist, and a radiological engineer would each provide one week (40 hours) of support for review and document preparation.

Radiological Work Permit: It was assumed that it would take a radiological control technician two working days (18 hours) to complete counting preparation and review.

Implementation Plan: It was estimated that this activity would take 13 weeks of time for engineers, scientists or equivalent to complete. This would include preparation of an implementation plan as required (Rocky Flats Cleanup Agreement, Appendix 3, Interim Guidance Document, Dated August 1977). In addition this includes all tasks related to documentation for the Integrated Work Control Program and Integrated Safety Management.

Ecology Survey/National Environmental Protection Act (NEPA) Support: It was estimated that this would take 40 hours for an ecologist. The activities include NEPA review and support in document preparation, site surveys to verify compliance with ecological regulations, categorical exclusions, and NEPA evaluations.

Utility Clearance/Soil Disturbance Permits: It was estimated based on experience that it would take the equivalent 2 weeks (80 hours) for technical staff to do utility surveys, prepare and review soil disturbance permits, and prepare authorizing documents for excavation.

The combined resources for procurement and field preparations are:

Total Procurement and Field Preparation Hours

Environmental Engineer 1134 hours
Safety Engineer 40 hours
Industrial Hygiene 40 hours
Radiological Engineering 58 hours
Radiological Control Technician 18 hours
Ecologist/Life Scientist 40 hours
Manager 50 hours
Quality Assurance* 29 hours
A5H Total $10,000

* On some projects these hours were assumed to be included in other tasks or part of this task under environmental engineer or one of the other job functions.

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

Factor 1134 - Environmental Engineer 283 Hours
Factor 40 - Safety Engineer 10 Hours
Factor 40 - Industrial Hygiene 10 Hours
Factor 58 - Radiological Engineering 14 Hours
Factor 18 - RCT 5 Hours
Factor 40 - Life Scientist 10 Hours
Factor 50 - Project Manager 13 Hours
Factor 10000 - A5H Subcontracted Services 2,500 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### Rocky Flats Closure Project

#### Baseline Cost and Basis of Estimate

<table>
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<th>Activity ID: 1GFK642140</th>
<th>Description: Readiness Assessment - IHSS Group 400-2</th>
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**Line Item 0100 - Readiness assessment**

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Total for Activity 1GFK642140:

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**Item Desc:**
Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation

Breakdown of Cost Data:
- **Item:** Site Labor to perform Readiness Assessment for T-3/T-4.
  - Units: hours
  - Unit Cost: 187
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit: 48

- **Item:** Subcontractor costs to perform Readiness Assessment for T-3/T-4.
  - Units: 1 lot
  - Unit Cost: $4800
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit: $1200

It was estimated that subcontractor involvement would require 80 hours at $60/hour = $4,800. It was assumed that about 3 weeks of time was required for an environmental engineer or similar person in addition to 12 hours of project management, which yielded 132 hours. An additional 11 hours was added for management oversight. It was estimated that a radiological engineer (QA) and an industrial hygienist would be needed for 2.5 days each (22 hours).

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 projects will be conducted at once and only one of each fixed cost is needed for the group.

**Factors:**
- Factor 132 - Environmental Engineer 33 Hours
- Factor 22 - Health Physicists 6 Hours
- Factor 11 - Manager 3 Hours
- Factor 22 - Quality Assurance 6 Hours
- Factor 4,800 - ASH Subcontracted Svrs 1,200 Dollars

20 hours of administrative time will also be required.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
## Rocky Flats Closure Project
### Baseline Cost and Basis of Estimate

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#### Activity Filter: *

- **Starts In FY**: *

### Task Filters:

#### Task Filter: *

- **Starts In FY**: *

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Total for Activity 1GFK642150:

- **Quantity**: 1,600
- **Units**: 47,672
- **Total**: 510,581
- **Total Prime Cost**: 681,890
- **Burden Cost**: 697,077

### Breakdown of Cost Data:

- **Item Desc:** Collection of geoprobe samples with the site geoprobe with two technicians. A site Environmental Engineer will direct the boring placement, log the borings; collect, containerize, package, and ship the samples; prepare field QC documentation, and prepare field notes on a full time basis. A site RCT will monitor the site for radiological contamination on a full time basis. A site Industrial Hygienist will implement the field portion of the HASP on a full time basis. Decon Operations staff will decon the vehicle and equipment when it leaves the work area on a half time basis. It is estimated that one 10' boring will be place per 500 SF of building footprint (same as Bldg. 123 characterization) with 5 samples per 10' boring. It is estimated that one boring per eight hours can be completed.

- **Item**: Site Personnel for support of geoprobe samples
  - **Units**: hours
  - **Unit Cost**: 32
  - **Unit Cost Adjustment Factor**: none
  - **Revised Unit Hours**: 32

- **Item**: Kaiser-Hill/RMRS Geoprobe unit with 2 Technician crew. Item costs $100 per hour or $800 per 8-hour day.
  - **Units**: dollars
  - **Unit Cost**: 800
  - **Unit Cost Adjustment Factor**: none
  - **Revised Unit Hours**: 800

- **Basis for adjustment.**

A 50% reduction in the number of geoprobe is based on process history and building knowledge which indicates that characterization to the extent required for Building 123 is not required at this location.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources:

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### Summary:

- **Total Cost for Activity 1GFK642150**: 697,077 dollars

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**Note:**

- **Factors:** 6/23/00 9:21:00 AM
- **Page 250 of 1121**
- **6/23/00 9:21:00 AM OFFICIAL USE ONLY**
Line Item 0200 - analyze samples

**BOE**

Vendor Quote

Email quote: average cost from Kaiser-Hill ASD (V. Ideker).

Item Desc:
Analyze samples produced from geoprobe borings. It is anticipated that 3 samples from each boring will be collected. They will be analyzed for Metals, VOCs, SVOCs, PCBs, and radionuclides (est. 3 isotopes) with a 30 day TAT. This item is priced on a per sample basis. Per sample costs include DOT rad screen, bottle charge, shipping, and validation.

Breakdown of Cost Data:
- Item: Analyze samples at an offsite laboratory.
  - Unit Cost: Metals $345, VOCs $280, SVOCs $440, PCBs and other analytes $150, and Radionuclides 3 isotopes) $590 per each sample.
  - Unit Cost Adjustment Factor: Must add: DOT rad screen $32/sample, bottle charge $7/sample, shipping $4.2/bottle, and validation per each: $17.30 VOA, $19.25 SVOC, $16.75 Metals, $5.95 PCB, and $15.60 Rad.

Revised Unit Hours: Metals $405, VOCs $341, SVOCs $502, PCBs and other analytes $199, and Rad $649.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Resources**

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Line Item 0300 - project mgmt oversight

**BOE**

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

Item Desc:
Project Management/Oversight. Based on half time for a Project Manager, Administrative staff, and Cost Estimator/Scheduler.

Breakdown of Cost Data:
- Item: Mgmt oversight
  - Units: hours
  - Unit Cost: 12
  - Unit Cost Adjustment Factor: none
  - Revised Unit Hours: 12

Basis for adjustment.

A 50% reduction in characterization is based on process history and building knowledge which indicates that characterization to the extent required for Building 123 is not required at this location.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Resources**

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## Rocky Flats Closure Project
### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0402  
**Project:** Rocky Flats Closure Project  
**Baseline Deviation:** Baseline Cost and Basis of Estimate  
**WBS Filter:** 1GAC  
**Activity Filter:**   

### Line Item 01000 - develop documentation

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### Line Item 01000 - develop documentation

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**Estimator's Experience:**

Estimate for summary report based on estimator's 16 years of experience performing and costing projects of similar size and scope.

**Item Desc:**

Perform Data Analysis including GIS representation of data, NFA Summary, Characterization Report and associated project management. Disposition comments and finalize document.

- Computer Specialist 80 hrs: Identify & pull existing data from database.
- Technical Editor 40 hrs: Complete initial and revised tech edits of Report.
- Quality Assurance 60 hrs: Review
- Environmental Engineer 40 hrs: Peer review
- Regulatory Compliance 20 hrs: Review
- Management 48 hrs: Review
- Legal 8 hrs: Review
- Administrative Support 40 hrs: Copy & assemble final documents, submit to records.

**Breakdown of Cost Data:**

- Item: Develop Documentation
- Units: Hours
- Unit Cost: 656
- Revised Unit Hours: 656
- Basis for adjustment: N/A

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### Line Item SYS - Contingency And Escalation

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**Activity ID:** 1GFK642170  
**Description:** Prepare Summary/NFA - IHSS Group 400-2

**Factors:** 0.84576  
**SyS 061400:** .84576000 - System Factors

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### Resources

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## Line Item 0100 - PAM

**BOE**

**Description:** Preparation of PAM or IM/IRA in support of source removal of previously characterized UBC.

**Item Desc:** Preparation of PAM or IM/IRA in support of source removal of previously characterized UBC.

**Proposed Action Memorandum:** A bottoms-up estimate based on historical costs was used as the basis for the estimate. Based on Ryan's Pit (IHSS 108), the cost for the PAM was $50,000 (contractor costs). Assuming that labor rates at this time were approximately $75 (based on a cost center 217). The total labor for a PAM would be approximately 666 hours, which rounds to 700 hours. It was assumed that 10% would be required for managerial hours.

- **For a PAM the total labor hours are:**
  - **Environmental Engineer:** 700 Hours
  - **Manager:** 70 Hours

  - **Factor 700 Environmental Engineer 175 hours**
  - **Factor 70 Manager 18 hours**

**Breakdown of Cost Data:**

**Item:** Preparation of PAM for Ryan's Pit source removal action.

- **Units:** 700
- **Unit Cost:** $770
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit Hours:** 193

**Basis for adjustment:** Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

**Interim Measure/Interim Remedial Action Decision Document:** It was assumed that an IM/IRA Decision Document would take 75% more effort than a PAM or 1,166 hours, which rounds to 1200 hours. It was assumed that 10% of this labor would be required for managerial hours.

**For an IM/IRA the total labor hours are**

- **Environmental Engineer:** 1200 Hours
- **Manager:** 120 Hours

  - **Factor 1200 Environmental Engineer 300 hours**
  - **Factor 120 Manager 30 hours**

### Resources

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**Total for Activity 1GFK642180:**

- **Labor Cost Total:** 9,164
- **Material/ Sub Cost:** 0
- **Contingency & Escalation:** 1,677
- **Total Prime Cost:** 10,841
- **Burden Cost:** 2,584
- **Total Cost:** 13,426

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**Line Item 0200 - SAP**

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**Total for Activity 1GFK642180:**

- **Labor Cost Total:** 9,164
- **Material/ Sub Cost:** 0
- **Contingency & Escalation:** 1,677
- **Total Prime Cost:** 10,841
- **Burden Cost:** 2,584
- **Total Cost:** 13,426

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**Line Item 0300 - WMP**

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**Total for Activity 1GFK642180:**

- **Labor Cost Total:** 9,164
- **Material/ Sub Cost:** 0
- **Contingency & Escalation:** 1,677
- **Total Prime Cost:** 10,841
- **Burden Cost:** 2,584
- **Total Cost:** 13,426
### Rocky Flats Closure Project

#### Baseline Cost and Basis of Estimate

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#### Activity Filter

**Project Baseline Dev.**

**WBS Filter 1GAC**

**Activity Filter**

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#### Line Item 0200 - SAP

**BOE**

Estimator's Experience based generally on historical data for Ryan's Pit

**Item Desc:**
Preparation of SAP in support of source removal of previously characterized UBC.

**Breakdown of Historical Data:**

- **Item:** Preparation of SAP for Ryan's Pit source removal action.
- **Units:** hours
- **Unit Cost:** 300
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit Hours:** 76

**Basis for adjustment:** Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

**Sampling and Analysis Plan:** Based on the T-3/T-4 Sampling and Analysis Plan (SAP) it took 300 hours in total preparation time. It was assumed that 10% of this labor was for managerial hours (30 hours) and that the rest of the time, 270 hours, was for technical staff. It was assumed that these hours include all labor including quality assurance, secretarial support, graphics etc.

**Original Hours**

- 270 Environmental Engineer 68 hours
- 30 Manager 8 hours

**Resources**

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#### Line Item 0300 - WMP

**BOE**

Estimator's Experience based generally on historical data for Ryan's Pit

**Item Desc:**
Preparation of WMP in support of source removal of previously characterized UBC.

**Breakdown of Historical Data:**

- **Item:** Preparation of WMP for Ryan's Pit source removal action.
- **Units:** hours
- **Unit Cost:** 80
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit Hours:** 20

**Basis for adjustment:** Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

**Waste Management Plan:** It was assumed that a waste management plan would be needed and that it would take no more than two weeks to prepare (80 hours).

**Original Hours**

- 80 Environmental Engineer 20 hours

**Resources**

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#### Line Item SYS - Contingency And Escalation

**BOE**

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OFFICIAL USE ONLY
**Rocky Flats Closure Project**

**Baseline Cost and Basis of Estimate**

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<th>Description: Procurement and Field Prep - IHSS Group 400-2</th>
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**Line Item 0100 - procurement & field prep**

**BOE Estimator's Experience based generally on historical data for Ryan’s Pit and T-3/T4 Remediation**

**Item Desc:**


**Breakdown of Cost Data:**

**Item: Site Labor to perform above individual tasks for either Ryan's Pit or T-3/T-4.**

- **Units:** hours
- **Unit Cost:** 1380
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** 345 hours

**Item: Subcontractor costs to perform above individual tasks for either Ryan’s Pit or T-3/T-4.**

- **Units:** 1 lot
- **Unit Cost:** $10K
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** $2.5K

Basis for adjustment. Hours and costs for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be characterized at once.

**Procurement includes preparation of statement of work, proposal review (technical evaluation), and negotiations. Based on a T-3/T-4 burdened cost of $29,186.52. Assuming it is primarily labor hours (RMRS Environmental Engineer charging at $57.45 per hour) yields 508 hours which rounds to 510 total hours.**

**Davis Bacon Documentation:** It was assumed that it would take an environmental engineer twenty-four hours to prepare a Davis Bacon cost estimate and to support the Davis-Bacon determination.

**Subcontractor Health and Safety Plan:** Costs for the health and safety plan are based on Ryan's Pit, which cost approximately $10,000. It was assumed that these are A5H dollars. In addition, it was assumed that a safety engineer, an industrial hygienist, and a radiological engineer would each provide one week (40 hours) of support for review and document preparation.

**Radiological Work Permit:** It was assumed that it would take a radiological control technician two working days (18 hours) to complete counting preparation and review.

**Implementation Plan:** It was estimated that this activity would take 13 weeks of time for engineers, scientists or equivalent to complete. This would include preparation of an implementation plan as required (Rocky Flats Cleanup Agreement, Appendix J, Interim Guidance Document, Dated August 1977). In addition this includes all tasks related to documentation for the Integrated Work Control Program and Integrated Safety Management.

**Ecology Survey/National Environmental Protection Act (NEPA) Support:** It was estimated that this would take 40 hours for an ecologist. The activities include NEPA review and support in document preparation, site surveys to verify compliance with ecological regulations, categorical exclusions, and NEPA evaluations.

**Utility Clearance/Soil Disturbance Permits:** It was estimated based on experience that it would take the equivalent 2 weeks (80 hours) for technical staff to do utility surveys, prepare and review soil disturbance permits, and prepare authorizing documents for excavation.

The combined resources for procurement and field preparations are Total Procurement and Field Preparation Hours

- Environmental Engineer 1134 hours
- Safety Engineer 40 hours
- Industrial Hygiene 40 hours
- Radiological Engineering 58 hours

**Total for Activity 1GFK642210:**

- **Labor Hours:** 345
- **Labor Cost:** 10,637
- **Burden Cost:** 2,249
- **Total Cost:** 15,000
- **BOE Factors:** 1128.02 Dollars
Radiological Control Technician 18 hours  
Ecologist/Life Scientist 40 hours  
Manager 50 hours  
Quality Assurance* 29 hours  
A5K Total $10,000  

* On some projects these hours were assumed to be included in other tasks or part of this task under environmental engineer or one of the other job functions.

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

- Factor 1134 - Environmental Engineer 283 Hours  
- Factor 40 - Safety Engineer 10 Hours  
- Factor 40 - Industrial Hygiene 10 Hours  
- Factor 58 - Radiological Engineering 14 Hours  
- Factor 40 - Life Scientist 10 Hours  
- Factor 50 - Project Manager 13 Hours  
- Factor 10000 - A5H Subcontracted Services 2,500 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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Line Item SYS - Contingency And Escalation

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Activity ID: 1GFK642240  
Description: Readiness Assessment - IHSS Group 400-2

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Total for Activity 1GFK642240:  
116 | 3,306 | 4,821 | 1,294 | 9,421 | 932 | 10,353 |
Line Item 0100 - readiness assessment

Estimator's Experience based generally on historical data for Ryan’s Pit and T-3/T-4 Remediation

Item Desc:
Evaluate readiness of the field characterization team and plans.

Breakdown of Cost Data:
Item: Site Labor to perform Readiness Assessment for T-3/T-4.
  Units: hours
  Unit Cost: 187
  Unit Cost Adjustment Factor: 0.25
  Revised Unit: 48

  Units: 1 lot
  Unit Cost: $4800
  Unit Cost Adjustment Factor: 0.25
  Revised Unit: $1200

It was estimated that subcontractor involvement would require 80 hours at $60/hour = $4,800. It was assumed that about 3 weeks of time was required for an environmental engineer or similar person in addition to 12 hours of project management, which yielded 132 hours. An additional 11 hours was added for management oversight. It was estimated that a radiological engineer (QA) and an industrial hygienist would be needed for 2.5 days each (22 hours).

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 projects will be conducted at once and only one of each fixed cost is needed for the group.

Factor 132 - Environmental Engineer 33 Hours
Factor 22 - Health Physicists 6 Hours
Factor 11 - Manager 3 Hours
Factor 4,800 - ASH Subcontracted Srvs 1,200 Dollars

20 hours of administrative time will also be required.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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Line Item 0200 - training

Estimator's Experience based generally on historical data for T-3/T-4 Remediation.

Item Desc:
Conduct perform Training in support of source removal action.

Breakdown of Cost Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
  Units: hours
  Unit Cost: 132 Hours
**Subcontractor costs to perform above individual tasks for T-3/T-4.**

- **Units:** 1 lot
- **Unit Cost:** $12K
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** $3K

Basis for adjustment. Costs for each UBC are divided by 4 to account for the fact that 4 UBCs will be remediated at once and only one training is needed for the group.

It was estimated training would cost $1,000 per subcontractor worker and that 12 subcontractor employees would require training. It was estimated that onsite contractor employees would require the equivalent of 15 hours of training including instructor time and that eight onsite employees would be trained.

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

**Factor 132 - Onsite employees 33 Hours**
**Factor 12000 - Subcontractor employees 3,000 dollars**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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<th>Cost Element</th>
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**Line Item 0300 - pre-evolution meeting**

**BOE**

- **Estimator's Experience based generally on historical data for T-3/T4 Remediation.**

**Item Desc:**
Conduct Pre-Evolution Meeting in support of source removal action

**Breakdown of Cost Data:**

- **Item:** Site Labor to perform above individual tasks for T-3/T-4.
  - **Units:** hours
  - **Unit Cost:** 60 hours
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** 15 hours

- **Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
  - **Units:** 1 lot
  - **Unit Cost:** $6K
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** $1.5K

Basis for adjustment. Costs for each UBC are divided by 4 to account for the fact that 4 UBCs will be remediated at once and only one Pre-Evolution Meeting is needed for the group.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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<th>Department</th>
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**Line Item SYS - Contingency And Escalation**

**BOE**

- **0.84576 [SYS 061400] .84576000 - System**

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Line Item 0100 - mobilization

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc:
Mobilization in support of remediation.

Breakdown of Cost Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
Units: hours
Unit Cost: 1,100
Unit Cost Adjustment Factor: 0.25
Revised Unit: 275

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
Units: 1 lot
Unit Cost: 184k
Unit Cost Adjustment Factor: 0.25
Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

T3/T4 hours 110 Health Physicists 27 Hours
T3/T4 hours 330 Manager 83 Hours
T3/T4 hours 550 Environmental Engineer 138 Hours
T3/T4 hours 110 Industrial Hygienist 27 Hours
T3/T4 subcontractor dollars 184,000 Subcontractor 46,000

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
WBS No: 1GAC0402
Activity ID: 1GFK64250

Rocky Flats Closure Project
Baseline Cost and Basis of Estimate

WBS Filter: 1GAC
Activity Filter: *

Line Item 0200 - site prep
BOE

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc:
Site Preparation including setting up fencing, trailer, etc.

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
  Units: hours
  Unit Cost: see below
  Unit Cost Adjustment Factor: see below
  Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
  Units: 1 lot
  Unit Cost: see below
  Unit Cost Adjustment Factor: see below
  Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

T3/T4 hours 120 Environmental Engineer 30 hours
T3/T4 dollars 30,000 Subcontracted Srvs 7,500 Dollars

D&D construction trade hours were calculated using the following methodology:
A5H subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.

RCT hours were calculated using the following methodology, unless they were already estimated.
For Site Preparation tasks – RCT hours were the same as D&D construction hours.
For all other tasks A5H subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under KG10H department code.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

Resources

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Line Item 0300 - excavation
BOE

Estimator's Experience based generally on historical data for T-3/T4 Remediation.
Breakdown of Historical Data:

Item: Site Labor to perform above individual tasks for T-3/T-4.
  Units: hours
  Unit Cost: see below
  Unit Cost Adjustment Factor: see below
  Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
  Units: 1 lot
  Unit Cost: see below
  Unit Cost Adjustment Factor: see below
  Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.5 factor to account for the fact that 2 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Total Contaminated Soil to be removed 372 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 372 CY

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

factor 1.09 E050 Environmental Engineer 405 Hours
factor 0.47 P080 Health Physicists 175 Hours
factor 0.31ER Projects 115 Hours
factor 0.31 P090 Industrial Hygienists 115 Hours
factor 1.00 Radiological Control Technician 372 Hours
factor 45.23 A5H Subcontracted Srvs 16,826 Dollars

D&D construction trade hours were calculated using the following methodology:
A5H subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.
RCT hours were calculated using the following methodology, unless they were already estimated.
For Site Preparation tasks - RCT hours were the same as D&D construction hours.
For all other tasks A5H subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under KG10H department code.
The dollars amounts calculated for D&D construction workers and RCTs were subtracted from the subcontractor dollars and the revised A5H dollar amount was entered into Best.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
WBS No: 1GAC0402
Activity ID: 1GF642250

Rocky Flats Closure Project
Baseline Cost and Basis of Estimate

WBS Filter: 1GAC
Activity Filter: *

Starts In FY: *

Line Item 0400 - remove and clean debris

BOE

Estimator’s Experience based generally on a base case of 700 cy.

Item Desc:
Remove and clean debris.

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
Units: hours
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
Units: 1 lot
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.5 factor to account for the fact that 2 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Total Contaminated Soil to be removed 372 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 1076 CY

For the base case, it was assumed that about five cubic yards out of 700 cubic yards would be debris and would be segregated and cleaned. It was estimated that each cubic yard of debris would cost $1,000 or $5,000 total for 700 cubic yards. This yields a rate of $7.14 per cubic yard.

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 7.14 A5H Subcontracted Srvs 2,656 Dollars

D&D construction trade hours were calculated using the following methodology:
A5H subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.

RCT hours were calculated using the following methodology, unless they were already estimated.
For Site Preparation tasks - RCT hours were the same as D&D construction hours.
For all other tasks A5H subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under KG10H department code.

The dollars amounts calculated for D&D construction workers and RCTs were subtracted from the subcontractor dollars and the revised A5H dollar amount was entered into Best.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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Factors 9 hrs
Factors 2152 sub/c support - units per yard

0.84576 (SYS 061400).84576000 - System
Line Item 0600 - confirmation sampling

BOE

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc: confirmation sampling.

Breakdown of Historical Data:

Item: Site Labor to perform above individual tasks for T-3/T-4.

Units: hours
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.

Units: 1 lot
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.5 factor to account for the fact that 2 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Total Contaminated Soil to be removed 372 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 372 CY

The analytical costs were based on T-3/T-4, which cost $435,574 for 3800 cubic yards of contaminated soil removed. This yielded a unit rate of about $115/cubic yard. Based on estimator experience the cost of sampling including labor and materials was estimated to be 20% of that rate or about $23/ cubic yard.

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 114.62 - A5H Subcontracted Srvs (Analytical) 42,639 Dollars
Factor 22.924 - A5H Subcontracted Srvs 8,527 Dollars

D&D construction trade hours were calculated using the following methodology:

A5H subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.

RCT hours were calculated using the following methodology, unless they were already estimated.

For Site Preparation tasks - RCT hours were the same as D&D construction hours.
For all other tasks A5H subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under KG10H department code.

The dollars amounts calculated for D&D construction workers and RCTs were subtracted from the subcontractor dollars and the revised A5H dollar amount was entered into Best.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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Line Item 0700 - prepare waste acceptance forms

BOE

Estimator's Experience based generally on historical data for T-3/T4 Remediation.
Breakdown of Historical Data:

Item: Site Labor to perform above individual tasks for T-3/T-4.
Units: hours
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
Units: 1 lot
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.5 factor to account for the fact that 2 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

B3/T4 hours 80 environmental engineer 20 hours

Factors 20 hrs

Line Item 0800 - waste acceptance sampling

BOE

Estimator's Experience based generally on historical data for T-3/T4 Remediation.
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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### Line Item 0900 - field oversight & project mgmt

Estimator's Experience based generally on a base case of 700 cy.

**Item Desc:**
Field Oversight and Project Management

**Breakdown of Historical Data:**
- **Item:** Site Labor to perform above individual tasks for T-3/T-4.
  - **Units:** hours
  - **Unit Cost Adjustment Factor:** see below
  - **Revised Unit:** see below
- **Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
  - **Units:** 1 lot
  - **Unit Cost:** see below
  - **Unit Cost Adjustment Factor:** see below
  - **Revised Unit:** see below

**Basis for adjustment.** The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.5 factor to account for the fact that 2 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

It was assumed that a field manager would be needed for 150 nine-hour working days or about 33 weeks. This work breaks down as follows:

- **Preparation Activities** 50 working days
- **Field Activities** - 80 working days
- **Demobilization** - 20 working days
- Total 150 nine-hour working days or 1350 hours

In addition it was estimated that technical staff, quality assurance, and project management would be required for the equivalent of ten additional weeks, which is 400 hours each.

Based on the base case of a 700 cubic yard removal project, these values yielded unit rates as follows:

- **Hours Per Cubic Yard**
- **Of Contaminated Soil Field Manager 1.93**
- **Technical Staff .57**
- **Quality Assurance .57**
- **Project Management 0.57**

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

- **Total Contaminated Soil to be removed 372 CY**
- **Total Soil for thermal Desorption 0 CY**
- **Offsite Waste Volume 372 CY**

Factor 1.93 - Environmental Engineer 29,336 Hours
Resources

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Line Item 1000 - backfill

BOE

Trade Publication

Means 1995, Site Work & Landscape Cost Data (page 34, 42, and 34)

Item Desc:

Backfill.

Breakdown of Historical Data:

Item: Site Labor to perform above individual tasks for T-3/T-4.

- Units: hours
- Unit Cost: see below
- Unit Cost Adjustment Factor: see below
- Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.

- Units: 1 lot
- Unit Cost: see below
- Unit Cost Adjustment Factor: see below
- Revised Unit: see below

Means (1995) Site Work & Landscape Cost Data as follows:

- Common Fill $ 4.77/cubic yard (page 34 Borrow Bank Measure)
- Hauling $ 3.98/cubic yard (page 42 2-mile round-trip, 6 cubic yard dump truck)
- Backfilling $ 1.69/cubic yard (page 34)
- Burden (43%) $ 4.49/cubic yard
- Total $14.23/cubic yard or about $15/cubic yard

Total Contaminated Soil to be removed 372 CY

Offsite Waste Volume 372 CY

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 15 - ASH Subcontracted Srvs 5,580 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

Resources

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Line Item 1100 - demobilization

BOE

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc:

Demobilization.
Breakdown of Historical Data:

Item: Site Labor to perform above individual tasks for T-3/T-4.
Units: hours
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
Units: 1 lot
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Demobilization: Based on the T-3/T-4 project, it was assumed that demobilization costs would cover demobilization for excavation activities also. The subcontractor cost for demobilization was about $95,000 for 3,800 cubic yards at the T-3/T-4 project. In addition it was estimated that the following hours were necessary:

Environmental Engineer 300 hours
Health Physicist 100 hours
Industrial Hygiene 100 hours

Factor 300 - Environmental Engineer 75 Hours
Factor 100 – Health Physicists 25 Hours
Factor 200 – Manager 50 Hours
Factor 100 – P090 Industrial Hygienists 25 Hours
Factor 9500 = ASH Subcontracted Srvs 23,750 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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Line Item SYS - Contingency And Escalation

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Activity ID: 1GFK642270 Description: Prepare Closeout Report - IHSS Group 400-2
### Rocky Flats Closure Project
#### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0402  
**Activity ID:** 1GFK642270

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**Total for Activity 1GFK642270:** 320 9,046 0 6,716 15,761 3,148 18,909

---

**Resources**

**Cost Element**  
**Skill**  
**Department**  
**Curve**  
**Quantity**  
**Units**

| 750 | STRAIGHT TIME BASE | E950 ENVIRONMENTAL ENGINEERS | R100S RMRS Salaried | Linear | 80.00 |
| 750 | STRAIGHT TIME BASE | G010 ADMINISTRATIVE ASSISTANTS | R100S RMRS Salaried | Linear | 20.00 |
| 750 | STRAIGHT TIME BASE | M020 MANAGERS (GRADE 69 - 72) | R100S RMRS Salaried | Linear | 20.00 |
| 750 | STRAIGHT TIME BASE | P060 COMPUTER SYSTEMS ANALYSTS | R100S RMRS Salaried | Linear | 160.00 |
| 750 | STRAIGHT TIME BASE | P070 COST ESTIMATORS PLANNERS AN | R100S RMRS Salaried | Linear | 20.00 |
| 750 | STRAIGHT TIME BASE | S020 ENVIRONMENTAL SCIENTISTS | R100S RMRS Salaried | Linear | 20.00 |

---

**Line Item 0100 - develop report**

**BOE**

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Item Desc:**

Perform Data Analysis including GIS representation of data, Closeout Report, and associated project management.

**Breakdown of Cost Data:**

- Unit Cost: 320
- Unit Cost Adjustment Factor: none
- Required level of effort: Environmental Engineer - 80 hours, Environmental Scientist - 20 hours, Computer Specialist - 160 hours (GIS, SWD), Manager - 20 hours, Administrative - 20 hours

**Cost Estimators - 20 hours**

---

**Line Item SYS - Contingency And Escalation**

**BOE**

**Resources**

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
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**WBS No:** 1GAC0403  
**Title:** Group 400-3 (B444/447)

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<th>Description: SAP Preparation - IHSS Group 400-3 (B444/447)</th>
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<th>Materials/ Sub Cost</th>
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**Total for Activity 1GFN643100:** 280 10,021 1,421 4,133 15,757 3,467 19,042
### Line Item 0100 - SAP Addenda

**BOE**

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Item Desc:**
Preparation of SAP Addenda to Industrial Area Characterization Plan.

**Breakdown of Cost Data:**
- **Item:** Preparation of SAP addenda
  - **Units:** hours
  - **Unit Cost:** 120
  - **Unit Cost Adjustment Factor:** none
  - **Revised Unit Hours:** 120

**Basis for adjustment.**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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<thead>
<tr>
<th>Cost Element</th>
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<th>Department</th>
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**Resources**

- **Factors:** 80 hrs
- **Factors:** 20 hrs
- **Factors:** 20 hrs
- **Factors:** 40 hrs
- **Factors:** 40 hrs

### Line Item 0200 - HASP Addenda

**BOE**

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Item Desc:**
Preparation of HASP addenda to Industrial Area Characterization Plan

**Breakdown of Cost Data:**
- **Item:** Preparation of addenda for HASP.
  - **Units:** hours
  - **Unit Cost:** 140
  - **Unit Cost Adjustment Factor:** none
  - **Revised Unit Hours:** 140

**Basis for adjustment.**

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<th>Curve</th>
<th>Quantity</th>
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**Resources**

- **Factors:** 20 hrs
- **Factors:** 40 hrs
- **Factors:** 40 hrs
- **Factors:** 40 hrs

### Line Item 0300 - QAP Addenda

**BOE**

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Item Desc:**
Preparation of SAP Addenda to Industrial Area Characterization Plan.

**Breakdown of Cost Data:**
- **Item:** Preparation of QAP addenda
  - **Units:** hours
  - **Unit Cost:** 60
  - **Unit Cost Adjustment Factor:** none

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Revised Unit Hours: 60

Basis for adjustment.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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</table>

Factors 40 hrs

ASH SUBCONTRACTED SRVS  P070 COST ESTIMATORS PLANNERS AN  K128S ER Programs

Factors 20 hrs

42 estimated $/hr

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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Factors 2990.09 Dollars

ESC ESCALATION 0000 NONE ZDEPT No Department

Factors 1143.27 Dollars

Activity ID: 1GFN643100  Description: Procurement and Field Prep - IHSS Group 400-3

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<th>Units</th>
<th>BOE Type</th>
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<td>4,556</td>
<td>4,556</td>
<td>17,307</td>
<td>3,680</td>
<td>20,987</td>
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</table>

Total for Activity 1GFN643100: 345 10,637 2,114 4,556 17,307 3,680 20,987

Item Desc:


Breakdown of Cost Data:

Item: Site Labor to perform above individual tasks for either Ryan's Pit or T-3/T-4.

Units: hours

Unit Cost: 1380

Unit Cost Adjustment Factor: 0.25

Revised Unit: 345 hours

Item: Subcontractor costs to perform above individual tasks for either Ryan's Pit or T-3/T-4.

Units: 1 lot

Unit Cost: $10K

Unit Cost Adjustment Factor: 0.25

Revised Unit: $2.5K

Basis for adjustment. Hours and costs for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be characterized at once.

Procurement includes preparation of statement of work, proposal review (technical evaluation), and negotiations. Based on a T-3/T-4 burdened cost of $29,186.52. Assuming it is primarily labor hours (RMRS Environmental Engineer charging at $57.45 per hour) yields 508 hours which rounds to 510 total hours.

Davis Bacon Documentation: It was assumed that it would take an environmental engineer twenty-four hours to prepare a Davis-Bacon cost estimate and to support the Davis-Bacon determination.

Subcontractor Health and Safety Plan: Costs for the health and safety plan are based on Ryan's Pit, which cost approximately $10,000. It was assumed that these are ASH dollars. In addition, it was assumed that a safety engineer, an industrial hygienist, and a radiological engineer would each provide one week (40 hours) of support for review and document preparation.
Radiological Work Permit: It was assumed that it would take a radiological control technician two working days (18 hours) to complete counting preparation and review.

Implementation Plan: It was estimated that this activity would take 13 weeks of time for engineers, scientists or equivalent to complete. This would include preparation of an implementation plan as required (Rocky Flats Cleanup Agreement, Appendix 3, Interim Guidance Document, Dated August 1977). In addition this includes all tasks related to documentation for the Integrated Work Control Program and Integrated Safety Management.

Ecology Survey/National Environmental Protection Act (NEPA) Support: It was estimated that this would take 40 hours for an ecologist. The activities include NEPA review and support in document preparation, site surveys to verify compliance with ecological regulations, categorical exclusions, and NEPA evaluations.

Utility Clearance/Soil Disturbance Permits: It was estimated based on experience that it would take the equivalent 2 weeks (80 hours) for technical staff to do utility surveys, prepare and review soil disturbance permits, and prepare authorizing documents for excavation.

The combined resources for procurement and field preparations are:

<table>
<thead>
<tr>
<th>Total Procurement and Field Preparation Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Engineer 1134 hours</td>
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<tr>
<td>Safety Engineer 40 hours</td>
</tr>
<tr>
<td>Industrial Hygiene 40 hours</td>
</tr>
<tr>
<td>Radiological Engineering 58 hours</td>
</tr>
<tr>
<td>Radiological Control Technician 18 hours</td>
</tr>
<tr>
<td>Ecologist/Life Scientist 40 hours</td>
</tr>
<tr>
<td>Manager 50 hours</td>
</tr>
<tr>
<td>Quality Assurance* 29 hours</td>
</tr>
<tr>
<td>ASH Total $10,000</td>
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</table>

* On some projects these hours were assumed to be included in other tasks or part of this task under environmental engineer or one of the other job functions.

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

| Factor 1134 - Environmental Engineer 283 Hours |
| Factor 40 - Safety Engineer 10 Hours           |
| Factor 40 - Industrial Hygiene 10 Hours        |
| Factor 58 - Radiological Engineering 14 Hours  |
| Factor 18 - RCT 5 Hours                        |
| Factor 40 - Life Scientist 10 Hours            |
| Factor 50 - Project Manager 13 Hours           |
| Factor 10000 - ASH Subcontracted Services 2,500 Dollars |

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
**Line Item SYS - Contingency And Escalation**

<table>
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<th>Cost Element</th>
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<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
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</thead>
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**Activity ID:** 1GFN643140  
**Description:** Readiness Assessment - IHSS Group 400-3

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<th>BOE Type</th>
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**Line Item 0100 - readiness assessment**

Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation

Item Desc:
Evaluate readiness of the field characterization team and plans.

Breakdown of Cost Data:
Item: Site Labor to perform Readiness Assessment for T-3/T-4.
Units: hours
Unit Cost: 187
Unit Cost Adjustment Factor: 0.25
Revised Unit: 48

Units: 1 lot
Unit Cost: $4800
Unit Cost Adjustment Factor: 0.25
Revised Unit: $1200

It was estimated that subcontractor involvement would require 80 hours at $60/hour = $4,800. It was assumed that about 3 weeks of time was required for an environmental engineer or similar person in addition to 12 hours of project management, which yielded 132 hours. An additional 11 hours was added for management oversight. It was estimated that a radiological engineer (QA) and an industrial hygienist would be needed for 2.5 days each (22 hours).

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 projects will be conducted at once and only one of each fixed cost is needed for the group.

Factor 132 - Environmental Engineer 33 Hours
Factor 22 - Quality Assurance 6 Hours
Factor 4,800 - A5H Subcontracted Svrs 1,200 Dollars

20 hours of administrative time will also be required.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Resources**

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<td>RMRS Salaried</td>
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<td>QUALITY CONTROL ENGINEERS</td>
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<td>RMRS Salaried</td>
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<td>ADMINISTRATIVE ASSISTANTS</td>
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<td>RMRS Salaried</td>
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<td>MANAGERS (GRADE 69 - 72)</td>
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### Rocky Flats Closure Project
#### Baseline Cost and Basis of Estimate

**WBS Filter:** 1GAC  
**Activity Filter:** Baseline Devi

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#### Activity 1GFN643150 - Field Sampling, Lab Analysis - IHSS Group 400-3

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<th>Contingency &amp; Escalation</th>
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#### Total for Activity 1GFN643150:

- Labor Hours: 2,600
- Labor Cost: 81,344
- Materials/ Sub Cost: 991,910
- Total Prime Cost: 1,378,613
- Burden Cost: 28,145
- Total Cost: 1,406,758

---

**Cost Element**  
**Skill**  
**Department**  
**Curve**  
**Quantity**  
**Units**

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#### Resources

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**Breakdown of Cost Data:**

- **Item:** Site Personnel for support of geoprobe samples  
  - Units: hours  
  - Unit Cost: 32  
  - Unit Cost Adjustment Factor: none  
  - Revised Unit Hours: 32

- **Item:** Subcontracted Geoprobe unit with 2 Technician crew. Item costs $100 per hour or $800 per 8-hour day.  
  - Units: dollars  
  - Unit Cost: 800  
  - Unit Cost Adjustment Factor: none  
  - Revised Unit Hours: 800

---

**Item Desc:** Collection of pre-investigation samples for geoprobe samples with the site geoprobe with two technicians. A site Environmental Engineer will direct the boring placement, log the borings; collect, containerize, package, and ship the samples; prepare field QC documentation, and prepare field notes on a 1 1/2 time basis. A site RCT will monitor the site for radiological contamination on a full time basis. A site Industrial Hygienist will implement the field portion of the HASP on a full time basis. Decon Operations staff will decon the vehicle and equipment when it leaves the work area on a half time basis. It is estimated that one 24' boring (to bedrock) will be place per 1000 SF of IHSSs 116.1, 182, and 208 footprint for a total of 20 soil borings with 5 samples per 24' boring. It is estimated that one 24' boring (to bedrock) will be place per 10,000 SF of IHSS 157.2 and UBCs 444 and 447 footprint for a total of 45 soil borings with 5 samples per 24' boring. It is estimated that one boring per ten hours can be completed. In order to expedite the schedule, 5 field characterization crew are assumed.

---

**Resources**

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**Revision:** 6/23/00 9:21:05 AM  
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OFFICIAL USE ONLY
Line Item 0200 - analyze samples

BOE

Vendor Quote

Email quote: average cost from Kaiser-Hill ASD (V. Ideker).

Item Desc:
Analyze samples produced from geoprobe borings. It is anticipated that 3 samples from each boring will be collected. They will be analyzed for Metals, VOCs, SVOCs, PCBs, and radionuclides (est. 3 isotopes) with a 30 day TAT. This item is priced on a per sample basis. Per sample costs include DOT rad screen, bottle charge, shipping, and validation.

Breakdown of Cost Data:

Item: Analyze samples at an offsite laboratory.
Units: analysis

Unit Cost: Metals $345, VOCs $280, SVOCs $440, PCBs and other analytes $150, and Radionuclides 3 isotopes) $590 per each sample.
Unit Cost Adjustment Factor: Must add: DOT rad screen $32/sample, bottle charge $7/sample, shipping $4.2/bottle, and validation per each: $17.30 VOA, $19.25 SVOC, $16.75 Metals, $5.95 PCB, and $15.60 Rad.

Revised Unit Hours: Metals $405, VOCs $341, SVOCs $502, PCBs and other analytes $199, and Rad $649.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

Line Item 0300 - project mgmt oversight

BOE

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

Item Desc:
Project Management/Oversight. Based on half time for a Project Manager, Administrative staff, and Cost Estimator/Scheduler.

Breakdown of Cost Data:

Item: Mgmt oversight
Units: hours

Unit Cost: 12
Unit Cost Adjustment Factor: none

Revised Unit Hours: 12

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

Line Item SYS - Contingency And Escalation

BOE

Estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### Rocky Flats Closure Project
#### Baseline Cost and Basis of Estimate

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**Activity 1GFN643170**

**Description:** Prepare Decision Document - IHSS 400-3

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### Rocky Flats Closure Project

#### Baseline Cost and Basis of Estimate

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#### Line Item 0100 - PAM

**Estimator's Experience based generally on historical data for Ryan's Pit**

**Item Desc:**
Preparation of of PAM or IM/IRA in support of source removal of previously characterized UBC.

**Proposed Action Memorandum:** A bottoms-up estimate based on historical costs was used as the basis for the estimate. Based on Ryan's Pit (IHSS 108), the cost for the PAM was $50,000 (contractor costs). Assuming that labor rates at this time were approximately $75 (based on a cost center 217). The total labor for a PAM would be approximately 666 hours, which rounds to 700 hours. It was assumed that 10% would be required for managerial hours.

For a PAM the total labor hours are:

- Environmental Engineer 700 Hours
- Manager 70 Hours
- Factor 700 Environmental Engineer 175 hours
- Factor 70 Manager 18 hours

**Breakdown of Cost Data:**
- Item: Preparation of PAM for Ryan's Pit source removal action.
  - Units: hours
  - Unit Cost: 770
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit Hours: 193

**Basis for adjustment.** Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

**Interim Measure/Interim Remedial Action Decision Document:** It was assumed that an IM/IRA Decision Document would take 75% more effort than a PAM or 1,166 hours, which rounds to 1200 hours. It was assumed that 10% of this labor would be required for managerial hours.

For an IM/IRA the total labor hours are:

- Environmental Engineer 1200 Hours
- Manager 120 Hours
- Factor 1200 Environmental Engineer 300 hours
- Factor 120 Manager 30 hours

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#### Line Item 0200 - SAP

**Estimator's Experience based generally on historical data for Ryan's Pit**

**Item Desc:**
Preparation of SAP in support of source removal of previously characterized UBC.

**Breakdown of Historical Data:**
- Item: Preparation of SAP for Ryan's Pit source removal action.
  - Units: hours
  - Unit Cost: 300
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit Hours: 76
### Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

**WBS No:** 1GAC0403  
**Activity ID:** 1GFN643180

**Baseline Deviation**

**WBS Filter:** 1GAC  
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**Start In FY:** *

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**Activity ID:** 1GFN643210  
**Description:** Procurement and Field Prep - IHSS Grouping 400-3

---

**Line Item 0300 - WMP**

Estimator's Experience based generally on historical data for Ryan's Pit

Item Desc:
Preparation of WMP in support of source removal of previously characterized UBC.

Breakdown of Historical Data:
- Item: Preparation of WMP for Ryan's Pit source removal action.
- Units: hours
- Unit Cost: 80
- Unit Cost Adjustment Factor: 0.25
- Revised Unit Hours: 20

Basis for adjustment. Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

Waste Management Plan: It was assumed that a waste management plan would be needed and that it would take no more than two weeks to prepare (80 hours).

Original Hours 80 Environmental Engineer 20 hours

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**Line Item SYS - Contingency And Escalation**

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**Line Item 0100 - procurement & field prep**

Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation

Item Desc:

Breakdown of Cost Data:
Item: Site Labor to perform above individual tasks for either Ryan's Pit or T-3/T-4.
  Units: hours
  Unit Cost: 1380
  Unit Cost Adjustment Factor: 0.25
  Revised Unit: 345 hours

Item: Subcontractor costs to perform above individual tasks for either Ryan's Pit or T-3/T-4.
  Units: 1 lot
  Unit Cost: $10K
  Unit Cost Adjustment Factor: 0.25
  Revised Unit: $2.5K

Basis for adjustment. Hours and costs for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be characterized at once.

Procurement includes preparation of statement of work, proposal review (technical evaluation), and negotiations. Based on a T-3/T-4 burdened cost of $29,186.52. Assuming it is primarily labor hours (RMRS Environmental Engineer charging at $57.45 per hour) yields 508 hours which rounds to 510 total hours.

Davis Bacon Documentation: It was assumed that it would take an environmental engineer twenty-four hours to prepare a Davis Bacon cost estimate and to support the Davis-Bacon determination.

Subcontractor Health and Safety Plan: Costs for the health and safety plan are based on Ryan's Pit, which cost approximately $10,000. It was assumed that these are A5H dollars. In addition, it was assumed that a safety engineer, an industrial hygienist, and a radiological engineer would each provide one week (40 hours) of support for review and document preparation.

Radiological Work Permit: It was assumed that it would take a radiological control technician two working days (18 hours) to complete counting preparation and review.

Implementation Plan: It was estimated that this activity would take 13 weeks of time for engineers, scientists or equivalent to complete. This would include preparation of an implementation plan as required (Rocky Flats Cleanup Agreement, Appendix 3, Interim Guidance Document, Dated August 1977). In addition this includes all tasks related to documentation for the Integrated Work Control Program and Integrated Safety Management.

Ecology Survey/National Environmental Protection Act (NEPA) Support: It was estimated that this would take 40 hours for an ecologist. The activities include NEPA review and support in document preparation, site surveys to verify compliance with ecological regulations, categorical exclusions, and NEPA evaluations.

Utility Clearance/Soil Disturbance Permits: It was estimated based on experience that it would take the equivalent 2 weeks (80 hours) for technical staff to do utility surveys, prepare and review soil disturbance permits, and prepare authorizing documents for excavation.

The combined resources for procurement and field preparations are

Total Procurement and Field Preparation Hours

Environmental Engineer 1134 hours
Safety Engineer 40 hours
Industrial Hygiene 40 hours
Radiological Engineering 58 hours
Radiological Control Technician 18 hours
Ecologist/Life Scientist 40 hours
Manager 50 hours
Quality Assurance 29 hours
A5H Total $10,000

* On some projects these hours were assumed to be included in other tasks or part of this task under environmental engineer or one of the other job functions.

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

Factor 1134 - Environmental Engineer 283 Hours
Factor 40 - Safety Engineer 10 Hours
Factor 40 - Industrial Hygiene 10 Hours
Factor 58 - Radiological Engineering 14 Hours
Factor 18 - RCT 5 Hours
Factor 40 - Life Scientist 10 Hours
Factor 50 - Project Manager 13 Hours
Factor 10000 - A5H Subcontracted Services 2,500 Dollars
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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| Line Item 0100 - readiness assessment | |
| Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation |
| Item Desc: Conduct Readiness Assessment in support of source removal action. |
| Breakdown of Cost Data: |
| Item: Site Labor to perform Readiness Assessment for T-3/T-4. |
| Units: hours |
| Unit Cost: 187 |
| Unit Cost Adjustment Factor: 0.25 |
| Revised Unit: 48 |
| Units: 1 lot |
| Unit Cost: $4,800 |
| Unit Cost Adjustment Factor: 0.25 |
| Revised Unit: $1,200 |

It was estimated that subcontractor involvement would require 80 hours at $60/hour = $4,800. It was assumed that about 3 weeks of time was required for an environmental engineer or similar person in addition to 12 hours of project management, which yielded 132 hours. An additional 11 hours was added for...
management oversight. It was estimated that a radiological engineer (QA) and an industrial hygienist would be needed for 2.5 days each (22 hours).

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 projects will be conducted at once and only one of each fixed cost is needed for the group.

Factor 132 - Environmental Engineer 33 Hours
Factor 22 - Health Physicists 6 Hours
Factor 11 - Manager 3 Hours
Factor 22 - Quality Assurance 6 Hours
Factor 4,800 - A5H Subcontracted Srvs 1,200 Dollars

20 hours of administrative time will also be required.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
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Line Item 0200 - training

BOE

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc:
Conduct perform Training in support of source removal action.

Breakdown of Cost Data:

Item: Site Labor to perform above individual tasks for T-3/T-4.
Units: hours
Unit Cost: 132 Hours
Unit Cost Adjustment Factor: 0.25
Revised Unit: 33 hours

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
Units: 1 lot
Unit Cost: $12K
Unit Cost Adjustment Factor: 0.25
Revised Unit: $3K

Basis for adjustment. Costs for each UBC are divided by 4 to account for the fact that 4 UBCs will be remediated at once and only one Training is needed for the group.

It was estimated training would cost $1,000 per subcontractor worker and that 12 subcontractor employees would require training. It was estimated that onsite contractor employees would require the equivalent of 15 hours of training including instructor time and that eight onsite employees would be trained.

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

Factor 132 - Onsite employees 33 Hours
Factor 12000 - Subcontractor employees 3,000 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
Rocky Flats Closure Project
Baseline Cost and Basis of Estimate

WBS No: 1GAC0403
Activity ID: 1GFR643240

Baseline Deviation

WBS Filter: 1GAC
Activity Filter: *

Project

Activity ID: 1GFR643250
Description: Remedial Action - IHSS Group 400-3

Cost Risk: 2
Schedule Risk: 3

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<th>Materials/Sub Cost</th>
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6/23/00 9:21:06 AM
OFFICIAL USE ONLY
### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0403  
**Activity ID:** 1GFN643250  
**Activity Filter:** 1GAC

#### Project: Rocky Flats Closure Project

<table>
<thead>
<tr>
<th>Line Item 0100 - mobilization</th>
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<tbody>
<tr>
<td>Estimator's Experience based generally on historical data for T-3/T4 Remediation.</td>
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<tr>
<td><strong>Item Desc:</strong> Mobilization in support of remediation.</td>
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<tr>
<td><strong>Breakdown of Cost Data:</strong></td>
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<td><strong>Item:</strong> Site Labor to perform above individual tasks for T-3/T-4.</td>
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<td><strong>Units:</strong> hours</td>
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<td><strong>Revised Unit:</strong> 275</td>
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<td><strong>Item:</strong> Subcontractor costs to perform above individual tasks for T-3/T-4.</td>
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<tr>
<td><strong>Units:</strong> 1 lot</td>
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<td><strong>Unit Cost:</strong> 184k</td>
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<td><strong>Unit Cost Adjustment Factor:</strong> 0.25</td>
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<td><strong>Revised Unit:</strong> see below</td>
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**Basis for adjustment.** The costs were divided into fixed costs and variable costs. The fixed costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

**T3/T4 hours**
- **110 Health Physicists:** 27 Hours  
- **330 Manager:** 83 Hours  
- **550 Environmental Engineer:** 138 Hours  
- **110 Industrial Hygienist:** 27 Hours  
- **Subcontractor dollars:** 184,000 Subcontractor 46,000

*This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.*

#### Resources

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<th>Skill</th>
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<tr>
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**Line Item 0200 - site prep**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:** Site Preparation including setting up fencing, trailer, etc.
Breakdown of Historical Data:

Item: Site Labor to perform above individual tasks for T-3/T-4.
Units: hours
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
Units: 1 lot
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

T3/T4 hours 120 Environmental Engineer 30 hours
T3/T4 dollars 30,000 Subcontracted Svrs 7,500 Dollars

D&D construction trade hours were calculated using the following methodology:

A5H subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.

RCT hours were calculated using the following methodology, unless they were already estimated.

For Site Preparation tasks - RCT hours were the same as D&D construction hours.
For all other tasks A5H subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under KG10H department code.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Total Contaminated Soil to be removed 15200 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 15200 CY

The excavation cost was based on the excavation cost for the T-3/T-4 Project. Burdened cost based on the T-3/T-4 actuals is $171,487. For the 3,800 cubic yards of contaminated soil removed this yielded a unit cost of $45 per cubic yard of contaminated soil removed. This estimate includes the removal of overburden that might be on top of the contaminated soil. The hours for an environmental engineer from T-3/T-4 were 1.09 hours per cubic yard of contaminated soil. Likewise the hours for the following were assumed to be linearly proportional:

Health Physicists .47 hours per cubic yard
Environmental Operations .31 hours per cubic yard
Industrial Hygienists 0.31 hours per cubic yard
Radiological Control Technician 1.00 hour per cubic yard

* Based on $50/cubic yard from T-3/T-4, assumes a labor rate of $50/hour

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 1.09 - E050 Environmental Engineer 16,568 Hours
Factor 0.47 - P080 Health Physicists 7,144 Hours
Factor 0.31 - Environmental Operations 4,712 Hours
Factor 0.31 - P090 Industrial Hygienists 4,712 Hours
Factor 1.00 - T050 Radiological Control Technician Linear 15,200 Hours
Factor 45.23 - A5H Subcontracted Svcs 687,496 Dollars

D&D construction trade hours were calculated using the following methodology:

A5H subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.

RCT hours were calculated using the following methodology, unless they were already estimated.

For Site Preparation tasks - RCT hours were the same as D&D construction hours.
For all other tasks A5H subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under KG10H department code.

The dollars amounts calculated for D&D construction workers and RCTs were subtracted from the subcontractor dollars and the revised A5H dollar amount was entered into Best.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
Line Item 0400 - remove and clean debris

BOE

Estimator's Experience based generally on a base case of 700 cy.

Item Desc:
Remove and clean debris.

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.

- Units: hours
- Unit Cost: see below
- Unit Cost Adjustment Factor: see below
- Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.

- Units: 1 lot
- Unit Cost: see below
- Unit Cost Adjustment Factor: see below
- Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Total Contaminated Soil to be removed 15200 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 15200 CY

For the base case, it was assumed that about five cubic yards out of 700 cubic yards would be debris and would be segregated and cleaned. It was estimated that each cubic yard of debris would cost $1,000 or $5,000 total for 700 cubic yards. This yields a rate of $7.14 per cubic yard.

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 7.14 - A5H Subcontracted Srvs 108,528 Dollars

D&D construction trade hours were calculated using the following methodology:

A5H subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.

RCT hours were calculated using the following methodology, unless they were already estimated.
For Site Preparation tasks - RCT hours were the same as D&D construction hours.
For all other tasks A5H subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under KG10H department code.

The dollars amounts calculated for D&D construction workers and RCTs were subtracted from the subcontractor dollars and the revised A5H dollar amount was entered into Best.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

Resources

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Line Item 0600 - confirmation sampling

Item Desc: Confirmation Sampling.

Breakdown of Historical Data:

Item: Site labor to perform above individual tasks for T-3/T-4.

- Unit Cost: see below
- Unit Cost Adjustment Factor: see below

Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.

- Unit Cost: see below
- Unit Cost Adjustment Factor: see below

Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Total Contaminated Soil to be removed 15200 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 15200 CY

The analytical costs were based on T-3/T-4, which cost $435,574 for 3800 cubic yards of contaminated soil removed. This yielded a unit rate of about $115/cubic yard. Based on estimator experience the cost of sampling including labor and materials was estimated to be 20% of that rate or about $23/ cubic yard.

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 114.62 - A5H Subcontracted Srvs (Analytical) 1,742,224 Dollars
Factor 22.924 - A5H Subcontracted Srvs 348,445 Dollars

D&D construction trade hours were calculated using the following methodology:

- A5H subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.
- RCT hours were calculated using the following methodology, unless they were already estimated.

RCT hours were calculated using the following methodology, for Site Preparation tasks - RCT hours were the same as D&D construction hours.

For all other tasks A5H subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under KG10H department code.

The dollars amounts calculated for D&D construction workers and RCTs were subtracted from the subcontractor dollars and the revised A5H dollar amount was entered into Best.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
Project: Rocky Flats Closure Project
Baseline Cost and Basis of Estimate

WBS No: 1GAC0403
Activity ID: 1GFN643250

Item Desc: Prepare Waste Acceptance Forms
Breakdown of Historical Data:

Item: Site Labor to perform above individual tasks for T-3/T-4.
Units: hours
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
Units: 1 lot
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

T3/T4 hours 80 environmental engineer 20 hours

Resources

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<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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Factors 20 hrs

Line Item 0800 - waste acceptance sampling

BOE

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc: Waste Acceptance Sampling
Breakdown of Historical Data:

Item: Site Labor to perform above individual tasks for T-3/T-4.
Units: hours
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
Units: 1 lot
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Because the waste acceptance sampling is difficult to predict and could vary significantly from project to project, it was assumed that about $800 worth of additional analysis would be required for 20 cubic yards which is the volume that can be placed in one roll-off. This yielded a unit rate of about $40/cubic yard. This sampling and analysis is in addition to the confirmational samples so the costs are not as great. It was assumed that this sampling would be more labor intensive so the sampling costs were estimated to be about 50% of the analytical costs or about $20/cubic yard.

Total Contaminated Soil to be removed 15200 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 15200 CY

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.
Factor 40 - A5H Analytical 608,000 Dollars
Factor 20 - A5H Subcontracted Svrs 304,000 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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Line Item 0900 - field oversight & project mgmt

BOE

Estimator's Experience based generally on a base case of 700 cy.

Item Desc:
Field Oversight and Project Management

Breakdown of Historical Data:

Item: Site Labor to perform above individual tasks for T-3/T-4.
Units: hours
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
Units: 1 lot
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

It was assumed that a field manager would be needed for 150 nine-hour working days or about 33 weeks. This work breaks down as follows:

Preparation Activities 50 working days  
Field Activities - 80 working days  
Demobilization - 20 working days  
Total 150 nine-hour working days or 1350 hours

In addition it was estimated that technical staff, quality assurance, and project management would be required for the equivalent of ten additional weeks, which is 400 hours each.

Based on the base case of a 700 cubic yard removal project, these values yielded unit rates as follows:

Hours Per Cubic Yard  
Of Contaminated Soil Field Manager 1.93  
Technical Staff .57  
Quality Assurance .57  
Project Management 0.57

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Total Contaminated Soil to be removed 15200 CY  
Total Soil for Thermal Desorption 0 CY  
Offsite Waste Volume 15200 CY

Factor 1.93 - Environmental Engineer 29,336 Hours
### Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

**WBS No:** 1GAC0403  
**Activity ID:** 1GFN643250

#### Line Item 1000 - backfill

**BOE**

**Trade Publication**

Means 1995, Site Work & Landscape Cost Data (page 34, 42, and 34)

**Item Desc:**

Backfill.

**Breakdown of Historical Data:**

**Item:** Site Labor to perform above individual tasks for T-3/T-4.
- **Units:** hours
- **Unit Cost:** see below
- **Unit Cost Adjustment Factor:** see below
- **Revised Unit:** see below

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
- **Units:** 1 lot
- **Unit Cost:** see below
- **Unit Cost Adjustment Factor:** see below
- **Revised Unit:** see below

**Means (1995) Site Work & Landscape Cost Data as follows:**

- **Common Fill:** $4.77/cubic yard (page 34 Borrow Bank Measure)
- **Hauling:** $3.98/cubic yard (page 42 2-mile round-trip, 6 cubic yard dump truck)
- **Backfilling:** $1.69/cubic yard (page 34)
- **Burden (43%)** $4.49/cubic yard
- **Total:** $14.23/cubic yard or about $15/cubic yard

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

**Factor 15 - ASH Subcontracted Srvs 228,000 Dollars**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

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**Line Item 1100 - demobilization**

**BOE**

**Estimator's Experience based generally on historical data for T-3/T4 Remediation.**

**Item Desc:**

Demobilization.

**Breakdown of Historical Data:**

**Item:** Site Labor to perform above individual tasks for T-3/T-4.
- **Units:** hours
### Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

**WBS No:** 1GAC0403  
**Activity ID:** 1GFCN643250

#### Activity ID: 1GFCN643250  
**Description:** Prepare Closeout Report - HSS Group 400-3

---

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**Notes:**

- **Baseline Devi**
- **WBS Filter:** 1GAC
- **Activity Filter:** *Suers In FY*

---

- **Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
- **Units:** 1 lot
- **Unit Cost:** see below
- **Unit Cost Adjustment Factor:** see below
- **Revised Unit:** see below

**Basis for adjustment:** The costs were divided into fixed costs and variable costs. The fixed costs include Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

- **Demobilization:** Based on the T-3/T-4 project, it was assumed that demobilization costs would cover demobilization for excavation activities also. The subcontractor cost for demobilization was about $95,000 for 3,800 cubic yards at the T-3/T-4 project. In addition it was estimated that the following hours were necessary:
  - Environmental Engineer 300 hours
  - Health Physicist 100 hours
  - Manager 200 hours
  - Industrial Hygiene 100 hours

- The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

- **Factor 300 - Environmental Engineer 75 Hours**
- **Factor 100 - Health Physicists 25 Hours**
- **Factor 200 - Manager 50 Hours**
- **Factor 100 - P090 Industrial Hygienists 25 Hours**
- **Factor 95000 - A5H Subcontracted Srvs 23,750 Dollars**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
Rocky Flats Closure Project
Baseline Cost and Basis of Estimate

WBS No: 1GAC0403
Activity ID: 1GFN643270

Baseline Deviation: WBS Filter: 1GAC

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**Line Item 0100 - develop report**

**BOE**

Estimator's Experience on similar projects (T-3/T-4 and others)

Item Desc:
Perform Data Analysis including GIS representation of data, Closeout Report, and associated project management.

Required level of effort:
- Environmental Engineer - 80 hours
- Environmental Scientist - 20 hours
- Computer Specialist - 160 hours (GIS, SWD)
- Manager - 20 hours
- Administrative - 20 hours

Cost Estimators - 20 hours

Breakdown of Cost Data:
- Item: Develop Documentation
  - Units: hours
  - Unit Cost: 320
  - Unit Cost Adjustment Factor: none
- Revised Unit Hours: 320

**Resources**

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**Line Item SYS - Contingency And Escalation**

**BOE**

Contingency

Item Desc:

Required level of effort:

Item: Develop Documentation

Breakdown of Cost Data:
- Units: hours
- Unit Cost: 320
- Unit Cost Adjustment Factor: none

Revised Unit Hours: 320

**Resources**

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**WBS No: 1GAC0404**

**Activity ID:** 1GHE644100

**Title:** Group 400-4 (B444)

**Description:** SAP Preparation - IHSS Group 400-4 (B444)

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**SYS**

Contingency And Escalation

Item Desc:
Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

Total for Activity 1GHE644100:

- Total Cost: 19,042
- Total Cost: 19,042

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6/23/00 9:21:08 AM
OFFICIAL USE ONLY
**Preparation of SAP Addenda to Industrial Area Characterization Plan.**

**Breakdown of Cost Data:**
- **Item:** Preparation of SAP addenda
  - **Units:** hours
  - **Unit Cost:** 120
  - **Unit Cost Adjustment Factor:** none
  - **Revised Unit Hours:** 120

**Basis for adjustment.**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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**Line Item 0200 - HASP Addenda**

**BOE**

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Item Desc:**
Preparation of HASP addenda to Industrial Area Characterization Plan

**Breakdown of Cost Data:**
- **Item:** Preparation of addenda for HASP.
  - **Units:** hours
  - **Unit Cost:** 140
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  - **Revised Unit Hours:** 140

**Basis for adjustment.**

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**Line Item 0300 - QAP Addenda**

**BOE**

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Item Desc:**
Preparation of SAP Addenda to Industrial Area Characterization Plan.

**Breakdown of Cost Data:**
- **Item:** Preparation of QAP addenda
  - **Units:** hours
  - **Unit Cost:** 60
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  - **Revised Unit Hours:** 60

**Basis for adjustment.**
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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Line Item 0100 - procurement & field prep

BOE

Estimator's Experience based on historical data for Ryan's Pit and T-3/T-4 Remediation

Item Desc:

Breakdown of Cost Data:
Item: Site Labor to perform above individual tasks for either Ryan's Pit or T-3/T-4.
Units: hours
Unit Cost: $1380/40 hours
Unit Cost Adjustment Factor: 0.25
Revised Unit: 345 hours

Item: Subcontractor costs to perform above individual tasks for either Ryan's Pit or T-3/T-4.
Units: 1 lot
Unit Cost: $10K
Unit Cost Adjustment Factor: 0.25
Revised Unit: $2.5K

Basis for adjustment. Hours and costs for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be characterized at once.

Procurement includes preparation of statement of work, proposal review (technical evaluation), and negotiations. Based on a T-3/T-4 burdened cost of $29,186.52. Assuming it is primarily labor hours (RMRS Environmental Engineer charging at $57.45 per hour) yields 508 hours which rounds to 510 total hours.

Davis Bacon Documentation: It was assumed that it would take an environmental engineer twenty-four hours to prepare a Davis Bacon cost estimate and to support the Davis-Bacon determination.

Subcontractor Health and Safety Plan: Costs for the health and safety plan are based on Ryan's Pit, which cost approximately $10,000. It was assumed that these are A5H dollars. In addition, it was assumed that a safety engineer, an industrial hygienist, and a radiological engineer would each provide one week (40 hours) of support for review and document preparation.

Radiological Work Permit: It was assumed that it would take a radiological control technician two working days (18 hours) to complete counting preparation and review.

Implementation Plan: It was estimated that this activity would take 13 weeks of time for engineers, scientists or equivalent to complete. This would include...
preparation of an implementation plan as required (Rocky Flats Cleanup Agreement, Appendix 3, Interim Guidance Document, Dated August 1977). In addition this includes all tasks related to documentation for the Integrated Work Control Program and Integrated Safety Management.

Ecology Survey/National Environmental Protection Act (NEPA) Support: It was estimated that this would take 40 hours for an ecologist. The activities include NEPA review and support in document preparation, site surveys to verify compliance with ecological regulations, categorical exclusions, and NEPA evaluations.

Utility Clearance/Soil Disturbance Permits: It was estimated based on experience that it would take the equivalent 2 weeks (80 hours) for technical staff to do utility surveys, prepare and review soil disturbance permits, and prepare authorizing documents for excavation.

The combined resources for procurement and field preparations are

Total Procurement and Field Preparation Hours

Environmental Engineer 1134 hours
Safety Engineer 40 hours
Industrial Hygiene 40 hours
Radiological Engineering 58 hours
Radiological Control Technician 18 hours
Ecologist/Life Scientist 40 hours
Manager 50 hours
Quality Assurance* 29 hours
ASH Total $10,000

* On some projects these hours were assumed to be included in other tasks or part of this task under environmental engineer or one of the other job functions.

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

Factor 1134 - Environmental Engineer 283 Hours
Factor 40 - Safety Engineer 10 Hours
Factor 40 - Industrial Hygiene 10 Hours
Factor 58 - Radiological Engineering 14 Hours
Factor 18 - RCT 5 Hours
Factor 40 - Life Scientist 10 Hours
Factor 50 - Project Manager 13 Hours
Factor 10000 - ASH Subcontracted Services 2,500 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
Activity ID: 1GHE644140  Description: Readiness Assessment - IHSS Group 400-4

Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation

Item Desc:
Evaluate readiness of the field characterization team and plans.

Breakdown of Cost Data:
Item: Site Labor to perform Readiness Assessment for T-3/T-4.
Units: hours
Unit Cost: 187
Unit Cost Adjustment Factor: 0.25
Revised Unit: 48

Units: 1 lot
Unit Cost: $4800
Unit Cost Adjustment Factor: 0.25
Revised Unit: $1200

It was estimated that subcontractor involvement would require 80 hours at $60/hour = $4,800. It was assumed that about 3 weeks of time was required for an environmental engineer or similar person in addition to 12 hours of project management, which yielded 132 hours. An additional 11 hours was added for management oversight. It was estimated that a radiological engineer (QA) and an industrial hygienist would be needed for 2.5 days each (22 hours).

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 projects will be conducted at once and only one of each fixed cost is needed for the group.

Factor 132 - Environmental Engineer 33 Hours
Factor 22 - Health Physicists 6 Hours
Factor 11 - Manager 3 Hours
Factor 22 - Quality Assurance 6 Hours
Factor 4,800 - ASH Subcontracted Svrs 1,200 Dollars

20 hours of administrative time will also be required.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### Rocky Flats Closure Project

#### Baseline Cost and Basis of Estimate

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**Activity Filter: * Starts In FY: ***

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**Total for Activity 1GHE644150:**

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**Breakdown of Cost Data:**

**Item:** Site Personnel for support of geoprobe samples  
**Units:** hours  
**Unit Cost:** $144  
**Unit Cost Adjustment Factor:** none  
**Revised Unit Hours:** 8

**Item:** Kaiser-Hill/RMRS Geoprobe unit with 2 Technrcian crew. Item costs $100 per hour or $800 per 8-hour day.  
**Units:** dollars  
**Unit Cost:** 800  
**Unit Cost Adjustment Factor:** none  
**Revised Unit Hours:** 800

**Basis for adjustment:**

A 50% reduction in the number of geoprobos is based on process history and building knowledge which indicates that characterization to the extent required for Building 123 is not required at this location.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

**Resources:**

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### Line Item 0200 - Analyze samples - 400-803, 804

**BOE**

**Vendor Quote:** average cost from Kaiser-Hill ASD (V. Ideker).

**Item Desc:** Analyze samples produced from geoprobe borings. It is anticipated that 3 samples from each boring will be collected. They will be analyzed for Metals, VOCs, SVOCs, PCBs, and Radionuclides (estimated isotope) with a 30-day TAT. This item is priced on a per-sample basis. Per-sample costs include DOT rad screen, bottle charge, shipping, and validation.

**Breakdown of Cost Data:**

- **Item:** Analyze samples at an offsite laboratory.
  - **Units:** analysis
  - **Unit Cost:** Metals $345, VOCs $280, SVOCs $440, PCBs and other analytes $150, and Radionuclides 3 isotopes $590 per sample.
  - **Unit Cost Adjustment Factor:** Must add: DOT rad screen $32/sample, bottle charge $7/sample, shipping $4.2/bottle, and validation per each: $17.30 VOA, $16.75 Metals, $5.95 PCB, and $15.60 Rad.
  - **Revised Unit Hours:** Metals $405, VOCs $341, SVOCs $502, PCBs and other analytes $199, and Rad $649.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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### Line Item 0300 - Project Mgmt Oversight

**BOE**

**Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.**

**Item Desc:**

- **Project Management/Oversight. Based on half time for a Project Manager, Administrative staff, and Cost Estimator/Scheduler**

**Breakdown of Cost Data:**

- **Item:** Mgmt oversight
  - **Units:** hours
  - **Unit Cost:** 12
  - **Unit Cost Adjustment Factor:** none
  - **Revised Unit Hours:** 12

**Basis for adjustment:**

A 50% reduction in characterization is based on process history and building knowledge which indicates that characterization to the extent required for Building 123 is not required at this location.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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### Line Item SY5 - Contingency And Escalation

**BOE**

**Resources**

- **Contingency:** 35,162.50 Dollars

---

**6/23/00 9:21:09 AM**

**OFFICIAL USE ONLY**
**Rocky Flats Closure Project**  
**Base Cost and Basis of Estimate**

**Activity ID**: 1GHE644170  
**Description**: Prepare Summary/NFA - IHSS Group 400-4

**Resources**

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Total for Activity 1GHE644170:  
- Labor Hours: 656
- Labor Cost: 19,024
- Materials/Sub Cost: 0
- Total Prime Cost: 22,506
- Burden Cost: 5,365
- Total Cost: 27,871

**Estimator's Experience**:  
Estimate for summary report based on estimator’s 16 years of experience performing and costing projects of similar size and scope.

**Item Description**:  
Perform Data Analysis including GIS representation of data, NFA Summary, Characterization Report, and associated project management. Disposition comments and finalize document.

**Breakdown of Cost Data**:  
- Item: Develop Documentation  
  - Units: Hours  
  - Unit Cost: 656  
  - Revised Unit Hours: 656  
  - Basis for adjustment: N/A

**Contingency and Escalation**:  
- **Line Item SYS - Contingency And Escalation**  
  - Resources

**Line Item 01000 - develop documentation**

**BOE**

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**Factors**

- **280.00 Hours**
- **60.00 Hours**
- **40.00 Hours**
- **48.00 Hours**
- **160.00 Hours**
- **40.00 Hours**
- **20.00 Hours**

Offical Use Only
### Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

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#### Activity Filter

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- 2.341.67 Dollars

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#### Line Item 0100 - PAM

**BOE (Estimator's Experience based generally on historical data for Ryan's Pit)**

- **Item Desc:** Preparation of PAM or IM/IRA in support of source removal of previously characterized UBC.

**Proposed Action Memorandum:** A bottoms-up estimate based on historical costs was used as the basis for the estimate. Based on Ryan's Pit (IHSS 108), the cost for the PAM was $50,000 (contractor costs). Assuming that labor rates at this time were approximately $75 (based on a cost center 217). The total labor for a PAM would be approximately 666 hours, which rounds to 700 hours. It was assumed that 10% would be required for managerial hours.

For a PAM the total labor hours are:

- Environmental Engineer 700 Hours
- Manager 70 Hours

**Factor 700 Environmental Engineer 175 hours**

**Factor 70 Manager 18 hours**

**Breakdown of Cost Data:**

- **Item:** Preparation of PAM for Ryan's Pit source removal action.

- **Units:** hours
- **Unit Cost:** 770
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit Hours:** 193

**Basis for adjustment.** Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

**Interim Measure/Interim Remedial Action Decision Document:** It was assumed that an IM/IRA Decision Document would take 75% more effort than a PAM or 1,166 hours, which rounds to 1200 hours. It was assumed that 10% of this labor would be required for managerial hours.

**For an IM/IRA the total labor hours are**

- Environmental Engineer 1200 Hours
- Manager 120 Hours

**Factor 1200 Environmental Engineer 300 hours**

**Factor 120 Manager 30 hours**

#### Line Item 0200 - SAP

**BOE (Estimator's Experience based generally on historical data for Ryan's Pit)**

- **Item Desc:** Preparation of SAP in support of source removal of previously characterized UBC.

**Proposed Action Memorandum:** A bottoms-up estimate based on historical costs was used as the basis for the estimate. Based on Ryan's Pit (IHSS 108), the cost for the SAP was $50,000 (contractor costs). Assuming that labor rates at this time were approximately $75 (based on a cost center 217). The total labor for a SAP would be approximately 666 hours, which rounds to 700 hours. It was assumed that 10% would be required for managerial hours.

For a SAP the total labor hours are:

- Environmental Engineer 700 Hours
- Manager 70 Hours

**Factor 700 Environmental Engineer 175 hours**

**Factor 70 Manager 18 hours**

**Breakdown of Cost Data:**

- **Item:** Preparation of SAP for Ryan's Pit source removal action.

- **Units:** hours
- **Unit Cost:** 770
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit Hours:** 193

**Basis for adjustment.** Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

**Interim Measure/Interim Remedial Action Decision Document:** It was assumed that an IM/IRA Decision Document would take 75% more effort than a PAM or 1,166 hours, which rounds to 1200 hours. It was assumed that 10% of this labor would be required for managerial hours.

**For an IM/IRA the total labor hours are**

- Environmental Engineer 1200 Hours
- Manager 120 Hours

**Factor 1200 Environmental Engineer 300 hours**

**Factor 120 Manager 30 hours**

#### Resources

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#### Line Item 0200 - SAP

**BOE (Estimator's Experience based generally on historical data for Ryan's Pit)**

- **Item Desc:** Preparation of SAP in support of source removal of previously characterized UBC.
Breakdown of Historical Data:

- **Item:** Preparation of SAP for Ryan's Pit source removal action.
  - **Units:** hours
  - **Unit Cost:** 300
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit Hours:** 76

Basis for adjustment. Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

Sampling and Analysis Plan: Based on the T-3/T-4 Sampling and Analysis Plan (SAP) it took 300 hours in total preparation time. It was assumed that 10% of this labor was for managerial hours (30 hours) and that the rest of the time, 270 hours, was for technical staff. It was assumed that these hours include all labor including quality assurance, secretarial support, graphics etc.

Original Hours 270 Environmental Engineer 68 hours
Original Hours 30 Manager 8 hours

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Estimator's Experience based generally on historical data for Ryan's Pit

**Item Desc:**
Preparation of WMP in support of source removal of previously characterized UBC.

Breakdown of Historical Data:

- **Item:** Preparation of WMP for Ryan's Pit source removal action.
  - **Units:** hours
  - **Unit Cost:** 80
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit Hours:** 20

Basis for adjustment. Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

Waste Management Plan: It was assumed that a waste management plan would be needed and that it would take no more than two weeks to prepare (80 hours).

Original Hours 80 Environmental Engineer 20 hours

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### Activity ID: 1GHE644210

**Description:** Procurement and Field Prep - HSS Grouping 400-4

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**Line Item 0100 - Procurement & Field Prep**

**BOE**

Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T-4 Remediation

**Item Desc:**

**Breakdown of Cost Data:**
- **Item:** Site Labor to perform above individual tasks for either Ryan's Pit or T-3/T-4.
  - **Units:** hours
  - **Cost:** $1380
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** 345 hours

- **Item:** Subcontractor costs to perform above individual tasks for either Ryan's Pit or T-3/T-4.
  - **Units:** 1 lot
  - **Cost:** $10K
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** $2.5K

**Basis for adjustment.** Hours and costs for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be characterized at once.

Procurement includes preparation of statement of work, proposal review (technical evaluation), and negotiations. Based on a T-3/T-4 burdened cost of $29,186.52. Assuming it is primarily labor hours (RMRS Environmental Engineer charging at $57.45 per hour) yields 508 hours which rounds to 510 total hours.

Davis Bacon Documentation: It was assumed that it would take an environmental engineer twenty-four hours to prepare a Davis Bacon cost estimate and to support the Davis-Bacon determination.

Subcontractor Health and Safety Plan: Costs for the health and safety plan are based on Ryan's Pit, which cost approximately $10,000. It was assumed that these are A5H dollars. In addition, it was assumed that a safety engineer, an industrial hygienist, and a radiological engineer would each provide one week (40 hours) of support for review and document preparation.

Radiological Work Permit: It was assumed that it would take a radiological control technician two working days (18 hours) to complete counting preparation and review.

Implementation Plan: It was estimated that this activity would take 13 weeks of time for engineers, scientists or equivalent to complete. This would include preparation of an implementation plan as required (Rocky Flats Cleanup Agreement, Appendix 3, Interim Guidance Document, Dated August 1977). In addition this includes all tasks related to documentation for the Integrated Work Control Program and Integrated Safety Management.

Ecology Survey/National Environmental Protection Act (NEPA) Support: It was estimated that this would take 40 hours for an ecologist. The activities include NEPA review and support in document preparation, site surveys to verify compliance with ecological regulations, categorical exclusions, and NEPA evaluations.

Utility Clearance/Soil Disturbance Permits: It was estimated based on experience that it would take the equivalent 2 weeks (80 hours) for technical staff to do utility surveys, prepare and review soil disturbance permits, and prepare authorizing documents for excavation.

The combined resources for procurement and field preparations are:

**Total Procurement and Field Preparation Hours**

- Environmental Engineer 1134 hours
- Safety Engineer 40 hours
- Industrial Hygiene 40 hours
- Radiological Engineering 58 hours
- Radiological Control Technician 18 hours
- Ecologist/Life Scientist 40 hours
- Manager 50 hours
- Quality Assurance* 29 hours
- A5H Total $10,000

* On some projects these hours were assumed to be included in other tasks or part of this task under environmental engineer or one of the other job functions.

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.
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**Line Item 0100 - readiness assessment**

- **BOE**
  - Item Desc:
    - Estimator’s Experience based generally on historical data for Ryan’s Pit and T-3/T4 Remediation
  - Breakdown of Cost Data:
      - Units: hours
      - Unit Cost: $187
      - Unit Cost Adjustment Factor: 0.25
Revised Unit: 48

Units: 1 lot
Unit Cost: $4800
Unit Cost Adjustment Factor: 0.25
Revised Unit: $1200

It was estimated that subcontractor involvement would require 80 hours at $60/hour = $4,800. It was assumed that about 3 weeks of time was required for an environmental engineer or similar person in addition to 12 hours of project management, which yielded 132 hours. An additional 11 hours was added for management oversight. It was estimated that a radiological engineer (QA) and an industrial hygienist would be needed for 2.5 days each (22 hours).

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 projects will be conducted at once and only one of each fixed cost is needed for the group.

Factor 132 - Environmental Engineer 33 Hours
Factor 11 - Manager 3 Hours
Factor 22 - Quality Assurance 6 Hours
Factor 4,800 - ASH Subcontracted Srvs 1,200 Dollars

20 hours of administrative time will also be required.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

Resources

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Line Item 0200 - training

BOE

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc:
Conduct perform Training in support of source removal action.

Breakdown of Cost Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
Units: hours
Unit Cost: 132 Hours
Unit Cost Adjustment Factor: 0.25
Revised Unit: 33 hours

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
Units: 1 lot
Unit Cost: $12K
Unit Cost Adjustment Factor: 0.25
Revised Unit: $3K

Basis for adjustment. Costs for each UBC are divided by 4 to account for the fact that 4 UBCs will be remediated at once and only one Training is needed for the group.
It was estimated training would cost $1,000 per subcontractor worker and that 12 subcontractor employees would require training. It was estimated that onsite contractor employees would require the equivalent of 15 hours of training including instructor time and that eight onsite employees would be trained.

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

- Factor 132 - Onsite employees 33 Hours
- Factor 12000 - Subcontractor employees 3,000 dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Resources**

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**Line Item 0300 - pre-evolution meeting**

- Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:**
Conduct Pre-Evolution Meeting in support of source removal action

**Breakdown of Cost Data:**
- **Item:** Site Labor to perform above individual tasks for T-3/T-4.
  - Units: hours
  - Unit Cost: 60 hours
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit: 15 hours

- **Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
  - Units: 1 lot
  - Unit Cost: $6K
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit: $1.5K

**Basis for adjustment.** Costs for each UBC are divided by 4 to account for the fact that 4 UBCs will be remediated at once and only one Pre-Evolution Meeting is needed for the group.

- It was assumed that the Pre-Evolution Meeting would be limited to five hours. Assuming that 20 subcontract employees would attend at an average cost of $60/hour burdened yields a cost of $6,000. It was assumed that 12 onsite contractor employees would attend to yield another 60 hours.

- The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

- Factor 60 - Onsite employees 15 Hours
- Factor 6,000 - Subcontractor employees 1,500 dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### Activity ID: 1GHE644250

**Description:** Remedial Action - IHSS Group 400-4

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<td>1100</td>
<td>demobilization</td>
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**Total for Activity 1GHE644250:**

- **Quantity:** 2,423
- **Labor Hours Total:** 80,019
- **Labor Cost Total:** 122,137
- **Materials/Sub Cost:** 326,632
- **Total Cost:** 354,866

---

**Item Description:**

**Mobilization in support of remediation.**

**Breakdown of Cost Data:**

**Item:** Site Labor to perform above individual tasks for T-3/T-4.

- **Units:** hours
- **Unit Cost:** 1,100
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** 275

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.

- **Units:** 1 lot
- **Unit Cost:** 184k
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** see below

**Basis for adjustment.** The costs were divided into fixed costs and variable costs. The fixed costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

**T3/T4 hours**

- **110 Health Physicists** 27 Hours
- **330 Manager** 63 Hours
- **550 Environmental Engineer** 138 Hours
- **110 Industrial Hygienist** 27 Hours
- **184,000 Subcontractor** 46,000

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

**Resources**

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<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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### Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

**WBS No:** 1GAC0404  
**Activity ID:** 1GHE644250

#### Line Item 0200 - Site Preparations

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<tr>
<td><strong>ER Programs</strong></td>
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</table>

**Factors**

- 27 hours
- 46000 sub/c support

**Cost Element**

- **Line Item 0200 - Site Prep**

**BOE**

- **Estimator's Experience based generally on historical data for T-3/T4 Remediation.**

**Item Desc:**

**Site Preparation including setting up fencing, trailer, etc.**

**Breakdown of Historical Data:**

- **Item:** Site Labor to perform above individual tasks for T-3/T-4.
  - **Units:** hours
  - **Unit Cost:** see below
  - **Unit Cost Adjustment Factor:** see below
  - **Revised Unit:** see below

- **Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
  - **Units:** 1 lot
  - **Unit Cost:** see below
  - **Unit Cost Adjustment Factor:** see below
  - **Revised Unit:** see below

**Basis for adjustment:** The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

- T3/T4 hours 120 Environmental Engineer 30 hours
- T3/T4 dollars 30,000 Subcontracted Srvs 7,500 Dollars

**D&D construction trade hours were calculated using the following methodology:**

- ASK subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.
- RCT hours were calculated using the following methodology, unless they were already estimated.

**For Site Preparation tasks - RCT hours were the same as D&D construction hours.**

For all other tasks ASK subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under KG10H department code.

**This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.**

### Resources

<table>
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<tr>
<th>Cost Element</th>
<th>Skill</th>
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<th>Unit Cost</th>
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<td><strong>ER Programs</strong></td>
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- **BOE**

- **E050 ENVIRONMENTAL ENGINEERS**

- **R100S RMRS Salaried**

- **Line Item 0200 - Site Prep**

**Factors**

- 27 hrs
- 46000 sub/c support

- **Line Item 0300 - Excavation**

**BOE**

- **Estimator's Experience based generally on historical data for T-3/T4 Remediation.**

**Item Desc:**

**Excavation.**

---

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**6/23/00 9:21:11 AM**  
**OFFICIAL USE ONLY**
Breakdown of Historical Data:

Item: Site Labor to perform above individual tasks for T-3/T-4.
- Units: hours
- Unit Cost: see below
- Unit Cost Adjustment Factor: see below
- Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
- Units: 1 lot
- Unit Cost: see below
- Unit Cost Adjustment Factor: see below
- Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Total Contaminated Soil to be removed 269CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 269 CY

The excavation cost was based on the excavation cost for the T-3/T-4 Project. Burdened cost based on the T-3/T-4 actuals is $171,487. For the 3,800 cubic yards of contaminated soil removed this yielded a unit cost of $45 per cubic yard of contaminated soil removed. This estimate includes the removal of overburden that might be on top of the contaminated soil. The hours for an environmental engineer from T-3/T-4 were 1.09 hours per cubic yard of contaminated soil. Likewise the hours for the following were assumed to be linearly proportional:

- Health Physicists .47 hours per cubic yard
- Environmental Operations .31 hours per cubic yard
- Industrial Hygienists 0.31 hours per cubic yard
- Radiological Control Technician 1.00 hour per cubic yard

* Based on $50/cubic yard from T-3/T-4, assumes a labor rate of $50/hour

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

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<thead>
<tr>
<th>Factor</th>
<th>Skill</th>
<th>Hours</th>
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<td>Health Physicists</td>
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<td>0.31</td>
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<td>0.31</td>
<td>Industrial Hygienists</td>
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<td>1.00</td>
<td>Radiological Control Technician</td>
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<td>45.23</td>
<td>A5H Subcontracted Svrs</td>
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D&D construction trade hours were calculated using the following methodology:
A5H subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.
RCT hours were calculated using the following methodology, unless they were already estimated.
For Site Preparation tasks - RCT hours were the same as D&D construction hours.
For all other tasks A5H subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under KG10H department code.
The dollars amounts calculated for D&D construction workers and RCTs were subtracted from the subcontractor dollars and the revised A5H dollar amount was entered into Best.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

<table>
<thead>
<tr>
<th>Resources</th>
<th>Cost Element</th>
<th>Skill</th>
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Rocky Flats Closure Project
Baseline Cost and Basis of Estimate

WBS No: 1GAC0404
Activity ID: 1GHE644250

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<th>Activity ID</th>
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<td>1GHE644250</td>
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Line Item 0400 - remove and clean debris

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc:
Remove and clean debris.

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
- Units: hours
- Unit Cost: see below
- Unit Cost Adjustment Factor: see below
- Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
- Units: 1 lot
- Unit Cost: see below
- Unit Cost Adjustment Factor: see below
- Revised Unit: see below

 Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Total Contaminated Soil to be removed 269CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 269 CY

For the base case, it was assumed that about five cubic yards out of 700 cubic yards would be debris and would be segregated and cleaned. It was estimated that each cubic yard of debris would cost $1,000 or $5,000 total for 700 cubic yards. This yields a rate of $7.14 per cubic yard.

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 7.14 - ASH Subcontracted Srvs 1,921 Dollars

D&D construction trade hours were calculated using the following methodology:
ASH subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.

RCT hours were calculated using the following methodology, unless they were already estimated.
For Site Preparation tasks - RCT hours were the same as D&D construction hours.
For all other tasks ASH subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under KG10H department code.

The dollars amounts calculated for D&D construction workers and RCTs were subtracted from the subcontractor dollars and the revised ASH dollar amount was entered into Best.
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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**Line Item 0600 - confirmation sampling**

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:**
Confirmation Sampling.

**Breakdown of Historical Data:**

- **Item:** Site Labor to perform above individual tasks for T-3/T-4.
  - **Units:** hours
  - **Unit Cost:** see below
  - **Unit Cost Adjustment Factor:** see below
  - **Revised Unit:** see below

- **Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
  - **Units:** 1 lot
  - **Unit Cost:** see below
  - **Unit Cost Adjustment Factor:** see below
  - **Revised Unit:** see below

**Basis for adjustment.** The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

The analytical costs were based on T-3/T-4, which cost $435,574 for 3800 cubic yards of contaminated soil removed. This yielded a unit rate of about $115/cubic yard. Based on estimator experience the cost of sampling including labor and materials was estimated to be 20% of that rate or about $23/ cubic yard.

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

**Total Contaminated Soil to be removed 269CY**

**Total Soil for Thermal Desorption 0 CY**

**Offsite Waste Volume 269 CY**

- **Factor 114.62 - A5H Subcontracted Srvs (Analytical) 30,833 Dollars**
- **Factor 22.924 - A5H Subcontracted Srvs 6,167 Dollars**

D&D construction trade hours were calculated using the following methodology:

A5H subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.

RCT hours were calculated using the following methodology, unless they were already estimated.

For Site Preparation tasks - RCT hours were the same as D&D construction hours.

For all other tasks A5H subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under KG10H department code.

The dollars amounts calculated for D&D construction workers and RCTs were subtracted from the subcontractor dollars and the revised A5H dollar amount was entered into Best.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
Line Item 0700 - prepare waste acceptance forms

BOE

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc:
Prepare Waste Acceptance Forms

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
   Units: hours
   Unit Cost: see below
   Unit Cost Adjustment Factor: see below
   Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
   Units: 1 lot
   Unit Cost: see below
   Unit Cost Adjustment Factor: see below
   Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

T3/T4 hours 80 environmental engineer 20 hours

Resources

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<tr>
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<th>Skill</th>
<th>Department</th>
<th>Curve</th>
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<th>Units</th>
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Line Item 0800 - waste acceptance sampling

BOE

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc:
Waste Acceptance Sampling

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
   Units: hours
   Unit Cost: see below
   Unit Cost Adjustment Factor: see below
   Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
   Units: 1 lot
   Unit Cost: see below
   Unit Cost Adjustment Factor: see below
   Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Because the waste acceptance sampling is difficult to predict and could vary significantly from project to project, it was assumed that about $800 worth of...
additional analysis would be required for 20 cubic yards which is the volume that can be placed in one roll-off. This yielded a unit rate of about $40/cubic yard. This sampling and analysis is in addition to the confirmational samples so the costs are not as great. It was assumed that this sampling would be more labor intensive so the sampling costs were estimated to be about 50% of the analytical costs or about $20/cubic yard.

Total Contaminated Soil to be removed 269CY
Total Soil for Thermal Desorption 0 CY

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 40 - A5H Analytical 10,760 Dollars
Factor 20 - A5H Subcontracted Srvs 2,152 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

<table>
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<tr>
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<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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BoE

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc: Field Oversight and Project Management

Breakdown of Historical Data:

Item: Site Labor to perform above individual tasks for T-3/T-4.
  Units: hours
  Unit Cost: see below
  Unit Cost Adjustment Factor: see below
  Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
  Units: 1 lot
  Unit Cost: see below
  Unit Cost Adjustment Factor: see below
  Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

It was assumed that a field manager would be needed for 150 nine-hour working days or about 33 weeks. This work breaks down as follows:

Preparation Activities 50 working days
Field Activities - 80 working days
Demobilization - 20 working days
Total 150 nine-hour working days or 1350 hours

In addition it was estimated that technical staff, quality assurance, and project management would be required for the equivalent of ten additional weeks, which is 400 hours each. These values yielded unit rates as follows:

Hours Per Cubic Yard Of Contaminated Soil
Field Manager 1.93
Technical Staff .57
Quality Assurance .57
Project Management 0.57
The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Total Contaminated Soil to be removed: 269 CY
Total Soil for Thermal Desorption: 0 CY
Offsite Waste Volume: 269 CY

Factor 1.93 - Environmental Engineer: 519 Hours
Factor 0.57 - Technical Support: 153 Hours
Factor 0.57 - Project Manager: 153 Hours
Factor 0.57 - Quality Assurance: 153 Hours

Cost Element | Skill | Quantity | Units | Curve | Department |
-------------|-------|----------|-------|-------|------------|
Line Item 1000 - backfill
BOE

Trade Publication
Means 1995, Site Work & Landscape Cost Data (page 34, 42, and 34)

Item Desc:
Backfill.

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
Units: hours
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
Units: 1 lot
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs include Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Means (1995) Site Work & Landscape Cost Data as follows:
Common Fill $4.77/cubic yard (page 34 Borrow Bank Measure)
Hauling $3.98/cubic yard (page 42 2-mile round-trip, 6 cubic yard dump truck)
Backfilling $1.69/cubic yard (page 34)
Burden (43%) $4.49/cubic yard
Total $14.23/cubic yard or about $15/cubic yard

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 15 - A5H Subcontracted Svrs 4,035 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
Line Item 1100 - demobilization

BOE

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc:
Demobilization.

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
Units: hours
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
Units: 1 lot
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Demobilization: Based on the T-3/T-4 project, it was assumed that demobilization costs would cover demobilization for excavation activities also. The subcontractor cost for demobilization was about $95,000 for 3,800 cubic yards at the T-3/T-4 project. In addition it was estimated that the following hours were necessary:

- Environmental Engineer 300 hours
- Health Physicist 100 hours
- Manager 200 hours
- Industrial Hygiene 100 hours

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

- Factor 300 - Environmental Engineer 75 Hours
- Factor 100 - Health Physicists 25 Hours
- Factor 200 - Manager 50 Hours
- Factor 100 - P090 Industrial Hygienists 25 Hours
- Factor 95000 - ASH Subcontracted Srvs 23,750 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

**WBS No:** 1GAC0404

**Activity ID:** 1GHE644250

**Project:** Rocky Flats Closure Project

**Baseline Devl:**

**WBS Filter:** 1GAC

**Activity Filter:**

**Starts In FY:**

---

**Line Item SYS - Contingency And Escalation**

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<th>Cost Element</th>
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**Activity ID:** 1GHE644270

**Description:** Prepare Closeout Report - IHSS Group 400-4

**Cost Risk:** 1

**Schedule Risk:** 1

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**Total for Activity 1GHE644270:**

- Labor Hours Total: 320
- Labor Cost Total: 9,045
- Total Prime Cost: 6,522
- Burden Cost: 0
- Total Cost: 15,567

---

**Breakdown of Cost Data:**

**Item:** Develop Documentation

**Units:** hours

**Unit Cost:** 320

**Unit Cost Adjustment Factor:** none

**Revised Unit Hours:** 320

**Estimated based on estimator’s experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.**

**Item Desc:** Perform Data Analysis including GIS representation of data, Closeout Report, and associated project management.

**Required level of effort:**

- Environmental Engineer - 80 hours
- Environmental Scientist - 160 hours (GIS, SWD)
- Computer Specialist - 160 hours (GIS, SWD)
- Manager - 20 hours
- Administrative - 20 hours
- Cost Estimators - 20 hours

**Breakdown of Cost Data:**

**Item:** Develop Documentation

**Units:** hours

**Unit Cost:** 320

**Unit Cost Adjustment Factor:** none

**Revised Unit Hours:** 320

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**Resources**

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**Line Item SYS - Contingency And Escalation**

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**Activity ID:** 1GHE644270

**Description:** Prepare Closeout Report - IHSS Group 400-4

**Cost Risk:** 1

**Schedule Risk:** 1

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**Total for Activity 1GHE644270:**

- Labor Hours Total: 320
- Labor Cost Total: 9,045
- Total Prime Cost: 6,522
- Burden Cost: 0
- Total Cost: 15,567

---

**Breakdown of Cost Data:**

**Item:** Develop Documentation

**Units:** hours

**Unit Cost:** 320

**Unit Cost Adjustment Factor:** none

**Revised Unit Hours:** 320

**Estimated based on estimator’s experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.**

**Item Desc:** Perform Data Analysis including GIS representation of data, Closeout Report, and associated project management.

**Required level of effort:**

- Environmental Engineer - 80 hours
- Environmental Scientist - 160 hours (GIS, SWD)
- Computer Specialist - 160 hours (GIS, SWD)
- Manager - 20 hours
- Administrative - 20 hours
- Cost Estimators - 20 hours

**Breakdown of Cost Data:**

**Item:** Develop Documentation

**Units:** hours

**Unit Cost:** 320

**Unit Cost Adjustment Factor:** none

**Revised Unit Hours:** 320

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## Project: Rocky Flats Closure Project
### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0404

**Activity ID:** 1GHE644270

**Baseline Devl; WBS Filter; 1GAC**

### Activity Filter

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- **CON CONTINGENCY 0000 NONE 1GAC No Department**
- **ESC ESCALATION 0000 NONE 1GAC No Department**

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## WBS No: 1GAC0405
### Title: Group 400-5 (B460)

**Activity ID:** 1GFP016100

**Description:** SAP Preparation - IHSS Group 400-5 (B460)

### Schedule Risk 1

### Cost Risk 1

### Line Item 0100 - SAP Addenda

**Description:** Preparation of SAP Addenda to Industrial Area Characterization Plan

**Breakdown of Cost Data:**
- **Item:** Preparation of SAP addenda
- **Units:** hours
- **Unit Cost:** 120
- **Unit Cost Adjustment Factor:** none
- **Revised Unit Hours:** 120

**Basis for adjustment:**
- This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**BOE:**
- Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Item Desc:**
- Preparation of SAP Addenda to Industrial Area Characterization Plan

### Resources

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### Line Item 0200 - HASP Addenda

**Description:** Preparation of HASP addenda to Industrial Area Characterization Plan

**Breakdown of Cost Data:**
- **Item:** Preparation of addenda for HASP
- **Units:** hours
- **Unit Cost:** 140
- **Unit Cost Adjustment Factor:** none
- **Revised Unit Hours:** 140

**Basis for adjustment:**
- This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**BOE:**
- Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Item Desc:**
- Preparation of HASP addenda to Industrial Area Characterization Plan

### Resources

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<th>Curve</th>
<th>Quantity</th>
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**Total for Activity 1GFP016120:**

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<td><strong>Total</strong></td>
<td><strong>345</strong></td>
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<td><strong>2,114</strong></td>
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**Line Item 0100 - procurement & field prep**

Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T-4 Remediation

**Item Desc:**

**Breakdown of Cost Data:**
- **Item:** Site Labor to perform above individual tasks for either Ryan's Pit or T-3/T-4.
  - **Units:** hours
  - **Unit Cost:** 1380
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** 345 hours
- **Item:** Subcontractor costs to perform above individual tasks for either Ryan's Pit or T-3/T-4.
  - **Units:** 1 lot
  - **Unit Cost:** $10K
Unit Cost Adjustment Factor: 0.25  
Revised Unit: $2.5K

Basis for adjustment. Hours and costs for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be characterized at once.

Procurement includes preparation of statement of work, proposal review (technical evaluation), and negotiations. Based on a T-3/T-4 burdened cost of $29,186.52. Assuming it is primarily labor hours (RMRS Environmental Engineer charging at $57.45 per hour) yields 508 hours which rounds to 510 total hours.

Davis Bacon Documentation: It was assumed that it would take an environmental engineer twenty-four hours to prepare a Davis Bacon cost estimate and to support the Davis-Bacon determination.

Subcontractor Health and Safety Plan: Costs for the health and safety plan are based on Ryan's Pit, which cost approximately $10,000. It was assumed that these are A5H dollars. In addition, it was assumed that a safety engineer, an industrial hygienist, and a radiological engineer would each provide one week (40 hours) of support for review and document preparation.

Radiological Work Permit: It was assumed that it would take a radiological control technician two working days (18 hours) to complete counting preparation and review.

Implementation Plan: It was estimated that this activity would take 13 weeks of time for engineers, scientists or equivalent to complete. This would include preparation of an implementation plan as required (Rocky Flats Cleanup Agreement, Appendix 3, Interim Guidance Document, Dated August 1977). In addition this includes all tasks related to documentation for the Integrated Work Control Program and Integrated Safety Management.

Ecology Survey/National Environmental Protection Act (NEPA) Support: It was estimated that this would take 40 hours for an ecologist. The activities include NEPA review and support in document preparation, site surveys to verify compliance with ecological regulations, categorical exclusions, and NEPA evaluations.

Utility Clearance/Soil Disturbance Permits: It was estimated based on experience that it would take the equivalent 2 weeks (80 hours) for technical staff to do utility surveys, prepare and review soil disturbance permits, and prepare authorizing documents for excavation.

The combined resources for procurement and field preparations are:

<table>
<thead>
<tr>
<th>Total Procurement and Field Preparation Hours</th>
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<tr>
<td>Environmental Engineer 1134 hours</td>
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<tr>
<td>Safety Engineer 40 hours</td>
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<td>Industrial Hygiene 40 hours</td>
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<td>Ecologist/Life Scientist 40 hours</td>
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<td>Quality Assurance* 29 hours</td>
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<td>A5H Total $10,000</td>
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* On some projects these hours were assumed to be included in other tasks or part of this task under environmental engineer or one of the other job functions.

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

- Factor 1134 - Environmental Engineer 283 Hours
- Factor 40 - Safety Engineer 10 Hours
- Factor 40 - Industrial Hygiene 10 Hours
- Factor 58 - Radiological Engineering 14 Hours
- Factor 18 - RCT 5 Hours
- Factor 40 - Life Scientist 10 Hours
- Factor 50 - Project Manager 13 Hours
- Factor 10000 - A5H Subcontracted Services 2,500 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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**Rocky Flats Closure Project**

**Baseline Cost and Basis of Estimate**

- **WBS No:** 1GAC0405
- **Activity ID:** 1GFP016120
- **WBS Filter:** 1GAC
- **Activity Filter:** *
- **Starts In FY:** *

### Activity 1GFP016140
**Description:** Readiness Assessment - IHSS Group 400-5

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Total for Activity 1GFP016140: 68, 1,887, 1,015, 490, 3,393, 532, 3,925

### Breakdown of Cost Data:

**Item:** Site Labor to perform Readiness Assessment for T-3/T4 Remediation
- **Units:** hours
- **Unit Cost:** $187
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** 48

**Item:** Subcontractor costs to perform Readiness Assessment for T-3/T4 Remediation
- **Units:** 1 lot
- **Unit Cost:** $4800
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** $1200

It was estimated that subcontractor involvement would require 80 hours at $60/hour = $4,800. It was assumed that about 3 weeks of time was required for an environmental engineer or similar person in addition to 12 hours of project management, which yielded 132 hours. An additional 11 hours was added for management oversight. It was estimated that a radiological engineer (QA) and an industrial hygienist would be needed for 2.5 days each (22 hours).

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 projects will be conducted at once and only one of each fixed cost is needed for the group.

- **Factor 132:** Environmental Engineer 33 Hours
- **Factor 22:** Health Physicists 6 Hours
- **Factor 11:** Manager 3 Hours
- **Factor 22:** Quality Assurance 6 Hours

---

**Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation**

Item Desc:
Evaluate readiness of the field characterization team and plans.
Factor 4,800 – ASH Subcontracted Srvs $1,200 Dollars

20 hours of administrative time will also be required.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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**Activity ID: 1GFP016150**

**Description:** Field Sampling, Lab Analysis - IHSS Group 400-5

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**Total for Activity 1GFP016150:**

192 5,721 31,127 5,578 42,426 1,613 44,039

**Item Description:**

Estimate based on estimator's experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Item Description:** Collection of geoprobe samples with the site geoprobe with two technicians. A site Environmental Engineer will direct the boring placement, log the borings; collect, containerize, package, and ship the samples; prepare field QC documentation, and prepare field notes on a full time basis. A site RCT will monitor the site for radiological contamination on a full time basis. A site Industrial Hygienist will implement the field portion of the HASP on a full time basis. Decon Operations staff will decon the vehicle and equipment when it leaves the work area on a half time basis. Decon Operations staff will decon the vehicle and equipment when it leaves the work area on a half time basis. It is estimated that one 10' boring will be place per 500 SF of building footprint (same as Bldg. 123 characterization) with 5 samples per 10' boring. It is estimated that one boring per eight hours can be completed.

**Breakdown of Cost Data:**

**Item:** Site Personnel for support of geoprobe samples

- Units: hours
- Unit Cost: 32
- Revised Unit Hours: 32

**Item:** Kaiser-Hill/RMRS Geoprobe unit with 2 Technician crew. Item costs $100 per hour or $800 per 8-hour day.

- Units: dollars
- Unit Cost: 800
- Unit Cost Adjustment Factor: none
Revised Unit Hours: 800

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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### Line Item 0200 - analyze samples

**BOE**

**Vendor Quote**

**Item Desc:**

Analyze samples produced from geoprobe borings. It is anticipated that 3 samples from each boring will be collected. They will be analyzed for Metals, VOCs, SVOCs, PCBs, and radionuclides (est. 3 isotopes) with a 30 day TAT. This item is priced on a per sample basis. Per sample costs include DOT rad screen, bottle charge, shipping, and validation.

**Breakdown of Cost Data:**

- **Item:** Analyze samples at an offsite laboratory.
- **Units:** Analysis
- **Unit Cost:** Metals $345, VOCs $280, SVOCs $440, PCBs and other analytes $150, and Radionuclides (est. 3 isotopes) $590 per each sample.
- **Unit Cost Adjustment Factor:**
  - DOT rad screen: 32/sample
  - Bottle charge: 7/sample
  - Shipping: 4.2/bottle
  - Validation per each: $17.30 VOA, $19.25 SVOC, $16.75 Metals, $5.95 PCB, and $15.60 Rad.

**Revised Unit Hours:** Metals 405, VOCs 341, SVOCs 502, PCBs and other analytes 199, and Rad 649.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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### Line Item 0300 - project mgmt oversight

**BOE**

**Estimator's Experience**

**Item Desc:**

Project Management/Oversight. Based on half time for a Project Manager, Administrative staff, and Cost Estimator/Scheduler

**Breakdown of Cost Data:**

- **Item:** Mgmt oversight
- **Units:** Hours
- **Unit Cost:** 12
- **Unit Cost Adjustment Factor:** none
- **Revised Unit Hours:** 12

**Basis for adjustment:**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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The document contains a detailed cost and basis of estimate for a project. It includes information on activity IDs, resource requirements, and cost breakdowns. The table includes columns for cost element, skill, quantity, units, labor hours/unit, labor cost, and total cost. The document also contains detailed descriptions of work activities, including environmental engineering, computer systems analysis, and administrative support. The data is presented in a structured format, making it easy to understand the costs associated with each activity.
Project: Rocky Flats Closure Project
Baseline Cost and Basis of Estimate

WBS No: 1GAC0405
Activity ID: 1GFP016170

Baseline Devl
WBS Filter: 1GAC
Activity Filter: *
Starts In FY: *

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Total for Activity 1GFP016180: 289 9,164 0 1,677 10,841 2,584 13,426

Estimator's Experience based generally on historical data for Ryan's Pit

Item Desc:
Preparation of of PAM or IM/IRA in support of source removal of previously characterized UBC.

Proposed Action Memorandum: A bottoms-up estimate based on historical costs was used as the basis for the estimate. Based on Ryan's Pit (IHSS 108), the cost for the PAM was $50,000 (contractor costs). Assuming that labor rates at this time were approximately $75 (based on a cost center 217). The total labor for a PAM would be approximately 666 hours, which rounds to 700 hours. It was assumed that 10% would be required for managerial hours.

For a PAM the total labor hours are:

Environmental Engineer 700 Hours
Manager 70 Hours

Factor 700 Environmental Engineer 175 hours
Factor 70 Manager 18 hours

Breakdown of Cost Data:
Item: Preparation of PAM for Ryan's Pit source removal action.
Units: hours
Unit Cost: 770
Unit Cost Adjustment Factor: 0.25
Revised Unit Hours: 193

Basis for adjustment. Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

Interim Measure/Interim Remedial Action Decision Document: It was assumed that an IM/IRA Decision Document would take 75% more effort than a PAM or 1,166 hours, which rounds to 1200 hours. It was assumed that 10% of this labor would be required for managerial hours.

For an IM/IRA the total labor hours are:

Environmental Engineer 1200 Hours
Manager 120 Hours
Factor 1200 Environmental Engineer 300 hours
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#### Item Desc:
Estimator's Experience based generally on historical data for Ryan's Pit.

#### Breakdown of Historical Data:
- **Item:** Preparation of SAP in support of source removal of previously characterized UBC.
- **Units:** hours
- **Unit Cost:** 300
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit Hours:** 76

#### Basis for adjustment:
Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

#### Sampling and Analysis Plan:
Based on the T-3/T-4 Sampling and Analysis Plan (SAP) it took 300 hours in total preparation time. It was assumed that 10% of this labor was for managerial hours (30 hours) and that the rest of the time, 270 hours, was for technical staff. It was assumed that these hours include all labor including quality assurance, secretarial support, graphics etc.

#### Original Hours:
- 270 Environmental Engineer 68 hours
- 30 Manager 8 hours

### Resources

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#### Item Desc:
Estimator's Experience based generally on historical data for Ryan's Pit.

#### Breakdown of Historical Data:
- **Item:** Preparation of WMP in support of source removal of previously characterized UBC.
- **Units:** hours
- **Unit Cost:** 80
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit Hours:** 20

#### Basis for adjustment:
Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.
### Rocky Flats Closure Project

#### Baseline Cost and Basis of Estimate

**Project:** Baseline Devi  
**WBS Filter:** 1GAC  
**Activity Filter:** *  
**Starts in FY:** *

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#### Activity ID: 1GFP016210

- **Description:** Procurement and Field Prep - IHSS Group 400-5
- **Factors:** 1128.02 Dollars

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**Total for Activity 1GFP016210:**

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**Line Item 0100 - procurement & field prep**

- **BOE Estimator's Experience:** Based generally on historical data for Ryan's Pit and T-3/T4 Remediation
- **Item Desc:**

**Breakdown of Cost Data:**

- **Item:** Site Labor to perform above individual tasks for either Ryan's Pit or T-3/T-4.
  - **Units:** hours
  - **Unit Cost:** $1,380
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** 345 hours

- **Item:** Subcontractor costs to perform above individual tasks for either Ryan's Pit or T-3/T-4.
  - **Units:** 1 lot
  - **Unit Cost:** $10K
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** $2.5K

**Basis for adjustment:** Hours and costs for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be characterized at once.

**Procurement includes preparation of statement of work, proposal review (technical evaluation), and negotiations.** Based on a T-3/T-4 burdened cost of $29,186.52. Assuming it is primarily labor hours (RMRS Environmental Engineer charging at $57.45 per hour) yields 508 hours which rounds to 510 total hours.

**Davis Bacon Documentation:** It was assumed that it would take an environmental engineer twenty-four hours to prepare a Davis Bacon cost estimate and to support the Davis-Bacon determination.

**Subcontractor Health and Safety Plan:** Costs for the health and safety plan are based on Ryan's Pit, which cost approximately $10,000. It was assumed that these are A5H dollars. In addition, it was assumed that a safety engineer, an industrial hygienist, and a radiological engineer would each provide one week (40 hours) of support for review and document preparation.

**Radiological Work Permit:** It was assumed that it would take a radiological control technician two working days (18 hours) to complete counting preparation and review.

**Implementation Plan:** It was estimated that this activity would take 13 weeks of time for engineers, scientists or equivalent to complete. This would include preparation of an implementation plan as required (Rocky Flats Cleanup Agreement, Appendix 3, Interim Guidance Document, Dated August 1977). In addition, this includes all tasks related to documentation for the Integrated Work Control Program and Integrated Safety Management.

**Ecology Survey/National Environmental Protection Act (NEPA) Support:** It was estimated that this would take 40 hours for an ecologist. The activities include NEPA review and support in document preparation, site surveys to verify compliance with ecological regulations, categorical exclusions, and NEPA evaluations.

**Utility Clearance/Soil Disturbance Permits:** It was estimated based on experience that it would take the equivalent 2 weeks (80 hours) for technical staff to do utility surveys, prepare and review soil disturbance permits, and prepare authorizing documents for excavation.

The combined resources for procurement and field preparations are:

- Total Procurement and Field Preparation Hours
  - Environmental Engineer 1134 hours
  - Safety Engineer 40 hours
  - Industrial Hygiene 40 hours
  - Radiological Engineering 58 hours
Radiological Control Technician 18 hours
Ecologist/Life Scientist 40 hours
Manager 50 hours
Quality Assurance* 29 hours
A5K Total $10,000

* On some projects these hours were assumed to be included in other tasks or part of this task under environmental engineer or one of the other job functions.

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

- Factor 1134 - Environmental Engineer 283 Hours
- Factor 40 - Safety Engineer 10 Hours
- Factor 40 - Industrial Hygiene 10 Hours
- Factor 58 - Radiological Engineering 14 Hours
- Factor 18 - RCT 5 Hours
- Factor 50 - Project Manager 13 Hours
- Factor 10000 - ASH Subcontracted Services 2,500 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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### Activity 1GFP016240

**Description**: Readiness Assessment - IHSS Group 400-5

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Page 325 of 1121
Line Item 0100 - readiness assessment

**BOE**

Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation

**Item Desc:**
Evaluate readiness of the field characterization team and plans.

**Breakdown of Cost Data:**

**Item:** Site Labor to perform Readiness Assessment for T-3/T-4.
- Units: hours
- Unit Cost: 187
- Unit Cost Adjustment Factor: 0.25
- Revised Unit: 48

**Item:** Subcontractor costs to perform Readiness Assessment for T-3/T-4.
- Units: 1 lot
- Unit Cost: $4800
- Unit Cost Adjustment Factor: 0.25
- Revised Unit: $1200

It was estimated that subcontractor involvement would require 80 hours at $60/hour = $4,800. It was assumed that about 3 weeks of time was required for an environmental engineer or similar person in addition to 12 hours of project management, which yielded 132 hours. An additional 11 hours was added for management oversight. It was estimated that a radiological engineer (QA) and an industrial hygienist would be needed for 2.5 days each (22 hours).

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 projects will be conducted at once and only one of each fixed cost is needed for the group.

**Factors**
- Factor 132 - Environmental Engineer 33 Hours
- Factor 22 - Health Physicists 6 Hours
- Factor 11 - Manager 3 Hours
- Factor 4,800 - A5H Subcontracted Srvs 1,200 Dollars

20 hours of administrative time will also be required.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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Line Item 0200 - training

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:**
Conduct perform Training in support of source removal action.

**Breakdown of Cost Data:**

**Item:** Site Labor to perform above individual tasks for T-3/T-4.
- Units: hours
- Unit Cost: 132 Hours
Item: Subcontractor costs to perform above individual tasks for T-3/T-4.

- Units: 1 lot
- Unit Cost: $12K
- Unit Cost Adjustment Factor: 0.25
- Revised Unit: $3K

Basis for adjustment. Costs for each UBC are divided by 4 to account for the fact that 4 UBCs will be remediated at once and only one training is needed for the group.

It was estimated that on-site contractor employees would require the equivalent of 15 hours of training including instructor time and that eight on-site employees would be trained.

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

Factor 132 - Onsite employees 33 Hours
Factor 12000 - Subcontractor employees 3,000 dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

### Resources

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### Line Item 0300 - pre-evolution meeting

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:**
Conduct Pre-Evolution Meeting in support of source removal action

**Breakdown of Cost Data:**

- **Item:** Site Labor to perform above individual tasks for T-3/T-4.
  - Units: hours
  - Unit Cost: 60 hours
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit: 15 hours

- **Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
  - Units: 1 lot
  - Unit Cost: $6K
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit: $1.5K

Basis for adjustment. Costs for each UBC are divided by 4 to account for the fact that 4 UBCs will be remediated at once and only one Pre-Evolution Meeting is needed for the group.

It was assumed that the Pre-Evolution Meeting would be limited to five hours. Assuming that 20 subcontract employees would attend at an average cost of $60/hour burdened yields a cost of $6,000. It was assumed that 12 on-site contractor employees would attend to yield another 60 hours.

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

Factor 60 - Onsite employees 15 Hours
Factor 6,000 - Subcontractor employees 1,500 dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### Rocky Flats Closure Project - Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0405  
**Activity ID:** 1GFP016240

#### Project Details
- **Baseline Deviation:** 1GAC
- **Activity Filter:** 1GAC
- **Starts In FY:** *

#### WBS Filter: Baseline Cost and Basis of Estimate

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#### Activity Details
- **Activity ID:** 1GFP016240  
- **Description:** Remedial Action - IHSS Group 400-5

#### Activity Details Table

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**Total for Activity 1GFP016250:**

- **Total Hours:** 701
- **Total Labor Cost:** 24,345
- **Total Materials/Sub Cost:** 68,880
- **Total Contingency & Escalation:** 87,376
- **Total Prime Cost:** 180,601
- **Burden Cost:** 8,620
- **Total Cost:** 189,221

### Additional Notes
- **BOE:** Estimator's Experience based generally on historical data for T-3/T4 Remediation.

#### Breakdown of Cost Data:
- **Item**: Site Labor to perform above individual tasks for T-3/T-4.
  - **Units**: hours
  - **Unit Cost**: 1,100
  - **Unit Cost Adjustment Factor**: 0.25
  - **Revised Unit**: 275

#### Contingency Costs
- **Item**: Subcontractor costs to perform above individual tasks for T-3/T-4.
  - **Units**: 1 lot
  - **Unit Cost**: 184k
  - **Unit Cost Adjustment Factor**: 0.25
  - **Revised Unit**: not specified

**Basis for adjustment.** The costs were divided into fixed costs and variable costs. The fixed costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once. The variable costs are calculated on a per yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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**Line Item 0200 - site prep**

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:**

- Site Preparation including setting up fencing, trailer, etc.

**Breakdown of Historical Data:**

- **Item:** Site Labor to perform above individual tasks for T-3/T-4.
  - **Units:** hours
  - **Unit Cost:** see below
  - **Unit Cost Adjustment Factor:** see below
  - **Revised Unit:** see below

- **Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
  - **Units:** 1 lot
  - **Unit Cost:** see below
  - **Unit Cost Adjustment Factor:** see below
  - **Revised Unit:** see below

**Basis for adjustment.** The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

- T3/T4 hours 120 Environmental Engineer 30 hours
- T3/T4 dollars 30,000 Subcontracted Svrs 7,500 Dollars
- D&D construction trade hours were calculated using the following methodology:
- A5H subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.
- RCT hours were calculated using the following methodology, unless they were already estimated.

For Site Preparation tasks - RCT hours were the same as D&D construction hours. For all other tasks A5H subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under KG10H department code.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
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Line Item 0300 - excavation

BOE

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc:
Excavation.

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
  Units: hours
  Unit Cost: see below
  Unit Cost Adjustment Factor: see below
  Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
  Units: 1 lot
  Unit Cost: see below
  Unit Cost Adjustment Factor: see below
  Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Total Contaminated Soil to be removed 22CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 22 CY

The excavation cost was based on the excavation cost for the T-3/T-4 Project. Burdened cost based on the T-3/T-4 actuals is $171,487. For the 3,800 cubic yards of contaminated soil removed this yielded a unit cost of $45 per cubic yard of contaminated soil removed. This estimate includes the removal of overburden that might be on top of the contaminated soil. The hours for an environmental engineer from T-3/T-4 were 1.09 hours per cubic yard of contaminated soil. Likewise the hours for the following were assumed to be linearly proportional:

Health Physicists .47 hours per cubic yard
Environmental Operations .31 hours per cubic yard
Industrial Hygienists 0.31 hours per cubic yard
Radiological Control Technician 1.00 hour per cubic yard*

* Based on $50/cubic yard from T-3/T-4, assumes a labor rate of $50/hour

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 1.09 - Environmental Engineer 24 Hours
Factor 0.47 - Health Physicists 10 Hours
Factor 0.31 - Environmental Operations 7 Hours
Factor 0.31 - Industrial Hygienists 7 Hours
Factor 1.00 - Radiological Control Technician Linear 22 Hours
Factor 45.23 - ASH Subcontracted Svrs 996 Dollars

Additional adjustments to hours and subcontractor services were based on the presence of tanks and professional judgement.

D&D construction trade hours were calculated using the following methodology:

ASH subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.

RCT hours were calculated using the following methodology, unless they were already estimated.
For Site Preparation tasks - RCT hours were the same as D&D construction hours.
For all other tasks A5H subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under KG10H department code.

The dollars amounts calculated for D&D construction workers and RCTs were subtracted from the subcontractor dollars and the revised A5H dollar amount was entered into Best.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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<tr>
<th>Resources</th>
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Line Item 0400 - remove and clean debris

Estimator's Experience based generally on a base case of 700 cy.

Item Desc:
Remove and clean debris.

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
- Units: hours
  - Unit Cost: see below
  - Unit Cost Adjustment Factor: see below
  - Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
- Units: 1 lot
  - Unit Cost: see below
  - Unit Cost Adjustment Factor: see below
  - Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Total Contaminated Soil to be removed 22CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 22 CY

It was assumed that about five cubic yards out of 700 cubic yards would be debris and would be segregated and cleaned. It was estimated that each cubic yard of debris would cost $1,000 or $5,000 total for 700 cubic yards. This yields a rate of $7.14 per cubic yard.

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.
Additional adjustments to hours and subcontractor services were based on the presence of tanks and professional judgement.

D&D construction trade hours were calculated using the following methodology:

D&D subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.

RCT hours were calculated using the following methodology, unless they were already estimated.

For Site Preparation tasks - RCT hours were the same as D&D construction hours.

For all other tasks A5H subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under KG10H department code.

The dollars amounts calculated for D&D construction workers and RCTs were subtracted from the subcontractor dollars and the revised A5H dollar amount was entered into Best.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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<tr>
<th>Cost Element</th>
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### Breakdown of Historical Data:

Item Desc: Confirmation Sampling.

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The fixed costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Total Contaminated Soil to be removed 22 CY

Total Soil for Thermal Desorption 0 CY

Offsite Waste Volume 22 CY

The analytical costs were based on T-3/T-4, which cost $435,574 for 3800 cubic yards of contaminated soil removed. This yielded a unit rate of about $115/cubic yard. Based on estimator experience the cost of sampling including labor and materials was estimated to be 20% of that rate or about $23/ cubic yard.

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.
D&D construction trade hours were calculated using the following methodology:

A5H subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.

RCT hours were calculated using the following methodology, unless they were already estimated.

For Site Preparation tasks - RCT hours were the same as D&D construction hours.

For all other tasks A5H subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under KG10H department code.

The dollars amounts calculated for D&D construction workers and RCTs were subtracted from the subcontractor dollars and the revised A5H dollar amount was entered into Best.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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### Resources

**Line Item 0700 - prepare waste acceptance forms**

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Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc:
Prepare Waste Acceptance Forms

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.

- Units: hours
- Unit Cost: see below
- Unit Cost Adjustment Factor: see below
- Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.

- Units: 1 lot
- Unit Cost: see below
- Unit Cost Adjustment Factor: see below
- Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

T3/T4 hours 80 environmental engineer 20 hours
WBS No: 1GAC0405
Activity ID: 1GFPO16250

### Rocky Flats Closure Project
#### Baseline Cost and Basis of Estimate

**Project**
Baseline Devl

**WBS Filter**
1GAC

**Activity Filter**

**Suite In FY**

---

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Item: Subcontractor costs to perform above individual tasks for T-3/T-4.

- Units: 1 lot
- Unit Cost: see below
- Unit Cost Adjustment Factor: see below
- Revised Unit: see below

**Basis for adjustment.** The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Because the waste acceptance sampling is difficult to predict and could vary significantly from project to project, it was assumed that about $800 worth of additional analysis would be required for 20 cubic yards which is the volume that can be placed in one roll-off. This yielded a unit rate of about $40/cubic yard. This sampling and analysis is in addition to the confirmational samples so the costs are not as great. It was assumed that this sampling would be more labor intensive so the sampling costs were estimated to be about 50% of the analytical costs or about $20/cubic yard.

Total Contaminated Soil to be removed 22 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 22 CY

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 40 - ASH Analytical 880 Dollars
Factor 20 - ASH Subcontracted Svrs 440 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

#### Resources

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**Line Item 0900 - field oversight & project mgmt**

BOE

Estimator's Experience based generally on a base case of 700 cy.

**Item Desc:**
Field Oversight and Project Management

**Breakdown of Historical Data:**

**Item:** Site Labor to perform above individual tasks for T-3/T-4.

- Units: hours
- Unit Cost: see below
- Unit Cost Adjustment Factor: see below
- Revised Unit: see below

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.

- Units: 1 lot
- Unit Cost: see below
- Unit Cost Adjustment Factor: see below
- Revised Unit: see below

**Basis for adjustment.** The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.
It was assumed that a field manager would be needed for 150 nine-hour working days or about 33 weeks. This work breaks down as follows:

- Preparation Activities: 50 working days
- Field Activities: 80 working days
- Demobilization: 20 working days

Total 150 nine-hour working days or 1350 hours

In addition it was estimated that technical staff, quality assurance, and project management would be required for the equivalent of ten additional weeks, which is 400 hours each.

Based on the base case of a 700 cubic yard removal project, these values yielded unit rates as follows:

- Hours Per Cubic Yard
- Field Manager: 1.93 hours
- Technical Staff: 0.57 hours
- Quality Assurance: 0.57 hours
- Project Management: 0.57 hours

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 1.93 - Environmental Engineer 43 Hours
Factor 0.57 - Technical Support 13 Hours
Factor 0.57 - Project Manager 13 Hours
Factor 0.57 - Quality Assurance 13 Hours

Additional adjustments to hours and subcontractor services were based on the presence of tanks and professional judgement.

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<th>Resources</th>
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Line Item 1000 - backfill

BOE

Trade Publication
Means 1995, Site Work & Landscape Cost Data (page 34, 42, and 34)

Item Desc:
Backfill.

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
  Units: hours
  Unit Cost: see below
  Unit Cost Adjustment Factor: see below
  Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
  Units: 1 lot
  Unit Cost: see below
  Unit Cost Adjustment Factor: see below
  Revised Unit: see below

Means (1995) Site Work & Landscape Cost Data as follows:

Common Fill $ 4.77/cubic yard (page 34 Borrow Bank Measure)
Hauling $ 3.98/cubic yard (page 42 2-mile round-trip, 6 cubic yard dump truck)
Backfilling $ 1.69/cubic yard (page 34)
Burden (43%) $ 4.49/cubic yard
The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 15 - ASH Subcontracted Srvs 330 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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Line Item 1100 - demobilization

BOE

Demobilization: Based on the T-3/T-4 project, it was assumed that demobilization costs would cover demobilization for excavation activities also. The subcontractor cost for demobilization was about $95,000 for 3,800 cubic yards at the T-3/T-4 project. In addition it was estimated that the following hours were necessary:

- Environmental Engineer 300 hours
- Health Physicist 100 hours
- Industrial Hygiene 100 hours

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

Factor 300 - Environmental Engineer 75 Hours
Factor 100 - Health Physicists 25 Hours
Factor 200 - Manager 50 Hours
Factor 100 - P090 Industrial Hygienists 25 Hours
Factor 95000 - ASH Subcontracted Srvs 23,750 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
Rocky Flats Closure Project
Baseline Cost and Basis of Estimate

WBS Filter: 1GAC
Activity Filter: *

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**Project: Baseline Deviation**

**WBS Filter: 1GAC**

**Activity Filter: ***

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**Cost Element**

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**Line Item 0100 - develop report**

- **Description:** Prepare Closeout Report - IHSS Group 400-5

**Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.**

**Item Desc:**
Perform Data Analysis including GIS representation of data, Closeout Report, and associated project management.

**Required level of effort:**
- Environmental Engineer - 80 hours
- Environmental Scientist - 20 hours
- Computer Specialist - 160 hours (GIS, SWD)
- Manager - 20 hours
- Administrative - 20 hours
- Cost Estimators - 20 hours

**Breakdown of Cost Data:**
- Item: Develop Documentation
  - Units: hours
  - Unit Cost: 320
  - Unit Cost Adjustment Factor: none
  - Revised Unit Hours: 320

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**Line Item SYS - Contingency And Escalation**

**BOE**

**Factors**

- 25 hours
- 25 hours
- 25 hours
- 25 hours
- 25 hours

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**Line Item SYS - Contingency And Escalation**

**BOE**

**Factors**

- 25 hours
- 25 hours
- 25 hours
- 25 hours
- 25 hours
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### WBS No: 1GAC0405

#### Title: Group 400-6 (B439/40/4/7/60)

### Activity ID: 1GHE646100

**Description:** SAP Preparation-IHSS Group 400-6 (439/40/4/7/60)

**Schedule Risk:** 1

**Cost Risk:** 1

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**Total for Activity 1GHE646100:**

280 10,021 1,421 4,133 15,575 3,467 19,042

#### BOE

**Line Item 0100 - SAP Addenda**

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Item Desc:** Preparation of SAP Addenda to Industrial Area Characterization Plan.

**Breakdown of Cost Data:**

- **Item:** Preparation of SAP addenda
  - **Units:** hours
  - **Unit Cost:** none

**Basis for adjustment:**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

#### Resources

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#### Line Item 0200 - HASP Addenda

**BOE**

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Item Desc:** Preparation of HASP addenda to Industrial Area Characterization Plan.

**Breakdown of Cost Data:**

- **Item:** Preparation of addenda for HASP.
  - **Units:** hours
  - **Unit Cost:** 140

**Basis for adjustment:**

0.84576 [SYS 061400].8457600 - System
## Rocky Flats Closure Project

### Baseline Cost and Basis of Estimate

**WBS Filter:** 1GAC

**Activity Filter:** 1GHE646100

**WBS No:** 1GAC0406

**Activity ID:** 1GHE646100

---

### Line Item 0300 - QAP Addenda

**Activity ID:** 1GHE646120

**Description:** Procurement and Field Prep - IHSS Group 400-6

**BOE**

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Item Desc:**
Preparation of SAP Addenda to Industrial Area Characterization Plan.

**Breakdown of Cost Data:**
- **Item:** Preparation of QAP addenda
  - **Units:** hours
  - **Unit Cost:** 60
  - **Unit Cost Adjustment Factor:** none
  - **Revised Unit Hours:** 60

**Basis for adjustment:**
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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### Line Item 0100 - procurement & field prep

**Activity ID:** 1GHE646120

**Description:** Procurement and Field Prep - IHSS Group 400-6

**BOE**

**Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation**

**Item Desc:**

**Breakdown of Cost Data:**
- **Item:** Site Labor to perform above individual tasks for either Ryan's Pit or T-3/T-4.
  - **Units:** hours
  - **Unit Cost:** 1380
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** 345 hours

---

**Line Item 0100 - procurement & field prep**

**BOE**

**Description:** Procurement and Field Prep - IHSS Group 400-6

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Total for Activity 1GHE646120:

- 17,307
- 3,680
- 20,987
**Rocky Flats Closure Project**

**Baseline Cost and Basis of Estimate**

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- **Item:** Subcontractor costs to perform above individual tasks for either Ryan's Pit or T-3/T-4.

  - Units: 1 lot
  - Unit Cost: $10K
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit: $2.5K

  Basis for adjustment. Hours and costs for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be characterized at once.

- **Procurement** includes preparation of statement of work, proposal review (technical evaluation), and negotiations. Based on a T-3/T-4 burdened cost of $25,111,152. Assuming it is primarily labor hours (RMRS Environmental Engineer charging at $57.45 per hour) yields 508 hours which rounds to 510 total hours.

- **Davis Bacon Documentation:** It was assumed that it would take an environmental engineer twenty-four hours to prepare a Davis Bacon cost estimate and to support the Davis-Bacon determination.

- **Subcontractor Health and Safety Plan:** Costs for the health and safety plan are based on Ryan's Pit, which cost approximately $10,000. It was assumed that these are A5H dollars. In addition, it was assumed that a safety engineer, an industrial hygienist, and a radiological engineer would each provide one week (40 hours) of support for review and document preparation.

- **Radiological Work Permit:** It was assumed that it would take a radiological control technician two working days (18 hours) to complete counting preparation and review.

- **Implementation Plan:** It was estimated that this activity would take 13 weeks of time for engineers, scientists or equivalent to complete. This would include preparation of an implementation plan as required (Rocky Flats Cleanup Agreement, Appendix J, Interim Guidance Document, Dated August 1977). In addition this includes all tasks related to documentation for the Integrated Work Control Program and Integrated Safety Management.

- **Ecology Survey/National Environmental Protection Act (NEPA) Support:** It was estimated that this would take 40 hours for an ecologist. The activities include NEPA review and support in document preparation, site surveys to verify compliance with ecological regulations, categorical exclusions, and NEPA evaluations.

- **Utility Clearance/Soil Disturbance Permits:** It was estimated based on experience that it would take the equivalent 2 weeks (80 hours) for technical staff to do utility surveys, prepare and review soil disturbance permits, and prepare authorizing documents for excavation.

- **The combined resources for procurement and field preparations are**

- **Total Procurement and Field Preparation Hours**

  - Environmental Engineer 1134 hours
  - Safety Engineer 40 hours
  - Industrial Hygiene 40 hours
  - Radiological Engineering 58 hours
  - Radiological Control Technician 18 hours
  - Ecologist/Life Scientist 40 hours
  - Manager 50 hours
  - Quality Assurance* 29 hours
  - A5H Total $10,000

  * On some projects these hours were assumed to be included in other tasks or part of this task under environmental engineer or one of the other job functions.

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

- Factor 1134 - Environmental Engineer 283 Hours
- Factor 40 - Safety Engineer 10 Hours
- Factor 40 - Industrial Hygiene 10 Hours
- Factor 58 - Radiological Engineering 14 Hours
- Factor 18 - RCT 5 Hours
- Factor 40 - Life Scientist 10 Hours
- Factor 50 - Project Manager 11 Hours
- Factor 10000 - A5H Subcontracted Services 2,500 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
**Rocky Flats Closure Project**

**Baseline Cost and Basis of Estimate**

- **Activity ID:** 1GHE646140
- **Description:** Readiness Assessment - IHSS Group 400-6

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**Factors**

- BOE

**Line Item 0100 - Readiness assessment**

- **BOE**

  **Description:** Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation

  - **Item Desc:** Evaluate readiness of field team and plans.
  - **Breakdown of Cost Data:**
    - **Item:** Site Labor to perform Readiness Assessment for T-3/T-4.
      - **Units:** hours
        - **Unit Cost:** $187
        - **Unit Cost Adjustment Factor:** 0.25
        - **Revised Unit:** 48
      - **Item:** Subcontractor costs to perform Readiness Assessment for T-3/T-4.
        - **Units:** 1 lot
        - **Unit Cost:** $4800
        - **Unit Cost Adjustment Factor:** 0.25
        - **Revised Unit:** $1200

  It was estimated that subcontractor involvement would require 80 hours at $60/hour = $4,800. It was assumed that about 3 weeks of time was required for an environmental engineer or similar person in addition to 12 hours of project management, which yielded 132 hours. An additional 11 hours was added for management oversight. It was estimated that a radiological engineer (QA) and an industrial hygienist would be needed for 2.5 days each (22 hours).

  The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 projects will be conducted at once and only one of each fixed cost is needed for the group.

  - **Factor 132 - Environmental Engineer 33 Hours**
  - **Factor 22 - Health Physicists 6 Hours**
  - **Factor 11 - Manager 3 Hours**
  - **Factor 22 - Quality Assurance 6 Hours**
20 hours of administrative time will also be required.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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| Activity ID: 1GHE646150 | Description: Field Sampling, Lab Analysis - IHSS Group 400-6 | BOE |

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<td>project romnt oversight</td>
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Total for Activity 1GHE646150:
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### Line Item 0200 - analyze samples

**BOE**

**Vendor Quote**

Email quote: average cost from Kaiser-Hill ASD (V. Ideker).

**Item Desc:**

Analyze samples produced from geoprobe borings. It is anticipated that 3 samples from each boring will be collected. They will be analyzed for Metals, VOCs, SVOCs, PCBs, and Radionuclides (est. 3 isotopes) with a 30 day TAT. This item is priced on a per sample basis. Per sample costs include DOT rad screen, bottle charge, shipping, and validation.

**Breakdown of Cost Data:**

- **Item:** Analyze samples at an offsite laboratory.
- **Units:** analysis
- **Unit Cost:** Metals $345, VOCs $280, SVOCs $440, PCBs and other analytes $150, and Radionuclides 3 isotopes) $590 per each sample.
- **Unit Cost Adjustment Factor:** Must add: DOT rad screen $32/sample, bottle charge $7/sample, shipping $4.2/bottle, and validation per each: $17.30 VOA, $19.25 SVOC, $16.75 Metals, $5.95 PCB, and $15.60 Rad.
- **Revised Unit Hours:** Metals $405, VOCs $341, SVOCs $502, PCBs and other analytes $199, and Rad $649.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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### Line Item 0300 - project mgmt oversight

**BOE**

**Item Desc:**

Project Management/Oversight. Based on half time for a Project Manager, Administrative staff, and Cost Estimator/Scheduler

**Breakdown of Cost Data:**

- **Item:** Mgmt oversight
- **Units:** hours
- **Unit Cost:** 12
- **Unit Cost Adjustment Factor:** none
- **Revised Unit Hours:** 12

Basis for adjustment.

A 50% reduction in characterization is based on process history and building knowledge which indicates that characterization to the extent required for Building 123 is not required at this location.
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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Total for Activity 1GHE646170: 656 | 19,024 | 0 | 3,482 | 22,506 | 5,365 | 27,871 |

### Breakdown of Cost Data:

- **Item: Develop Documentation**
- **Units: Hours**
- **Unit Cost: 656**
- **Unit Cost Adjustment Factor: none**

### Resources

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Project: Rocky Flats Closure Project
Baseline Cost and Basis of Estimate

WBS Filter: 1GAC
Activity Filter: * 
Starts In FY: *

**Project Baseline Development**

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**WBS Filter**

1GAC

**1GAC - Contingency And Escalation**

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**SYS Contingency And Escalation**

1.00 ka

Total for Activity 1GHE646180:

289 | 9,164 | 0 | 1,677 | 10,841 | 2,584 | 13,426

**Line Item 0100 - PAM**

Estimator's Experience based generally on historical data for Ryan's Pit

Item Desc:
Preparation of PAM or IM/IRA in support of source removal of previously characterized UBC.

Proposed Action Memorandum: A bottoms-up estimate based on historical costs was used as the basis for the estimate. Based on Ryan's Pit (IHSS 108), the cost for the PAM was $50,000 (contractor costs). Assuming that labor rates at this time were approximately $75 (based on a cost center 217). The total labor for a PAM would be approximately 666 hours, which rounds to 700 hours. It was assumed that 10% would be required for managerial hours.

For a PAM the total labor hours are:

Environmental Engineer 700 Hours
Manager 70 Hours

Factor 700 Environmental Engineer 175 hours
Factor 70 Manager 18 hours

Breakdown of Cost Data:
- Item: Preparation of PAM for Ryan's Pit source removal action.
  - Units: hours
  - Unit Cost: 770
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit Hours: 193

Based for adjustment. Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

Interim Measure/Interim Remedial Action Decision Document: It was assumed that an IM/IRA Decision Document would take 75% more effort than a PAM or 1,166 hours, which rounds to 1200 hours. It was assumed that 10% of this labor would be required for managerial hours.

For an IM/IRA the total labor hours are
### Environmental Engineer 1200 Hours
Manager 120 Hours
Factor 120 Environmental Engineer 300 hours
Factor 120 Manager 30 hours

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### Line Item 0200 - SAP
Estimator's Experience based generally on historical data for Ryan's Pit

**Item Desc:**
Preparation of SAP in support of source removal of previously characterized UBC.

**Breakdown of Historical Data:**
- **Item:** Preparation of SAP for Ryan's Pit source removal action.
  - **Units:** hours
  - **Unit Cost:** 300
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit Hours:** 76

**Basis for adjustment.** Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

**Sampling and Analysis Plan:** Based on the T-3/T-4 Sampling and Analysis Plan (SAP) it took 300 hours in total preparation time. It was assumed that 10% of this labor was for managerial hours (30 hours) and that the rest of the time, 270 hours, was for technical staff. It was assumed that these hours include all labor including quality assurance, secretarial support, graphics etc.

**Original Hours**
- 270 Environmental Engineer 68 hours
- 30 Manager 8 hours

### Line Item 0300 - WMP
Estimator's Experience based generally on historical data for Ryan's Pit

**Item Desc:**
Preparation of WMP in support of source removal of previously characterized UBC.

**Breakdown of Historical Data:**
- **Item:** Preparation of WMP for Ryan's Pit source removal action.
  - **Units:** hours
  - **Unit Cost:** 80
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit Hours:** 20

**Basis for adjustment.** Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

**Original Hours**
- 68 Environmental Engineer 8 hours
- 8 Manager 20 hours

### Line Item SYS - Contingency And Escalation
**BOE**

---

_Official Use Only_
Projected Baseline Development

Rocky Flats Closure Project
Baseline Cost and Basis of Estimate

WBS No: 1GAC0406
Activity ID: 1GHE646180

Baseline Cost and Basis of Estimate

WBS Filter: 1GAC
Activity Filter: *

Starts In FY: *

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Factors

549.477 Dollars

Factors

1128.02 Dollars

Activity ID: 1GHE646210
Description: Procurement and Field Prep - IHSS Grouping 400-6

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Total for Activity 1GHE646210: 345 10,637 2,114 3,683 16,435 3,136 19,571

Line Item 0100 - procurement & field prep

BOE

Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation

Item Desc:

Breakdown of Cost Data:

Item: Site Labor to perform above individual tasks for either Ryan's Pit or T-3/T-4.

*Units: hours
*Unit Cost: 1380
*Unit Cost Adjustment Factor: 0.25
*Revised Unit: 345 hours

Item: Subcontractor costs to perform above individual tasks for either Ryan's Pit or T-3/T-4.

*Units: 1 lot
*Unit Cost: $10K
*Unit Cost Adjustment Factor: 0.25
*Revised Unit: $2.5K

Basis for adjustment. Hours and costs for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be characterized at once.

Procurement includes preparation of statement of work, proposal review (technical evaluation), and negotiations. Based on a T-3/T-4 burdened cost of $29,186.52. Assuming it is primarily labor hours (RMRS Environmental Engineer charging at $57.45 per hour) yields 508 hours which rounds to 510 total hours.

David Bacon Documentation: It was assumed that it would take an environmental engineer twenty-four hours to prepare a Davis Bacon cost estimate and to support the Davis-Bacon determination.

Subcontractor Health and Safety Plan: Costs for the health and safety plan are based on Ryan's Pit, which cost approximately $10,000. It was assumed that these are A5H dollars. In addition, it was assumed that a safety engineer, an industrial hygienist, and a radiological engineer would each provide one week (40 hours) of support for review and document preparation.

Radiological Work Permit: It was assumed that it would take a radiological control technician two working days (18 hours) to complete counting preparation and review.

Implementation Plan: It was estimated that this activity would take 13 weeks of time for engineers, scientists or equivalent to complete. This would include preparation of an implementation plan as required (Rocky Flats Cleanup Agreement, Appendix 3, Interim Guidance Document, Dated August 1977). In addition this includes all tasks related to documentation for the Integrated Work Control Program and Integrated Safety Management.

Ecology Survey/National Environmental Protection Act (NEPA) Support: It was estimated that this would take 40 hours for an ecologist. The activities include NEPA review and support in documentation, site surveys to verify compliance with ecological regulations, categorical exclusions, and NEPA evaluations.

Utility Clearance/Soil Disturbance Permits: It was estimated based on experience that it would take the equivalent 2 weeks (80 hours) for technical staff to do utility surveys, prepare and review soil disturbance permits, and prepare authorizing documents for excavation.

The combined resources for procurement and field preparations are

Total Procurement and Field Preparation Hours
### Environmental Engineer 1134 hours
- Safety Engineer 40 hours
- Industrial Hygiene 40 hours
- Radiological Engineering 58 hours
- Radiological Control Technician 18 hours
- Ecologist/Life Scientist 40 hours
- Manager 50 hours
- Quality Assurance* 29 hours
- ASK Total $10,000

* On some projects these hours were assumed to be included in other tasks or part of this task under environmental engineer or one of the other job functions.

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

Factor 1134 - Environmental Engineer 283 Hours
Factor 40 - Safety Engineer 10 Hours
Factor 40 - Industrial Hygiene 10 Hours
Factor 58 - Radiological Engineering 14 Hours
Factor 18 - RCT 5 Hours
Factor 40 - Life Scientist 10 Hours
Factor 50 - Project Manager 13 Hours
Factor 10000 - ASK Subcontracted Services 2,500 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### Line Item 0100 - readiness assessment

**BOE**

**Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation**

**Item Desc:**
- Evaluate readiness of field team and plans.

**Breakdown of Cost Data:**
- **Item:** Site Labor to perform Readiness Assessment for T-3/T-4.
  - **Units:** hours
  - **Unit Cost:** $187
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** 48

- **Item:** Subcontractor costs to perform Readiness Assessment for T-3/T-4.
  - **Units:** 1 lot
  - **Unit Cost:** $4800
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** $1200

**It was estimated that subcontractor involvement would require 80 hours at $60/hour = $4,800. It was assumed that about 3 weeks of time was required for an environmental engineer or similar person in addition to 12 hours of project management, which yielded 132 hours. An additional 11 hours was added for management oversight. It was estimated that a radiological engineer (QA) and an industrial hygienist would be needed for 2.5 days each (22 hours).**

**The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 projects will be conducted at once and only one of each fixed cost is needed for the group.**

- Factor 132 - Environmental Engineer 33 Hours
- Factor 22 - Health Physicists 6 Hours
- Factor 11 - Manager 3 Hours
- Factor 22 - Quality Assurance 6 Hours
- Factor 4,800 - ASH Subcontracted Svrs 1,200 Dollars

20 hours of administrative time will also be required.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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**Line Item 0200 - training**

**BOE**

**Estimator's Experience based generally on historical data for T-3/T4 Remediation.**

**Item Desc:**
- Conduct perform Training in support of source removal action.

**Breakdown of Cost Data:**
- **Item:** Site Labor to perform above individual tasks for T-3/T-4.
  - **Units:** hours

---

**Total for Activity 1GHE646240:**

| Total | 116 | 3,306 | 4,821 | 13,090 | 1,151 | 14,241 |

---

**Note:**
- Factor 0.84576 [SYS 061400] .84576000 - System
Rocky Flats Closure Project
Baseline Cost and Basis of Estimate

WBS No: 1GAC0406
Activity ID: 1GHE646240

- Unit Cost: 132 Hours
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit: 33 hours

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
  - Units: 1 lot
  - Unit Cost: $12K
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit: $3K

Basis for adjustment. Costs for each UBC are divided by 4 to account for the fact that 4 UBCs will be remediated at once and only one Training is needed for the group.

It was estimated training would cost $1,000 per subcontractor worker and that 12 subcontractor employees would require training. It was estimated that onsite contractor employees would require the equivalent of 15 hours of training including instructor time and that eight onsite employees would be trained.

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

Factor 132 - Onsite employees 33 Hours
Factor 12000 - Subcontractor employees 3,000 dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

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Line Item 0300 - Pre-evolution meeting

- Item Desc: Conduct Pre-Evolution Meeting in support of source removal action

Breakdown of Cost Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
  - Units: 60 hours
  - Unit Cost: 60 hours
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit: 15 hours

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
  - Units: 1 lot
  - Unit Cost: $6K
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit: $1.5K

Basis for adjustment. Costs for each UBC are divided by 4 to account for the fact that 4 UBCs will be remediated at once and only one Pre-Evolution Meeting is needed for the group.

It was assumed that the Pre-Evolution Meeting would be limited to five hours. Assuming that 20 subcontract employees would attend at an average cost of $60/hour burdened yields a cost of $6,000. It was assumed that 12 onsite contractor employees would attend to yield another 60 hours.

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

Factor 60 - Onsite employees 15 Hours
Factor 6,000 - Subcontractor employees 1,500 dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### Breakdown of Cost Data:

#### Item: Site Labor to perform above individual tasks for T-3/T-4.

- **Units:** hours
- **Unit Cost:** 1,100
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** 275

#### Item: Subcontractor costs to perform above individual tasks for T-3/T-4.

- **Units:** 1 lot
- **Unit Cost:** 184k
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** see below

#### Basis for adjustment:

The costs were divided into fixed costs and variable costs. The fixed costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

**T3/T4 hours:**
- Health Physicists: 27 Hours
- Manager: 83 Hours
- Environmental Engineer: 138 Hours
- Industrial Hygienist: 27 Hours
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Line Item 0200 - Site Prep

**BOE**

Estimator's Experience based generally on historical data for T-3/T-4 Remediation.

**Item Desc:** Site Preparation including setting up fencing, trailer, etc.

**Breakdown of Historical Data:**

**Item:** Site Labor to perform above individual tasks for T-3/T-4.

**Units:** hours

**Unit Cost:** see below

**Unit Cost Adjustment Factor:** see below

**Revised Unit:** see below

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.

**Units:** 1 lot

**Unit Cost:** see below

**Unit Cost Adjustment Factor:** see below

**Revised Unit:** see below

**Basis for adjustment.** The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

T3/T4 hours 120 Environmental Engineer 30 hours

T3/T4 dollars 30,000 Subcontracted Srvs 7,500 Dollars

D&D construction trade hours were calculated using the following methodology:

A5H subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.

RCT hours were calculated using the following methodology, unless they were already estimated.

For Site Preparation tasks - RCT hours were the same as D&D construction hours.

For all other tasks A5H subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under KG10H department code.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
Rocky Flats Closure Project
Baseline Cost and Basis of Estimate

Project: Baseline Devi
WBS Filter: 1GAC
Activity Filter: *
Starts In FY: *

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Rocky Flats Closure Project
Baseline Cost and Basis of Estimate

WBS No: 1GAC0406
Activity ID: 1GHE646250

Line Item 0300 - excavation

BOE

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc:
Excavation.

Breakdown of Historical Data:

Item: Site Labor to perform above individual tasks for T-3/T-4.
Units: hours
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
Units: 1 lot
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Basis for adjustment: The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Total Contaminated Soil to be removed 3333 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 3333 CY

The excavation cost was based on the excavation cost for the T-3/T-4 Project. Burdened cost based on the T-3/T-4 actuals is $171,487. For the 3,800 cubic yards of contaminated soil removed this yielded a unit cost of $45 per cubic yard of contaminated soil removed. This estimate includes the removal of overburden that might be on top of the contaminated soil. The hours for an environmental engineer from T-3/T-4 were 1.09 hours per cubic yard of contaminated soil. Likewise the hours for the following were assumed to be linearly proportional:

Health Physicists .47 hours per cubic yard
Environmental Operations .31 hours per cubic yard
Industrial Hygienists 0.31 hours per cubic yard
Radiological Control Technician 1.00 hour per cubic yard

* Based on $50/cubic yard from T-3/T-4, assumes a labor rate of $50/hour

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 1.09 - E050 Environmental Engineer 3633 Hours
Factor 0.47 - P080 Health Physicists 1567 Hours
Factor 0.31 - Environmental Operations 1,033 Hours
Factor 0.31 - P090 Industrial Hygienists 1,033 Hours
Factor 1.00 - T050 Radiological Control Technician Linear 3333 Hours
Factor 45.23 - A5H Subcontracted Srvs 150,752 Dollars (81% subcontracted services/19% D&D construction workers)

D&D construction trade hours represent 19% of the subcontract dollars and were calculated using the following methodology:

A5H subcontracted dollars were multiplied by .19, the result was divided by $60/hr to determine the number of hours allocated to D&D construction.

The dollars amount calculated for D&D construction workers was subtracted from the subcontractor dollars.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### Resources

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**Line Item 0400 - remove and clean debris**

**BOE**

Estimator's Experience based generally on a base case of 700 cy.

**Item Desc:**
Remove and clean debris.

**Breakdown of Historical Data:**

- **Item:** Site Labor to perform above individual tasks for T-3/T-4.
  - Units: hours
    - Unit Cost: see below
    - Unit Cost Adjustment Factor: see below
    - Revised Unit: see below

- **Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
  - Units: 1 lot
    - Unit Cost: see below
    - Unit Cost Adjustment Factor: see below
    - Revised Unit: see below

**Basis for adjustment:** The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

**Total Contaminated Soil to be removed 3333 CY**

**Total Soil for Thermal Desorption 0 CY**

**Offsite Waste Volume 3333 CY**

For the base case, it was assumed that about five cubic yards out of 700 cubic yards would be debris and would be segregated and cleaned. It was estimated that each cubic yard of debris would cost $1,000 or $5,000 total for 700 cubic yards. This yields a rate of $7.14 per cubic yard.

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

**Factor 7.14 - ASH Subcontracted Srvs 23,798 Dollars**

D&D construction trade hours were calculated using the following methodology:

ASH subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.

RCT hours were calculated using the following methodology, unless they were already estimated.

For Site Preparation tasks - RCT hours were the same as D&D construction hours.
For all other tasks A5H subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under KG10H department code.

The dollars amounts calculated for D&D construction workers and RCTs were subtracted from the subcontractor dollars and the revised A5H dollar amount was entered into Best.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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<th>Cost Element</th>
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**Line Item 0600 - confirmation sampling**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:** Confirmation Sampling.

**Breakdown of Historical Data:**

**Item:** Site Labor to perform above individual tasks for T-3/T-4.

- Units: hours
- Unit Cost: see below
- Unit Cost Adjustment Factor: see below
- Revised Unit: see below

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.

- Units: 1 lot
- Unit Cost: see below
- Unit Cost Adjustment Factor: see below
- Revised Unit: see below

**Basis for adjustment:** The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

**Total Contaminated Soil to be removed 3333 CY**
**Total Soil for Thermal Desorption 0 CY**
**Offsite Waste Volume 3333 CY**

The analytical costs were based on T-3/T-4, which cost $435,574 for 3800 cubic yards of contaminated soil removed. This yielded a unit rate of about $115/cubic yard. Based on estimator experience the cost of sampling including labor and materials was estimated to be 20% of that rate or about $23/ cubic yard.

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

**Factor 114.62 - A5H Subcontracted Srvs (Analytical) 382,028 Dollars**
**Factor 22.924 - A5H Subcontracted Srvs 76,406 Dollars**

D&D construction trade hours were calculated using the following methodology:

A5H subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.

RCT hours were calculated using the following methodology, unless they were already estimated.

For Site Preparation tasks – RCT hours were the same as D&D construction hours.

For all other tasks A5H subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under KG10H department code.

The dollars amounts calculated for D&D construction workers and RCTs were subtracted from the subcontractor dollars and the revised A5H dollar amount was...
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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**Line Item 0700 - prepare waste acceptance forms**

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

| Item Desc: | Prepare Waste Acceptance Forms |
| Breakdown of Historical Data: | |
| Item: Site Labor to perform above individual tasks for T-3/T-4. | |
| Units: hours | |
| Unit Cost: see below | |
| Unit Cost Adjustment Factor: see below | |
| Revised Unit: see below | |
| Item: Subcontractor costs to perform above individual tasks for T-3/T-4. | |
| Units: 1 lot | |
| Unit Cost: see below | |
| Unit Cost Adjustment Factor: see below | |
| Revised Unit: see below | |

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

T3/T4 hours 80 environmental engineer 20 hours

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**Line Item 0800 - waste acceptance sampling**

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

| Item Desc: | Waste Acceptance Sampling |
| Breakdown of Historical Data: | |
| Item: Site Labor to perform above individual tasks for T-3/T-4. | |
| Units: hours | |
| Unit Cost: see below | |
| Unit Cost Adjustment Factor: see below | |
| Revised Unit: see below | |
| Item: Subcontractor costs to perform above individual tasks for T-3/T-4. | |
| Units: 1 lot | |
| Unit Cost: see below | |
| Unit Cost Adjustment Factor: see below | |
| Revised Unit: see below | |

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.
Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Because the waste acceptance sampling is difficult to predict and could vary significantly from project to project, it was assumed that about $800 worth of additional analysis would be required for 20 cubic yards which is the volume that can be placed in one roll-off. This yielded a unit rate of about $40/cubic yard. It was assumed that this sampling would be more labor intensive so the sampling costs were estimated to be about 50% of the analytical costs or about $20/cubic yard.

Total Contaminated Soil to be removed 3333 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 3333 CY

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 40 - ASH Analytical 133,320 Dollars
Factor 20 - ASH Subcontracted Srvs 66,660 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

Resources

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<th>Skill</th>
<th>Department</th>
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Line Item 0900 - field oversight & project mgmt

BOE

Estimator's experience based generally on a base case of 700 cy.

Item Desc:
Field Oversight and Project Management

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
  Units: hours
  Unit Cost: see below
  Unit Cost Adjustment Factor: see below
  Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
  Units: 1 lot
  Unit Cost: see below
  Unit Cost Adjustment Factor: see below
  Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

It was assumed that a field manager would be needed for 150 nine-hour working days or about 33 weeks. This work breaks down as follows:

Preparation Activities 50 working days
Field Activities - 80 working days
Demobilization - 20 working days
Total 150 nine-hour working days or 1350 hours

In addition it was estimated that technical staff, quality assurance, and project management would be required for the equivalent of ten additional weeks, which is 400 hours each.

Based on the base case of a 700 cubic yard removal project, these values yielded unit rates as follows.
**Rocky Flats Closure Project**

**Baseline Cost and Basis of Estimate**

<table>
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<tr>
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**Line Item 1000 - backfill**

**BOE**

Trade Publication

Means 1995, Site Work & Landscape Cost Data (page 34, 42, and 34)

**Item Desc:**

Backfill.

Breakdown of Historical Data:

**Item:** Site Labor to perform above individual tasks for T-3/T-4.

- Units: hours
- Unit Cost: see below
- Unit Cost Adjustment Factor: see below
- Revised Unit: see below

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.

- Units: 1 lot
- Unit Cost: see below
- Unit Cost Adjustment Factor: see below
- Revised Unit: see below

Means (1995) Site Work & Landscape Cost Data as follows:

- Common Fill $ 4.77/cubic yard (page 34 Borrow Bank Measure)
- Hauling $ 3.98/cubic yard (page 42 2-mile round-trip, 6 cubic yard dump truck)
- Backfilling $ 1.69/cubic yard (page 34)
- Burden (43%) $ 4.49/cubic yard
- Total $14.23/cubic yard or about $15/cubic yard

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

**Factor** 15 - A5H Subcontracted Srvs 49,995 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### Line Item 1100 - Demobilization

**BOE**

**Estimator's Experience based generally on historical data for T-3/T4 Remediation.**

**Item Desc:** Demobilization.

**Breakdown of Historical Data:**

**Item:** Site Labor to perform above individual tasks for T-3/T-4.
  - Units: hours
  - Unit Cost: see below
  - Unit Cost Adjustment Factor: see below
  - Revised Unit: see below

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
  - Units: 1 lot
  - Unit Cost: see below
  - Unit Cost Adjustment Factor: see below
  - Revised Unit: see below

**Basis for adjustment.** The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Demobilization: Based on the T-3/T-4 project, it was assumed that demobilization costs would cover demobilization for excavation activities also. The subcontractor cost for demobilization was about $95,000 for 3,800 cubic yards at the T-3/T-4 project. In addition it was estimated that the following hours were necessary:

- **Environmental Engineer**: 300 hours
- **Health Physicist**: 100 hours
- **Manager**: 200 hours
- **Industrial Hygienist**: 100 hours

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

**Factors**

- **Environmental Engineer**: 75 Hours
- **Health Physicist**: 25 Hours
- **Manager**: 50 Hours
- **Industrial Hygienist**: 75 Hours
- **ASH Subcontracted Svrs**: 23,750 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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**Line Item SYS - Contingency And Escalation**

**BOE**

**Resources**

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<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
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6/23/00 9:21:20 AM  
OFFICIAL USE ONLY
## Rocky Flats Closure Project
### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0406  
**Activity ID:** 1GHE646250

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**Project:** Baseline Devi  
**Baseline Cost and Basis of Estimate**

**WBS Filter:** *  
**Activity Filter:** *

### Activity ID: 1GHE646270
**Description:** Prepare Closeout Report - IHSS Group 400-6

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### Line Item 0100 - develop report
**BOE**

- **Cost Element:** Line Item 0100 - develop report
- **Skill:** Resources
- **Department:** BOE
- **Curve:** Linear

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**Line Item SYS - Contingency And Escalation**

| BOE | **Cost Element:** Line Item SYS - Contingency And Escalation
|-----|-----------------
|     | **Skill:** Resources
|     | **Department:** BOE
|     | **Curve:** Linear

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<th>Units</th>
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<th>Labor Hours</th>
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### Resources

| **Cost Element:** Line Item 0100 - develop report  
| **Skill:** Resources  
| **Department:** BOE  
| **Curve:** Linear  
| **Quantity:** 1.00  
| **Units:** 320  
| **Labor Hours/Unit:** EE |

| **Factors:** 80 hrs |
| **Factors:** 20 hrs |

| **Cost Element:** Line Item SYS - Contingency And Escalation  
| **Skill:** Resources  
| **Department:** BOE  
| **Curve:** Linear  
| **Quantity:** 1.00  
| **Units:** 0  
| **Labor Hours/Unit:** EE |

| **Factors:** 20 hrs |

### Notes
- **Item Desc:**
- Perform Data Analysis including GIS representation of data, Closeout Report, and associated project management.

- **Breakdown of Cost Data:**
  - Item: Develop Documentation
  - Units: hours
  - Unit Cost: 320
  - Unit Cost Adjustment Factor: none
  - Revised Unit Hours: 320

- **Basis for adjustment:**
- Required level of effort:
  - Environmental Engineer - 80 hours
  - Environmental Scientist - 20 hours
  - Computer Specialist - 160 hours (GIS, SWD)
  - Manager - 20 hours
  - Administrative - 20 hours
  - Cost Estimators - 20 hours

### Contingency 

**Contingency Factors**

| **Cost Element:** Line Item 0100 - develop report  
| **Skill:** Resources  
| **Department:** BOE  
| **Curve:** Linear  
| **Quantity:** 1.00  
| **Units:** 320  
| **Labor Hours/Unit:** EE |

| **Factors:** 80 hrs |

| **Cost Element:** Line Item SYS - Contingency And Escalation  
| **Skill:** Resources  
| **Department:** BOE  
| **Curve:** Linear  
| **Quantity:** 1.00  
| **Units:** 0  
| **Labor Hours/Unit:** EE |

| **Factors:** 20 hrs |

### Escalation 

**Escalation Factors**

**WBS No:** 1GAC0407  
**Title:** Group 400-7 (B442)

**Activity ID:** 1GF847100  
**Description:** SAP Preparation - IHSS Group 400-7 (B442)

| **Factors:** 2719.51 Dollars |

**Factors:** 2719.51 Dollars |

**Factors:** 7630.02 Dollars |

**Factors:** 2197.51 Dollars |

### Schedule Risk

- **Cost Risk:** 1
- **Schedule Risk:** 1

### Total for Activity 1GHE646270:

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**Page 360 of 1121**
## Rocky Flats Closure Project
### Baseline Cost and Basis of Estimate

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#### Activity Filter & Escalation

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### Line Item 0100 - SAP Addenda

**BOE**

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

- **Item Desc:** Preparation of SAP Addenda to Industrial Area Characterization Plan.

#### Breakdown of Cost Data:

- **Item:** Preparation of SAP addenda
- **Units:** hours
- **Unit Cost:** 120
- **Unit Cost Adjustment Factor:** none
- **Revised Unit Hours:** 120

#### Basis for adjustment:

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

#### Resources

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**Factors**

- 80 hrs

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**Factors**

- 20 hrs

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**Factors**

- 20 hrs

- 42 estimated $/hr

### Line Item 0200 - HASP Addenda

**BOE**

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

- **Item Desc:** Preparation of HASP addenda to Industrial Area Characterization Plan.

#### Breakdown of Cost Data:

- **Item:** Preparation of addenda for HASP.
- **Units:** hours
- **Unit Cost:** 140
- **Unit Cost Adjustment Factor:** none
- **Revised Unit Hours:** 140

#### Basis for adjustment:

### Resources

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**Factors**

- 20 hrs

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**Factors**

- 40 hrs

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<th>Curve</th>
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**Factors**

- 40 hrs

### Line Item 0300 - QAP Addenda

**BOE**

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

- **Item Desc:** Preparation of QAP addenda to Industrial Area Characterization Plan.

#### Breakdown of Cost Data:

- **Item:** Preparation of addenda for QAP.
- **Units:** hours
- **Unit Cost:** 180
- **Unit Cost Adjustment Factor:** none
- **Revised Unit Hours:** 180

#### Basis for adjustment:

---

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6/23/00 9:21:21 AM OFFICIAL USE ONLY
Preparation of SAP Addenda to Industrial Area Characterization Plan.

Breakdown of Cost Data:
Item: Preparation of QAP addenda
Units: hours
Unit Cost: 60
Unit Cost Adjustment Factor: none
Revised Unit Hours: 60

Basis for adjustment.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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Line Item SYS - Contingency And Escalation
BOE

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Activity ID: 1GFB647120 Description: Procurement and Field Prep - IHSS Group 400-7

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Total for Activity 1GFB647120: 345 10,637 2,114 2,249 15,000 3,000 18,000

Line Item 0100 - procurement & field prep

BOE

Estimator's Experience based generally on historical data for Ryan’s Pit and T-3/T4 Remediation

Item Desc:

Breakdown of Cost Data:
Item: Site Labor to perform above individual tasks for either Ryan's Pit or T-3/T-4.
Units: hours
Unit Cost: 1380
Unit Cost Adjustment Factor: 0.25
Revised Unit: 345 hours

Item: Subcontractor costs to perform above individual tasks for either Ryan's Pit or T-3/T-4.
Units: 1 lot
Unit Cost: $10K
Unit Cost Adjustment Factor: 0.25
Revised Unit: $2.5K

Basis for adjustment. Hours and costs for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be characterized at once.

Procurement includes preparation of statement of work, proposal review (technical evaluation), and negotiations. Based on a T-3/T-4 burdened cost of $29,186.52. Assuming it is primarily labor hours (EMRS Environmental Engineer charging at $57.45 per hour) yields 508 hours which rounds to 510 total hours.
Davis Bacon Documentation: It was assumed that it would take an environmental engineer twenty-four hours to prepare a Davis Bacon cost estimate and to support the Davis-Bacon determination.

Subcontractor Health and Safety Plan: Costs for the health and safety plan are based on Ryan’s Pit, which cost approximately $10,000. It was assumed that these are A5H dollars. In addition, it was assumed that a safety engineer, an industrial hygienist, and a radiological engineer would each provide one week (40 hours) of support for review and document preparation.

Radiological Work Permit: It was assumed that it would take a radiological control technician two working days (18 hours) to complete counting preparation and review.

Implementation Plan: It was estimated that this activity would take 13 weeks of time for engineers, scientists or equivalent to complete. This would include preparation of an implementation plan as required (Rocky Flats Cleanup Agreement, Appendix J, Interim Guidance Document, Dated August 1977). In addition this includes all tasks related to documentation for the Integrated Work Control Program and Integrated Safety Management.

Ecology Survey/National Environmental Protection Act (NEPA) Support: It was estimated that this would take 40 hours for an ecologist. The activities include NEPA review and support in document preparation, site surveys to verify compliance with ecological regulations, categorical exclusions, and NEPA evaluations.

Utility Clearance/Soil Disturbance Permits: It was estimated based on experience that it would take the equivalent 2 weeks (80 hours) for technical staff to do utility surveys, prepare and review soil disturbance permits, and prepare authorizing documents for excavation.

The combined resources for procurement and field preparations are:

**Total Procurement and Field Preparation Hours**

- Environmental Engineer 1134 hours
- Safety Engineer 40 hours
- Industrial Hygiene 40 hours
- Radiological Engineering 58 hours
- Radiological Control Technician 18 hours
- Ecologist/Life Scientist 40 hours
- Manager 50 hours
- Quality Assurance* 29 hours
- A5H Total $10,000

* On some projects these hours were assumed to be included in other tasks or part of this task under environmental engineer or one of the other job functions.

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

Factor 1134 - Environmental Engineer 283 Hours
Factor 40 - Safety Engineer 10 Hours
Factor 40 - Industrial Hygiene 10 Hours
Factor 58 - Radiological Engineering 14 Hours
Factor 18 - RCT 5 Hours
Factor 40 - Life Scientist 10 Hours
Factor 50 - Project Manager 13 Hours
Factor 10000 - A5H Subcontracted Services 2,500 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### Rocky Flats Closure Project
#### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0407  
**Activity ID:** 1GF8B67120

### Activity Filter
- **Starts In FY:** 
- **Remediation Steelworkers:** K26SS  
- **ER Programs:** KG10H

#### Line Item 1GFB647140
**Description:** Readiness Assessment - IHSS Group 400-7

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**Factors:**
- **Contingency:** 0.84576
- **Escalation:** 0.84576

### Breakdown of Cost Data:
- **Units:** hours
- **Unit Cost:** $60/hour
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** $60

**Breakdown of Cost Data:**
- **Site Labor to perform Readiness Assessment for T-3/T-4:**
  - Units: hours
  - Unit Cost: $60/hour
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit: $60

**Subcontractor costs to perform Readiness Assessment for T-3/T-4:**
- **Units:** 1 lot
- **Unit Cost:** $4800
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** $4800

**Breakdown of Fixed Costs:**
- **Environmental Engineer:** 33 hours
- **Quality Assurance:** 6 hours
- **Manager:** 3 hours

#### Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation

**Item Desc:**
Evaluate readiness of the field characterization team and plans.

**Breakdown of Cost Data:**
- **Units:** hours
- **Unit Cost:** $60/hour
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** $60

**Subcontractor involvement would require 80 hours at $60/hour = $4,800. It was assumed that about 3 weeks of time was required for an environmental engineer or similar person in addition to 12 hours of project management, which yielded 132 hours. An additional 11 hours was added for management oversight. It was estimated that a radiological engineer (QA) and an industrial hygienist would be needed for 2.5 days each (22 hours).**

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 projects will be conducted at once and only one of each fixed cost is needed for the group.

**Breakdown of Fixed Costs:**
- **Environmental Engineer:** 33 hours
- **Quality Assurance:** 6 hours
- **Manager:** 3 hours
- **ASH Subcontracted Svrs:** $4,800

20 hours of administrative time will also be required.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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<td>R100S RMRS Salaried</td>
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## Rocky Flats Closure Project

### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0407  
**Activity ID:** 1GFB647140  
**Activity Filter:** 1GAC

**Starts In FY**

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### Costs and Resources

**Line Item 0100 - collect geoprobe samples**

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<td>1,913</td>
<td>131,704</td>
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<td>0200</td>
<td>Kaiser-Hill/RMRS Geoprobe unit with 2 Technician crew. Item costs $100 per hour or $800 per 8-hour day.</td>
<td>53.00</td>
<td>each</td>
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<tr>
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<tr>
<td>0400</td>
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*Item Description:*

Collection of geoprobe samples with the site geoprobe with two technicians. A site Environmental Engineer will direct the boring placement, log the borings; collect, containerize, package, and ship the samples; prepare field QC documentation, and prepare field notes on a full time basis. A site RCT will monitor the site for radiological contamination on a full time basis. A site Industrial Hygienist will implement the field portion of the HASP on a full time basis. Decon Operations staff will decon the vehicle and equipment when it leaves the work area on a half time basis. It is estimated that one 10' boring will be placed per 500 SF of building footprint (same as Bldg. 123 characterization) with 5 samples per 10' boring. It is estimated that one boring per eight hours can be completed.

**Resources**

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<th>Skill</th>
<th>Quantity</th>
<th>Units</th>
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**Activity ID:** 1GFB647150  
**Description:** Field Sampling, Lab Analysis - IHSS Group 400-7

**Schedule Risk:** 1  
**Cost Risk:** 1  
**Schedule Risk:** 1

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**Total for Activity 1GFB647150:**

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<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
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**Total:** 220  
**Total Labor Hours:** 6,785  
**Total Labor Cost:** 106,550  
**Total Material/Sub Cost:** 16,456  
**Total Prime Cost:** 129,791  
**Total Cost:** 131,704

**Breakdown of Cost Data:**

- **Item: Site Personnel for support of geoprobe samples**
  - **Units:** hours
  - **Unit Cost:** 32
  - **Unit Cost Adjustment Factor:** none
  - **Revised Unit Hours:** 32

- **Item: Kaiser-Hill/RMRS Geoprobe unit with 2 Technician crew. Item costs $100 per hour or $800 per 8-hour day.**
  - **Units:** dollars
  - **Unit Cost:** 800
  - **Unit Cost Adjustment Factor:** none
  - **Revised Unit Hours:** 800

**Basis for adjustment:**

A 50% reduction in the number of geoprobes is based on process history and building knowledge which indicates that characterization to the extent required for Building 123 is not required at this location.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Item Desc:**

- For a Site Environmental Engineer to direct the boring placement, log the borings; collect, containerize, package, and ship the samples; prepare field QC documentation, and prepare field notes on a full time basis.
- A site RCT will monitor the site for radiological contamination on a full time basis.
- A site Industrial Hygienist will implement the field portion of the HASP on a full time basis.
- Decon Operations staff will decon the vehicle and equipment when it leaves the work area on a half time basis.
- It is estimated that one 10' boring will be placed per 500 SF of building footprint (same as Bldg. 123 characterization) with 5 samples per 10' boring.
- It is estimated that one boring per eight hours can be completed.

**Breakdown of Cost Data:**

- **Item: Site Personnel for support of geoprobe samples**
  - **Units:** hours
  - **Unit Cost:** 32
  - **Unit Cost Adjustment Factor:** none
  - **Revised Unit Hours:** 32

- **Item: Kaiser-Hill/RMRS Geoprobe unit with 2 Technician crew. Item costs $100 per hour or $800 per 8-hour day.**
  - **Units:** dollars
  - **Unit Cost:** 800
  - **Unit Cost Adjustment Factor:** none
  - **Revised Unit Hours:** 800

**Basis for adjustment:**

A 50% reduction in the number of geoprobes is based on process history and building knowledge which indicates that characterization to the extent required for Building 123 is not required at this location.
## Rocky Flats Closure Project

### Baseline Cost and Basis of Estimate

#### WBS Filter
- WBS No: 1GAC0407
- Activity ID: 1GFB6747050
- Project: Baseline Devl
- WBS Filter: 1GAC
- Activity Filter: *
- Starts in FY: *

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**Line Item 0200 - analyze samples**

**BOE**

**Vendor Quote**

Email quote: average cost from Kaiser-Hill ASD (V. Ideker).

**Item Desc:**

Analyze samples produced from geoprobe borings. It is anticipated that 3 samples from each boring will be collected. They will be analyzed for Metals, VOCs, SVOCs, PCBs, and radionuclides (est. 3 isotopes) with a 30 day TAT. This item is priced on a per sample basis. Per sample costs include DOT rad screen, bottle charge, shipping, and validation.

**Breakdown of Cost Data:**

- **Item:** Analyze samples at an offsite laboratory.
- **Quantity:** analysis
- **Unit Cost:** Metals $345, VOCs $280, SVOCs $440, PCBs and other analytes $150, and Radionuclides 3 isotopes) $590 per each sample.
- **Unit Cost Adjustment Factor:** Must add: DOT rad screen $32/sample, bottle charge $7/sample, shipping $4.2/bottle, and validation per each: $17.30 VOA, $19.25 SVOC, $16.75 Metals, $5.95 PCB, and $15.60 Rad.
- **Revised Unit Hours:** Metals $405, VOCs $341, SVOCs $502, PCBs and other analytes $199, and Rad $649.

This includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

**Line Item 0300 - project mgmt oversight**

**BOE**

**Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.**

**Item Desc:**

Project Management/Oversight. Based on half time for a Project Manager, Administrative staff, and Cost Estimator/Scheduler

**Breakdown of Cost Data:**

- **Item:** Mgmt oversight
- **Quantity:** hours
- **Unit Cost:** 12
- **Unit Cost Adjustment Factor:** none
- **Revised Unit Hours:** 12

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### Rocky Flats Closure Project

#### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0407  
**Activity ID:** 1GF647150

**Project:** Baseline Devl  
**WBS Filter:** 1GAC  
**Activity Filter:**  
**Starts In FY:**

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#### Line Item SYS - Contingency And Escalation

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#### Activity ID: 1GF647170

**Description:** Prepare Summary/NFA - IHSS Group 400-7

**Schedule Risk:** 3  
**Cost Risk:** 3

### Line Item 01000 - develop documentation

**BOE**

Estimator's Experience: Estimate for summary report based on estimator's 16 years of experience performing and costing projects of similar size and scope.  

Item Desc: Perform Data Analysis including GIS representation of data, NFA Summary, Characterization Report, and associated project management. Disposition comments and finalize document

Breakdown of Cost Data:

- **Environmental Engineer:** 240 hrs Evaluate & assemble existing data. Draft Report.
- **Computer Specialist:** 80 hrs Identify & pull existing data from database.
- **GIS Specialist:** 80 hrs Develop maps for Report. Print multiple copies.
- **Technical Editor:** 40 hrs Complete initial and revised tech edits of Report.
- **Quality Assurance:** 60 hrs Review
- **Environmental Engineer:** 40 hrs Peer review
- **Regulatory Compliance:** 20 hrs Review
- **Management:** 48 hrs
- **Legal:** 8 hrs Review
- **Administrative Support:** 40 hrs Copy & assemble final documents, submit to records.

**Resources**

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Rocky Flats Closure Project
Baseline Cost and Basis of Estimate

WBS No: 1GAC0407
Activity ID: 1GFB647170

Baseline Devl
WBS Filter: 1GAC
Activity Filter: *

Starts In FY

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Total for Activity 1GFB647180: 289 9,164 0 1,677 10,841 2,584 13,426

**Line Item 0100 - PAM**

**BOE**

Estimator's Experience based generally on historical data for Ryan's Pit

**Item Desc:**
Preparation of of PAM or IM/IRA in support of source removal of previously characterized UBC.

**Proposed Action Memorandum:** A bottoms-up estimate based on historical costs was used as the basis for the estimate. Based on Ryan's Pit (IHSS 108), the cost for the PAM was $50,000 (contractor costs). Assuming that labor rates at this time were approximately $75 (based on a cost center 217). The total labor for a PAM would be approximately 666 hours, which rounds to 700 hours. It was assumed that 10% would be required for managerial hours.

For a PAM the total labor hours are:

**Environmental Engineer 700 Hours**
Manager 70 Hours
Factor 700 Environmental Engineer 175 hours
Factor 70 Manager 18 hours

**Breakdown of Cost Data:**
- Item: Preparation of PAM for Ryan's Pit source removal action.
  - Units: hours
  - Unit Cost: $770
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit Hours: 193

**Basis for adjustment:** Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

**Interim Measure/Interim Remedial Action Decision Document:** It was assumed that an IM/IRA Decision Document would take 75% more effort than a PAM or 1,166 hours, which rounds to 1200 hours. It was assumed that 10% of this labor would be required for managerial hours.

For an IM/IRA the total labor hours are:

**Environmental Engineer 1200 Hours**
Manager 120 Hours
Factor 1200 Environmental Engineer 300 hours
Factor 120 Manager 30 hours

**Resources**

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### Rocky Flats Closure Project
#### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0407  
**Activity ID:** 1GFB647180

**Project:** Baseline Devl  
**WBS Filter:** 1GAC  
**Activity Filter:** *

**Starts In FY:**

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**Line Item 0200 - SAP**

**BOE**

Estimator’s Experience based generally on historical data for Ryan’s Pit

**Item Desc:**
Preparation of SAP in support of source removal of previously characterized UBC.

**Breakdown of Historical Data:**
- **Item:** Preparation of SAP for Ryan's Pit source removal action.
- **Units:** hours
- **Unit Cost:** 300
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit Hours:** 76

**Basis for adjustment.** Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

**Sampling and Analysis Plan:** Based on the T-3/T-4 Sampling and Analysis Plan (SAP) it took 300 hours in total preparation time. It was assumed that 10% of this labor was for managerial hours (30 hours) and that the rest of the time, 270 hours, was for technical staff. It was assumed that these hours include all labor including quality assurance, secretarial support, graphics etc.

**Original Hours** 270  
**Environmental Engineer** 68 hours  
**Original Hours** 30  
**Manager** 8 hours

---

**Line Item 0300 - WMP**

**BOE**

Estimator’s Experience based generally on historical data for Ryan's Pit

**Item Desc:**
Preparation of WMP in support of source removal of previously characterized UBC.

**Breakdown of Historical Data:**
- **Item:** Preparation of WMP for Ryan's Pit source removal action.
- **Units:** hours
- **Unit Cost:** 80
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit Hours:** 20

**Basis for adjustment.** Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

**Waste Management Plan:** It was assumed that a waste management plan would be needed and that it would take no more than two weeks to prepare (80 hours).

**Original Hours** 80  
**Environmental Engineer** 20 hours

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**Line Item SYS - Contingency And Escalation**

**BOE**

**Resources**

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**Activity ID:** 1GFB647210  
**Description:** Procurement and Field Prep - IHSS Grouping 400-7

| Line Item | Description | Quantity | Units | BOE | Labor | Labor Hours | Labor Cost | Materials/Sub | Contingency | Total Prime | Burden Cost | Total Cost |
|-----------|-------------|----------|-------|-----|-------|-------------|------------|--------------|-------------|-------------|-------------|------------|------------|

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6/23/00 9:21:22 AM  
OFFICIAL USE ONLY
## Rocky Flats Closure Project

### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0407  
**Activity ID:** 1GFB647210

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**Total for Activity 1GFB647210:** 345, 10,637, 2,114, 8,801, 21,553, 3,702, 8,801

### Line Item 0100 - procurement & field prep

**BOE**

**Item Desc:**  
Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T-4 Remediation.

**Breakdown of Cost Data:**  
Item: Site Labor to perform above individual tasks for either Ryan's Pit or T-3/T-4.
- Units: hours
- Unit Cost: 1380
- Unit Cost Adjustment Factor: 0.25
- Revised Unit: 345 hours

Item: Subcontractor costs to perform above individual tasks for either Ryan's Pit or T-3/T-4.
- Units: 1 lot
- Unit Cost: $10K
- Unit Cost Adjustment Factor: 0.25
- Revised Unit: $2.5K

**Basis for adjustment.** Hours and costs for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be characterized at once.

Procurement includes preparation of statement of work, proposal review (technical evaluation), and negotiations. Based on a T-3/T-4 burdened cost of $29,186.52. Assuming it is primarily labor hours (RMRS Environmental Engineer charging at $57.45 per hour) yields 508 hours which rounds to 510 total hours.

Davis Bacon Documentation: It was assumed that it would take an environmental engineer twenty-four hours to prepare a Davis Bacon cost estimate and to support the Davis-Bacon determination.

Subcontractor Health and Safety Plan: Costs for the health and safety plan are based on Ryan's Pit, which cost approximately $10,000. It was assumed that these are A5H dollars. In addition, it was assumed that a safety engineer, an industrial hygienist, and a radiological engineer would each provide one week (40 hours) of support for review and document preparation.

Radiological Work Permit: It was assumed that it would take a radiological control technician two working days (18 hours) to complete counting preparation and review.

Implementation Plan: It was estimated that this activity would take 13 weeks of time for engineers, scientists or equivalent to complete. This would include preparation of an implementation plan as required (Rocky Flats Cleanup Agreement, Appendix 3, Interim Guidance Document, Dated August 1977). In addition this includes all tasks related to documentation for the Integrated Work Control Program and Integrated Safety Management.

Ecology Survey/National Environmental Protection Act (NEPA) Support: It was estimated that this would take 40 hours for an ecologist. The activities include NEPA review and support in document preparation, site surveys to verify compliance with ecological regulations, categorical exclusions, and NEPA evaluations.

Utility Clearance/Soil Disturbance Permits: It was estimated based on experience that it would take the equivalent 2 weeks (80 hours) for technical staff to do utility surveys, prepare and review soil disturbance permits, and prepare authorizing documents for excavation.

The combined resources for procurement and field preparations are total procurement and field preparation hours:

- Environmental Engineer: 1134 hours
- Safety Engineer: 40 hours
- Industrial Hygiene: 40 hours
- Radiological Engineering: 58 hours
- Radiological Control Technician: 18 hours
- Ecologist/Life Scientist: 40 hours
- Manager: 50 hours
- Quality Assurance: 29 hours
- A5H: Total $10,000
* On some projects these hours were assumed to be included in other tasks or part of this task under environmental engineer or one of the other job functions. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

Factor 1134 - Environmental Engineer 283 Hours
Factor 40 - Safety Engineer 10 Hours
Factor 40 - Industrial Hygiene 10 Hours
Factor 58 - Radiological Engineering 14 Hours
Factor 50 - Project Manager 13 Hours
Factor 10000 - A5H Subcontracted Services 2,500 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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**Line Item SYS - Contingency And Escalation**

**BOE Resources**

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**Activity ID:** 1GBF647240  
**Description:** Readiness Assessment - IHSS Group 400-7

**Line Item 0100 - readiness assessment**

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**Line Item 0100 - readiness assessment**

Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation

Item Desc:
Evaluate readiness of the field characterization team and plans.
Breakdown of Cost Data:

Item: Site Labor to perform Readiness Assessment for T-3/T-4.
  Units: hours
  Unit Cost: 187
  Unit Cost Adjustment Factor: 0.25
  Revised Unit: 48

  Units: 1 lot
  Unit Cost: $4800
  Unit Cost Adjustment Factor: 0.25
  Revised Unit: $1200

It was estimated that subcontractor involvement would require 80 hours at $60/hour = $4,800. It was assumed that about 3 weeks of time was required for an environmental engineer or similar person in addition to 12 hours of project management, which yielded 132 hours. An additional 11 hours was added for management oversight. It was estimated that a radiological engineer (QA) and an industrial hygienist would be needed for 2.5 days each (22 hours).

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 projects will be conducted at once and only one of each fixed cost is needed for the group.

Factor 132: Environmental Engineer 33 Hours
Factor 22: Health Physicists 6 Hours
Factor 11: Manager 3 Hours
Factor 22: Quality Assurance 6 Hours
Factor 4,800: ASH Subcontracted Srvs 1,200 Dollars

20 hours of administrative time will also be required.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

Line Item 0200 - training
BOE

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc:
Conduct perform Training in support of source removal action.

Breakdown of Cost Data:

Item: Site Labor to perform above individual tasks for T-3/T-4.
  Units: hours
  Unit Cost: 132 Hours
  Unit Cost Adjustment Factor: 0.25
  Revised Unit: 33 hours

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
  Units: 1 lot
  Unit Cost: $12K
  Unit Cost Adjustment Factor: 0.25
Revised Unit: $3K

Basis for adjustment. Costs for each UBC are divided by 4 to account for the fact that 4 UBCs will be remediated at once and only one Training is needed for the group.

It was estimated training would cost $1,000 per subcontractor worker and that 12 subcontractor employees would require training. It was estimated that onsite contractor employees would require the equivalent of 15 hours of training including instructor time and that eight onsite employees would be trained.

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

Factor 132 – Onsite employees 33 Hours
Factor 12000 – Subcontractor employees 3,000 dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Line Item 0300 - pre-evolution meeting

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Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc:
Conduct Pre-Evolution Meeting in support of source removal action

#### Breakdown of Cost Data:

**Item: Site Labor to perform above individual tasks for T-3/T-4.**
- Units: hours
  - 60 hours
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit: 15 hours

**Item: Subcontractor costs to perform above individual tasks for T-3/T-4.**
- Units: 1 lot
  - Unit Cost: $6K
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit: $1.5K

Basis for adjustment. Costs for each UBC are divided by 4 to account for the fact that 4 UBCs will be remediated at once and only one Pre-Evolution Meeting is needed for the group.

It was assumed that the Pre-Evolution Meeting would be limited to five hours. Assuming that 20 subcontract employees would attend at an average cost of $60/hour burdened yields a cost of $6,000. It was assumed that 12 onsite contractor employees would attend to yield another 60 hours.

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

Factor 60 – Onsite employees 15 Hours
Factor 6,000 – Subcontractor employees 1,500 dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### Rocky Flats Closure Project

#### Baseline Cost and Basis of Estimate

**WBS Filter:** 1GAC

**Activity Filter:** 

#### WBS No: 1GAC0407

**Activity ID:** 1GFB647240

**Baseline Devl WBS Filter:**

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**Project:** Rocky Flats Closure Project

**WBS No:** 1GAC0407

**Activity ID:** 1GFB647240

---

#### Line Item SYS - Contingency And Escalation

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#### Activity ID: 1GFB647250

**Description:** Remedial Action - IHSS Group 400-7

**Schedule Risk:** 3

**Cost Risk:** 2

#### Line Item Description

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**Total for Activity 1GFB647250:** 1,357 | 45,526 | 89,299 | 81,536 | 216,360 | 232,448

---

**Line Item 0100 - mobilization**

- **BOE Resources**
  - **Cost Element:** 0100 - mobilization
  - **Skill:** BOE
  - **Department:** RMRS Salaried
  - **Curve:** Linear
  - **Quantity:** 1,357
  - **Units:** 45,526
  - **Contingency And Escalation:** 89,299
  - **Burden Cost:** 81,536
  - **Total Cost:** 216,360

---

**Estimator's Experience based generally on historical data for T-3/T4 Remediation.**

**Item Desc:** Mobilization in support of remediation.

**Breakdown of Cost Data:**

- **Item:** Site Labor to perform above individual tasks for T-3/T-4.
  - **Units:** hours
  - **Unit Cost:** $1,100
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** 275

- **Item:** Subcontractors to perform above individual tasks for T-3/T-4.
  - **Units:** 1 lot
  - **Unit Cost:** $184k
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** see below

**Basis for adjustment.** The costs were divided into fixed costs and variable costs. The fixed costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

- T3/T4 hours 110 Health Physicists 27 Hours
- T3/T4 hours 330 Manager 83 Hours
- T3/T4 hours 550 Environmental Engineer 138 Hours
- T3/T4 hours 110 Industrial Hygienist 27 Hours
- T3/T4 subcontractor dollars 184,000 Subcontractor 46,000

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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**OFFICIAL USE ONLY**
ESTIMATOR'S EXPERIENCE BASED GENERALLY ON HISTORICAL DATA FOR T-3/T4 REMEDIATION.

ITEM DESC:
SITE PREPARATION INCLUDING SETTING UP FENCING, TRAILER, ETC.

BREAKDOWN OF HISTORICAL DATA:

ITEM: SITE LABOR TO PERFORM ABOVE INDIVIDUAL TASKS FOR T-3/T-4.

UNITS: HOURS
UNIT COST: SEE BELOW
UNIT COST ADJUSTMENT FACTOR: SEE BELOW
REVISED UNIT: SEE BELOW

ITEM: SUBCONTRACTOR COSTS TO PERFORM ABOVE INDIVIDUAL TASKS FOR T-3/T-4.

UNITS: 1 LOT
UNIT COST: SEE BELOW
UNIT COST ADJUSTMENT FACTOR: SEE BELOW
REVISED UNIT: SEE BELOW

BASIS FOR ADJUSTMENT. THE COSTS WERE DIVIDED INTO FIXED COSTS AND VARIABLE COSTS. THE FIXED COSTS ARE MOBILIZATION, SITE PREPARATION, PREPARE WASTE ACCEPTANCE FORMS, AND DEMOBILIZATION. THE VARIABLE COSTS ARE EXCAVATION, REMOVE AND CLEAN DEBRIS, THERMAL DESORPTION, CONFIRMATION SAMPLING, WASTE ACCEPTANCE SAMPLING, FIELD OVERSIGHT, AND BACKFILL. THE FIXED COSTS ARE ADJUSTED BY A 0.25 FACTOR TO ACCOUNT FOR THE FACT THAT 4 UBCS WILL BE REMEDIATED AT ONCE AND ONLY ONE OF EACH FIXED COST IS NEEDED FOR THE GROUP. THE VARIABLE COSTS WERE CALCULATED ON A PER CUBIC YARD HISTORICAL BASIS. THE ESTIMATED CONTAMINATED SOIL VOLUMES AND WASTE TYPE DISTRIBUTIONS WERE APPLIED TO THE PER YARD HISTORICAL UNIT RATES TO ARRIVE AT THE ESTIMATED COSTS.

T3/T4 HOURS 120 ENVIRONMENTAL ENGINEER 30 HOURS
T3/T4 DOLLARS 30,000 SUBCONTRACTED SRVS 7,500 DOLLARS

D&D construction trade hours were calculated using the following methodology:

A5H subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.

RCT hours were calculated using the following methodology, unless they were already estimated.

For Site Preparation tasks - RCT hours were the same as D&D construction hours.
For all other tasks A5H subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under KG10H department code.

THIS ESTIMATE INCLUDES A PROJECT PRODUCTIVITY/EFFICIENCY FACTOR FOR COMMITTED BUT AS YET UNDEFINED COST REDUCTIONS.
Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc: Excavation.

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
Units: hours
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
Units: 1 lot
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Total Contaminated Soil to be removed 116 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 116 CY

The excavation cost was based on the excavation cost for the T-3/T-4 Project. Burdened cost based on the T-3/T-4 actuals is $171,487. For the 3,800 cubic yards of contaminated soil removed this yielded a unit cost of $45 per cubic yard of contaminated soil removed. This estimate includes the removal of overburden that might be on top of the contaminated soil. The hours for an environmental engineer from T-3/T-4 were 1.09 hours per cubic yard of contaminated soil. Likewise the hours for the following were assumed to be linearly proportional:

Health Physicists .47 hours per cubic yard
Environmental Operations .31 hours per cubic yard
Industrial Hygienists 0.31 hours per cubic yard
Radiological Control Technician 1.00 hour per cubic yard *

* Based on $50/cubic yard from T-3/T-4, assumes a labor rate of $50/hour

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 1.09 - E050 Environmental Engineer 126 Hours
Factor 0.47 - P080 Health Physicists 55 Hours
Factor 0.31 - P090 Industrial Hygienists 36 Hours
Factor 1.00 - T050 Radiological Control Technician Linear 116 Hours
Factor 45.23 - A5H Subcontracted Srvs 5,247 Dollars (81% subcontracted services/19% D&D construction workers)

D&D construction trade hours represent 19% of the subcontract dollars and were calculated using the following methodology:

A5H subcontracted dollars were multiplied by .19, the result was divided by $60/hr to determine the number of hours allocated to D&D construction.

The dollar amount calculated for D&D construction workers was subtracted from the subcontractor dollars.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
**Project**

**Baseline Devl**

**Baseline Cost and Basis of Estimate**

**WBS Filter**

1GAC

**Activity Filter**

*

**Starts In FY**

*

---

**Line Item 0400 - remove and clean debris**

**BOE**

Estimator's Experience based generally on a base case of 700 cy.

**Item Desc:**

- Remove and clean debris.

**Breakdown of Historical Data:**

- **Item:** Site Labor to perform above individual tasks for T-3/T-4.
  - **Units:** hours
  - **Unit Cost:** see below
  - **Unit Cost Adjustment Factor:** see below
  - **Revised Unit:** see below

- **Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
  - **Units:** 1 lot
  - **Unit Cost:** see below
  - **Unit Cost Adjustment Factor:** see below
  - **Revised Unit:** see below

**Basis for adjustment.** The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

**Total Contaminated Soil to be removed 116 CY**

**Total Soil for Thermal Desorption 0 CY**

**Offsite Waste Volume 116 CY**

For the base case, it was assumed that about five cubic yards out of 700 cubic yards would be debris and would be segregated and cleaned. It was estimated that each cubic yard of debris would cost $1,000 or $5,000 total for 700 cubic yards. This yields a rate of $7.14 per cubic yard.

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

**Factor 7.14 - ASH Subcontracted Srvs 671 Dollars**

This estimate includes a product productivity/efficiency factor for committed but as yet undefined cost reductions.

---

**Line Item 0600 - confirmation sampling**

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

---
**Item Desc:**
Confirmation Sampling.

**Breakdown of Historical Data:**

**Item:** Site Labor to perform above individual tasks for T-3/T-4.
- **Units:** hours
- **Unit Cost:** see below
- **Unit Cost Adjustment Factor:** see below
- **Revised Unit:** see below

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
- **Units:** 1 lot
- **Unit Cost:** see below
- **Unit Cost Adjustment Factor:** see below
- **Revised Unit:** see below

**Basis for adjustment.** The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

**Total Contaminated Soil to be removed 116 CY**
**Total Soil for Thermal Desorption 0 CY**
**Offsite Waste Volume 116 CY**

The analytical costs were based on T-3/T-4, which cost $435,574 for 3800 cubic yards of contaminated soil removed. This yielded a unit rate of about $115/cubic yard. Based on estimator experience the cost of sampling including labor and materials was estimated to be 20% of that rate or about $23/ cubic yard.

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

**Factor 114.62 - A5H Subcontracted Srvs (Analytical) 13,296 Dollars**
**Factor 22.924 - A5H Subcontracted Srvs 2,659 Dollars**

D&D construction trade hours were calculated using the following methodology:

AS$H$ subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.

RCT hours were calculated using the following methodology, unless they were already estimated.

For Site Preparation tasks - RCT hours were the same as D&D construction hours.

For all other tasks A5H subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under KG10H department code.

The dollars amounts calculated for D&D construction workers and RCTs were subtracted from the subcontractor dollars and the revised A5H dollar amount was entered into Best.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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**BOE Line Item 0700 - prepare waste acceptance forms**

**Item Desc:**
Estimator’s Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:**
Prepare Waste Acceptance Forms
Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
Units: hours
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
Units: 1 lot
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

T3/T4 hours 80 environmental engineer 20 hours

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Factors 20 hrs

Line Item 0800 - waste acceptance sampling

Item Desc: Waste Acceptance Sampling

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
Units: hours
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
Units: 1 lot
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Because the waste acceptance sampling is difficult to predict and could vary significantly from project to project, it was assumed that about $800 worth of additional analysis would be required for 20 cubic yards which is the volume that can be placed in one roll-off. This yielded a unit rate of about $40/cubic yard. This sampling and analysis is in addition to the confirmational samples so the costs are not as great. It was assumed that this sampling would be more labor intensive so the sampling costs were estimated to be about 50% of the analytical costs or about $20/cubic yard.

Total Contaminated Soil to be removed 116CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 116 CY

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 40 - A5H Analytical 4,640 Dollars
Factor 20 - A5H Subcontracted Srvs 2,320 Dollars
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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| ASH SUBCONTRACTED SRVS | 0000 NONE | K267S Analytical Laboratory Services | Linear | 33.83 Dollars |
| Factors 40 | units per yard in crates (analytical) | 0.84576 (SYS 061400) .84576000 - System |

**Line Item 0900 - field oversight & project mgmt**

Estimator's Experience based generally on a base case of 700 cy.

Item Desc: Field Oversight and Project Management

Breakdown of Historical Data:

**Item:** Site Labor to perform above individual tasks for T-3/T-4.
- Units: hours
- Unit Cost: see below
- Unit Cost Adjustment Factor: see below
- Revised Unit: see below

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
- Units: 1 lot
- Unit Cost: see below
- Unit Cost Adjustment Factor: see below
- Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

It was assumed that a field manager would be needed for 150 nine-hour working days or about 33 weeks. This work breaks down as follows:

- Preparation Activities 50 working days
- Field Activities - 80 working days
- Demobilization - 20 working days
- Total 150 nine-hour working days or 1350 hours

In addition it was estimated that technical staff, quality assurance, and project management would be required for the equivalent of ten additional weeks, which is 400 hours each.

Based on the base case of a 700 cubic yard removal project, these values yielded unit rates as follows

- Hours Per Cubic Yard Of Contaminated Soil
- Field Manager 1.93
- Technical Staff .57
- Quality Assurance .57
- Project Management 0.57

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

- Factor 1.93 - Environmental Engineer 224 Hours
- Factor 0.57 - Technical Support 66 Hours
- Factor 0.57 - Project Manager 66 Hours
- Factor 0.57 - Quality Assurance 66 Hours

**Resources**

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</table>
### Rocky Flats Closure Project

#### Baseline Cost and Basis of Estimate

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<th>WBS No: 1GAC0407</th>
<th>Activity ID: 1GF647250</th>
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</table>

**Activity Filter**: Baseline Deviation
**WBS Filter**: 1GAC
**Activity Filter**: *  
**Starts In FY**: *

<table>
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<tr>
<th>Line Item 1000 - backfill</th>
<th>BOE</th>
</tr>
</thead>
</table>

**Trade Publication**
Means 1995, Site Work & Landscape Cost Data (page 34, 42, and 34)

**Item Desc:**
Backfill.

**Breakdown of Historical Data:**

**Item**: Site Labor to perform above individual tasks for T-3/T-4.
- **Units**: hours
- **Unit Cost**: see below
- **Unit Cost Adjustment Factor**: see below
- **Revised Unit**: see below

**Item**: Subcontractor costs to perform above individual tasks for T-3/T-4.
- **Units**: 1 lot
- **Unit Cost**: see below
- **Unit Cost Adjustment Factor**: see below
- **Revised Unit**: see below

**Means (1995) Site Work & Landscape Cost Data as follows:**
- **Common Fill**: $4.77/cubic yard (page 34 Borrow Bank Measure)
- **Hauling**: $3.98/cubic yard (page 42 2-mile round-trip, 6 cubic yard dump truck)
- **Backfilling**: $1.69/cubic yard (page 34)
- **Burden (43%)**: $4.49/cubic yard

**Total $14.23/cubic yard or about $15/cubic yard**

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

**Factors**: 15 - A5H Subcontracted Srvs 1,740 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

<table>
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<tr>
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<td>ER Programs</td>
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</table>

**Factors**: 15 units per yard in crates

**Line Item 1100 - demobilization**

**BOE**

**Estimator's Experience based generally on historical data for T-3/T4 Remediation.**

**Item Desc:**
Demobilization.

**Breakdown of Historical Data:**

**Item**: Site Labor to perform above individual tasks for T-3/T-4.
- **Units**: hours
- **Unit Cost**: see below
- **Unit Cost Adjustment Factor**: see below
- **Revised Unit**: see below

**Item**: Subcontractor costs to perform above individual tasks for T-3/T-4.
- **Units**: 1 lot
- **Unit Cost**: see below
- **Unit Cost Adjustment Factor**: see below
- **Revised Unit**: see below
Project Baseline Devl
Rocky Flats Closure Project Baseline Cost and Basis of Estimate

WBS Filter 1GAC
Activity Filter * Suits In FY *

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Demobilization: Based on the T-3/T-4 project, it was assumed that demobilization costs would cover demobilization for excavation activities also. The subcontractor cost for demobilization was about $95,000 for 3,800 cubic yards at the T-3/T-4 project. In addition it was estimated that the following hours were necessary:

Environmental Engineer 300 hours
Health Physicist 100 hours
Manager 200 hours
Industrial Hygiene 100 hours

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

Factor 300 - Environmental Engineer 75 Hours
Factor 100 - Health Physicists 25 Hours
Factor 200 - Manager 50 Hours
Factor 95000 - ASH Subcontracted Svrs 23,750 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Resources**

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**Line Item SYS - Contingency And Escalation**

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**Activity ID: 1GFB647270**

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Total for Activity 1GFB647270: 320, 9,045, 0, 6,522, 15,567, 3,148, 18,714.8

**Line Item 0100 - develop report**

Estimate based on estimator's experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

Item Desc:
Perform Data Analysis including GIS representation of data, Closeout Report, and associated project management.
# Breakdown of Cost Data:

**Item:** Develop Documentation  
**Units:** hours  
**Unit Cost:** 320  
**Unit Cost Adjustment Factor:** none  
**Revised Unit Hours:** 320

Basis for adjustment: 
Required level of effort: 
- Environmental Engineer - 80 hours  
- Environmental Scientist - 160 hours (GIS, SWD)  
- Manager - 20 hours  
- Administrative - 20 hours  
- Cost Estimators - 20 hours

## Resources

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**WBS No:** 1GAC0407  
**Activity ID:** 1GFB647270  
**Title:** Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

**WBS Filter:** 1GAC  
**Activity Filter:** *  
**Saves In FY:** *

**Bole**

**Description:** SAP Preparation - IHSS Group 400-8 (B441)

**WBS No:** 1GAC0408  
**Title:** Group 400-8 (B441)  
**Activity ID:** 1GFB648100

**Cost Risk:** 1  
**Schedule Risk:** 1

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Total for Activity 1GFB648100:

**Quantity:** 280  
**Units:** 10,021  
**Labor Hours:** 4,133  
**Labor Cost:** 15,575  
**Materials/Sub Cost:** 3,467  
**Total Cost:** 19,042

**Line Item 0100 - SAP Addenda**

**Item Desc:** 
Preparation of SAP Addenda to Industrial Area Characterization Plan.

**Breakdown of Cost Data:**

**Item:** Preparation of SAP addenda  
**Units:** hours  
**Unit Cost:** 120  
**Unit Cost Adjustment Factor:** none  
**Revised Unit Hours:** 120

---

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### Resources

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### Line Item 0200 - HASP Addenda

**Item Desc:**
Preparation of HASP addenda to Industrial Area Characterization Plan.

**Breakdown of Cost Data:**
- Item: Preparation of addenda for HASP.
  - Units: hours
  - Unit Cost: 140
  - Unit Cost Adjustment Factor: none
  - Revised Unit Hours: 140

**Line Item 0300 - QAP Addenda

**Item Desc:**
Preparation of QAP Addenda to Industrial Area Characterization Plan.

**Breakdown of Cost Data:**
- Item: Preparation of QAP addenda
  - Units: hours
  - Unit Cost: 60
  - Unit Cost Adjustment Factor: none
  - Revised Unit Hours: 60

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### Line Item SYS - Contingency And Escalation

#### BOE Resources

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Factors:
- **2,990.09 Dollars**
- **1,143.27 Dollars**

#### Activity ID: 1GFB648120

**Description:** Procurement and Field Prep - IHSS Group 400-8

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**Total for Activity 1GFB648120:**

| | | | | | | | | | | | | |
| | | | | | | | | | | | | |

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**BOE Estimator's Experience**

*Based generally on historical data for Ryan's Pit and T-3/T4 Remediation*

**Item Desc:**

**Breakdown of Cost Data:**

**Item: Site Labor to perform above individual tasks for either Ryan's Pit or T-3/T-4.**
- **Units:** hours
- **Unit Cost:** $1300
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** 345 hours

**Item: Subcontractor costs to perform above individual tasks for either Ryan's Pit or T-3/T-4.**
- **Units:** 1 lot
- **Unit Cost:** $10K
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** $2.5K

**Breakdown for adjustment. Hours and costs for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be characterized at once.**

**Procurement includes preparation of statement of work, proposal review (technical evaluation), and negotiations. Based on a T-3/T-4 burdened cost of $29,186.52. Assuming it is primarily labor hours (RMRS Environmental Engineer charging at $57.45 per hour) yields 508 hours which rounds to 510 total hours.**

**Davis Bacon Documentation:** It was assumed that it would take an environmental engineer twenty-four hours to prepare a Davis Bacon cost estimate and to support the Davis-Bacon determination.

**Subcontractor Health and Safety Plan:** Costs for the health and safety plan are based on Ryan's Pit, which cost approximately $10,000. It was assumed that these are A5H dollars. In addition, it was assumed that a safety engineer, an industrial hygienist, and a radiological engineer would each provide one week (40 hours) of support for review and document preparation.

**Radiological Work Permit:** It was assumed that it would take a radiological control technician two working days (18 hours) to complete counting preparation and review.

**Implementation Plan:** It was estimated that this activity would take 13 weeks of time for engineers, scientists or equivalent to complete. This would include preparation of an implementation plan as required (Rocky Flats Cleanup Agreement, Appendix 3, Interim Guidance Document, Dated August 1977). In addition this includes all tasks related to documentation for the Integrated Work Control Program and Integrated Safety Management.

**Ecology Survey/National Environmental Protection Act (NEPA) Support:** It was estimated that this would take 40 hours for an ecologist. The activities include NEPA review and support in document preparation, site surveys to verify compliance with ecological regulations, categorical exclusions, and NEPA evaluations.

**Utility Clearance/Soil Disturbance Permits:** It was estimated based on experience that it would take the equivalent 2 weeks (80 hours) for technical staff to do utility surveys, prepare and review soil disturbance permits, and prepare authorizing documents for excavation.
### Environmental Engineer

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### Radiological Engineering

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<th>Department</th>
<th>Skill</th>
<th>Quantity</th>
<th>Units</th>
<th>Curve</th>
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<td>14</td>
<td>Hours</td>
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### A5H Total

- $10,000

*On some projects these hours were assumed to be included in other tasks or part of this task under environmental engineer or one of the other job functions.

The project productivity/efficiency factor for committed but as yet undefined cost reductions is 0.84576. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

Factors for each resource are as follows:

- Environmental Engineer: 283 hours
- Safety Engineer: 10 hours
- Industrial Hygienist: 10 hours
- Radiological Engineering: 14 hours
- Radiological Control Technician: 5 hours
- Ecologist/Life Scientist: 10 hours
- Manager: 13 hours
- Quality Assurance: 29 hours
- A5H Total: 2,500 dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
Line Item 0100 - readiness assessment

Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation.

Item Desc:
Evaluate readiness of the field characterization team and plans.

Breakdown of Cost Data:
Item: Site Labor to perform Readiness Assessment for T-3/T-4.
  Units: hours
  Unit Cost: $4800
  Unit Cost Adjustment Factor: 0.25
  Revised Unit: $1200

  Units: 1 lot
  Unit Cost: $4800
  Unit Cost Adjustment Factor: 0.25
  Revised Unit: $1200

It was estimated that subcontractor involvement would require 80 hours at $60/hour = $4,800. It was assumed that about 3 weeks of time was required for an environmental engineer or similar person in addition to 12 hours of project management, which yielded 132 hours. An additional 11 hours was added for management oversight. It was estimated that a radiological engineer (QA) and an industrial hygienist would be needed for 2.5 days each (22 hours).

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 projects will be conducted at once and only one of each fixed cost is needed for the group.

Factor 132 - Environmental Engineer 33 Hours
Factor 22 - Health Physicists 6 Hours
Factor 11 - Manager 3 Hours
Factor 4,800 - ASH Subcontracted Svrs 1,200 Dollars

20 hours of administrative time will also be required.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

### Resources

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### Contingency And Escalation

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0.84576  [SYS 061400].84576000 - System
### Rocky Flats Closure Project 
#### Baseline Cost and Basis of Estimate

**Activity ID:** 1GFB648150  
**Description:** Field Sampling, Lab Analysis - IHSS Group 400-8

**Line Item 0100 - collect geoprobe samples**

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<th>Description</th>
<th>Quantity</th>
<th>Units</th>
<th>BOE Type</th>
<th>Labor Hours/Unit</th>
<th>Labor Total</th>
<th>Labor Cost/Total</th>
<th>Materials/Sub Cost</th>
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**Line Item 0200 - analyze samples**

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**Total for Activity 1GFB648150:**

- 608 hours
- 18,115 Labor Hours
- 190,475 Labor Cost
- 313,631 Total Cost

---

**BOE Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.**

**Item Desc:**
Collection of geoprobe samples with the site geoprobe with two technicians. A site Environmental Engineer will direct the boring placement, log the borings; collect, containerize, package, and ship the samples; prepare field QC documentation, and prepare field notes on a full time basis. A site RCT will monitor the site for radiological contamination on a full time basis. A site Industrial Hygienist will implement the field portion of the HASP on a full time basis. Decon Operations staff will decon the vehicle and equipment when it leaves the work area on a half time basis. It is estimated that one 10' boring will be place per 500 SF of building footprint (same as Bldg. 123 characterization) with 5 samples per 10' boring. It is estimated that one boring per eight hours can be completed.

**Breakdown of Cost Data:**
- **Item:** Site Personnel for support of geoprobe samples
  - **Units:** hours
  - **Unit Cost:** 32
  - **Unit Cost Adjustment Factor:** none
  - **Revised Unit Hours:** 32
- **Item:** Kaiser-Hill/RMRS Geoprobe unit with 2 Technician crew. Item costs $100 per hour or $800 per 8-hour day.
  - **Units:** dollars
  - **Unit Cost:** 800
  - **Unit Cost Adjustment Factor:** none
  - **Revised Unit Hours:** 800

**Basis for adjustment:**
A 50% reduction in the number of geoprosbes is based on process history and building knowledge which indicates that characterization to the extent required for Building 123 is not required at this location.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

**Resources**

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**Line Item 0100 - collect geoprobe samples**

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**Rocky Flats Closure Project**

**Baseline Cost and Basis of Estimate**

**WBS No:** 1GAC0408

**Activity ID:** 1GFB648150

---

**Breakdown of Cost Data:**

- **Item:** Analyze samples at an offsite laboratory.
- **Units:** analysis
- **Unit Cost:** Metals $345, VOCs $280, SVOCs $440, PCBs and other analytes $150, and Radionuclides 3 isotopes) $590 per each sample.
- **Unit Cost Adjustment Factor:** Must add: DOT rad screen $32/sample, bottle charge $7/sample, shipping $4.2/bottle, and validation per each: $17.30 VOA, $19.25 SVOC, $16.75 Metals, $5.95 PCB, and $15.60 Rad.
- **Revised Unit Hours:** Metals $405, VOCs $341, SVOCs $502, PCBs and other analytes $199, and Rad $649.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

**Resources**

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<td>A 50% reduction in characterization is based on process history and building knowledge which indicates that characterization to the extent required for Building 123 is not required at this location.</td>
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<td>This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.</td>
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**Line Item 01000 - develop documentation**

**BOE**

**Estimate for summary report based on estimator's 16 years of experience performing and costing projects of similar size and scope.**

---

**Activity ID:** 1GFB648170

**Description:** Prepare Summary/NFA - IHSS Group 400-8

---

### Activity: 1GFB648170

**Description:** Prepare Summary/NFA - IHSS Group 400-8

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<th>Materials/Sub Cost</th>
<th>Contingency &amp; Escalation</th>
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Total for Activity 1GFB648170:

| 656 | 19,024 | 0 | 13,718 | 32,741 | 6,620 | 39,361 |

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6/23/00 9:21:26 AM

OFFICIAL USE ONLY
### Item Desc:
Perform Data Analysis including GIS representation of data, NFA Summary, Characterization Report, and associated project management. Disposition comments and finalize document.

- **Computer Specialist** 80 hrs: Identify & pull existing data from database.
- **GIS Specialist** 80 hrs: Develop maps for Report. Print multiple copies.
- **Technical Editor** 80 hrs: Complete initial and revised tech edits of Report.
- **Quality Assurance** 60 hrs: Review
- **Environmental Engineer** 48 hrs: Peer review
- **Regulatory Compliance** 48 hrs: Review
- **Management** 48 hrs
- **Legal** 8 hrs: Review
- **Administrative Support** 48 hrs: Copy & assemble final documents, submit to records.

### Breakdown of Cost Data:
**Item:** Develop Documentation  
**Units:** Hours  
**Unit Cost:** $656  
**Unit Cost Adjustment Factor:** none  
**Revised Unit Hours:** 656  
**Basis for adjustment:** N/A

### Resources

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### Line Item SYS - Contingency And Escalation

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### Activity ID: 1GFB648180
**Description:** Prepare Decision Document - HSS Group 400-8
**Cost Risk:** 1  
**Schedule Risk:** 1

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<th>Materials/Sub Cost</th>
<th>Contingency &amp; Escalation</th>
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**Total for Activity 1GFB648180:** 289 9,164 0 6,608 15,772 3,189 18,961
Line Item 0100 - PAM

BOE

Estimator's Experience based generally on historical data for Ryan's Pit

Item Desc:
Preparation of PAM or IM/IRA in support of source removal of previously characterized UBC.

Proposed Action Memorandum: A bottoms-up estimate based on historical costs was used as the basis for the estimate. Based on Ryan's Pit (IHSS 108), the cost for the PAM was $50,000 (contractor costs). Assuming that labor rates at this time were approximately $75 (based on a cost center 217). The total labor for a PAM would be approximately 666 hours, which rounds to 700 hours. It was assumed that 10% would be required for managerial hours.

For a PAM the total labor hours are:
Environmental Engineer 700 Hours
Manager 70 Hours
Factor 700 Environmental Engineer 175 hours
Factor 70 Manager 18 hours

Breakdown of Cost Data:
- Item: Preparation of PAM for Ryan's Pit source removal action.
  - Units: hours
  - Unit Cost: 770
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit Hours: 193

Basis for adjustment. Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

Line Item 0200 - SAP

BOE

Estimator's Experience based generally on historical data for Ryan's Pit

Item Desc:
Preparation of SAP in support of source removal of previously characterized UBC.

Breakdown of Historical Data:
- Item: Preparation of SAP for Ryan's Pit source removal action.
  - Units: hours
  - Unit Cost: 300
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit Hours: 76

Basis for adjustment. Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

Sampling and Analysis Plan: Based on the T-3/T-4 Sampling and Analysis Plan (SAP) it took 300 hours in total preparation time. It was assumed that 10% of this labor was for managerial hours (30 hours) and that the rest of the time, 270 hours, was for technical staff. It was assumed that these hours include all labor including quality assurance, secretarial support, graphics etc.
### Rocky Flats Closure Project
**Baseline Cost and Basis of Estimate**

**WBS No:** 1GAC0408  
**Activity ID:** 1GFB648180

#### Table 1: Resources

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#### Table 2: Line Item 0300 - WMP

**BOE**

Estimator's Experience based generally on historical data for Ryan's Pit

Item Desc: Preparation of WMP in support of source removal of previously characterized UBC.

Breakdown of Historical Data:
- Item: Preparation of WMP for Ryan's Pit source removal action.  
  Units: hours  
  Unit Cost: 80  
  Unit Cost Adjustment Factor: 0.25  
  Revised Unit Hours: 20

Basis for adjustment. Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

#### Table 3: Line Item SYS - Contingency And Escalation

**BOE**

**Activity ID:** 1GFB648210  
**Description:** Procurement and Field Prep - IHSS Grouping 400-8

**Cost Risk:** 1  
**Schedule Risk:** 1

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Total for Activity 1GFB648210:  
- Labor Hours Total: 345  
- Labor Cost Total: 10637  
- Burden Cost: 3702  
- Total Cost: 16453

---

### Line Item 0100 - procurement & field prep

**BOE**

Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation


Breakdown of Cost Data:
- Item: Site Labor to perform above individual tasks for either Ryan's Pit or T-3/T-4.  
  Units: hours  
  Unit Cost: 1380  
  Unit Cost Adjustment Factor: 0.25  
  Revised Unit: 345 hours

Item: Subcontractor costs to perform above individual tasks for either Ryan's Pit or T-3/T-4.  
- Units: 1 lot  
- Unit Cost: $10K
Unit Cost Adjustment Factor: 0.25
Revised Unit: $2.5K

Basis for adjustment. Hours and costs for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be characterized at once.

Procurement includes preparation of statement of work, proposal review (technical evaluation), and negotiations. Based on a T-3/T-4 burdened cost of $25,186.52. Assuming it is primarily labor hours (RMRS Environmental Engineer charging at $57.45 per hour) yields 508 hours which rounds to 510 total hours.

Davis Bacon Documentation: It was assumed that it would take an environmental engineer twenty-four hours to prepare a Davis Bacon cost estimate and to support the Davis-Bacon determination.

Subcontractor Health and Safety Plan: Costs for the health and safety plan are based on Ryan's Pit, which costs approximately $10,000. It was assumed that these are A5H dollars. In addition, it was assumed that a safety engineer, an industrial hygienist, and a radiological engineer would each provide one week (40 hours) of support for review and document preparation.

Radiological Work Permit: It was assumed that it would take a radiological control technician two working days (18 hours) to complete counting preparation and review.

Implementation Plan: It was estimated that this activity would take 13 weeks of time for engineers, scientists or equivalent to complete. This would include preparation of an implementation plan as required (Rocky Flats Cleanup Agreement, Appendix 3, Interim Guidance Document, Dated August 1977). In addition this includes all tasks related to documentation for the Integrated Work Control Program and Integrated Safety Management.

Ecology Survey/National Environmental Protection Act (NEPA) Support: It was estimated that this would take 40 hours for an ecologist. The activities include NEPA review and support in document preparation, site surveys to verify compliance with ecological regulations, categorical exclusions, and NEPA evaluations.

Utility Clearance/Soil Disturbance Permits: It was estimated based on experience that it would take the equivalent 2 weeks (80 hours) for technical staff to do utility surveys, prepare and review soil disturbance permits, and prepare authorizing documents for excavation.

The combined resources for procurement and field preparations are:

Total Procurement and Field Preparation Hours:

- Environmental Engineer: 1,134 hours
- Safety Engineer: 40 hours
- Industrial Hygiene: 40 hours
- Radiological Engineering: 58 hours
- Radiological Control Technician: 18 hours
- Ecologist/Life Scientist: 40 hours
- Manager: 50 hours
- Quality Assurance: 29 hours
- A5H Total: $10,000

* On some projects these hours were assumed to be included in other tasks or part of this task under environmental engineer or one of the other job functions.

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

- Factor 1,134 - Environmental Engineer: 283 Hours
- Factor 40 - Safety Engineer: 10 Hours
- Factor 40 - Industrial Hygiene: 10 Hours
- Factor 50 - Radiological Engineering: 14 Hours
- Factor 18 - RCT: 5 Hours
- Factor 40 - Life Scientist: 10 Hours
- Factor 50 - Project Manager: 13 Hours
- Factor 10,000 - A5H Subcontracted Services: 2,500 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### Rocky Flats Closure Project
#### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0408  
**Activity ID:** 1GB6848210  
**Project:** Baseline Devl  
**WBS Filter:** 1GAC  
**Activity Filter:** *  
**Starts In FY:** *

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**Activity ID:** 1GFB648240  
**Description:** Readiness Assessment - IHSS Group 400-8  
**Cost Risk:** 1  
**Schedule Risk:** 1

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**Line Item 0100 - readiness assessment**

**BOE**  
**Description:** Readiness Assessment - IHSS Group 400-8  
**Item Desc:** Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation

**Breakdown of Cost Data:**  
- **Item:** Site Labor to perform Readiness Assessment for T-3/T-4.  
  - Units: hours  
  - Unit Cost: $187  
  - Unit Cost Adjustment Factor: 0.25  
  - Revised Unit: 48

**Item:** Subcontractor costs to perform Readiness Assessment for T-3/T-4.  
- Units: 1 lot  
- Unit Cost: $4800  
- Unit Cost Adjustment Factor: 0.25  
- Revised Unit: $1200

It was estimated that subcontractor involvement would require 80 hours at $60/hour = $4,800. It was assumed that about 3 weeks of time was required for an environmental engineer or similar person in addition to 12 hours of project management, which yielded 132 hours. An additional 11 hours was added for management oversight. It was estimated that a radiological engineer (QA) and an industrial hygienist would be needed for 2.5 days each (22 hours).

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 projects will be conducted at once and only one of each fixed cost is needed for the group.

**Factor 132- Environmental Engineer 33 Hours**  
**Factor 22 - Health Physicists 6 Hours**  
**Factor 11 - Manager 3 Hours**
Factor 22 - Quality Assurance 6 Hours
Factor 4,800 - ASH Subcontracted Srvs 1,200 Dollars

20 hours of administrative time will also be required.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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Line Item 0200 - training

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc:
Conduct perform Training in support of source removal action.

Breakdown of Cost Data:

Item: Site Labor to perform above individual tasks for T-3/T-4.
Units: hours
Unit Cost: 132 Hours
Unit Cost Adjustment Factor: 0.25
Revised Unit: 33 hours

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
Units: 1 lot
Unit Cost: $12K
Unit Cost Adjustment Factor: 0.25
Revised Unit: $3K

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
**Line Item 0300 - pre-evolution meeting**

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:**

Conduct Pre-Evolution Meeting in support of source removal action

**Breakdown of Cost Data:**

**Item:** Site Labor to perform above individual tasks for T-3/T-4.
- **Units:** hours
  - **Unit Cost:** 60 hours
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** 15 hours

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
- **Units:** 1 lot
  - **Unit Cost:** $6K
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** $1.5K

**Basis for adjustment.** Costs for each UBC are divided by 4 to account for the fact that 4 UBCs will be remediated at once and only one Pre-Evolution Meeting is needed for the group.

It was assumed that the Pre-Evolution Meeting would be limited to five hours. Assuming that 20 subcontract employees would attend at an average cost of $60/hour burdened yields a cost of $6,000. It was assumed that 12 onsite contractor employees would attend to yield another 60 hours.

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one each fixed cost is needed for the group.

Factor 60 - Onsite employees 15 Hours

Factor 6,000 - Subcontractor employees 1,500 dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
Rocky Flats Closure Project
Baseline Cost and Basis of Estimate

WBS No: 1GAC0408
Baseline Devl
Activity ID: 1GF684250
WBS Filter 1GAC

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### Baseline Cost and Basis of Estimate

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### Costs and Rates

#### Premobilization

**BOE**

**Item Description**: Mobilization in support of remediation.

**Breakdown of Cost Data**:

- **Item**: Site Labor to perform above individual tasks for T-3/T-4.
  - **Units**: hours
  - **Unit Cost**: see below
  - **Unit Cost Adjustment Factor**: see below
  - **Revised Unit**: see below

**Item**: Subcontractor costs to perform above individual tasks for T-3/T-4.

- **Units**: 1 lot
- **Unit Cost**: see below
- **Unit Cost Adjustment Factor**: see below
- **Revised Unit**: see below

**Basis for Adjustment**:

The costs were divided into fixed costs and variable costs. The fixed costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

**Line Item 0100 - mobilization**

- **BOE**: Estimator's Experience based generally on historical data for T-3/T4 Remediation.
  - **Item Desc**: Mobilization in support of remediation.
  - **Breakdown of Cost Data**:
    - **Item**: Site Labor to perform above individual tasks for T-3/T-4.
      - **Units**: hours
      - **Unit Cost**: see below
      - **Unit Cost Adjustment Factor**: see below
      - **Revised Unit**: see below
    - **Item**: Subcontractor costs to perform above individual tasks for T-3/T-4.
      - **Units**: 1 lot
      - **Unit Cost**: see below
      - **Unit Cost Adjustment Factor**: see below
      - **Revised Unit**: see below

**Rated Values**:

- **T3/T4 hours 110 Health Physicists 27 Hours**: 27
- **T3/T4 hours 330 Manager 83 Hours**: 83
- **T3/T4 hours 550 Environmental Engineer 138 Hours**: 138
- **T3/T4 hours 110 Industrial Hygienist 27 Hours**: 27
- **T3/T4 subcontractor dollars 184,000 Subcontractor 46,000**: 46000

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

#### Site Preparation

**BOE**

**Item Description**: Site Preparation including setting up fencing, trailer, etc.

**Breakdown of Historical Data**:

- **Item**: Site Labor to perform above individual tasks for T-3/T-4.
  - **Units**: hours
  - **Unit Cost**: see below
  - **Unit Cost Adjustment Factor**: see below
  - **Revised Unit**: see below

**Rated Values**:

- **T3/T4 hours 110 Health Physicists 27 Hours**: 27
- **T3/T4 hours 330 Manager 83 Hours**: 83
- **T3/T4 hours 550 Environmental Engineer 138 Hours**: 138
- **T3/T4 hours 110 Industrial Hygienist 27 Hours**: 27
- **T3/T4 subcontractor dollars 184,000 Subcontractor 46,000**: 46000

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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**Factors**:

- **BOE**

  **Item Description**: Mobilization in support of remediation.

  **Breakdown of Cost Data**:

  - **Item**: Site Labor to perform above individual tasks for T-3/T-4.
    - **Units**: hours
    - **Unit Cost**: see below
    - **Unit Cost Adjustment Factor**: see below
    - **Revised Unit**: see below

  **Rated Values**:

  - **T3/T4 hours 110 Health Physicists 27 Hours**: 27
  - **T3/T4 hours 330 Manager 83 Hours**: 83
  - **T3/T4 hours 550 Environmental Engineer 138 Hours**: 138
  - **T3/T4 hours 110 Industrial Hygienist 27 Hours**: 27
  - **T3/T4 subcontractor dollars 184,000 Subcontractor 46,000**: 46000

  This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Line Item 0200 - site prep

**BOE**

**Item Description**: Site Preparation including setting up fencing, trailer, etc.

**Breakdown of Historical Data**:

- **Item**: Site Labor to perform above individual tasks for T-3/T-4.
  - **Units**: hours
  - **Unit Cost**: see below
  - **Unit Cost Adjustment Factor**: see below
  - **Revised Unit**: see below

**Rated Values**:

- **T3/T4 hours 110 Health Physicists 27 Hours**: 27
- **T3/T4 hours 330 Manager 83 Hours**: 83
- **T3/T4 hours 550 Environmental Engineer 138 Hours**: 138
- **T3/T4 hours 110 Industrial Hygienist 27 Hours**: 27
- **T3/T4 subcontractor dollars 184,000 Subcontractor 46,000**: 46000

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### Rocky Flats Closure Project

#### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0408  
**Activity ID:** 1GFB684250

**Project:** Rocky Flats Closure Project  
**Baseline Devl:**  
**WBS Filter:** 1GAC  
**Activity Filter:** *  
**Starts In FY:** *

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<th>Unit Cost</th>
<th>Unit Cost Adjustment Factor</th>
<th>Revised Unit</th>
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<tr>
<td>Item: Subcontractor costs to perform above individual tasks for T-3/T-4.</td>
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<td>see below</td>
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<tr>
<td></td>
<td>Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.</td>
<td></td>
<td>see below</td>
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<td>T3/T4 hours 120 Environmental Engineer 30 hours</td>
<td>T3/T4 dollars 30,000 Subcontracted Srvs 7,500 Dollars</td>
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<td>D&amp;D construction trade hours were calculated using the following methodology:</td>
<td>A5H subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&amp;D construction.</td>
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<td>RCT hours were calculated using the following methodology, unless they were already estimated.</td>
<td>For Site Preparation tasks - RCT hours were the same as D&amp;D construction hours.</td>
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<tr>
<td>For all other tasks A5H subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under KG10H department code.</td>
<td>This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.</td>
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### Resources

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**Line Item 0300 - excavation**

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:** Excavation.

**Breakdown of Historical Data:**

**Item:** Site Labor to perform above individual tasks for T-3/T-4.  
**Units:** hours  
**Unit Cost:** see below  
**Unit Cost Adjustment Factor:** see below  
**Revised Unit:** see below

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.  
**Units:** 1 lot  
**Unit Cost:** see below  
**Unit Cost Adjustment Factor:** see below  
**Revised Unit:** see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.
The excavation cost was based on the excavation cost for the T-3/T-4 Project. Burdened cost based on the T-3/T-4 actuals is $171,487. For the 3,800 cubic yards of contaminated soil removed this yielded a unit cost of $45 per cubic yard of contaminated soil removed. This estimate includes the removal of overburden that might be on top of the contaminated soil. Likewise the hours for the following were assumed to be linearly proportional:

Health Physicists .47 hours per cubic yard
Environmental Operations .31 hours per cubic yard
Industrial Hygienists .31 hours per cubic yard
Radiological Control Technician 1.00 hour per cubic yard

* Based on $50/cubic yard from T-3/T-4, assumes a labor rate of $50/hour

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 1.09 - E050 Environmental Engineer 370 Hours
Factor 0.47 - P080 Health Physicists 159 Hours
Factor 0.31 - P090 Industrial Hygienists 105 Hours
Factor 1.00 - T050 Radiological Control Technician 339 Hours
Factor 45.23 - A5H Subcontracted Srvs 15,333 Dollars (81% subcontracted services/19% D&D construction workers)

D&D construction trade hours represent 19% of the subcontract dollars and were calculated using the following methodology:

A5H subcontracted dollars were multiplied by .19, the result was divided by $60/hr to determine the number of hours allocated to D&D construction.

The dollar amount calculated for D&D construction workers was subtracted from the subcontractor dollars.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
Units: 1 lot
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Total Contaminated Soil to be removed 339 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 339 CY

For the base case, it was assumed that about five cubic yards out of 700 cubic yards would be debris and would be segregated and cleaned. It was estimated that each cubic yard of debris would cost $1,000 or $5,000 total for 700 cubic yards. This yields a rate of $7.14 per cubic yard.

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 7.14 - A5H Subcontracted Srvs 2,421 Dollars

D&D construction trade hours were calculated using the following methodology:

A5H subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.

RCT hours were calculated using the following methodology, unless they were already estimated.

For Site Preparation tasks - RCT hours were the same as D&D construction hours.
For all other tasks A5H subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under KG10H department code.

The dollars amounts calculated for D&D construction workers and RCTs were subtracted from the subcontractor dollars and the revised A5H dollar amount was entered into Best.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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Line Item 0600 - confirmation sampling

BOE

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc: Confirmation Sampling.

Breakdown of Historical Data:

Item: Site Labor to perform above individual tasks for T-3/T-4.
Units: hours
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
Units: 1 lot
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Total Contaminated Soil to be removed 339 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 339 CY

The analytical costs were based on T-3/T-4, which cost $435,574 for 3800 cubic yards of contaminated soil removed. This yielded a unit rate of about $115/cubic yard. Based on estimator experience the cost of sampling including labor and materials was estimated to be 20% of that rate or about $23/ cubic yard.

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 114.62 - ASH Subcontracted Srvs (Analytical) 38,856 Dollars
Factor 22.924 - ASH Subcontracted Srvs 7,771 Dollars

D&D construction trade hours were calculated using the following methodology:

ASH subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.

RCT hours were calculated using the following methodology, unless they were already estimated.

For Site Preparation tasks - RCT hours were the same as D&D construction hours.
For all other tasks ASH subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under KG10H department code.

The dollars amounts calculated for D&D construction workers and RCTs were subtracted from the subcontractor dollars and the revised ASH dollar amount was entered into Best.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

T3/T4 hours 80 environmental engineer 20 hours

Resources

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<td>Item: Subcontractor costs to perform above individual tasks for T-3/T-4.</td>
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<tr>
<td>Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.</td>
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<td>Because the waste acceptance sampling is difficult to predict and could vary significantly from project to project, it was assumed that about $800 worth of additional analysis would be required for 20 cubic yards which is the volume that can be placed in one roll-off. This yielded a unit rate of about $40/cubic yard. This sampling and analysis is in addition to the confirmational samples so the costs are not as great. It was assumed that this sampling would be more labor intensive so the sampling costs were estimated to be about 50% of the analytical costs or about $20/cubic yard.</td>
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<td>Total Contaminated Soil to be removed 339 CY</td>
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<td>The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.</td>
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Resources

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Line Item 0900 - field oversight & project mgmt

BOE

Estimator's Experience based generally on a base case of 700 cy.
### Breakdown of Historical Data:

**Item:** Site Labor to perform above individual tasks for T-3/T-4.
- **Units:** hours
- **Unit Cost:** see below
- **Unit Cost Adjustment Factor:** see below
- **Revised Unit:** see below

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
- **Units:** 1 lot
- **Unit Cost:** see below
- **Unit Cost Adjustment Factor:** see below
- **Revised Unit:** see below

### Basis for adjustment.

The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

It was assumed that a field manager would be needed for 150 nine-hour working days or about 33 weeks. This work breaks down as follows:

- **Preparation Activities** 50 working days
- **Field Activities** - 80 working days
- **Demobilization** - 20 working days

Total 150 nine-hour working days or 1350 hours

In addition it was estimated that technical staff, quality assurance, and project management would be required for the equivalent of ten additional weeks, which is 400 hours each.

Based on the base case of a 700 cubic yard removal project, these values yielded unit rates as follows:

- **Hours Per Cubic Yard**
  - Of Contaminated Soil
  - Field Manager 1.93
  - Technical Staff .57
  - Quality Assurance .57
  - Project Management 0.57

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

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**Line Item 1000 - backfill**

**BOE**

- Trade Publication
- Means 1995, Site Work & Landscape Cost Data (page 34, 42, and 34)

**Item Desc:**

Backfill.
Breakdown of Historical Data:

Item: Site Labor to perform above individual tasks for T-3/T-4.
Units: hours
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
Units: 1 lot
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Means (1995) Site Work & Landscape Cost Data as follows:

- Common Fill: $4.77/cubic yard (page 34 Borrow Bank Measure)
- Hauling: $3.98/cubic yard (page 42 2-mile round-trip, 6 cubic yard dump truck)
- Backfilling: $1.69/cubic yard (page 34)
- Burden: (43%) € 4.49/cubic yard

Total $14.23/cubic yard or about $15/cubic yard

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 15 - A5H Subcontracted Srvs 5,085 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

Breakdown of Historical Data:

Item: Site Labor to perform above individual tasks for T-3/T-4.
Units: hours
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
Units: 1 lot
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Demobilization: Based on the T-3/T-4 project, it was assumed that demobilization costs would cover demobilization for excavation activities also. The subcontractor cost for demobilization was about $95,000 for 3,800 cubic yards at the T-3/T-4 project. In addition it was estimated that the following hours were necessary:

- Environmental Engineer 300 hours
- Health Physicist 100 hours
Manager 200 hours

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

Factor 300 - Environmental Engineer 75 Hours
Factor 100 - Health Physicists 25 Hours
Factor 200 - Manager 50 Hours
Factor 100 - P090 Industrial Hygienists 25 Hours
Factor 95000 - A5H Subcontracted Srvs 23,750 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
## Rocky Flats Closure Project
### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0408  
**Activity ID:** 1GFB648270

**WBS Filter:** 1GAC  
**Activity Filter:** *  
**Starts In FY:** *

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### Line Item SYS - Contingency And Escalation

**BOE Resources**

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### WBS No:** 1GAC040A  
**Activity ID:** 1GHE64A100  
**Title:** Group 400-10 (Non D&D)  
**Description:** SAP Preparation - IHSS Group 400-10 (Non D&D)

### Line Item 0100 - SAP Addenda

**BOE**

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Item Desc:**
Preparation of SAP Addenda to Industrial Area Characterization Plan.

**Breakdown of Cost Data:**
- **Item:** Preparation of SAP addenda
- **Units:** hours
- **Unit Cost:** 120
- **Unit Cost Adjustment Factor:** none
- **Revised Unit Hours:** 120

**Basis for adjustment:**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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## Rocky Flats Closure Project
### Baseline Cost and Basis of Estimate

**WBS No.:** 1GAC040A  
**Activity ID:** 1GHE64A1100  
**Activity Filter:**  

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**Starts In FY:** *  
**Duration:**  

### Line Item 0200 - HASP Addenda

**BOE**  
Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Item Desc:**  
Preparation of HASP addenda to Industrial Area Characterization Plan

**Breakdown of Cost Data:**  
- **Item:** Preparation of addenda for HASP.
- **Units:** hours
- **Unit Cost:** 140
- **Unit Cost Adjustment Factor:** none
- **Revised Unit Hours:** 140

**Basis for adjustment:**

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### Line Item 0300 - QAP Addenda

**BOE**  
Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Item Desc:**  
Preparation of QAP Addenda to Industrial Area Characterization Plan.

**Breakdown of Cost Data:**  
- **Item:** Preparation of QAP addenda
- **Units:** hours
- **Unit Cost:** 60
- **Unit Cost Adjustment Factor:** none
- **Revised Unit Hours:** 60

**Basis for adjustment:**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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### Line Item SYS - Contingency And Escalation

**BOE**  
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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**Activity ID:** 1GHE64A120  
**Description:** Procurement and Field Prep - IHSS Group 400-10  
**Cost Risk:** 1  
**Schedule Risk:** 1
Line Item 0100 - procurement & field prep

BOE

Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T-4 Remediation

Item Desc:

Breakdown of Cost Data:
- Item: Site Labor to perform above individual tasks for either Ryan's Pit or T-3/T-4.
  - Units: hours
  - Unit Cost: 1380
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit: 345 hours

- Item: Subcontractor costs to perform above individual tasks for either Ryan's Pit or T-3/T-4.
  - Units: 1 lot
  - Unit Cost: $10K
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit: $2.5K

Basis for adjustment. Hours and costs for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be characterized at once.

Procurement includes preparation of statement of work, proposal review (technical evaluation), and negotiations. Based on a T-3/T-4 burdened cost of $29,186.52. Assuming it is primarily labor hours (RMRS Environmental Engineer charging at $57.45 per hour) yields 508 hours which rounds to 510 total hours.

Davis Bacon Documentation: It was assumed that it would take an environmental engineer twenty-four hours to prepare a Davis Bacon cost estimate and to support the Davis-Bacon determination.

Subcontractor Health and Safety Plan: Costs for the health and safety plan are based on Ryan's Pit, which cost approximately $10,000. It was assumed that these are A5H dollars. In addition, it was assumed that a safety engineer, an industrial hygienist, and a radiological engineer would each provide one week (40 hours) of support for review and document preparation.

Radiological Work Permit: It was assumed that it would take a radiological control technician two working days (18 hours) to complete counting preparation and review.

Implementation Plan: It was estimated that this activity would take 13 weeks of time for engineers, scientists or equivalent to complete. This would include preparation of an implementation plan as required (Rocky Flats Cleanup Agreement, Appendix 3, Interim Guidance Document, Dated August 1977). In addition this includes all tasks related to documentation for the Integrated Work Control Program and Integrated Safety Management.

Ecology Survey/National Environmental Protection Act (NEPA) Support: It was estimated that this would take 40 hours for an ecologist. The activities include NEPA review and support in document preparation, site surveys to verify compliance with ecological regulations, categorical exclusions, and NEPA evaluations.

Utility Clearance/Soil Disturbance Permits: It was estimated based on experience that it would take the equivalent 2 weeks (80 hours) for technical staff to do utility surveys, prepare and review soil disturbance permits, and prepare authorizing documents for excavation.

The combined resources for procurement and field preparations are Total Procurement and Field Preparation Hours

Environmental Engineer 1134 hours
Safety Engineer 40 hours
Industrial Hygiene 40 hours
Radiological Engineering 58 hours
Radiological Control Technician 18 hours
Ecologist/Life Scientist 40 hours
Manager 50 hours
Quality Assurance* 29 hours
**Rocky Flats Closure Project**

**Baseline Cost and Basis of Estimate**

**WBS No:** 1GAC040A  
**Activity ID:** 1GHE64A120  
**Project:** Baseline Devl  
**WBS Filter:** 1GAC  
**Activity Filter:**  

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**Resources**

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**Line Item SYS - Contingency And Escalation**

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**Line Item 0100 - readiness assessment**

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Total for Activity 1GHE64A140:

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**Activity ID:** 1GHE64A140  
**Description:** Readiness Assessment - IHSS Group 400-10  
**Cost Risk:** 1  
**Schedule Risk:** 1

---

**Resources**

- **BOE:** Estimator's experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation
- **Item Desc:** Evaluate readiness of the field characterization team and plans.
- **Breakdown of Cost Data:** Item: Site Labor to perform Readiness Assessment for T-3/T-4.
Rocky Flats Closure Project
Baseline Cost and Basis of Estimate

WBS No: 1GAC040A
Activity ID: 1GHE64A140

Baseline_Devl
WBS Filter 1GAC
Activity Filter *

Units: 1 lot
Unit Cost: $4800
Unit Cost Adjustment Factor: 0.25
Revised Unit: $1200

It was estimated that subcontractor involvement would require 80 hours at $60/hour = $4,800. It was assumed that about 3 weeks of time was required for an environmental engineer or similar person in addition to 12 hours of project management, which yielded 132 hours. An additional 11 hours was added for management oversight. It was estimated that a radiological engineer (QA) and an industrial hygienist would be needed for 2.5 days each (22 hours).

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 projects will be conducted at once and only one of each fixed cost is needed for the group.

Factor 132 - Environmental Engineer 33 Hours
Factor 22 - Health Physicists 6 Hours
Factor 11 - Manager 3 Hours
Factor 22 - Quality Assurance 6 Hours
Factor 4,800 - ASH Subcontracted Srvs 1,200 Dollars

20 hours of administrative time will also be required.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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Factors 1200 Dollars

Line Item SYS - Contingency And Escalation

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Factors 713.075 Dollars

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Factors 272.646 Dollars

Activity ID: 1GHE64A150
Description: Field Sampling, Lab Analysis - IHSS Group 400-10

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Total for Activity 1GHE64A150: 2,240, 66,741, 656,202, 206,836, 929,779, 23,092, 952,871
**Line Item 0100 - Collect Geoprobe Samples**

**BOE**

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Item Desc:**
Collection of geoprobe samples with the site geoprobe with two technicians. A site Environmental Engineer will direct the boring placement, log the borings; collect, containerize, package, and ship the samples; prepare field QC documentation, and prepare field notes on a full time basis. A site RCT will monitor the site for radiological contamination on a full time basis. A site Industrial Hygienist will implement the field portion of the HASP on a full time basis. Decon Operations staff will decon the vehicle and equipment when it leaves the work area on a half time basis. It is estimated that one 10' boring will be place per 500 SF of building footprint (same as Bldg. 123 characterization) with 5 samples per 10' boring. It is estimated that one boring per eight hours can be completed.

**Breakdown of Cost Data:**

- **Item:** Site Personnel for support of geoprobe samples
  - **Units:** hours
  - **Unit Cost:** 32
  - **Unit Cost Adjustment Factor:** none
  - **Revised Unit Hours:** 32

- **Item:** Kaiser-Hill/RMRS Geoprobe unit with 2 Technician crew. Item costs $100 per hour or $800 per 8-hour day.
  - **Units:** dollars
  - **Unit Cost:** 800
  - **Unit Cost Adjustment Factor:** none
  - **Revised Unit Hours:** 800

**Basis for adjustment:**
A 50% reduction in the number of geoprobe is based on process history and building knowledge which indicates that characterization to the extent required for Building 123 is not required at this location.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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**Line Item 0200 - Analyze Samples**

**BOE**

Vendor quote

Email quote: average cost from Kaiser-Hill ASD (V. Ideker).

**Item Desc:**
Analyze samples produced from geoprobe borings. It is anticipated that 3 samples from each boring will be collected. They will be analyzed for Metals, VOCs, SVOCs, PCBs, and radionuclides (est. 3 isotopes) with a 30 day TAT. This item is priced on a per sample basis. Per sample costs include DOT rad screen, bottle charge, shipping, and validation.

**Breakdown of Cost Data:**

- **Item:** Sample analysis at an offsite laboratory.
  - **Units:** analysis
  - **Unit Cost:** Metals $345, VOCs $280, SVOCs $440, PCBs and other analytes $150, and Radionuclides 3 isotopes) $590 per each sample
  - **Unit Cost Adjustment Factor:** Must add: DOT rad screen $32/sample, bottle charge $7/sample, shipping $4.2/bottle, and validation per each: $17.30 VOA, $15.25 SVOC, $14.75 Metals, $5.95 PCB, and $15.60 Rad
  - **Revised Unit Hours:** Metals $405, VOCs $341, SVOCs $502, PCBs and other analytes $199, and Rad $649

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
# Rocky Flats Closure Project
## Baseline Cost and Basis of Estimate

**WBS No:** 1GAC040A  
**Activity ID:** 1GHE64A150  
**Project:** Baseline Devl  
**WBS Filter:** 1GAC  
**Activity Filter:** *  
**Starts In FY:** *

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### Line Item 0300 - project mgmt oversight

**BOE**

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Item Desc:**

Project Management/Oversight. Based on half time for a Project Manager, Administrative staff, and Cost Estimator/Scheduler

**Breakdown of Cost Data:**

- **Item:** Mgmt oversight  
  - **Units:** hours  
  - **Unit Cost:** $1,605.25  
  - **Unit Cost Adjustment Factor:** none  
  - **Revised Unit Hours:** 12

**Basis for adjustment:**

A 50% reduction in characterization is based on process history and building knowledge which indicates that characterization to the extent required for Building 123 is not required at this location.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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### Line Item SYS - Contingency And Escalation

**BOE**

**Factors** 57209.9 dollars

### Activity ID: 1GHE64A170

**Description:** Prepare Summary/NFA - IHSS Group 400-10

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**Total for Activity 1GHE64A170:** 656 | 19,024 | 0 | 7,099 | 26,123 | 6,582 | 32,705 |

### Line Item 01000 - develop documentation

**BOE**

**Estimator's Experience:**

Estimate for summary report based on estimator's 16 years of experience performing and costing projects of similar size and scope.

**Item Desc:**

Perform Data Analysis including GIS representation of data, NFA Summary, Characterization Report, and associated project management. Disposition comments and finalize document

- Environmental Engineer 240 hrs  
- Computer Specialist 80 hrs  
  - Identify & pull existing data from database.
- GIS Specialist  
  - 80 hrs Develop maps for Report. Print multiple copies.
- Technical Editor 40 hrs  
  - Complete initial and revised tech edits of Report.
- Quality Assurance 60 hrs  
  - Review
- Environmental Engineer 40 hrs  
  - Peer review

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**Rocky Flats Closure Project**  
**Baseline Cost and Basis of Estimate**

**WBS Filter:** 1GAC  
**Activity Filter:** 

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Breakdown of Cost Data:
- **Item:** Develop Documentation  
  **Units:** Hours  
  **Unit Cost:** 656  
  **Unit Cost Adjustment Factor:** none  
  **Revised Unit Hours:** 656  
  **Basis for adjustment:** N/A

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### Activity ID: 1GHE64A180

**Description:** Prepare Decision Document - IHSS Group 400-10

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**Total for Activity 1GHE64A180:**

- Labor Hours: 289  
- Labor Cost: 9,164  
- Contingency & Escalation: 2,655  
- Total Cost: 11,819  
- Burden Cost: 2,938  
- Total: 14,757

### Line Item 0100 - PAM

**BOE**

**Estimator's Experience based generally on historical data for Ryan's Pit**

**Item Desc:**
Preparation of of PAM or IM/IRA in support of source removal of previously characterized UBC.

Proposed Action Memorandum: A bottoms-up estimate based on historical costs was used as the basis for the estimate. Based on Ryan's Pit (IHSS 108), the cost for the PAM was $50,000 (contractor costs). Assuming that labor rates at this time were approximately $75 (based on a cost center 217). The total labor for a PAM would be approximately 666 hours, which rounds to 700 hours. It was assumed that 10% would be required for managerial hours.

For a PAM the total labor hours are:
Environmental Engineer 700 Hours
Manager 70 Hours
Factor 700 Environmental Engineer 175 hours
Factor 70 Manager 18 hours

Breakdown of Cost Data:
Item: Preparation of PAM for Ryan's Pit source removal action.
Units: hours
Unit Cost: 770
Unit Cost Adjustment Factor: 0.25
Revised Unit Hours: 193

Basis for adjustment. Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

Interim Measure/Interim Remedial Action Decision Document: It was assumed that an IM/IRA Decision Document would take 75% more effort than a PAM or 1,166 hours, which rounds to 1200 hours. It was assumed that 10% of this labor would be required for managerial hours.

For an IM/IRA the total labor hours are
Environmental Engineer 1200 Hours
Manager 120 Hours
Factor 1200 Environmental Engineer 300 hours
Factor 120 Manager 30 hours

---

Environmental Engineer 700 Hours
Manager 70 Hours
Factor 700 Environmental Engineer 175 hours
Factor 70 Manager 18 hours

Breakdown of Cost Data:
Item: Preparation of SAP in support of source removal of previously characterized UBC.
Units: hours
Unit Cost: 300
Unit Cost Adjustment Factor: 0.25
Revised Unit Hours: 76

Basis for adjustment. Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

Sampling and Analysis Plan: Based on the T-3/T-4 Sampling and Analysis Plan (SAP) it took 300 hours in total preparation time. It was assumed that 10% of this labor was for managerial hours (30 hours) and that the rest of the time, 270 hours, was for technical staff. It was assumed that these hours include all labor including quality assurance, secretarial support, graphics etc.

Original Hours 270 Environmental Engineer 68 hours
Original Hours 30 Manager 8 hours

---

Environmental Engineer 700 Hours
Manager 70 Hours
Factor 700 Environmental Engineer 175 hours
Factor 70 Manager 18 hours

Breakdown of Cost Data:
Item: Preparation of SAP in support of source removal of previously characterized UBC.
Units: hours
Unit Cost: 300
Unit Cost Adjustment Factor: 0.25
Revised Unit Hours: 76

Basis for adjustment. Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

Sampling and Analysis Plan: Based on the T-3/T-4 Sampling and Analysis Plan (SAP) it took 300 hours in total preparation time. It was assumed that 10% of this labor was for managerial hours (30 hours) and that the rest of the time, 270 hours, was for technical staff. It was assumed that these hours include all labor including quality assurance, secretarial support, graphics etc.

Original Hours 270 Environmental Engineer 68 hours
Original Hours 30 Manager 8 hours
**Line Item 0300 - WMP**

**BOE**

Estimator's Experience based generally on historical data for Ryan's Pit

**Item Desc:**
Preparation of WMP in support of source removal of previously characterized UBC.

**Breakdown of Historical Data:**
- **Item:** Preparation of WMP for Ryan's Pit source removal action.
  - **Units:** hours
  - **Unit Cost:** 80
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit Hours:** 20

**Basis for adjustment:** Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

Waste Management Plan: It was assumed that a waste management plan would be needed and that it would take no more than two weeks to prepare (80 hours).

**Original Hours 80 Environmental Engineer 20 hours**

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**Line Item SYS - Contingency And Escalation**

**BOE**

**Resources**

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**Activity ID: 1GHE65A210**
**Description:** Procurement and Field Prep - HSS Grouping 400-10

**Cost Risk:** 1  **Schedule Risk:** 1

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**Line Item 0100 - procurement & field prep**

**BOE**

Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation

**Item Desc:**

**Breakdown of Cost Data:**
- **Item:** Site Labor to perform above individual tasks for either Ryan's Pit or T-3/T-4.
  - **Units:** hours
  - **Unit Cost:** 130
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit Hours:** 345 hours

- **Item:** Subcontractor costs to perform above individual tasks for either Ryan's Pit or T-3/T-4.
  - **Units:** 1 lot
  - **Unit Cost:** $10K
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** $2.5K

**Basis for adjustment:** Hours and costs for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be characterized at once.
Procurement includes preparation of statement of work, proposal review (technical evaluation), and negotiations. Based on a T-3/T-4 burdened cost of $29,186.52. Assuming it is primarily labor hours (RMRS Environmental Engineer charging at $57.45 per hour) yields 508 hours which rounds to 510 total hours.

Davis Bacon Documentation: It was assumed that it would take an environmental engineer twenty-four hours to prepare a Davis Bacon cost estimate and to support the Davis-Bacon determination.

Subcontractor Health and Safety Plan: Costs for the health and safety plan are based on Ryan's Pit, which cost approximately $10,000. It was assumed that these are A5H dollars. In addition, it was assumed that a safety engineer, an industrial hygienist, and a radiological engineer would each provide one week (40 hours) of support for review and document preparation.

Radiological Work Permit: It was assumed that it would take a radiological control technician two working days (18 hours) to complete counting preparation and review.

Implementation Plan: It was estimated that this activity would take 13 weeks of time for engineers, scientists or equivalent to complete. This would include preparation of an implementation plan as required (Rocky Flats Cleanup Agreement, Appendix 3, Interim Guidance Document, Dated August 1977). In addition this includes all tasks related to documentation for the Integrated Work Control Program and Integrated Safety Management.

Ecology Survey/National Environmental Protection Act (NEPA) Support: It was estimated that this would take 40 hours for an ecologist. The activities include NEPA review and support in document preparation, site surveys to verify compliance with ecological regulations, categorical exclusions, and NEPA evaluations.

Utility Clearance/Soil Disturbance Permits: It was estimated based on experience that it would take the equivalent 2 weeks (80 hours) for technical staff to do utility surveys, prepare and review soil disturbance permits, and prepare authorizing documents for excavation.

The combined resources for procurement and field preparations are:

Total Procurement and Field Preparation Hours

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<td>A5H Total</td>
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* On some projects these hours were assumed to be included in other tasks or part of this task under environmental engineer or one of the other job functions.

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

Factor 1134 - Environmental Engineer 283 Hours
Factor 40 x Safety Engineer 10 Hours
Factor 40 - Industrial Hygiene 10 Hours
Factor 58 - Radiological Engineering 14 Hours
Factor 18 - RCT 5 Hours
Factor 40 - Life Scientist 10 Hours
Factor 50 - Project Manager 13 Hours
Factor 10000 - A5H Subcontracted Services 2,500 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
Project: Rocky Flats Closure Project  
Baseline Cost and Basis of Estimate

WBS No: 1GAC040A  
Activity ID: 1GHE64A210

**Baseline Development (WBS Filter):**

- **WBS No:** 1GAC040A  
- **Activity ID:** 1GHE64A210

---

**Activity Details:**

- **Activity ID:** 1GHE64A210  
- **Description:** Readiness Assessment - IHSS Group 400-10

---

**Cost Element Details:**

- **Activity ID:** 1GHE64A240

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<th>Description</th>
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**Total for Activity 1GHE64A240:**

- **Total Cost:** $14,241

---

**Breakdown of Cost Data:**

- **Item:** Site Labor to perform Readiness Assessment for T-3/T4.
  - **Units:** hours
  - **Unit Cost:** $800
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** 48

- **Item:** Subcontractor costs to perform Readiness Assessment for T-3/T4.
  - **Units:** 1 lot
  - **Unit Cost:** $4800
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** $1200

**Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation**

**Factors:**

- **Factor 132- Environmental Engineer 33 Hours**
- **Factor 22 - Health Physicists 6 Hours**
- **Factor 11 - Manager 3 Hours**
- **Factor 22 - Quality Assurance 6 Hours**
- **Factor 4,800 - ASH Subcontracted Srvs 1,200 Dollars**

20 hours of administrative time will also be required.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
## Rocky Flats Closure Project
### Baseline Cost and Basis of Estimate

#### Resources

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**Line Item 0200 - training**

**BOE**

- **Estimator's Experience** based generally on historical data for T-3/T4 Remediation.
- **Item Desc:**
  - Conduct perform Training in support of source removal action.

**Breakdown of Cost Data:**
- **Item:** Site Labor to perform above individual tasks for T-3/T-4.
  - Units: hours
  - Unit Cost: 132 Hours
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit: 33 hours
- **Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
  - Units: 1 lot
  - Unit Cost: $12K
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit: $3K

**Basis for adjustment:** Costs for each UBC are divided by 4 to account for the fact that 4 UBCs will be remediated at once and only one Training is needed for the group.

**This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.**

---

**Line Item 0300 - pre-evolution meeting**

**BOE**

- **Estimator's Experience** based generally on historical data for T-3/T4 Remediation.
- **Item Desc:**
  - Conduct Pre-Evolution Meeting in support of source removal action.

**Breakdown of Cost Data:**
- **Item:** Site Labor to perform above individual tasks for T-3/T-4.
  - Units: hours
  - Unit Cost: 60 hours
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit: 15 hours
- **Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
  - Units: 1 lot

---

*OFFICIAL USE ONLY*
Project Baseline Devi
WBS Filter 1GAC
Activity Filter: "Suces In FY"

Rocky Flats Closure Project
Baseline Cost and Basis of Estimate

WBS No: 1GAC040A
Activity ID: 1GHE64A240

WBS Filter
1GAC

Baseline Cost and Basis of Estimate

Cost Element: Project Skill
Department: ROYAL SALARIED
Curve: Linear
Quantity: 15.00
Units: Hours

Cost Element: Activity Filter
Starts In FY

Cost Element: Activity ID
1GHE64A250
Description: Remedial Action - IHSS Group 400-10

Cost Risk: 2 Schedule Risk: 3

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Total for Activity 1GHE64A250: 1,822 61,249 104,023 100,977 266,249 21,622 287,871

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc: Mobilization in support of remediation.

Breakdown of Cost Data:

Item: Site Labor to perform above individual tasks for T-3/T-4.

Units: hours
Unit Cost: 1,100
Unit Cost Adjustment Factor: 0.25
Revised Unit: 275

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.

Units: 1 lot
Unit Cost: 184k
Unit Cost Adjustment Factor: 0.25
Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs are Mobilization, Site Preparation, Prepare Waste...
Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

T3/T4 hours 110 Health Physicists 27 Hours
T3/T4 hours 330 Manager 83 Hours
T3/T4 hours 550 Environmental Engineer 138 Hours
T3/T4 hours 110 Industrial Hygienist 27 Hours
T3/T4 subcontractor dollars 184,000 Subcontractor 46,000

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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Line Item 0200 – site prep

BOE

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc:
Site Preparation including setting up fencing, trailer, etc.

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
Units: hours
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
Units: 1 lot
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

T3/T4 hours 120 Environmental Engineer 30 hours
T3/T4 dollars 30,000 Subcontracted Srvs 7,500 Dollars

D&D construction trade hours were calculated using the following methodology:

A5H subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.

RCT hours were calculated using the following methodology, unless they were already estimated.

For Site Preparation tasks - RCT hours were the same as D&D construction hours.
For all other tasks A5H subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under KG10H department code.
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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**Line Item 0300 - excavation**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc:
Excavation.

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
Units: hours
- Unit Cost: see below
- Unit Cost Adjustment Factor: see below
- Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
Units: 1 lot
- Unit Cost: see below
- Unit Cost Adjustment Factor: see below
- Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Total Contaminated Soil to be removed 185 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 185 CY

The excavation cost was based on the excavation cost for the T-3/T-4 Project. Burdened cost based on the T-3/T-4 actuals is $171,487. For the 3,800 cubic yards of contaminated soil removed this yielded a unit cost of $45 per cubic yard of contaminated soil removed. This estimate includes the removal of overburden that might be on top of the contaminated soil. The hours for an environmental engineer from T-3/T-4 were 1.09 hours per cubic yard of contaminated soil. Likewise the hours for the following were assumed to be linearly proportional:

- Health Physicists .47 hours per cubic yard
- Environmental Operations .31 hours per cubic yard
- Industrial Hygienists 0.31 hours per cubic yard
- Radiological Control Technician 1.00 hour per cubic yard

* Based on $50/cubic yard from T-3/T-4, assumes a labor rate of $50/hour

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 1.09 - E050 Environmental Engineer 202 Hours
Factor 0.47 - F080 Health Physicists 89 Hours
Factor 0.31 - Environmental Operations 57 Hours
Factor 0.31 - F090 Industrial Hygienists 57 Hours
Factor 1.00 - T050 Radiological Control Technician Linear 185 Hours
Factor 45.23 - ASH Subcontracted Srvs 8,368 Dollars
D&D construction trade hours were calculated using the following methodology:

- A5H subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.

RCT hours were calculated using the following methodology, unless they were already estimated.

- For Site Preparation tasks - RCT hours were the same as D&D construction hours.
- For all other tasks A5H subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under KG10H department code.

The dollars amounts calculated for D&D construction workers and RCTs were subtracted from the subcontractor dollars and the revised A5H dollar amount was entered into Best.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

**Resources**

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**Line Item 0400 - remove and clean debris**

Estimator's Experience based generally on a base case of 700 cy.

Item Desc:

Remove and clean debris.

Breakdown of Historical Data:

- **Item:** Site Labor to perform above individual tasks for T-3/T-4.
  - Units: hours
  - Unit Cost: see below
  - Unit Cost Adjustment Factor: see below
  - Revised Unit: see below

- **Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
  - Units: 1 lot
  - Unit Cost: see below
  - Unit Cost Adjustment Factor: see below
  - Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Total Contaminated Soil to be removed 185 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 185 CY
For the base case, it was assumed that about five cubic yards out of 700 cubic yards would be debris and would be segregated and cleaned. It was estimated that each cubic yard of debris would cost $1,000 or $5,000 total for 700 cubic yards. This yields a rate of $7.14 per cubic yard.

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 7.14 - A5H Subcontracted Srvs 1,321 Dollars

D&D construction trade hours were calculated using the following methodology:

A5H subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.

RCT hours were calculated using the following methodology, unless they were already estimated.

For Site Preparation tasks - RCT hours were the same as D&D construction hours.

For all other tasks A5H subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under KG10H department code.

The dollars amounts calculated for D&D construction workers and RCTs were subtracted from the subcontractor dollars and the revised A5H dollar amount was entered into Best.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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BOE

Line Item 0600 - confirmation sampling

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc:
Confirmation Sampling.

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
Units: hours
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
Units: 1 lot
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Total Contaminated Soil to be removed 185 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 185 CY

The analytical costs were based on T-3/T-4, which cost $435,574 for 3800 cubic yards of contaminated soil removed. This yielded a unit rate of about $115/cubic yard. Based on estimator experience the cost of sampling including labor and materials was estimated to be 20% of that rate or about $23/ cubic yard.

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.
Factor 114.62 - A5H Subcontracted Srvs (Analytical) 21,204 Dollars
Factor 22.924 - A5H Subcontracted Srvs 4,241 Dollars

D&D construction trade hours were calculated using the following methodology:

A5H subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.

RCT hours were calculated using the following methodology, unless they were already estimated.

For Site Preparation tasks - RCT hours were the same as D&D construction hours.
For all other tasks A5H subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under KG10H department code.

The dollars amounts calculated for D&D construction workers and RCTs were subtracted from the subcontractor dollars and the revised A5H dollar amount was entered into Best.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

**Line Item 0700 - prepare waste acceptance forms**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:** Prepare Waste Acceptance Forms

**Breakdown of Historical Data:**

**Item:** Site Labor to perform above individual tasks for T-3/T-4.
  **Units:** hours
  **Unit Cost:** see below
  **Unit Cost Adjustment Factor:** see below
  **Revised Unit:** see below

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
  **Units:** 1 lot
  **Unit Cost:** see below
  **Unit Cost Adjustment Factor:** see below
  **Revised Unit:** see below

**Basis for adjustment.** The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

T3/T4 hours 80 environmental engineer 20 hours

---

**Line Item 0800 - waste acceptance sampling**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:** Waste Acceptance Sampling
Breakdown of Historical Data:

Item: Site Labor to perform above individual tasks for T-3/T-4.
- Units: hours
- Unit Cost: see below
- Unit Cost Adjustment Factor: see below
- Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
- Units: 1 lot
- Unit Cost: see below
- Unit Cost Adjustment Factor: see below
- Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Because the waste acceptance sampling is difficult to predict and could vary significantly from project to project, it was assumed that about $800 worth of additional analysis would be required for 20 cubic yards which is the volume that can be placed in one roll-off. This yielded a unit rate of about $40/cubic yard. This sampling and analysis is in addition to the confiniational samples so the costs are not as great. It was assumed that this sampling would be more labor intensive so the sampling costs were estimated to be about 50% of the analytical costs or about $20/cubic yard.

Total Contaminated Soil to be removed 185 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 185 CY

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 40 - ASH Analytical 7,400 Dollars
Factor 20 - ASH Subcontracted Srvs 3,700 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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<tr>
<th>Resource</th>
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Line Item 0900 - field oversight & project mgmt

Estimator's experience based generally on a base case of 700 cy.

Item Desc:
Field Oversight and Project Management

Breakdown of Historical Data:

Item: Site Labor to perform above individual tasks for T-3/T-4.
- Units: hours
- Unit Cost: see below
- Unit Cost Adjustment Factor: see below
- Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
- Units: 1 lot
- Unit Cost: see below
- Unit Cost Adjustment Factor: see below
- Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Offsite Waste Volume 185 CY

Factor 40 - ASH Analytical 7,400 Dollars
Factor 20 - ASH Subcontracted Srvs 3,700 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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<td>ASH SUBCONTRACTED SRVS</td>
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<td>33.83</td>
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Line Item 0900 - field oversight & project mgmt

Estimator's experience based generally on a base case of 700 cy.

Item Desc:
Field Oversight and Project Management

Breakdown of Historical Data:

Item: Site Labor to perform above individual tasks for T-3/T-4.
- Units: hours
- Unit Cost: see below
- Unit Cost Adjustment Factor: see below
- Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
- Units: 1 lot
- Unit Cost: see below
- Unit Cost Adjustment Factor: see below
- Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Offsite Waste Volume 185 CY

Factor 40 - ASH Analytical 7,400 Dollars
Factor 20 - ASH Subcontracted Srvs 3,700 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

It was assumed that a field manager would be needed for 150 nine-hour working days or about 33 weeks. This work breaks down as follows:

- Preparation Activities: 50 working days
- Field Activities: 80 working days
- Demobilization: 20 working days
- Total: 150 nine-hour working days or 1350 hours

In addition it was estimated that technical staff, quality assurance, and project management would be required for the equivalent of ten additional weeks, which is 400 hours each.

Based on the base case of a 700 cubic yard removal project, these values yielded unit rates as follows:

- Hours Per Cubic Yard
  - Contaminated Soil: 1.93
  - Field Manager: 1.93
  - Technical Staff: 0.57
  - Quality Assurance: 0.57
  - Project Management: 0.57

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

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Item: Backfill.

Trade Publication
Means 1995, Site Work & Landscape Cost Data (page 34, 42, and 34)

Item Desc: Backfill.

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
  - Units: hours
  - Unit Cost: see below
  - Unit Cost Adjustment Factor: see below
  - Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
  - Units: 1 lot
  - Unit Cost: see below
  - Unit Cost Adjustment Factor: see below
  - Revised Unit: see below

Means (1995) Site Work & Landscape Cost Data as follows:
Common Fill $ 4.77/cubic yard (page 34 Borrow Bank Measure)
Hauling $ 3.98/cubic yard (page 42 2-mile round-trip, 6 cubic yard dump truck)
**Rocky Flats Closure Project**  
**Baseline Cost and Basis of Estimate**

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**Backfilling**  
$1.69/cubic yard (page 34)  
Burden (43%) $ 4.49/cubic yard  
Total $14.23/cubic yard or about $15/cubic yard

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

**Factor 15 - A5H Subcontracted Srvs 2,775 Dollars**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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**Line Item 1100 - demobilization**

**BOE**  
Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:**  
Demobilization.

**Breakdown of Historical Data:**  
**Item:** Site Labor to perform above individual tasks for T-3/T-4.  
Units: hours  
Unit Cost: see below  
Unit Cost Adjustment Factor: see below  
Revised Unit: see below

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.  
Units: 1 lot  
Unit Cost: see below  
Unit Cost Adjustment Factor: see below  
Revised Unit: see below

**Basis for adjustment.** The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Demobilization: Based on the T-3/T-4 project, it was assumed that demobilization costs would cover demobilization for excavation activities also. The subcontractor cost for demobilization was about $95,000 for 3,800 cubic yards at the T-3/T-4 project. In addition it was estimated that the following hours were necessary:

- Environmental Engineer 300 hours  
- Health Physicist 100 hours  
- Manager 200 hours  
- Industrial Hygiene 100 hours

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

**Factor 300 - Environmental Engineer 75 Hours**  
**Factor 100 - Health Physicists 25 Hours**  
**Factor 200 - Manager 50 Hours**  
**Factor 100 - P090 Industrial Hygienists 25 Hours**  
**Factor 95000 - A5H Subcontracted Srvs 23,750 Dollars**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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<th>Curve</th>
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Factors 75 hrs
### Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

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<th>1GAC040A</th>
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**WBS No:** 1GHE64A290

#### Activity ID: 1GHE64A290

**Description:** Prepare Closeout Report - IHSS Group 400-10

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<th>Description</th>
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**Total for Activity 1GHE64A270:**

- Quantity: 320
- Labor Hours Total: 9,045
- Labor Cost Total: 0
- Materials/Sub Cost: 0
- Contingency & Escalation: 0
- Total Prime Cost: 6,522
- Burden Cost: 0
- Total Cost: 6,522

---

**BOE**

Estimate based on estimator's experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Item Desc:**

Perform data analysis including GIS representation of data, Closeout Report, and associated project management.

**Breakdown of Cost Data:**

- Item: Develop Documentation
- Units: hours
- Unit Cost: 320
- Unit Cost Adjustment Factor: none
- Revised Unit Hours: 320

**Required level of effort:**

- Environmental Engineer - 80 hours
- Environmental Scientist - 20 hours
- Computer Specialist - 160 hours (GIS, SWD)
- Manager - 20 hours
- Administrative - 20 hours
- Cost Estimator - 20 hours

**Resources**

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**Total for Activity 1GHE64A270:**

- Quantity: 320
- Labor Hours Total: 9,045
- Labor Cost Total: 0
- Materials/Sub Cost: 0
- Contingency & Escalation: 0
- Total Prime Cost: 6,522
- Burden Cost: 0
- Total Cost: 6,522
Rocky Flats Closure Project
Baseline Cost and Basis of Estimate

Project
Baseline Deviation

Activity Filter
WBS Filter
1GAC

WBS No: 1GAC040A
Activity ID: 1GHE64A270

WBS Filter
1GAC

Baseline Cost and Basis of Estimate

WBS No: 1GAC0501
Title: Group 500-1 (B552)
Activity ID: 1GHE651100
Description: SAP Preparation - IHSS Group 500-1 (B552)

Line Item 0100 - SAP Addenda

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

Item Desc: Preparation of SAP Addenda to Industrial Area Characterization Plan.

Breakdown of Cost Data:
Item: Preparation of SAP addenda
Units: hours
Unit Cost: 120
Unit Cost Adjustment Factor: none
Revised Unit Hours: 120

Basis for adjustment:
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

Line Item 0200 - HASP Addenda

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

Item Desc: Preparation of HASP addenda to Industrial Area Characterization Plan.

Breakdown of Cost Data:
Item: Preparation of addenda for HASP
Units: hours
Unit Cost: 140
Unit Cost Adjustment Factor: none
Revised Unit Hours: 140

Basis for adjustment:
**Activity ID:** 1GHE651100  
**WBS Filter:** 1GAC

**Baseline Cost and Basis of Estimate**

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**Total for Activity 1GHE651120:**

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**Notes:**
- **Estimator's Experience:** Based generally on historical data for Ryan's Pit and T-3/T4 Remediation.

**Breakdown of Cost Data:**
- **Item:** Site Labor to perform above individual tasks for either Ryan's Pit or T-3/T-4.
  - **Units:** hours
  - **Unit Cost:** $1.30
  - **Unit Cost Adjustment Factor:** 0.25
Item: Subcontractor costs to perform above individual tasks for either Ryan's Pit or T-3/T-4.

Units: 1 lot
Unit Cost: $10K
Revised Unit: $2.5K

Basis for adjustment. Hours and costs for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be characterized at once.

Procurement includes preparation of statement of work, proposal review (technical evaluation), and negotiations. Based on a T-3/T-4 burdened cost of $29,186.52. Assuming it is primarily labor hours (RMES Environmental Engineer charging at $57.45 per hour) yields 508 hours which rounds to 510 total hours.

Davis Bacon Documentation: It was assumed that it would take an environmental engineer twenty-four hours to prepare a Davis Bacon cost estimate and to support the Davis-Bacon determination.

Subcontractor Health and Safety Plan: Costs for the health and safety plan are based on Ryan's Pit, which cost approximately $10,000. It was assumed that these are ASH dollars. In addition, it was assumed that a safety engineer, an industrial hygienist, and a radiological engineer would each provide one week (40 hours) of support for review and document preparation.

Radiological Work Permit: It was assumed that it would take a radiological control technician two working days (18 hours) to complete counting preparation and review.

Implementation Plan: It was estimated that this activity would take 13 weeks of time for engineers, scientists or equivalent to complete. This would include preparation of an implementation plan as required (Rocky Flats Cleanup Agreement, Appendix 3, Interim Guidance Document, Dated August 1977). In addition this includes all tasks related to documentation for the Integrated Work Control Program and Integrated Safety Management.

Ecology Survey/National Environmental Protection Act (NEPA) Support: It was estimated that this would take 40 hours for an ecologist. The activities include NEPA review and support in document preparation, site surveys to verify compliance with ecological regulations, categorical exclusions, and NEPA evaluations.

Utility Clearance/Soil Disturbance Permits: It was estimated based on experience that it would take the equivalent 2 weeks (80 hours) for technical staff to do utility surveys, prepare and review soil disturbance permits, and prepare authorizing documents for excavation.

The combined resources for procurement and field preparations are

Total Procurement and Field Preparation Hours
Environmental Engineer 1134 hours
Safety Engineer 40 hours
Industrial Hygiene 40 hours
Radiological Engineering 58 hours
Radiological Control Technician 18 hours
Ecologist/Life Scientist 40 hours
Manager 50 hours
Quality Assurance* 29 hours
ASH Total $10,000

* On some projects these hours were assumed to be included in other tasks or part of this task under environmental engineer or one of the other job functions.

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

Factor 1134 - Environmental Engineer 283 Hours
Factor 40 - Safety Engineer 10 Hours
Factor 40 - Industrial Hygiene 10 Hours
Factor 58 - Radiological Engineering 14 Hours
Factor 18 - RCT 5 Hours
Factor 40 - Life Scientist 10 Hours
Factor 50 - Project Manager 13 Hours
Factor 10000 - ASH Subcontracted Services 2,500 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### Line Item SYS - Contingency And Escalation

**BOE** (Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation)

**Activity ID:** 1GHE651140  
**Description:** Readiness Assessment - IHSS Group 500-1  
**Cost Risk:** 1  
**Schedule Risk:** 1

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**Total for Activity 1GHE651140:**  68  1,887  1,015  986  986  3,886  653  4,541

---

**Item 0100 - readiness assessment**

**BOE**

**Item Description:**  
Evaluate readiness of the field characterization team and plans.

**Breakdown of Cost Data:**  
- **Item:** Site Labor to perform Readiness Assessment for T-3/T-4.  
  - **Units:** hours  
  - **Unit Cost:** $187  
  - **Unit Cost Adjustment Factor:** 0.25  
  - **Revised Unit:** 48

- **Item:** Subcontractor costs to perform Readiness Assessment for T-3/T-4.  
  - **Units:** 1 lot  
  - **Unit Cost:** $4800  
  - **Unit Cost Adjustment Factor:** 0.25  
  - **Revised Unit:** $1200

It was estimated that subcontractor involvement would require 80 hours at $60/hour = $4,800. It was assumed that about 3 weeks of time was required for an environmental engineer or similar person in addition to 12 hours of project management, which yielded 132 hours. An additional 11 hours was added for management oversight. It was estimated that a radiological engineer (QA) and an industrial hygienist would be needed for 2.5 days each (22 hours).

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 projects will be conducted at once and only one of each fixed cost is needed for the group.
Factor 132 - Environmental Engineer 33 Hours
Factor 22 - Health Physicists 6 Hours
Factor 11 - Manager 3 Hours
Factor 22 - Quality Assurance 6 Hours
Factor 4,800 - A5H Subcontracted Srvs 1,200 Dollars

20 hours of administrative time will also be required.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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### Line Item 0100 - collect geoprobe samples

**BOE**

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<th>Description: Field Sampling, Lab Analysis - IHSS Group 500-1</th>
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<td>0300</td>
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Total for Activity 1GHE651150: 1,504,44,812, 2,559,339, 726,291, 3,330,441, 15,505, 3,345,946

**Breakdown of Cost Data:**

**Item Desc:**
Collection of geoprobe samples with the site geoprobe with two technicians. A site Environmental Engineer will direct the boring placement, log the borings; collect, containerize, package, and ship the samples; prepare field QC documentation, and prepare field notes on a full time basis. A site RCT will monitor the site for radiological contamination on a full time basis. A site Industrial Hygienist will implement the field portion of the HASP on a full time basis. Decon Operations staff will decon the vehicle and equipment when it leaves the work area on a half time basis. It is estimated that one 10' boring will be placed per 500 SF of building footprint (same as Bldg. 123 characterization) with 5 samples per 10' boring. It is estimated that one boring per eight hours can be completed.

**Breakdown of Cost Data:**

**Item:** Site Personnel for support of geoprobe samples

**Unit Cost:** 32

**Revised Unit Hours:** 32
### Resources

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<th>Cost Element</th>
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<th>Curve</th>
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**Line Item 0200 - analyze samples**

**BOE**

Vendor Quote

Email quote: average cost from Kaiser-Hill ASD (V. Ideker).

**Item Desc:**

Analyze samples produced from geoprobe borings. It is anticipated that 3 samples from each boring will be collected. They will be analyzed for Metals, VOCs, SVOCs, PCBs, and radionuclides (est. 3 isotopes) with a 30 day TAT. This item is priced on a per sample basis. Per sample costs include DOT rad screen, bottle charge, shipping, and validation.

**Breakdown of Cost Data:**

- Item: Analyze samples at an offsite laboratory.
  - Units: analysis
  - Unit Cost: Metals $345, VOCs $280, SVOCs $440, PCBs and other analytes $150, and Radionuclides 3 isotopes) $590 per each sample.
  - Unit Cost Adjustment Factor: Must add: DOT rad screen $32/sample, bottle charge $7/sample, shipping $4.2/bottle, and validation per each: $17.30 VOA, $19.25 SVOC, $6.75 Metals, $5.95 PCB, and $15.60 Rad.
  - Revised Unit Hours: Metals $405, VOCs $341, SVOCs $502, PCBs and other analytes $199, and Rad $649.

**This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.**

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**Line Item 0300 - project mgmt oversight**

**BOE**

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Item Desc:**

Project Management/Oversight. Based on half time for a Project Manager, Administrative staff, and Cost Estimator/Scheduler.

**Breakdown of Cost Data:**

- Item: Mgmt oversight
  - Units: hours
  - Unit Cost: 12
  - Unit Cost Adjustment Factor: none
  - Revised Unit Hours: 12

**Basis for adjustment.**
The characterization effort was reduced by 50% because these are newer buildings with new processes and better controls so that spills are less likely and UBC less likely than at Building 123.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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### Line Item SYS - Contingency And Escalation

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### Activity 1GHE651170 - Prepare Summary/NFA - IHSS Group 500-1

**Item Desc:**
Perform Data Analysis including GIS representation of data, NFA Summary, Characterization Report and associated project management. Disposition comments and finalize document.

**Item: Develop Documentation**
3.00 each

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**Breakdown of Cost Data:**
- **Item:** Develop Documentation
- **Units:** Hours
- **Unit Cost:** 19,024
- **Unit Cost Adjustment Factor:** none
- **Revised Unit Hours:** 656
- **Basis for adjustment:** N/A

**Resources**

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## Rocky Flats Closure Project
### Baseline Cost and Basis of Estimate

**Activity ID:** 1GHE651170  
**Project:** Baseline Dev

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**Total: 289, 9,164, 0, 2,543, 11,707, 2,883, 14,590**

**Description:** Prepare Decision Document - IHSS Group 500-1

**Cost Risk:** 1  
**Schedule Risk:** 1

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**Factors:** 5206.6 Dollars

**Factors:** 1983.59 Dollars

**Line Item ID:** 1GHE651180

**Activity ID:** 1GHE651180

**Estimator's Experience based generally on historical data for Ryan's Pit**

**Item Desc:**

Preparation of of PAM or IM/IRA in support of source removal of previously characterized UBC.

Proposed Action Memorandum: A bottoms-up estimate based on historical costs was used as the basis for the estimate. Based on Ryan's Pit (IHSS 108), the cost for the PAM was $50,000 (contractor costs). Assuming that labor rates at this time were approximately $75 (based on a cost center 217). The total labor for a PAM would be approximately 666 hours, which rounds to 700 hours. It was assumed that 10% would be required for managerial hours.

For a PAM the total labor hours are:

- Environmental Engineer 700 Hours
- Manager 70 Hours

Factor 700 Environmental Engineer 175 hours  
Factor 70 Manager 18 hours

**Breakdown of Cost Data:**

- Item: Preparation of PAM for Ryan's Pit source removal action.
  - Units: hours
  - Unit Cost: 770
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit Hours: 193

Basis for adjustment. Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediating at once and only one set of decision/planning documents are needed for the group.
Interim Measure/Interim Remedial Action Decision Document: It was assumed that an IM/IRA Decision Document would take 75% more effort than a PAM or 1,166 hours, which rounds to 1200 hours. It was assumed that 10% of this labor would be required for managerial hours.

For an IM/IRA the total labor hours are

Environmental Engineer 1200 Hours
Manager 120 Hours

Factor 1200 Environmental Engineer 300 hours
Factor 120 Manager 30 hours

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Line Item 0200 - SAP

Estimator's Experience based generally on historical data for Ryan's Pit

Item Desc:
Preparation of SAP in support of source removal of previously characterized UBC.

Breakdown of Historical Data:
   Item: Preparation of SAP for Ryan's Pit source removal action.
   Units: hours
   Unit Cost: 300
   Unit Cost Adjustment Factor: 0.25
   Revised Unit Hours: 76

Basis for adjustment. Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

Sampling and Analysis Plan: Based on the T-3/T-4 Sampling and Analysis Plan (SAP) it took 300 hours in total preparation time. It was assumed that 10% of this labor was for managerial hours (30 hours) and that the rest of the time, 270 hours, was for technical staff. It was assumed that these hours include all labor including quality assurance, secretarial support, graphics etc.

Original Hours 270 Environmental Engineer 68 hours
Original Hours 30 Manager 8 hours

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Line Item 0300 - WMP

Estimator's Experience based generally on historical data for Ryan's Pit

Item Desc:
Preparation of WMP in support of source removal of previously characterized UBC.

Breakdown of Historical Data:
   Item: Preparation of WMP for Ryan's Pit source removal action.
   Units: hours
   Unit Cost: 80
   Unit Cost Adjustment Factor: 0.25
   Revised Unit Hours: 20

Basis for adjustment. Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

Waste Management Plan: It was assumed that a waste management plan would be needed and that it would take no more than two weeks to prepare (80 hours).
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### Line Item SYS - Contingency And Escalation

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### Activity ID: 1GHE651210

**Description:** Procurement and Field Prep - HSS Grouping 500-1

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### Line Item 0100 - procurement & field prep

**BOE**

Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T-4 Remediation


**Breakdown of Cost Data:**

**Item:** Site Labor to perform above individual tasks for either Ryan's Pit or T-3/T-4.

- **Units:** hours
- **Unit Cost:** 1380
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** 345 hours

**Item:** Subcontractor costs to perform above individual tasks for either Ryan's Pit or T-3/T-4.

- **Units:** 1 lot
- **Unit Cost:** $10K
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** $2.5K

**Basis for adjustment:** Hours and costs for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be characterized at once.

**Procurement includes preparation of statement of work, proposal review (technical evaluation), and negotiations.** Based on a T-3/T-4 burdened cost of $29,186.52. Assuming it is primarily labor hours (RMRS Environmental Engineer charging at $57.45 per hour) yields 508 hours which rounds to 510 total hours.

**Davis Bacon Documentation:** It was assumed that it would take an environmental engineer twenty-four hours to prepare a Davis Bacon cost estimate and to support the Davis-Bacon determination.

**Subcontractor Health and Safety Plan:** Costs for the health and safety plan are based on Ryan's Pit, which cost approximately $10,000. It was assumed that these are $5K dollars. In addition, it was assumed that a safety engineer, an industrial hygienist, and a radiological engineer would each provide one week (40 hours) of support for review and document preparation.

**Radiological Work Permit:** It was assumed that it would take a radiological control technician two working days (18 hours) to complete counting preparation and review.

**Implementation Plan:** It was estimated that this activity would take 13 weeks of time for engineers, scientists or equivalent to complete. This would include preparation of an implementation plan as required (Rocky Flats Cleanup Agreement, Appendix J, Interim Guidance Document, Dated August 1977). In addition, this includes all tasks related to documentation for the Integrated Work Control Program and Integrated Safety Management.

**Ecology Survey/National Environmental Protection Act (NEPA) Support:** It was estimated that this would take 40 hours for an ecologist. The activities include...
NEPA review and support in document preparation, site surveys to verify compliance with ecological regulations, categorical exclusions, and NEPA evaluations.

Utility Clearance/Soil Disturbance Permits: It was estimated based on experience that it would take the equivalent 2 weeks (80 hours) for technical staff to do utility surveys, prepare and review soil disturbance permits, and prepare authorizing documents for excavation.

The combined resources for procurement and field preparations are

Total Procurement and Field Preparation Hours

Environmental Engineer 1134 hours  
Safety Engineer 40 hours  
Industrial Hygiene 40 hours  
Radiological Engineering 58 hours  
Radiological Control Technician 18 hours  
Ecologist/Life Scientist 40 hours  
Manager 50 hours  
Quality Assurance 29 hours  
ASK Total $10,000

* On some projects these hours were assumed to be included in other tasks or part of this task under environmental engineer or one of the other job functions.

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

Factor 1134 - Environmental Engineer 283 Hours  
Factor 40 - Safety Engineer 10 Hours  
Factor 40 - Industrial Hygiene 10 Hours  
Factor 58 - Radiological Engineering 14 Hours  
Factor 18 - RCT 5 Hours  
Factor 40 - Life Scientist 10 Hours  
Factor 50 - Project Manager 13 Hours  
Factor 10000 - ASH Subcontracted Services 2,500 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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0.84576  [SYS 061400].84576000 - System

Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation

Item Desc:

Breakdown of Cost Data:

- **Item: Site Labor to perform Readiness Assessment for T-3/T-4.**
  - Units: hours
  - Unit Cost: 187
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit: 48
  - Breakdown of Cost Data:
      - Units: 1 lot
      - Unit Cost: $4800
      - Unit Cost Adjustment Factor: 0.25
      - Revised Unit: $1200

- Additional costs for management oversight:

  - Fixed costs are adjusted by a 0.25 factor to account for the fact that 4 projects will be conducted at once and only one of each fixed cost is needed for the group.
  - Factor 132 - Environmental Engineer 33 Hours
  - Factor 22 - Health Physicists 6 Hours
  - Factor 11 - Manager 3 Hours
  - Factor 22 - Quality Assurance 6 Hours
  - Factor 4,800 - ASH Subcontracted Srvs 1,200 Dollars

- Additional 20 hours of administrative time will also be required.

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 projects will be conducted at once and only one of each fixed cost is needed for the group.
**Line Item 0200 - training**

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:**
Conduct perform Training in support of source removal action.

**Breakdown of Cost Data:**
**Item:** Site Labor to perform above individual tasks for T-3/T-4.
- Units: hours
- Unit Cost: 132 Hours
- Unit Cost Adjustment Factor: 0.25
- Revised Unit: 33 hours

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
- Units: 1 lot
- Unit Cost: $12K
- Unit Cost Adjustment Factor: 0.25
- Revised Unit: $3K

**Basis for adjustment.** Costs for each UBC are divided by 4 to account for the fact that 4 UBCs will be remediated at once and only one Training is needed for the group.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Resources**

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**Line Item 0300 - pre-evolution meeting**

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:**
Conduct Pre-Evolution Meeting in support of source removal action.

**Breakdown of Cost Data:**
**Item:** Site Labor to perform above individual tasks for T-3/T-4.
- Units: hours
- Unit Cost: 60 hours
- Unit Cost Adjustment Factor: 0.25
- Revised Unit: 15 hours

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
- Units: 1 lot
- Unit Cost: $6K
- Unit Cost Adjustment Factor: 0.25
- Revised Unit: $1.5K

**Basis for adjustment.** Costs for each UBC are divided by 4 to account for the fact that 4 UBCs will be remediated at once and only one Pre-Evolution Meeting is needed for the group.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Resources**

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0.84576 [SYS 061400] .84576000 - System
### Line Item SYs - Contingency And Escalation

#### BOE Resources

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**Activity ID:** 1GHE651250  
**Description:** Remedial Action - IHSS Group 500-1

#### Line Item 0100 - mobilization

- **BOE:** Estimator's Experience based generally on historical data for T-3/T4 Remediation.
- **Item Desc:** Mobilization in support of remediation.
- **Item:** Site Labor to perform above individual tasks for T-3/T-4.
  - **Units:** hours
  - **Unit Cost:** 1,100
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** 275
- **Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
  - **Units:** 1 lot
  - **Unit Cost:** 184k
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** see below

**Basis for adjustment.** The costs were divided into fixed costs and variable costs. The fixed costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

- **T3/T4 hours 110 Health Physicists 27 Hours**
- **T3/T4 hours 330 Manager 83 Hours**
- **T3/T4 hours 550 Environmental Engineer 138 Hours**
- **T3/T4 hours 110 Industrial Hygienist 27 Hours**
- **T3/T4 subcontractor dollars 184,000 Subcontractor 46,000**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### Rocky Flats Closure Project

#### Baseline Cost and Basis of Estimate

**WBS Filter:** 1GAC  
**Activity Filter:** *  
**Starts In FY:** *

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**Line Item 0200 - site prep**

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:**  
Site Preparation including setting up fencing, trailer, etc.

**Breakdown of Historical Data:**

**Item:** Site Labor to perform above individual tasks for T-3/T4.  
- **Units:** hours  
  - Unit Cost: see below  
  - Unit Cost Adjustment Factor: see below  
  - Revised Unit: see below

**Item:** Subcontractor costs to perform above individual tasks for T-3/T4.  
- **Units:** 1 lot  
  - Unit Cost: see below  
  - Unit Cost Adjustment Factor: see below  
  - Revised Unit: see below

**Basis for adjustment.** The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

T3/T4 hours 120 Environmental Engineer 30 hours  
T3/T4 dollars 30,000 Subcontracted Srvs 7,500 Dollars

D&D construction trade hours were calculated using the following methodology:

- A5H subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.

RCT hours were calculated using the following methodology, unless they were already estimated.

For Site Preparation tasks - RCT hours were the same as D&D construction hours.  
For all other tasks A5H subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under KG10H department code.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

**Resources**

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Estimator's Experience based generally on historical data for T-3/T4 Remediation.

BOE

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
- Units: hours
- Unit Cost: see below
- Unit Cost Adjustment Factor: see below
- Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
- Units: 1 lot
- Unit Cost: see below
- Unit Cost Adjustment Factor: see below
- Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Total Contaminated Soil to be removed 4167 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 4167 CY

The excavation cost was based on the excavation cost for the T-3/T-4 Project. Burdened cost based on the T-3/T-4 actuals is $171,487. For the 3,800 cubic yards of contaminated soil removed this yielded a unit cost of $45 per cubic yard of contaminated soil removed. This estimate includes the removal of overburden that might be on top of the contaminated soil. The hours for an environmental engineer from T-3/T-4 were 1.09 hours per cubic yard of contaminated soil. Likewise the hours for the following were assumed to be linearly proportional:

Health Physicists .47 hours per cubic yard
Environmental Operations .31 hours per cubic yard
Industrial Hygienists .31 hours per cubic yard
Radiological Control Technician 1.00 hour per cubic yard *

* Based on $50/cubic yard from T-3/T-4, assumes a labor rate of $50/hour

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 1.09 - E050 Environmental Engineer 4,542 Hours
Factor 0.47 - P080 Health Physicists 1,959 Hours
Factor 0.31 - Environmental Operations 1,292 Hours
Factor 0.31 - P090 Industrial Hygienists 1,292 Hours
Factor 1.00 - T050 Radiological Control Technician Linear 4,167 Hours
Factor 45.23 - A5H Subcontracted Srvs 188,473 Dollars

D&D construction trade hours were calculated using the following methodology:

A5H subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.

RCT hours were calculated using the following methodology, unless they were already estimated.

For Site Preparation tasks - RCT hours were the same as D&D construction hours.
For all other tasks A5H subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under KG10H department code.

For this project the number of RCT hours was assumed to be the same as the number of health physics hours.

The dollars amounts calculated for D&D construction workers and RCTs were subtracted from the subcontractor dollars and the revised A5H dollar amount was
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

<table>
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<th>Resources</th>
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Line Item 0400 - remove and clean debris

BOE

Estimator's Experience based generally on a base case of 700 cy.

Item Desc:
Remove and clean debris.

Breakdown of Historical Data:

Item: Site Labor to perform above individual tasks for T-3/T-4.
Units: hours
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
Units: 1 lot
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Total Contaminated Soil to be removed 4,167 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 4,167 CY

For the base case, it was assumed that about five cubic yards out of 700 cubic yards would be debris and would be segregated and cleaned. It was estimated that each cubic yard of debris would cost $1,000 or $5,000 total for 700 cubic yards. This yields a rate of $7.14 per cubic yard.

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 7.14 - ASH Subcontracted Srvs 29,752 Dollars

D&D construction trade hours were calculated using the following methodology:

ASH subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.
RCT hours were calculated using the following methodology, unless they were already estimated.

For Site Preparation tasks - RCT hours were the same as D&D construction hours.

For all other tasks A5H subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under KG10K department code.

The dollars amounts calculated for D&D construction workers and RCTs were subtracted from the subcontractor dollars and the revised A5H dollar amount was entered into Best.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Resources**

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**Line Item 0600 - confirmation sampling**

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc:

Confirmation Sampling.

Breakdown of Historical Data:

Item: Site Labor to perform above individual tasks for T-3/T-4.

- Units: hours
- Unit Cost: see below
- Unit Cost Adjustment Factor: see below
- Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.

- Units: 1 lot
- Unit Cost: see below
- Unit Cost Adjustment Factor: see below
- Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Total Contaminated Soil to be removed 4,167 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 4,167 CY

The analytical costs were based on T-3/T-4, which cost $435,574 for 3800 cubic yards of contaminated soil removed. This yielded a unit rate of about $115/cubic yard. Based on estimator experience the cost of sampling including labor and materials was estimated to be 20% of that rate or about $23/ cubic yard.

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 114.62 - A5H Subcontracted Srvs (Analytical) 477, 621 Dollars
Factor 22.924 - A5H Subcontracted Srvs 92,899 Dollars

D&D construction trade hours were calculated using the following methodology:

A5H subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.

RCT hours were calculated using the following methodology, unless they were already estimated.

For Site Preparation tasks - RCT hours were the same as D&D construction hours.

For all other tasks A5H subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under...
The dollars amounts calculated for D&D construction workers and RCTs were subtracted from the subcontractor dollars and the revised A5H dollar amount was entered into Best.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

<table>
<thead>
<tr>
<th>Resources</th>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
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**Line Item 0700 - prepare waste acceptance forms**

BOE

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc:

Prepare Waste Acceptance Forms

Breakdown of Historical Data:

Item: Site Labor to perform above individual tasks for T-3/T-4.

- Units: hours
- Unit Cost: see below
- Unit Cost Adjustment Factor: see below
- Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.

- Units: 1 lot
- Unit Cost: see below
- Unit Cost Adjustment Factor: see below
- Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

T3/T4 hours 80 environmental engineer 20 hours

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**Line Item 0800 - waste acceptance sampling**

BOE

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc:

Waste Acceptance Sampling

Breakdown of Historical Data:

Item: Site Labor to perform above individual tasks for T-3/T-4.

- Units: hours
- Unit Cost: see below
- Unit Cost Adjustment Factor: see below
- Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.

- Units: 1 lot
- Unit Cost: see below
- Unit Cost Adjustment Factor: see below
- Revised Unit: see below
Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Because the waste acceptance sampling is difficult to predict and could vary significantly from project to project, it was assumed that about $800 worth of additional analysis would be required for 20 cubic yards which is the volume that can be placed in one roll-off. This yielded a unit rate of about $40/cubic yard. This sampling and analysis is in addition to the confirmational samples so the costs are not as great. It was assumed that this sampling would be more labor intensive so the sampling costs were estimated to be about 50% of the analytical costs or about $20/cubic yard.

Total Contaminated Soil to be removed 4,167 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 4,167 CY

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 40 - A5H Analytical 166,680 Dollars
Factor 20 - A5H Subcontracted Srvs 83,340 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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Line Item 0900 - field oversight & project mgmt

BOE

Estimator's Experience based generally on a base case of 700 cy.

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
- Units: hours
- Unit Cost: see below
- Unit Cost Adjustment Factor: see below
- Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
- Units: 1 lot
- Unit Cost: see below
- Unit Cost Adjustment Factor: see below
- Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

It was assumed that a field manager would be needed for 150 nine-hour working days or about 33 weeks. This work breaks down as follows:

Preparation Activities 50 working days
Field Activities – 80 working days
Demobilization – 20 working days
Total 150 nine-hour working days or 1350 hours

In addition it was estimated that technical staff, quality assurance, and project management would be required for the equivalent of ten additional weeks,
which is 400 hours each.

Based on the base case of a 700 cubic yard removal project, these values yielded unit rates as follows:

- Hours Per Cubic Yard
- Of Contaminated Soil: Field Manager 1.93, Technical Staff 0.57, Quality Assurance 0.57, Project Management 0.57

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

| Total Contaminated Soil to be removed | 4,167 CY |
| Total Soil for Thermal Desorption | 0 CY |
| Offsite Waste Volume | 4,167 CY |

- Factor 1.93 - Environmental Engineer 8,042 Hours
- Factor 0.57 - Technical Support 2,375 Hours
- Factor 0.57 - Project Manager 2,375 Hours
- Factor 0.57 - Quality Assurance 2,375 Hours

**Line Item 1000 - backfill**

**BOE**

- Trade Publication
  - Means 1995, Site Work & Landscape Cost Data (page 34, 42, and 34)
  - Item Desc: Backfill.
  - Breakdown of Historical Data:
    - Item: Site Labor to perform above individual tasks for T-3/T-4.
      - Units: hours
      - Unit Cost: see below
      - Unit Cost Adjustment Factor: see below
      - Revised Unit: see below
    - Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
      - Units: 1 lot
      - Unit Cost: see below
      - Unit Cost Adjustment Factor: see below
      - Revised Unit: see below

- Means (1995) Site Work & Landscape Cost Data as follows:
  - Common Fill $ 4.77/cubic yard (page 34 Borrow Bank Measure)
  - Hauling $ 3.98/cubic yard (page 42 2-mile round-trip, 6 cubic yard dump truck)
  - Backfilling $ 1.69/cubic yard (page 34)
  - Burden (43%) $ 4.49/cubic yard
  - Total $14.23/cubic yard or about $15/cubic yard

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

- Factor 15 - A5H Subcontracted Srvs 62,505 Dollars
### Resources

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**Factors** 15 units per yard in crates

**Line Item 1100 - demobilization**

Item Desc: Demobilization.

**Breakdown of Historical Data:**

- **Item:** Site Labor to perform above individual tasks for T-3/T-4.
  - **Units:** hours
  - **Unit Cost:** see below
  - **Unit Cost Adjustment Factor:** see below
  - **Revised Unit:** see below

- **Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
  - **Units:** 1 lot
  - **Unit Cost:** see below
  - **Unit Cost Adjustment Factor:** see below
  - **Revised Unit:** see below

**Basis for adjustment.** The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptancy Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Demobilization: Based on the T-3/T-4 project, it was assumed that demobilization costs would cover demobilization for excavation activities also. The subcontractor cost for demobilization was about $95,000 for 3,800 cubic yards at the T-3/T-4 project. In addition it was estimated that the following hours were necessary:

- **Environmental Engineer** 300 hours
- **Health Physicist** 100 hours
- **Manager** 200 hours
- **Industrial Hygiene** 100 hours

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

- **Factor 300 - Environmental Engineer** 75 Hours
- **Factor 100 - Health Physicists** 25 Hours
- **Factor 200 - Manager** 50 Hours
- **Factor 100 - P090 Industrial Hygienists** 25 Hours
- **Factor 95000 - ASH Subcontracted Srvs 23,750 Dollars**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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**Factors** 75 hrs

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**Factors** 25 hrs

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**Factors** 25 hrs
**Rocky Flats Closure Project**  
**Baseline Cost and Basis of Estimate**

**WBS No:** 1GAC0501  
**Activity ID:** 1GHE651250

### Line Item 1GHE651270
**Description:** Prepare Closeout Report - IHSS Group 500-1  
**Cost Risk:** 1  
**Schedule Risk:** 1

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Total for Activity 1GHE651270:  
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**Line Item 0100 - develop report**

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

Item Desc:
Perform Data Analysis including GIS representation of data, Closeout Report, and associated project management.

Breakdown of Cost Data:

- **Item:** Develop Documentation
  - Units: hours
  - Unit Cost: 320
  - Unit Cost Adjustment Factor: none
  - Revised Unit Hours: 320

Required level of effort:
- Environmental Engineer - 80 hours
- Environmental Scientist - 20 hours
- Computer Specialist - 160 hours (GIS, SWD)
- Manager - 20 hours
- Administrative - 20 hours
- Cost Estimators - 20 hours

### Resources

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**Line Item SYS - Contingency And Escalation**

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### Line Item 0100 - SAP Addenda

**Description:** Preparation of SAP Addenda to Industrial Area Characterization Plan.

**Breakdown of Cost Data:**
- **Item:** Preparation of SAP addenda
- **Units:** hours
- **Unit Cost:** 120
- **Unit Cost Adjustment Factor:** none
- **Revised Unit Hours:** 120

**Basis for adjustment:**
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Resources**

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**Factors**
- 80 hrs

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### Line Item 0200 - HASP Addendum

**Description:** Preparation of HASP addenda to Industrial Area Characterization Plan.

**Breakdown of Cost Data:**
- **Item:** Preparation of addenda for HASP.
- **Units:** hours
- **Unit Cost:** 140
- **Unit Cost Adjustment Factor:** none
- **Revised Unit Hours:** 140

**Basis for adjustment:**

**Resources**

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**Factors**
- 20 hrs

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### Line Item 0300 - QAP Addendum

**Description:** Planning IHSS - Group 500-2 (B551)

**Schedule Risk:** 1

**Cost Risk:** 1

**Line Item 0100 - SAP Addenda**

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**Total for Activity 1G50020100:**

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<th>Total Prime Cost</th>
<th>Total Burden Cost</th>
<th>Total Cost</th>
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</thead>
</table>

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**Page 452 of 1121 6/23/00 9:21:37 AM OFFICIAL USE ONLY**
**Rocky Flats Closure Project**

**Baseline Cost and Basis of Estimate**

<table>
<thead>
<tr>
<th>WBS No:</th>
<th>1GAC0502</th>
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<tbody>
<tr>
<td>Activity ID:</td>
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**WBS Filter**: 1GAC

**Activity Filter**: *

**Starts In FY**: *

### Line Item 0300 - QAP Addendum

**BOE**

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<th>Skill</th>
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<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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</thead>
<tbody>
<tr>
<td>750 STRAIGHT TIME BASE</td>
<td>E050 ENVIRONMENTAL ENGINEERS</td>
<td>R100S PMRS Salaried</td>
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Factors 40 hrs

**Resources**

**Line Item SYS - Contingency And Escalation**

**BOE**

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<th>Department</th>
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<th>Quantity</th>
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<tbody>
<tr>
<td>CON CONTINGENCY</td>
<td>0000 NONE</td>
<td>ZDEPT No Department</td>
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<td>1,706.13 Dollars</td>
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</tr>
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</table>

Factors 1706.13 Dollars

| ESC ESCALATION | 0000 NONE | ZDEPT No Department | Linear | 1,534.88 Dollars |

Factors 1534.88 Dollars

**Activity ID: 1G50020120**

**Description:** Procurement & Field Preparation - Group 500-2

<table>
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<tr>
<th>Line Item</th>
<th>Description</th>
<th>Quantity</th>
<th>Units</th>
<th>BOE Type</th>
<th>Labor Hours/Unit</th>
<th>Labor Hours Total</th>
<th>Labor Cost Total</th>
<th>Materials/ Sub Cost</th>
<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
<th>Burden Cost</th>
<th>Total Cost</th>
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<tbody>
<tr>
<td>0100</td>
<td>field prep and procurement</td>
<td>1.00 each</td>
<td>EE</td>
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<td>345</td>
<td>10,637</td>
<td>2,114</td>
<td>0</td>
<td>8,801</td>
<td>8,801</td>
<td>0</td>
<td>8,801</td>
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<tr>
<td>SYS</td>
<td>Contingency And Escalation</td>
<td>1.00 ka</td>
<td>EE</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>8,801</td>
<td>8,801</td>
<td>0</td>
<td>8,801</td>
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</table>

Total for Activity 1G50020120: 345, 10,637, 2,114, 8,801, 21,553, 3,702, 25,254

**Line Item 0100 - field prep and procurement**

**BOE**

**Estimator's Experience based on 15 years of experience planning, estimating, and conducting projects of similar scope and size.**

**Item Desc:** Prepare Radiological Work Permit, Implementation Plan, Ecology Survey/NEPA Support, and Utility Clearance/Soil Disturbance Permit.

**Breakdown of Cost Data:**

- Item: Site Labor to perform above individual tasks for either Ryan's Pit or T-3/T-4.
  - Units: 1380 hours
  - Unit Cost: 1380
  - Revised Unit: 345 hours

- Item: Subcontractor costs to perform above individual tasks for either Ryan's Pit or T-3/T-4.
  - Units: 1 lot
  - Unit Cost: $10K
  - Revised Unit: $2.5K

**Basis for adjustment. Hours and costs for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be characterized at once.**
Procurement includes preparation of statement of work, proposal review (technical evaluation), and negotiations. Based on a T-3/T-4 burdened cost of $29,186.52. Assuming it is primarily labor hours (RMRS Environmental Engineer charging at $57.45 per hour) yields 508 hours which rounds to 510 total hours.

Davis Bacon Documentation: It was assumed that it would take an environmental engineer twenty-four hours to prepare a Davis Bacon cost estimate and to support the Davis-Bacon determination.

Subcontractor Health and Safety Plan: Costs for the health and safety plan are based on Ryan's Pit, which cost approximately $10,000. It was assumed that these are A5H dollars. In addition, it was assumed that a safety engineer, an industrial hygienist, and a radiological engineer would each provide one week (40 hours) of support for review and document preparation.

Radiological Work Permit: It was assumed that it would take a radiological control technician two working days (18 hours) to complete counting preparation and review.

Implementation Plan: It was estimated that this activity would take 13 weeks of time for engineers, scientists or equivalent to complete. This would include preparation of an implementation plan as required (Rocky Flats Cleanup Agreement, Appendix 3, Interim Guidance Document, Dated August 1977). In addition this includes all tasks related to documentation for the Integrated Work Control Program and Integrated Safety Management.

Ecology Survey/National Environmental Protection Act (NEPA) Support: It was estimated that this would take 40 hours for an ecologist. The activities include NEPA review and support in document preparation, site surveys to verify compliance with ecological regulations, categorical exclusions, and NEPA evaluations.

Utility Clearance/Soil Disturbance Permits: It was estimated based on experience that it would take the equivalent 2 weeks (80 hours) for technical staff to do utility surveys, prepare and review soil disturbance permits, and prepare authorizing documents for excavation.

The combined resources for procurement and field preparations are

<table>
<thead>
<tr>
<th>Total Procurement and Field Preparation Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Engineer: 1134 hours</td>
</tr>
<tr>
<td>Safety Engineer: 40 hours</td>
</tr>
<tr>
<td>Industrial Hygiene: 40 hours</td>
</tr>
<tr>
<td>Radiological Engineering: 58 hours</td>
</tr>
<tr>
<td>Radiological Control Technician: 18 hours</td>
</tr>
<tr>
<td>Ecologist/Life Scientist: 40 hours</td>
</tr>
<tr>
<td>Manager: 50 hours</td>
</tr>
<tr>
<td>Quality Assurance: 29 hours</td>
</tr>
<tr>
<td>A5H Total: $10,000</td>
</tr>
</tbody>
</table>

* On some projects these hours were assumed to be included in other tasks or part of this task under environmental engineer or one of the other job functions.

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

| Factor 1134 - Environmental Engineer: 283 Hours |
| Factor 40 - Safety Engineer: 10 Hours |
| Factor 40 - Industrial Hygiene: 10 Hours |
| Factor 58 - Radiological Engineering: 14 Hours |
| Factor 18 - RCT: 5 Hours |
| Factor 40 - Life Scientist: 10 Hours |
| Factor 50 - Project Manager: 13 Hours |
| Factor 10000 - A5H: Subcontracted Services: 2,500 Dollars |

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

<table>
<thead>
<tr>
<th>Resources</th>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
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</tr>
</thead>
<tbody>
<tr>
<td>750</td>
<td>STRAIGHT TIME BASE</td>
<td>E050</td>
<td>ENVIRONMENTAL ENGINEERS</td>
<td>R100S</td>
<td>RMRS Salaried</td>
<td>Linear</td>
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<tr>
<td>750</td>
<td>STRAIGHT TIME BASE</td>
<td>E120</td>
<td>SAFETY ENGINEERS</td>
<td>R100S</td>
<td>RMRS Salaried</td>
<td>Linear</td>
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<tr>
<td>750</td>
<td>STRAIGHT TIME BASE</td>
<td>M020</td>
<td>MANAGERS (GRADE 69 - 72)</td>
<td>R100S</td>
<td>RMRS Salaried</td>
<td>Linear</td>
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<tr>
<td>750</td>
<td>STRAIGHT TIME BASE</td>
<td>P080</td>
<td>HEALTH PHYSICISTS</td>
<td>K265S</td>
<td>ER Programs</td>
<td>Linear</td>
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</table>

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**Rocky Flats Closure Project**

**Baseline Cost and Basis of Estimate**

**WBS No:** 1GAC0502  
**Activity ID:** 1G50020120

### Project Details
- **Baseline Deviation:** Baseline_Devl
- **WBS Filter:** 1GAC
- **Activity Filter:** *
- **Starts In FY:** *

### WBS No: 1GAC0502

**Activity ID:** 1G50020120

**Description:** Readiness Review - Group 500-2

<table>
<thead>
<tr>
<th>Line Item</th>
<th>Description</th>
<th>Quantity</th>
<th>Units</th>
<th>BOE Type</th>
<th>Labor Hours/Unit</th>
<th>Labor Hours Total</th>
<th>Labor Cost Total</th>
<th>Materials/Sub Cost</th>
<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
<th>Burden Cost</th>
<th>Total Cost</th>
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</thead>
<tbody>
<tr>
<td>0100</td>
<td>readiness assessment</td>
<td>1.00</td>
<td>each</td>
<td>EE</td>
<td>66</td>
<td>66</td>
<td>1,887</td>
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<td>657</td>
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<td>SYS</td>
<td>Contingency And Escalation</td>
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<td>ea</td>
<td>EE</td>
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<td>0</td>
<td>1,904</td>
<td>1,904</td>
<td>0</td>
<td>1,904</td>
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</table>

**Total for Activity 1G50020140:**
- **Quantity:** 66  
- **Labor Hours Total:** 1,887  
- **Labor Cost Total:** 1,015  
- **Materials/Sub Cost:** 1,904  
- **Contingency & Escalation:** 1,904  
- **Total Prime Cost:** 4,806  
- **Burden Cost:** 657  
- **Total Cost:** 5,463

**Line Item 0100 - readiness assessment**

**BOE**

Estimator's Experience based on 15 years of experience planning, estimating and conducting projects of similar scope and size.

**Item Desc:**
Evaluate readiness of the field characterization team and plans.

**Breakdown of Cost Data:**
- **Item:** Site Labor to perform Readiness Assessment for T-3/T-4.
  - **Units:** hours
  - **Unit Cost:** $187
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** 48

- **Item:** Subcontractor costs to perform Readiness Assessment for T-3/T-4.
  - **Units:** 1 lot
  - **Unit Cost:** $4800
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** $1200

It was estimated that subcontractor involvement would require 80 hours at $60/hour = $4,800. It was assumed that about 3 weeks of time was required for an environmental engineer or similar person in addition to 12 hours of project management, which yielded 132 hours. An additional 11 hours was added for management oversight. It was estimated that a radiological engineer (QA) and an industrial hygienist would be needed for 2.5 days each (22 hours).

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 projects will be conducted at once and only one of each fixed cost is needed for the group.

<table>
<thead>
<tr>
<th>Factor</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>132</td>
<td>Environmental Engineer 33 Hours</td>
</tr>
<tr>
<td>22</td>
<td>Health Physicists 6 Hours</td>
</tr>
<tr>
<td>11</td>
<td>Manager 3 Hours</td>
</tr>
<tr>
<td>22</td>
<td>Quality Assurance 6 Hours</td>
</tr>
<tr>
<td>4,800</td>
<td>A5H Subcontracted Svrs 1,200 Dollars</td>
</tr>
</tbody>
</table>

20 hours of administrative time will also be required.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
Project  
Baseline Cost and Basis of Estimate  
Baseline Devl:  Baseline_Devl  
WBS Filter:  WBS Filter  
Activity Filter:  Activity Filter  
Activity ID:  1G50020150  
Starts In FY:  *  

<table>
<thead>
<tr>
<th>Activity ID: 1G50020150</th>
<th>Description: Field Characterization - Group 500-2</th>
<th>WBS No: 1GAC0502</th>
<th>Baseline Cost and Basis of Estimate</th>
<th>Activity ID:  1G50020150</th>
</tr>
</thead>
<tbody>
<tr>
<td>0100 collect surficial soil samples</td>
<td>40.00 each EE 24 960 26,928 0 0 26,928 9,371 36,299</td>
<td>0.84576 [\text{SYS 061400}, 84576000 \cdot \text{System}]</td>
<td>1,014.91 Dollars</td>
<td>551.37 Dollars</td>
</tr>
<tr>
<td>0200 analyze samples (radioisotope)</td>
<td>40.00 each VQ 0 0 0 21,956 0 21,956 0 21,956</td>
<td>0.84576 [\text{SYS 061400}, 84576000 \cdot \text{System}]</td>
<td>1,014.91 Dollars</td>
<td>551.37 Dollars</td>
</tr>
<tr>
<td>0300 project mgmt oversight</td>
<td>40.00 each EE 8 320 11,210 5,684 0 16,893 3,901 20,794</td>
<td>0.84576 [\text{SYS 061400}, 84576000 \cdot \text{System}]</td>
<td>1,014.91 Dollars</td>
<td>551.37 Dollars</td>
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<tr>
<td>SYS Contingency And Escalation</td>
<td>1.00 ea EE 0 0 0 0 0 42,285 42,285 0 42,285</td>
<td>0.84576 [\text{SYS 061400}, 84576000 \cdot \text{System}]</td>
<td>1,014.91 Dollars</td>
<td>551.37 Dollars</td>
</tr>
</tbody>
</table>

Total for Activity 1G50020150: 1,280 38,138 27,639 42,285 108,063 13,272 121,334

Item Desc: 
Collection of surficial soil samples. A site Environmental Engineer will direct the sample collection, containerize, package, and ship the samples; prepare field QC documentation, and prepare field notes on a full time basis. A site RCT will monitor the site for radiological contamination on a full time basis. A site Industrial Hygienist will implement the field portion of the HASP on a full time basis.

Breakdown of Cost Data: 
- Item: Site Personnel for support of sample collection
  - Units: hours
  - Unit Cost: 24
  - Unit Cost Adjustment Factor: none
  - Revised Unit Hours: 24

Resources 
<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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<tbody>
<tr>
<td>750 STRAIGHT TIME BASE</td>
<td>E050 ENVIRONMENTAL ENGINEERS</td>
<td>Linear</td>
<td>8.00 Hours</td>
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<td>750 STRAIGHT TIME BASE</td>
<td>P090 INDUSTRIAL HYGIENISTS</td>
<td>Linear</td>
<td>8.00 Hours</td>
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<tr>
<td>750 STRAIGHT TIME BASE</td>
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<td>Linear</td>
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Item Desc: 
Email quote: average cost from Kaiser-Hill ASD (V. Ideker).
Analyze samples produced from geoprobe borings. It is anticipated that 3 samples from each boring will be collected. They will be analyzed for Metals, VOCs, SVOCs, PCBs, and radionuclides (est. 3 isotopes) with a 30 day TAT. This item is priced on a per sample basis. Per sample costs include DOT rad screen, bottle charge, shipping, and validation.

Breakdown of Cost Data:  
Item: Analyze samples at an offsite laboratory.  
Units: analysis  
Unit Cost: Metals $345, VOCs $280, SVOCs $440, PCBs and other analytes $150, and Radionuclides 3 isotopes) $590 per each sample.  
Unit Cost Adjustment Factor: Must add: DOT rad screen $32/sample, bottle charge $7/sample, shipping $4.2/bottle, and validation per each: $17.30 VOA, $19.25 SVOC, $16.75 Metals, $5.95 PCB, and $15.60 Rad.  
Revised Unit Hours:  Metals $405, VOCs $341, SVOCs $502, PCBs and other analytes $199, and Rad $649.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
level of effort required for remaining reports.

Item Desc:
Perform Data Analysis including GIS representation of data, NFA Summary, and associated project management.

Breakdown of Cost Data:
Item: Develop Documentation
Units: Hours
Unit Cost: 138

<table>
<thead>
<tr>
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<th>Skill</th>
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<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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<tr>
<td>Line Item SYS - Contingency And Escalation BOE</td>
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WBS No: 1GAC0503  Title: Group 500-3 (B559)
### Rocky Flats Closure Project

#### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0503  
**Activity ID:** 1GER653100  
**Description:** SAP Preparation - IHSS Group 500-3 (B559)

<table>
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<th>Line Item</th>
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<th>Units</th>
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<th>Labor Cost</th>
<th>Materials/Sub Cost</th>
<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
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</thead>
<tbody>
<tr>
<td>0100</td>
<td>SAP Addenda</td>
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**Total for Activity 1GER653100:**  
- Labor Hours: 280  
- Labor Cost: 10,021  
- Materials/Sub Cost: 1,421  
- Total Cost: 11,575  
- Burden Cost: 19,042  
- Total Cost: 30,617

#### Resources

**Line Item 0100 - SAP Addenda**

**BOE Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.**

**Item Desc:**
Preparation of SAP Addenda to Industrial Area Characterization Plan.

**Breakdown of Cost Data:**
- **Item:** Preparation of SAP addenda  
- **Units:** hours  
- **Unit Cost:** 120  
- **Unit Cost Adjustment Factor:** none  
- **Revised Unit Hours:** 120

**This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.**

- **Department:** RMRS Salaried  
- **Skill:** ENVIRO ENVIRONMENTAL ENGINEERS  
- **Units:** hours  
- **Factors:** 80

**Line Item 0200 - HASP Addenda**

**BOE Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.**

**Item Desc:**
Preparation of HASP addenda to Industrial Area Characterization Plan.

**Breakdown of Cost Data:**
- **Item:** Preparation of addenda for HASP  
- **Units:** hours  
- **Unit Cost:** 140  
- **Unit Cost Adjustment Factor:** none  
- **Revised Unit Hours:** 140

**This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.**

- **Department:** RMRS Salaried  
- **Skill:** MANAGER MANAGER MANAGER (GRADE 69 - 72)  
- **Units:** hours  
- **Factors:** 20

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Line Item 0300 - QAP Addenda

BOE

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

Item Desc:
Preparation of SAP Addenda to Industrial Area Characterization Plan.

Breakdown of Cost Data:
Item: Preparation of QAP addenda
Units: hours
Unit Cost: 60
Unit Cost Adjustment Factor: none
Revised Unit Hours: 60

Basis for adjustment.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

<table>
<thead>
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<th>BOE</th>
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</thead>
<tbody>
<tr>
<td>Cost Element</td>
<td>Skill</td>
</tr>
<tr>
<td>750</td>
<td>STRAIGHT TIME BASE</td>
</tr>
<tr>
<td>Factors: 40 hrs</td>
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</tr>
<tr>
<td>ASH</td>
<td>SUBCONTRACTED SRVS</td>
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<tr>
<td>Factors: 20 hrs</td>
<td>estimated $/hr</td>
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<td>Line Item SYS - Contingency And Escalation</td>
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<tr>
<td>BOE</td>
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Activity ID: 1GER653120  Description: Procurement and Field Prep - IHSS Group 500-3  Cost Risk 1  Schedule Risk 1

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<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
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</tr>
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<tbody>
<tr>
<td>0100</td>
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<td>345</td>
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<td>SYS</td>
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Line Item 0100 - procurement & field prep

BOE

Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation

Item Desc:

Breakdown of Cost Data:
Item: Site Labor to perform above individual tasks for either Ryan's Pit or T-3/T-4.
Units: hours
Unit Cost: 1380
Unit Cost Adjustment Factor: 0.25
Revised Unit: 345 hours

Item: Subcontractor costs to perform above individual tasks for either Ryan's Pit or T-3/T-4.
Units: 1 lot
Unit Cost: $10K
Unit Cost Adjustment Factor: 0.25
Revised Unit: $2.5K

Basis for adjustment. Hours and costs for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be characterized at once.
Procurement includes preparation of statement of work, proposal review (technical evaluation), and negotiations. Based on a T-3/T-4 burdened cost of $29,186.52. Assuming it is primarily labor hours (RMRS Environmental Engineer charging at $57.45 per hour) yields 508 hours which rounds to 510 total hours.

Davis Bacon Documentation: It was assumed that it would take an environmental engineer twenty-four hours to prepare a Davis Bacon cost estimate and to support the Davis-Bacon determination.

Subcontractor Health and Safety Plan: Costs for the health and safety plan are based on Ryan's Pit, which cost approximately $10,000. It was assumed that these are A5H dollars. In addition, it was assumed that a safety engineer, an industrial hygienist, and a radiological engineer would each provide one week (40 hours) of support for review and document preparation.

Radiological Work Permit: It was assumed that it would take a radiological control technician two working days (18 hours) to complete counting preparation and review.

Implementation Plan: It was estimated that this activity would take 13 weeks of time for engineers, scientists or equivalent to complete. This would include preparation of an implementation plan as required (Rocky Flats Cleanup Agreement, Appendix 4, Interim Guidance Document, Dated August 1977). In addition this includes all tasks related to documentation for the Integrated Work Control Program and Integrated Safety Management.

Ecology Survey/National Environmental Protection Act (NEPA) Support: It was estimated that this would take 40 hours for an ecologist. The activities include NEPA review and support in document preparation, site surveys to verify compliance with ecological regulations, categorical exclusions, and NEPA evaluations.

Utility Clearance/Soil Disturbance Permits: It was estimated based on experience that it would take the equivalent 2 weeks (80 hours) for technical staff to do utility surveys, prepare and review soil disturbance permits, and prepare authorizing documents for excavation.

The combined resources for procurement and field preparations are:

<table>
<thead>
<tr>
<th>Total Procurement and Field Preparation Hours</th>
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<tbody>
<tr>
<td>Environmental Engineer 1134 hours</td>
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<tr>
<td>Safety Engineer 40 hours</td>
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<tr>
<td>Industrial Hygiene 40 hours</td>
</tr>
<tr>
<td>Radiological Engineering 58 hours</td>
</tr>
<tr>
<td>Radiological Control Technician 18 hours</td>
</tr>
<tr>
<td>Ecologist/Life Scientist 40 hours</td>
</tr>
<tr>
<td>Manager 50 hours</td>
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<tr>
<td>Quality Assurance* 29 hours</td>
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<td>A5H Total $10,000</td>
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</table>

* On some projects these hours were assumed to be included in other tasks or part of this task under environmental engineer or one of the other job functions.

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

<table>
<thead>
<tr>
<th>Factor</th>
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<tr>
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<td>Factor 40</td>
<td>Safety Engineer 10 Hours</td>
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<td>Factor 40</td>
<td>Industrial Hygiene 10 Hours</td>
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<td>Factor 58</td>
<td>Radiological Engineering 14 Hours</td>
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<td>Factor 18</td>
<td>RCT 5 Hours</td>
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<td>Factor 40</td>
<td>Life Scientist 10 Hours</td>
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<td>Factor 50</td>
<td>Project Manager 13 Hours</td>
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<tr>
<td>Factor 10000</td>
<td>A5H Subcontracted Services 2,500 Dollars</td>
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This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

<table>
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<th>Cost Element</th>
<th>Skill</th>
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</table>
**Activity ID:** 1GER653140  
**Description:** Readiness Assessment - IHSS Group 500-3

**Line Item 0100 - Readiness Assessment**

Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation.

**Item Description:** Site Labor to perform Readiness Assessment for T-3/T4.

- **Units:** hours
- **Unit Cost:** $187
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** 48

Subcontractor costs to perform Readiness Assessment for T-3/T4:

- **Units:** 1 lot
- **Unit Cost:** $4800
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** $1200

It was estimated that subcontractor involvement would require 80 hours at $60/hour = $4,800. It was assumed that about 3 weeks of time was required for an environmental engineer or similar person in addition to 12 hours of project management, which yielded 132 hours. An additional 11 hours was added for management oversight. It was estimated that a radiological engineer (QA) and an industrial hygienist would be needed for 2.5 days each (22 hours).

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 projects will be conducted at once and only one of each fixed cost is needed for the group.

- **Factor 132:** Environmental Engineer 33 Hours
- **Factor 22:** Health Physicists 6 Hours
- **Factor 11:** Manager 3 Hours
- **Factor 22:** Quality Assurance 6 Hours
- **Factor 4,800:** ASH Subcontracted Srvs 1,200 Dollars

20 hours of administrative time will also be required.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
## Activity 1GER653140 - Rocky Flats Closure Project

### Baseline Cost and Basis of Estimate

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<th>Description</th>
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<th>Material/Sub Cost Total</th>
<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
<th>Burden Cost</th>
<th>Total Cost</th>
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### Breakdown of Cost Data:

**Item Desc:** Collection of geoprobe samples with the site geoprobe with two technicians. A site Environmental Engineer will direct the boring placement, log the borings; collect, containerize, package, and ship the samples; prepare field QC documentation, and prepare field notes on a full time basis. A site RCT will monitor the site for radiological contamination on a full time basis. A site Industrial Hygienist will implement the field portion of the HASP on a full time basis. Decon Operations staff will decon the vehicle and equipment when it leaves the work area on a half time basis. It is estimated that one 10' boring will be placed per 500 SF of building footprint (same as Bldg. 123 characterization) with 5 samples per 10' boring. It is estimated that one boring per eight hours can be completed. A 50% reduction in characterization from that which was done at Building 123 was taken because process history and building knowledge indicate that characterization to the extent required for Building 123 will not be required at this location.

**Breakdown of Cost Data:**

**Item: Site Personnel for support of geoprobe samples**

- **Units:** hours
- **Unit Cost:** 32
- **Unit Cost Adjustment Factor:** none
- **Revised Unit Hours:** 32

**Item: Kaiser-Hill/RMRS Geoprobe unit with 2 Technician crew.** Item costs $100 per hour or $800 per 8-hour day.

- **Units:** dollars
- **Unit Cost:** 800
- **Unit Cost Adjustment Factor:** none
- **Revised Unit Hours:** 800

**Basis for adjustment:** A 50% reduction in characterization from that which was done at Building 123 was taken because process history and building knowledge indicate that characterization to the extent required for Building 123 will not be required at this location.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### Resources

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#### Line Item 0200 - analyze samples

**BOE**

**Vendor Quote**

Email quote: average cost from Kaiser-Hill ASD (V. Ideker).

**Item Desc:**

Analyze samples produced from geoprobe borings. It is anticipated that 3 samples from each boring will be collected. They will be analyzed for Metals, VOCs, SVOCs, PCBs, and Radionuclides (est. 3 isotopes) with a 30 day TAT. This item is priced on a per sample basis. Per sample costs include DOT rad screen, bottle charge, shipping, and validation.

**Breakdown of Cost Data:**

- **Item:** Analyze samples at an offsite laboratory.
  - **Units:** analysis
  - **Unit Cost:** Metals $345, VOCs $280, SVOCs $440, PCBs and other analytes $150, and Radionuclides 3 isotopes) $590 per each sample.
  - **Unit Cost Adjustment Factor:** Must add: DOT rad screen $32/sample, bottle charge $7/sample, shipping $4.2/bottle, and validation per each: $17.30 VOA, $12.75 SVOC, $16.75 Metals, $5.95 PCB, and $15.60 Rad.
  - **Revised Unit Hours:** Metals $405, VOCs $341, SVOCs $502, PCBs and other analytes $199, and Rad $649.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

#### Resources

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#### Line Item 0300 - project mgmt oversight

**BOE**

**Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.**

**Item Desc:**

Project Management/Oversight. Based on half time for a Project Manager, Administrative staff, and Cost Estimator/Scheduler

**Breakdown of Cost Data:**

- **Item:** Mgmt oversight
  - **Units:** hours
  - **Unit Cost:** 12
  - **Unit Cost Adjustment Factor:** none
  - **Revised Unit Hours:** 12

**Basis for adjustment:** A 50% reduction in characterization from that which was done at Building 123 was taken because process history and building knowledge indicate that characterization to the extent required for Building 123 will not be required at this location.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

#### Resources

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<th>Curve</th>
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<th>Units</th>
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<td>Factors 4 hrs</td>
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### Rocky Flats Closure Project

#### Baseline Cost and Basis of Estimate

- **Project:** Baseline Devl
- **WBS Filter:** 1GAC
- **Activity:** 1GER653150

#### Project Details

- **WBS No.:** 1GAC0503
- **Activity ID:** 1GER653150
- **WBS Filter:** 1GAC

#### Activity Details

- **Activity ID:** 1GER653170
- **Description:** Prepare Summary/NFA - IHSS Group 500-3

#### Line Item Details

**Line Item 01000 - develop documentation**

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<th>Labor Hours/Unit</th>
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<th>Material/ Sub Cost</th>
<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
<th>Burden Cost</th>
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<tr>
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#### Resource Details

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<tr>
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#### BOE Resources

- **Estimator's Experience:**
  - Estimate for summary report based on estimator's 16 years of experience performing and costing projects of similar size and scope.
- **Item Description:**
  - Perform Data Analysis including GIS representation of data, NFA Summary, Characterization Report, and associated project management. Disposition comments and finalize document
- **Environmental Engineer:**
- **Computer Specialist:**
  - 80 hrs Identify & pull existing data from database.
- **GIS Specialist:**
  - 80 hrs Develop maps for Report. Print multiple copies.
- **Technical Editor:**
  - 40 hrs Complete initial and revised tech edits of Report.
- **Quality Assurance:**
  - 60 hrs Review
- **Environmental Engineer:**
  - Peer review
- **Regulatory Compliance:**
  - 20 hrs Review
- **Management:**
  - 48 hrs
- **Legal:**
  - 8 hrs Review
- **Administrative Support:**
  - Copy & assemble final documents, submit to records.

#### Breakdown of Cost Data:

- **Item:** Develop Documentation
- **Units:** Hours
- **Unit Cost:** 656
- **Unit Cost Adjustment Factor:** none
- **Revised Unit Hours:** 656

---

**Environmental Engineer:**

- 40 hrs Peer review

---

**Legal:**

- 8 hrs Review

---

**Estimator's Experience:**

- Estimate for summary report based on estimator's 16 years of experience performing and costing projects of similar size and scope.
Table 1: Rocky Flats Closure Project

<table>
<thead>
<tr>
<th>Activity ID: 1GER653180</th>
<th>Description: Prepare Decision Document - IHSS Group 500-3</th>
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**Cost Element** | **Skill** | **Quantity** | **Units** | **Labor Hours/Unit** | **Labor Hours Total** | **Labor Cost Total** | **Materials/Sub Cost** | **Contingency & Escalation** | **Total Prime Cost** | **Burden Cost** | **Total Cost** |
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For a PAM the total labor hours are:

- Environmental Engineer 700 Hours
  - Manager 70 Hours
  - Factor 700 Environmental Engineer 175 hours
  - Factor 70 Manager 18 hours

Breakdown of Cost Data:

- Item: Preparation of PAM for Ryan's Pit source removal action.
  - Units: hours
  - Unit Cost: 770
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit Hours: 193

Basis for adjustment. Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

Interim Measure/Interim Remedial Action Decision Document: It was assumed that an IM/IRA Decision Document would take 75% more effort than a PAM or 1,166 hours, which rounds to 1,200 hours. It was assumed that 10% of this labor would be required for managerial hours.

For an IM/IRA the total labor hours are:

- Environmental Engineer 1200 Hours
  - Manager 120 Hours
  - Factor 1200 Environmental Engineer 300 hours
  - Factor 120 Manager 30 hours

- Resources

**Resources**

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<td>Sampling and Analysis Plan: Based on the T-3/T-4 Sampling and Analysis Plan (SAP) it took 300 hours in total preparation time. It was assumed that 10% of this labor was for managerial hours (30 hours) and that the rest of the time, 270 hours, was for technical staff. It was assumed that these hours include all labor including quality assurance, secretarial support, graphics etc.</td>
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<td>Original Hours 80 Environmental Engineer 20 hours</td>
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### Activity ID: 1GER653210

**Description:** Procurement and Field Prep - IHSS Grouping 500-3

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**Line Item 0100 - procurement & field prep**

**Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation**

**Item Desc:**


**Breakdown of Cost Data:**

**Item:** Site Labor to perform above individual tasks for either Ryan's Pit or T-3/T-4.

- **Units:** hours
- **Unit Cost:** $1380
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** 345 hours

**Item:** Subcontractor costs to perform above individual tasks for either Ryan's Pit or T-3/T-4.

- **Units:** 1 lot
- **Unit Cost:** $10K
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** $2.5K

**Basis for adjustment.** Hours and costs for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be characterized at once.

**Procurement includes preparation of statement of work, proposal review (technical evaluation), and negotiations. Based on a T-3/T-4 burdened cost of $29,186.52. Assuming it is primarily labor hours (RMRS Environmental Engineer charging at $57.45 per hour) yields 508 hours which rounds to 510 total hours.**

**Davis Bacon Documentation:** It was assumed that it would take an environmental engineer twenty-four hours to prepare a Davis Bacon cost estimate and to support the Davis-Bacon determination.

**Subcontractor Health and Safety Plan:** Costs for the health and safety plan are based on Ryan's Pit, which cost approximately $10,000. It was assumed that these are A5H dollars. In addition, it was assumed that a safety engineer, an industrial hygienist, and a radiological engineer would each provide one week (40 hours) of support for review and document preparation.

**Radiological Work Permit:** It was assumed that it would take a radiological control technician two working days (18 hours) to complete counting preparation and review.

**Implementation Plan:** It was estimated that this activity would take 13 weeks of time for engineers, scientists or equivalent to complete. This would include preparation of an implementation plan as required (Rocky Flats Cleanup Agreement, Appendix 3, Interim Guidance Document, Dated August 1977). In addition this includes all tasks related to documentation for the Integrated Work Control Program and Integrated Safety Management.

**Ecology Survey/National Environmental Protection Act (NEPA) Support:** It was estimated that this would take 40 hours for an ecologist. The activities include NEPA review and document preparation, site surveys to verify compliance with ecological regulations, categorical exclusions, and NEPA evaluations.

**Utility Clearance/Soil Disturbance Permits:** It was estimated based on experience that it would take the equivalent 2 weeks (80 hours) for technical staff to do utility surveys, prepare and review soil disturbance permits, and prepare authorizing documents for excavation.

**The combined resources for procurement and field preparations are Total Procurement and Field Preparation Hours:**

- Environmental Engineer 1134 hours
- Safety Engineer 40 hours
- Industrial Hygiene 40 hours
- Radiological Engineering 58 hours
Radiological Control Technician 18 hours
Ecologist/Life Scientist 40 hours
Manager 50 hours
Quality Assurance* 29 hours
A5K Total $10,000

* On some projects these hours were assumed to be included in other tasks or part of this task under environmental engineer or one of the other job functions.

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

Factor 1134 - Environmental Engineer 283 Hours
Factor 40 - Safety Engineer 10 Hours
Factor 40 - Industrial Hygiene 10 Hours
Factor 58 - Radiological Engineering 14 Hours
Factor 10 - Life Scientist 10 Hours
Factor 50 - Project Manager 13 Hours
Factor 10000 - A5H Subcontracted Services 2,500 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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<th>Curve</th>
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<th>Units</th>
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ASH SUBCONTRACTED SRVS 0000 NONE K26SS ER Programs Linear 2,114.40 Dollars

Factors 2500 sub/c support

### Line Item SYS - Contingency And Escalation

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Factors 2572.41 Dollars

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Activity ID: 1GER653240

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Total for Activity 1GER653240: 116 3,306 4,821 4,963 13,090 1,151 14,241
Line Item 0100 - readiness assessment

BOE

Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation

Item Desc:
Evaluate readiness of the field characterization team and plans.

Breakdown of Cost Data:
Item: Site Labor to perform Readiness Assessment for T-3/T-4.
Units: hours
Unit Cost: 187
Unit Cost Adjustment Factor: 0.25
Revised Unit: 48

Units: 1 lot
Unit Cost: $4800
Unit Cost Adjustment Factor: 0.25
Revised Unit: $1200

It was estimated that subcontractor involvement would require 80 hours at $60/hour = $4,800. It was assumed that about 3 weeks of time was required for an environmental engineer or similar person in addition to 12 hours of project management, which yielded 132 hours. An additional 11 hours was added for management oversight. It was estimated that a radiological engineer (QA) and an industrial hygienist would be needed for 2.5 days each (22 hours).

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 projects will be conducted at once and only one of each fixed cost is needed for the group.

Factor 132 - Environmental Engineer 33 Hours
Factor 22 - Health Physicists 6 Hours
Factor 11 - Manager 3 Hours
Factor 22 - Quality Assurance 6 Hours
Factor 4,800 - A5H Subcontracted Srvs 1,200 Dollars

20 hours of administrative time will also be required.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

Resources

<table>
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<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
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Line Item 0200 - training

BOE

Estimator's Experience based generally on historical data for T-3/T4 Remediation

Item Desc:
Conduct perform Training in support of source removal action.

Breakdown of Cost Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
Units: hours
Unit Cost: 132 Hours
Unit Cost Adjustment Factor: 0.25
### Rocky Flats Closure Project
#### Baseline Cost and Basis of Estimate

**Activity ID:** 1GER653240  
**WBS Filter:** 1GAC  
**WBS No:** 1GAC0503  
**Description:** Remedial Action - IHSS Group 500-3

### Revised Unit: 33 hours

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.  
**Units:** 1 lot  
**Unit Cost:** $12K  
**Unit Cost Adjustment Factor:** 0.25  
**Revised Unit:** $3K

**Basis for adjustment.** Costs for each UBC are divided by 4 to account for the fact that 4 UBCs will be remediated at once and only one Training is needed for the group.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
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#### Line Item 0300 - pre-evolution meeting

**BOE**  
Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:**  
Conduct Pre-Evolution Meeting in support of source removal action

**Breakdown of Cost Data:**

**Item:** Site Labor to perform above individual tasks for T-3/T-4.  
**Units:** hours  
**Unit Cost:** 60 hours  
**Unit Cost Adjustment Factor:** 0.25  
**Revised Unit:** 15 hours

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.  
**Units:** 1 lot  
**Unit Cost:** $6K  
**Unit Cost Adjustment Factor:** 0.25  
**Revised Unit:** $1.5K

**Basis for adjustment.** Costs for each UBC are divided by 4 to account for the fact that 4 UBCs will be remediated at once and only one Pre-Evolution Meeting is needed for the group.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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#### Line Item SYS - Contingency And Escalation

**BOE**  
Contingency And Escalation

**Item Desc:**  
Contingency And Escalation

**Breakdown of Cost Data:**

**Item:** Contingency And Escalation

**Factors:** 3525.66 Dollars

**Factors:** 1437.27 Dollars

### Activity ID: 1GER653250  
**Description:** Remedial Action - IHSS Group 500-3  
**Cost Risk:** 2  
**Schedule Risk:** 3
**WBS No:** 1GAC0503  
**Activity ID:** 1GER653250

### Rocky Flats Closure Project  
**Baseline Cost and Basis of Estimate**

**WBS Filter:** 1GAC  
**Activity Filter:** *  
**Starts In FY:** *

#### Line Item 0100 - mobilization

**BOE**

**Estimator's Experience based generally on historical data for T-3/T4 Remediation.**

- **Item Desc:** Mobilization in support of remediation.
- **Breakdown of Cost Data:**
  - **Item:** Site Labor to perform above individual tasks for T-3/T-4.
    - **Units:** hours
    - **Unit Cost Adjustment Factor:** 0.25
    - **Revised Units:** 275
  - **Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
    - **Units:** 1 lot
    - **Unit Cost Adjustment Factor:** 0.25
    - **Revised Unit:** see below

**Basis for adjustment.** The costs were divided into fixed costs and variable costs. The fixed costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

**T3/T4 hours**
- 110 Health Physicists 27 Hours
- 330 Manager 83 Hours
- 550 Environmental Engineer 138 Hours
- 110 Industrial Hygienist 27 Hours
- 184,000 Subcontractor 46,000

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

#### Resources

**Cost Element**  
**Skill**  
**Department**  
**Curve**  
**Quantity**  
**Units**

- **750** STRAIGHT TIME BASE  
  - E050 ENVIRONMENTAL ENGINEERS  
  - R100S RMRS Salaried  
  - Linear  
  - **138.00** Hours
- **83.00** Hours

- **750** STRAIGHT TIME BASE  
  - M020 MANAGERS (GRADE 69 - 72)  
  - R100S RMRS Salaried  
  - Linear  
  - **83.00** Hours

- **750** STRAIGHT TIME BASE  
  - P080 HEALTH PHYSICISTS  
  - R100S RMRS Salaried  
  - Linear  
  - **27.00** Hours

- **750** STRAIGHT TIME BASE  
  - P090 INDUSTRIAL HYGIENISTS  
  - K265S ER Programs  
  - Linear  
  - **27.00** Hours

- **ASH** SUBCONTRACTED SRVS  
  - 0000 NONE  
  - K265S ER Programs  
  - Linear  
  - **38,904.96** Dollars

**Factors**
- **138** hrs
- **83** hrs
- **27** hrs
- **27** hrs
- **27** hrs
- **46000** sub/c support

**Line Item 0200 - site prep**

**BOE**

**Estimator's Experience based generally on historical data for T-3/T4 Remediation.**

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**6/23/00 9:21:42 AM**

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**Resources**

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**Line Item 0300 - excavation**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:**
Excavation.

**Breakdown of Historical Data:**

Item: Site Labor to perform above individual tasks for T-3/T-4.
- Units: hours
- Unit Cost: see below
- Unit Cost Adjustment Factor: see below
- Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
- Units: 1 lot
- Unit Cost: see below
- Unit Cost Adjustment Factor: see below
- Revised Unit: see below

**Basis for adjustment.**
The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

T3/T4 hours 120 Environmental Engineer 30 hours
T3/T4 dollars 30,000 Subcontracted Svrs 7,500 Dollars

D&D construction trade hours were calculated using the following methodology:

ASH subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.

RCT hours were calculated using the following methodology, unless they were already estimated.

For Site Preparation tasks - RCT hours were the same as D&D construction hours.

For all other tasks ASH subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under KG10H department code.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Form, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Total Contaminated Soil to be removed 1,506 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 1,506 CY

The excavation cost was based on the excavation cost for the T-3/T-4 Project. Burdened cost based on the T-3/T-4 actuals is $171,487. For the 3,800 cubic yards of contaminated soil removed this yielded a unit cost of $45 per cubic yard of contaminated soil removed. This estimate includes the removal of overburden that might be on top of the contaminated soil. The hours for an environmental engineer from T-3/T-4 were 1.09 hours per cubic yard of contaminated soil. Likewise the hours for the following were assumed to be linearly proportional:

Health Physicists .47 hours per cubic yard
Environmental Operations .31 hours per cubic yard

Radiological Control Technician 1.00 hour per cubic yard *

* Based on $50/cubic yard fromT-3/T-4, assumes a labor rate of $50/hour

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 1.09 – E050 Environmental Engineer 1,642 Hours
Factor 0.47 – P080 Health Physicists 708 Hours
Factor 0.31 – Environmental Operations 467 Hours
Factor 0.31 – P090 Industrial Hygienists 467 Hours
Factor 1.00 – T050 Radiological Control Technician Linear 1,506 Hours
Factor 45.23 – A5H Subcontracted Srvs 68,116 Dollars

D&D construction trade hours were calculated using the following methodology:

A5H subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.

RCT hours were calculated using the following methodology, unless they were already estimated.

For Site Preparation tasks – RCT hours were the same as D&D construction hours.

For all other tasks A5H subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under KG10H department code.

For this project the number of RCT hours was assumed to be the same as the number of health physics hours.

The dollars amounts calculated for D&D construction workers and RCTs were subtracted from the subcontractor dollars and the revised A5H dollar amount was entered into Best.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
Line Item 0400 - remove and clean debris

Estimator's Experience based generally on a base case of 700 cy.

Item Desc:
Remove and clean debris.

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
Units: hours
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
Units: 1 lot
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Total Contaminated Soil to be removed 1,506 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 1,506 CY

For the base case, it was assumed that about five cubic yards out of 700 cubic yards would be debris and would be segregated and cleaned. It was estimated that each cubic yard of debris would cost $1,000 or $5,000 total for 700 cubic yards. This yields a rate of $7.14 per cubic yard.

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 7.14 - A5H Subcontracted Svrs 10,753 Dollars
D&D construction trade hours were calculated using the following methodology:
A5H subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.

RCT hours were calculated using the following methodology, unless they were already estimated.
For Site Preparation tasks - RCT hours were the same as D&D construction hours.
For all other tasks A5H subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under KG10H department code.
The dollars amounts calculated for D&D construction workers and RCTs were subtracted from the subcontractor dollars and the revised A5H dollar amount was entered into Best.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
BOE

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc: Confirmation Sampling.

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
   Units: hours
   Unit Cost: see below
   Unit Cost Adjustment Factor: see below
   Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
   Units: 1 lot
   Unit Cost: see below
   Unit Cost Adjustment Factor: see below
   Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Total Contaminated Soil to be removed 1,506 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 1,506 CY

The analytical costs were based on T-3/T-4, which cost $435,574 for 3800 cubic yards of contaminated soil removed. This yielded a unit rate of about $115/cubic yard. Based on estimator experience the cost of sampling including labor and materials was estimated to be 20% of that rate or about $23/ cubic yard.

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 114.62 - A5H Subcontracted Srvs (Analytical) 172,618 Dollars
Factor 22.924 - A5H Subcontracted Srvs 34,524 Dollars

D&D construction trade hours were calculated using the following methodology:
A5H subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.
RCT hours were calculated using the following methodology, unless they were already estimated.
For Site Preparation tasks - RCT hours were the same as D&D construction hours.
For all other tasks A5H subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under KG10H department code.

The dollars amounts calculated for D&D construction workers and RCTs were subtracted from the subcontractor dollars and the revised A5H dollar amount was entered into Best.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
Line Item 0700 - prepare waste acceptance forms

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:** Prepare Waste Acceptance Forms

**Breakdown of Historical Data:**
- **Item:** Site Labor to perform above individual tasks for T-3/T-4.
  - **Units:** hours
  - **Unit Cost:** see below
  - **Unit Cost Adjustment Factor:** see below
  - **Revised Unit:** see below

- **Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
  - **Units:** 1 lot
  - **Unit Cost:** see below
  - **Unit Cost Adjustment Factor:** see below
  - **Revised Unit:** see below

**Basis for adjustment.** The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

T3/T4 hours 80 environmental engineer 20 hours

**Resources**

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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**Factors** 20 hrs

Line Item 0800 - waste acceptance sampling

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:** Waste Acceptance Sampling

**Breakdown of Historical Data:**
- **Item:** Site Labor to perform above individual tasks for T-3/T-4.
  - **Units:** hours
  - **Unit Cost:** see below
  - **Unit Cost Adjustment Factor:** see below
  - **Revised Unit:** see below

- **Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
  - **Units:** 1 lot
  - **Unit Cost:** see below
  - **Unit Cost Adjustment Factor:** see below
  - **Revised Unit:** see below

**Basis for adjustment.** The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Because the waste acceptance sampling is difficult to predict and could vary significantly from project to project, it was assumed that about $800 worth of additional analysis would be required for 20 cubic yards which is the volume that can be placed in one roll-off. This yielded a unit rate of about $40/cubic yard. This sampling and analysis is in addition to the confirmational samples so the costs are not as great. It was assumed that this sampling would be more labor intensive so the sampling costs were estimated to be about 50% of the analytical costs or about $20/cubic yard.
Total Contaminated Soil to be removed 1,506 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 1,506 CY

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 40 - A5H Analytical 60,240 Dollars
Factor 20 - A5H Subcontracted Srvs 30,120 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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<tr>
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<td>Factors</td>
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<td>units per yard in crates</td>
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| ASH SUBCONTRACTED SRVS | 0000 | NONE       | K267S | Analytical Laboratory Services | Linear | 33.83 Dollars |
| Factors               | 40    | units per yard in crates (analytical) |       |          |       |

Line Item 0900 - field oversight & project mgmt

BOE

Estimator's Experience based generally on a base case of 700 cy.

Breakdown of Historical Data:
- Item: Site Labor to perform above individual tasks for T-3/T-4.
  - Units: hours
  - Unit Cost: see below
  - Unit Cost Adjustment Factor: see below
  - Revised Unit: see below
- Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
  - Units: 1 lot
  - Unit Cost: see below
  - Unit Cost Adjustment Factor: see below
  - Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

It was assumed that a field manager would be needed for 150 nine-hour working days or about 33 weeks. This work breaks down as follows:
- Preparation Activities 50 working days
- Field Activities - 80 working days
- Demobilization - 20 working days
- Total 150 nine-hour working days or 1350 hours

In addition it was estimated that technical staff, quality assurance, and project management would be required for the equivalent of ten additional weeks, which is 400 hours each.

Based on the base case of a 700 cubic yard removal project, these values yielded unit rates as follows
- Hours Per Cubic Yard Of Contaminated Soil
  - Field Manager 1.93
  - Technical Staff .57
  - Quality Assurance .57
  - Project Management 0.57

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.
Total Contaminated Soil to be removed 1,506 CY  
Total Soil for Thermal Desorption 0 CY  
Offsite Waste Volume 1,506 CY  

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**Resources**

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**Line Item 1000 - backfill**

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<td>CY</td>
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**Line Item 1000 - backfill**

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<td>Subcontractor costs to perform above individual tasks for T-3/T-4</td>
<td>Environmental Scientists</td>
<td>858</td>
<td>Hours</td>
<td>Linear</td>
<td>858.00</td>
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**Means (1995) Site Work & Landscape Cost Data as follows:**

- Common Fill $ 4.77/cubic yard (page 34 Borrow Bank Measure)
- Hauling $ 3.98/cubic yard (page 42 2-mile round-trip, 6 cubic yard dump truck)
- Backfilling $ 1.69/cubic yard (page 34)
- Burden (43%) $ 4.49/cubic yard
- Total $14.23/cubic yard or about $15/cubic yard

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.
Line Item 1100 - demobilization

BOE

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc:
Demobilization.

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
  Units: hours
  Unit Cost: see below
  Unit Cost Adjustment Factor: see below
  Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
  Units: 1 lot
  Unit Cost: see below
  Unit Cost Adjustment Factor: see below
  Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Demobilization: Based on the T-3/T-4 project, it was assumed that demobilization costs would cover demobilization for excavation activities also. The subcontractor cost for demobilization was about $95,000 for 3,800 cubic yards at the T-3/T-4 project. In addition it was estimated that the following hours were necessary:

- Environmental Engineer: 300 hours
- Health Physicist: 100 hours
- Manager: 200 hours
- Industrial Hygienist: 100 hours

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

Factor 300 - Environmental Engineer 75 Hours
Factor 100 - Health Physicists 25 Hours
Factor 200 - Manager 50 Hours
Factor 100 - P090 Industrial Hygienists 25 Hours
Factor 95000 - ASH Subcontracted Svrs 23,750 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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<th>Resources</th>
<th>Cost Element</th>
<th>Skill Description</th>
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Line Item SYS - Contingency And Escalation

BOE

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**Rocky Flats Closure Project**

**Baseline Cost and Basis of Estimate**

**WBS No:** 1GAC0503  
**Activity ID:** 1GER653250

**CON CONTINGENCY**  
Factors: 337,277 Dollars  
Factors: 0000  
Factors: NONE  
Factors: ZDEPT  
Factors: No Department  
Factors: Linear

**ESC ESCALATION**  
Factors: 135,582 Dollars  
Factors: 0000  
Factors: NONE  
Factors: ZDEPT  
Factors: No Department  
Factors: Linear

---

**Activity ID:** 1GER653270  
**Description:** Prepare Closeout Report - IHSS Group 500-3

**Schedule Risk:** 1  
**Cost Risk:** 1

---

### Line Item 0100 - develop report

**BOE**  
Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Item Desc:**  
Perform Data Analysis including GIS representation of data, Closeout Report, and associated project management.

**Breakdown of Cost Data:**
- **Item:** Develop Documentation  
- **Units:** hours  
- **Cost:** 320  
- **Unit Cost Adjustment Factor:** none  
- **Revised Unit Hours:** 320

**Required level of effort:**
- Environmental Engineer - 80 hours  
- Environmental Scientist - 20 hours  
- Computer Specialist - 160 hours (GIS, SWD)  
- Manager - 20 hours  
- Administrative - 20 hours  
- Cost Estimators - 20 hours

---

**Resources**

### Cost Element  
**Skill**  
**Department**  
**Curve**  
**BOE**  
**Quantity**  
**Units**

- **Cost Element:** STRAIGHT TIME BASE  
- **Skill:** E050 ENVIRONMENTAL ENGINEERS  
- **Department:** R100S RMRS Salaried  
- **Curve:** Linear  
- **BOE:** 750  
- **Quantity:** 80.00 Hours  
- **Units:** hrs

- **Cost Element:** STRAIGHT TIME BASE  
- **Skill:** G010 ADMINISTRATIVE ASSISTANTS  
- **Department:** R100S RMRS Salaried  
- **Curve:** Linear  
- **BOE:** 750  
- **Quantity:** 20.00 Hours  
- **Units:** hrs

- **Cost Element:** STRAIGHT TIME BASE  
- **Skill:** M020 MANAGERS (GRADE 69 - 72)  
- **Department:** R100S RMRS Salaried  
- **Curve:** Linear  
- **BOE:** 750  
- **Quantity:** 20.00 Hours  
- **Units:** hrs

- **Cost Element:** STRAIGHT TIME BASE  
- **Skill:** P060 COMPUTER SYSTEMS ANALYSTS  
- **Department:** R100S RMRS Salaried  
- **Curve:** Linear  
- **BOE:** 750  
- **Quantity:** 160.00 Hours  
- **Units:** hrs

- **Cost Element:** STRAIGHT TIME BASE  
- **Skill:** P070 COST ESTIMATORS PLANNERS AN  
- **Department:** K26SS ER Programs  
- **Curve:** Linear  
- **BOE:** 750  
- **Quantity:** 20.00 Hours  
- **Units:** hrs

---

**WBS No:** 1GAC0504  
**Title:** Group 500-4 (Non D&D)  
**Activity ID:** 1GHE654100  
**Description:** SAP Preparation - IHSS Group 500-4 (Non D&D)

**Schedule Risk:** 1  
**Cost Risk:** 1
WBS No: 1GAC0504
Activity ID: 1GHE654100

Project Baseline Cost and Basis of Estimate

Baseline Cost and Basis of Estimate

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0100 SAP Addenda
0100 1.00 each EE 100 100 5.434 710 0 4.144 1.212 5.256
0200 HASP Addenda
0200 1.00 each EE 140 140 5.404 0 0 5.404 1.908 7.312
0300 QAP Addenda
0300 1.00 each EE 40 40 1.182 710 0 1.892 417 2.310
SYS Contingency And Escalation
SYS 1.00 hrs EE 0 0 0 2.239 2.239 0 2.239

Total for Activity 1GHE654100:

|                |                |                |                |                |
|----------------|----------------|----------------|----------------|
|                |                |                |                |

Line Item 0100 - SAP Addenda

BOE Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

Item Desc: Preparation of SAP Addenda to Industrial Area Characterization Plan.

Breakdown of Cost Data:
- Item: Preparation of SAP addenda
  - Units: hours
  - Unit Cost: 120
  - Unit Cost Adjustment Factor: none

Revised Unit Hours: 120

Basis for adjustment:

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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Factors 80 hrs

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Factors 20 hrs

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Factors estimated $/hr 0.84576 [SYS 061400] 84576000 - System

Line Item 0200 - HASP Addenda

BOE Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

Item Desc: Preparation of HASP addenda to Industrial Area Characterization Plan

Breakdown of Cost Data:
- Item: Preparation of addenda for HASP.
  - Units: hours
  - Unit Cost: 140
  - Unit Cost Adjustment Factor: none

Revised Unit Hours: 140

Basis for adjustment:

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Factors 40 hrs

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Factors 40 hrs

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<td>Linear</td>
<td>40.00</td>
<td>Hours</td>
</tr>
</tbody>
</table>

Factors 40 hrs

Line Item 0300 - QAP Addenda

BOE Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

Item Desc: Preparation of QAP Addenda to Industrial Area Characterization Plan.

<table>
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<tr>
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<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
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<td>Linear</td>
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</table>

Factors 40 hrs

---

Page 482 of 1121 6/23/00 9:21:43 AM OFFICIAL USE ONLY
Breakdown of Cost Data:
Item: Preparation of QAP addenda
Units: hours
Unit Cost: 60
Unit Cost Adjustment Factor: none
Revised Unit Hours: 60

Basis for adjustment.
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

<table>
<thead>
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Line Item SYs - Contingency And Escalation

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<tr>
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Activity ID: 1GHE654120 Description: Procurement and Field Prep - IHSS Group 500-4

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<th>Description</th>
<th>Quantity</th>
<th>Units</th>
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<th>Materials/Sub Cost Total</th>
<th>Contingency &amp; Escalation Total Prime Cost</th>
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<td>procurement &amp; field prep</td>
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<td>SYS Conti</td>
<td>ngency And Escalation</td>
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Total for Activity 1GHE654120:

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Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation

Item Desc:

Breakdown of Cost Data:
Item: Site Labor to perform above individual tasks for either Ryan's Pit or T-3/T-4.
Units: hours
Unit Cost: 1380
Unit Cost Adjustment Factor: 0.25
Revised Unit: 345 hours

Item: Subcontractor costs to perform above individual tasks for either Ryan's Pit or T-3/T-4.
Units: 1 lot
Unit Cost: $10K
Unit Cost Adjustment Factor: 0.25
Revised Unit: $2.5K

Basis for adjustment. Hours and costs for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be characterized at once.

Procurement includes preparation of statement of work, proposal review (technical evaluation), and negotiations. Based on a T-3/T-4 burdened cost of $29,186.52. Assuming it is primarily labor hours (RMRS Environmental Engineer charging at $57.45 per hour) yields 508 hours which rounds to 510 total hours.

Davis Bacon Documentation: It was assumed that it would take an environmental engineer twenty-four hours to prepare a Davis Bacon cost estimate and to
support the Davis-Bacon determination.

Subcontractor Health and Safety Plan: Costs for the health and safety plan are based on Ryan's Pit, which cost approximately $10,000. It was assumed that these are A5H dollars. In addition, it was assumed that a safety engineer, an industrial hygienist, and a radiological engineer would each provide one week (40 hours) of support for review and document preparation.

Radiological Work Permit: It was assumed that it would take a radiological control technician two working days (18 hours) to complete counting preparation and review.

Implementation Plan: It was estimated that this activity would take 13 weeks of time for engineers, scientists or equivalent to complete. This would include preparation of an implementation plan as required (Rocky Flats Cleanup Agreement, Appendix 3, Interim Guidance Document, Dated August 1977). In addition this includes all tasks related to documentation for the Integrated Work Control Program and Integrated Safety Management.

Ecology Survey/National Environmental Protection Act (NEPA) Support: It was estimated that this would take 40 hours for an ecologist. The activities include NEPA review and support in document preparation, site surveys to verify compliance with ecological regulations, categorical exclusions, and NEPA evaluations.

Utility Clearance/Soil Disturbance Permits: It was estimated based on experience that it would take the equivalent 2 weeks (80 hours) for technical staff to do utility surveys, prepare and review soil disturbance permits, and prepare authorizing documents for excavation.

The combined resources for procurement and field preparations are

Total Procurement and Field Preparation Hours

Environmental Engineer 1134 hours
Safety Engineer 40 hours
Industrial Hygiene 40 hours
Radiological Engineering 58 hours
Radiological Control Technician 18 hours
Ecologist/Life Scientist 40 hours
Manager 50 hours
Quality Assurance* 29 hours
A5H Total $10,000

* On some projects these hours were assumed to be included in other tasks or part of this task under environmental engineer or one of the other job functions.

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

Factor 1134 - Environmental Engineer 283 Hours
Factor 40 - Safety Engineer 10 Hours
Factor 40 - Industrial Hygiene 10 Hours
Factor 58 - Radiological Engineering 14 Hours
Factor 18 - RCT 5 Hours
Factor 40 - Life Scientist 10 Hours
Factor 50 - Project Manager 13 Hours
Factor 10000 - A5H Subcontracted Services 2,500 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
# Rocky Flats Closure Project

## Baseline Cost and Basis of Estimate

### Activity ID: 1GHE654120

<table>
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<tr>
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### Activity ID: 1GHE654140

**Description:** Readiness Assessment - IHSS Group 500-4

<table>
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<th>Line Item</th>
<th>Description</th>
<th>Quantity</th>
<th>Units</th>
<th>BOE Type</th>
<th>Labor Hours/Unit</th>
<th>Labor Hours</th>
<th>Labor Cost</th>
<th>Materials/Sub Cost</th>
<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
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**Total for Activity 1GHE654140:**

|         |                   | 68       | 1,887  | 1,015 | 533 | 4,102 |

### Notes:

- Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation
- Evaluate readiness of the field characterization team and plans.

**Breakdown of Cost Data:**

- **Item:** Site Labor to perform Readiness Assessment for T-3/T-4.
  - **Units:** hours
  - **Cost:** 187
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** 48

- **Item:** Subcontractor costs to perform Readiness Assessment for T-3/T-4.
  - **Units:** 1 lot
  - **Cost:** $4800
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** $1200

- It was estimated that subcontractor involvement would require 80 hours at $60/hour = $4,800. It was assumed that about 3 weeks of time was required for an environmental engineer or similar person in addition to 12 hours of project management, which yielded 132 hours. An additional 11 hours was added for management oversight. It was estimated that a radiological engineer (QA) and an industrial hygienist would be needed for 2.5 days each (22 hours).

- The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 projects will be conducted at once and only one of each fixed cost is needed for the group.

- Factor 132 - Environmental Engineer 33 Hours
- Factor 22 - Health Physicists 6 Hours
- Factor 11 - Manager 3 Hours
- Factor 22 - Quality Assurance 6 Hours
- Factor 4,800 - ASH Subcontracted Svrs 1,200 Dollars

- 20 hours of administrative time will also be required.

- This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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<th>Department</th>
<th>Curve</th>
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<td>R100S</td>
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</table>

**Facts:**

- RMRS Salaried
- ENVIRONMENTAL ENGINEERS
- Linear
- 33.00 Hours
- 6.00 Hours
**Activity ID:** 1GHE654150  
**Description:** Field Sampling, Lab Analysis - IHSS Group 500-4

### Line Item 0100 - collect geoprobe samples

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<th>BOE Type</th>
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<th>Labor Hours</th>
<th>Labor Cost</th>
<th>Materials/Sub Cost</th>
<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
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</table>

**SYS Contingency And Escalation**  
Line Item: 0000  
Units: dollars  
Unit Cost: 800  
Unit Cost Adjustment Factor: none  
Revised Unit Hours: 800

**Total for Activity 1GHE654150:**  
5,280 hours  
157,318 dollars  
1,681,371 dollars  
283,117 dollars  
283,117 dollars  
2,121,806 dollars  
55,533 dollars  
2,177,339 dollars

**Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.**

**Item Desc:**
Collection of geoprobe samples with the site geoprobe with two technicians. A site Environmental Engineer will direct the boring placement, log the borings; collect, containerize, package, and ship the samples; prepare field QC documentation, and prepare field notes on a full time basis. A site RCT will monitor the site for radiological contamination on a full time basis. A site Industrial Hygienist will implement the field portion of the HASP on a full time basis. Decon Operations staff will decon the vehicle and equipment when it leaves the work area on a half time basis. It is estimated that one 10' boring will be place per 500 SF of building footprint (same as Bldg. 123 characterization) with 5 samples per 10' boring. It is estimated that one boring per eight hours can be completed. A 50% reduction in characterization from that which was done at Building 123 was taken because process history and building knowledge indicate that characterization to the extent required for Building 123 will not be required at this location.

**Breakdown of Cost Data:**
- **Item:** Site Personnel for support of geoprobe samples  
  Units: hours  
  Unit Cost: 32  
  Unit Cost Adjustment Factor: none  
  Revised Unit Hours: 32

- **Item:** Kaiser-Hill/RMRS Geoprobe unit with 2 Technician crew. Item costs $100 per hour or $800 per 8-hour day.  
  Units: dollars  
  Unit Cost: 800  
  Unit Cost Adjustment Factor: none  
  Revised Unit Hours: 800

**Basis for adjustment:**
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
Baseline Deviation: 1GAC

**Rocky Flats Closure Project**

Baseline Cost and Basis of Estimate

- **WBS No:** 1GAC0504
- **Activity ID:** 1GHE654150
- **Project:** Rocky Flats Closure Project
- **Baseline Cost and Basis of Estimate**
- **WBS Filter:** 1GAC
- **Activity Filter:** *
- **Starts In FY:** *

### Line Item 0200 - Analyze Samples

**BOE**

- **Cost Element:** Analytical Laboratory Services
- **Skill:** K267S
- **Departments:** ER Programs
- **Factors:** 8 hrs
- **Units:** Analysis
- **Unit Cost:** $800.00
- **Unit Cost Adjustment Factor:** None
- **Revised Unit Hours:** 2096
- **Estimated $/hr:** $0.84576

**Cost Element Breakdown:**
- **Item:** Analyze samples at an offsite laboratory.
- **Units:** Analysis
- **Unit Cost:** $800.00
- **Unit Cost Adjustment Factor:** None
- **Revised Unit Hours:** 2096

**Cost Element Details:**
- **Description:** Analyze samples produced from geoprobe borings. It is anticipated that 3 samples from each boring will be collected. They will be analyzed for Metals, VOCs, SVOCs, PCBs, and radionuclides (est. 3 isotopes) with a 30 day TAT. This item is priced on a per sample basis. Per sample costs include DOT rad screen, bottle charge, shipping, and validation.

**Cost Element Summary:**
- **Item:** Analyze samples at an offsite laboratory.
- **Units:** Analysis
- **Unit Cost:** $800.00
- **Unit Cost Adjustment Factor:** None
- **Revised Unit Hours:** 2096

### Line Item 0300 - Project Mgmt Oversight

**BOE**

- **Cost Element:** Analytical Laboratory Services
- **Skill:** K267S
- **Departments:** ER Programs
- **Factors:** 8 hrs
- **Units:** Hours
- **Unit Cost:** $405.96
- **Unit Cost Adjustment Factor:** None
- **Revised Unit Hours:** 12

**Cost Element Breakdown:**
- **Item:** Mgmt oversight
- **Units:** Hours
- **Unit Cost:** $12
- **Unit Cost Adjustment Factor:** None
- **Revised Unit Hours:** 12

**Cost Element Details:**
- **Description:** Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Cost Element Summary:**
- **Item:** Mgmt oversight
- **Units:** Hours
- **Unit Cost:** $12
- **Unit Cost Adjustment Factor:** None
- **Revised Unit Hours:** 12

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### Resources

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### Activity ID: 1GHE654170
**Description:** Prepare Summary/NFA - IHSS Group 500-4

#### Line Item 01000 - develop documentation

**BOE**

Estimator's Experience:
Estimate for summary report based on estimator's 16 years of experience performing and costing projects of similar size and scope.

**Item Desc:**
Perform Data Analysis including GIS representation of data, NFA Summary, Characterization Report, and associated project management. Disposition comments and finalize document.

- **Environmental Engineer** 240 hrs Evaluate & assemble existing data. Draft Report.
- **Computer Specialist** 80 hrs Identify & pull existing data from database.
- **GIS Specialist** 80 hrs Develop maps for Report. Print multiple copies.
- **Technical Editor** 40 hrs Complete initial and revised tech edits of Report.
- **Quality Assurance** 60 hrs Review
- **Environmental Engineer** 40 hrs Peer review
- **Regulatory Compliance** 20 hrs Review
- **Management** 48 hrs
- **Legal** 8 hrs Review
- **Administrative Support** 40 hrs Copy & assemble final documents, submit to records.

#### Breakdown of Cost Data:
- **Item:** Develop Documentation
- **Units:** Hours
- **Unit Cost:** 656
- **Unit Cost Adjustment Factor:** none
- **Revised Unit Hours:** 656
- **Basis for adjustment:** N/A

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**Total for Activity 1GHE654170:**

656 | 19,024 | 0 | 3.847 | 22,871 | 6,715 | 29,586

### Line Item SYS - Contingency And Escalation

**BOE**

#### Resources

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**Rocky Flats Closure Project**

**Baseline Cost and Basis of Estimate**

**WBS No:** 1GAC0504  
**Activity ID:** 1GHE654170

**Baseline Devi**  
**WBS Filter:** 1GAC  
**Activity Filter:** *

### Activity ID: 1GHE654180
**Description:** Prepare Decision Document - IHSS Group 500-4

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**Factors**
- **Contingency:** 2644.21 Dollars  
- **Escalation:** 1202.82 Dollars

**Total for Activity 1GHE654180:** 289

**BOE**

Estimator's Experience based generally on historical data for Ryan's Pit

Item Desc:
Preparation of of PAM or IM/IRA in support of source removal of previously characterized UBC.

Proposed Action Memorandum: A bottoms-up estimate based on historical costs was used as the basis for the estimate. Based on Ryan's Pit (IHSS 108), the cost for the PAM was $50,025 (contractor costs). Assuming that labor rates at this time were approximately $75 (based on a cost center 217). The total labor for a PAM would be approximately 666 hours, which rounds to 700 hours. It was assumed that 10% would be required for managerial hours.

For a PAM the total labor hours are:

- Environmental Engineer 700 Hours
- Manager 70 Hours

Factor 700 Environmental Engineer 175 hours
Factor 70 Manager 18 hours

Breakdown of Cost Data:
- Item: Preparation of PAM for Ryan's Pit source removal action.
  - Units: hours
  - Unit Cost: 770
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit Hours: 193

Basis for adjustment: Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

Interim Measure/Interim Remedial Action Decision Document: It was assumed that an IM/IRA Decision Document would take 75% more effort than a PAM or 1,166 hours, which rounds to 1200 hours. It was assumed that 10% of this labor would be required for managerial hours.

For an IM/IRA the total labor hours are

- Environmental Engineer 1200 Hours
- Manager 120 Hours

Factor 1200 Environmental Engineer 300 hours
Factor 120 Manager 30 hours

---

**Line Item 0200 - SAP**

Estimator's Experience based generally on historical data for Ryan's Pit

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6/23/00 9:21:45 AM  
OFFICIAL USE ONLY
**Item Desc:**
Preparation of SAP in support of source removal of previously characterized UBC.

**Breakdown of Historical Data:**
- **Item:** Preparation of SAP for Ryan's Pit source removal action.
- **Units:** hours
- **Unit Cost:** 300
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit Hours:** 76

**Basis for adjustment.** Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

**Sampling and Analysis Plan:** Based on the T-3/T-4 Sampling and Analysis Plan (SAP) it took 300 hours in total preparation time. It was assumed that 10% of this labor was for managerial hours (30 hours) and that the rest of the time, 270 hours, was for technical staff. It was assumed that these hours include all labor including quality assurance, secretarial support, graphics etc.

**Original Hours 270 Environmental Engineer 68 hours**
**Original Hours 30 Manager 8 hours**

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**Line Item 0300 - WMP**
**BOE**

**Item Desc:**
Preparation of WMP in support of source removal of previously characterized UBC.

**Breakdown of Historical Data:**
- **Item:** Preparation of WMP for Ryan's Pit source removal action.
- **Units:** hours
- **Unit Cost:** 80
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit Hours:** 20

**Basis for adjustment.** Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

**Original Hours 80 Environmental Engineer 20 hours**

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**Line Item SYS - Contingency And Escalation**
**BOE**

**Cost Element**
**Description:** Procurement and Field Prep - IHSS Grouping 500-4
**Cost Risk**
**Schedule Risk**
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Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation

Item Desc:

Breakdown of Cost Data:

Item: Site Labor to perform above individual tasks for either Ryan's Pit or T-3/T-4.
Units: hours
Unit Cost: 1380
Unit Cost Adjustment Factor: 0.25
Revised Unit: 345 hours

Item: Subcontractor costs to perform above individual tasks for either Ryan's Pit or T-3/T-4.
Units: 1 lot
Unit Cost: $10K
Unit Cost Adjustment Factor: 0.25
Revised Unit: $2.5K

Basis for adjustment. Hours and costs for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be characterized at once.

Procurement includes preparation of statement of work, proposal review (technical evaluation), and negotiations. Based on a T-3/T-4 burdened cost of $29,186.52. Assuming it is primarily labor hours (RMRS Environmental Engineer charging at $57.45 per hour) yields 508 hours which rounds to 510 total hours.

Davis Bacon Documentation: It was assumed that it would take an environmental engineer twenty-four hours to prepare a Davis Bacon cost estimate and to support the Davis-Bacon determination.

Subcontractor Health and Safety Plan: Costs for the health and safety plan are based on Ryan's Pit, which cost approximately $10,000. It was assumed that these are A5K dollars. In addition, it was assumed that a safety engineer, an industrial hygienist, and a radiological engineer would each provide one week (40 hours) of support for review and document preparation.

Radiological Work Permit: It was assumed that it would take a radiological control technician two working days (18 hours) to complete counting preparation and review.

Implementation Plan: It was estimated that this activity would take 13 weeks of time for engineers, scientists or equivalent to complete. This would include preparation of an implementation plan as required (Rocky Flats Cleanup Agreement, Appendix 3, Interim Guidance Document, Dated August 1977). In addition this includes all tasks related to documentation for the Integrated Work Control Program and Integrated Safety Management.

Ecology Survey/National Environmental Protection Act (NEPA) Support: It was estimated that this would take 40 hours for an ecologist. The activities include NEPA review and support in document preparation, site surveys to verify compliance with ecological regulations, categorical exclusions, and NEPA evaluations.

Utility Clearance/Soil Disturbance Permits: It was estimated based on experience that it would take the equivalent 2 weeks (80 hours) for technical staff to do utility surveys, prepare and review soil disturbance permits, and prepare authorizing documents for excavation.

The combined resources for procurement and field preparations are:
Total Procurement and Field Preparation Hours:
Environmental Engineer 1134 hours
Safety Engineer 40 hours
Industrial Hygiene 40 hours
Radiological Engineering 58 hours
Radiological Control Technician 18 hours
Ecologist/Life Scientist 40 hours
Manager 50 hours
Quality Assurance* 29 hours
A5K Total $10,000

* On some projects these hours were assumed to be included in other tasks or part of this task under environmental engineer or one of the other job functions.
The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

Factor 1134 - Environmental Engineer 283 Hours
Factor 40 - Safety Engineer 10 Hours
Factor 40 - Industrial Hygiene 10 Hours
Factor 58 - Radiological Engineering 14 Hours
Factor 18 - RCT 5 Hours
Factor 40 - Life Scientist 10 Hours
Factor 50 - Project Manager 13 Hours
Factor 10000 - A5H Subcontracted Services 2,500 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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### Activity ID: 1GHE654240

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Total for Activity 1GHE654240:

Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation

Item Desc:
Evaluate readiness of the field characterization team and plans.

Breakdown of Cost Data:
Item: Site Labor to perform Readiness Assessment for T-3/T-4.
**Rocky Flats Closure Project**

**Baseline Cost and Basis of Estimate**

**WBS No:** 1GAC0504  
**Activity ID:** 1GHE654240

---

**Item:** Subcontractor costs to perform Readiness Assessment for T-3/T-4.

- **Units:** 1 lot  
- **Unit Cost:** $4800  
- **Unit Cost Adjustment Factor:** 0.25  
- **Revised Unit:** $1200

It was estimated that subcontractor involvement would require 80 hours at $60/hour = $4,800. It was assumed that about 3 weeks of time was required for an environmental engineer or similar person in addition to 12 hours of project management, which yielded 132 hours. An additional 11 hours was added for management oversight. It was estimated that a radiological engineer (QA) and an industrial hygienist would be needed for 2.5 days each (22 hours).

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 projects will be conducted at once and only one of each fixed cost is needed for the group.

- **Factor 132 - Environmental Engineer** 33 Hours
- **Factor 22 - Health Physicists** 6 Hours
- **Factor 11 - Manager** 3 Hours
- **Factor 22 - Quality Assurance** 6 Hours
- **Factor 4,800 - ASH Subcontracted Srvs** 1,200 Dollars

20 hours of administrative time will also be required.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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**Line Item 0200 - training**

**BOE**  
**Estimator's Experience based generally on historical data for T-3/T4 Remediation.**

**Item Desc:**  
Conduct perform Training in support of source removal action.

**Breakdown of Cost Data:**

- **Item:** Site Labor to perform above individual tasks for T-3/T-4.  
  - **Units:** hours  
  - **Unit Cost:** 132 Hours  
  - **Unit Cost Adjustment Factor:** 0.25  
  - **Revised Unit:** 33 hours

- **Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.  
  - **Units:** 1 lot  
  - **Unit Cost:** $12K  
  - **Unit Cost Adjustment Factor:** 0.25  
  - **Revised Unit:** $3K

---

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**6/23/00 9:21:46 AM**  
**OFFICIAL USE ONLY**
### Resources

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#### Line Item 0300 - Pre-Evolution Meeting

**BOE**

Estimator’s Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:**
Conduct Pre-Evolution Meeting in support of source removal action

**Breakdown of Cost Data:**
- **Item:** Site Labor to perform above individual tasks for T-3/T-4.
  - **Units:** hours
  - **Unit Cost:** $60
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** 15 hours
- **Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
  - **Units:** lot
  - **Unit Cost:** $6K
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** $1.5K

Basis for adjustment. Costs for each UBC are divided by 4 to account for the fact that 4 UBCs will be remediated at once and only one Pre-Evolution Meeting is needed for the group.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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#### Line Item SYS - Contingency And Escalation

**BOE**

**Resources**

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Activity ID: 1GHE654240

Description: Remedial Action - IHSS Group 500-4

Cost Risk: 2

Schedule Risk: 3

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Project: Rocky Flats Closure Project
Baseline Cost and Basis of Estimate

WBS No: 1GAC0504
Activity ID: 1GHE654250

WBS Filter: 1GAC
Activity Filter: *

**Line Item 0100 - mobilization**

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:**
Mobilization in support of remediation.

**Breakdown of Cost Data:**

**Item:** Site Labor to perform above individual tasks for T-3/T-4.

- **Units:** hours
- **Unit Cost:** 1,100
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** 275

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.

- **Units:** 1 lot
- **Unit Cost:** 184k
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** see below

**Basis for adjustment:** The costs were divided into fixed costs and variable costs. The fixed costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

T3/T4 hours 110 Health Physicists 27 Hours
T3/T4 hours 330 Manager 83 Hours
T3/T4 hours 550 Environmental Engineer 138 Hours
T3/T4 hours 110 Industrial Hygienist 27 Hours
T3/T4 subcontractor dollars 184,000 Subcontractor 46,000

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Resources**

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**Line Item 0200 - site prep**

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:**
Site Preparation including setting up fencing, trailer, etc.

**Breakdown of Historical Data:**

**Item:** Site Labor to perform above individual tasks for T-3/T-4.

- **Units:** hours
- **Unit Cost:** see below
Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
  Units: 1 lot
  Unit Cost: see below
  Unit Cost Adjustment Factor: see below

Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

T3/T4 hours 120 Environmental Engineer 30 hours
T3/T4 dollars 30,000 Subcontracted Srvs 7,500 Dollars

D&D construction trade hours were calculated using the following methodology:
A5H subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.

RCT hours were calculated using the following methodology, unless they were already estimated.
For Site Preparation tasks - RCT hours were the same as D&D construction hours.

For all other tasks A5H subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under KG10H department code.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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Line Item 0300 - excavation

BOE

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc:
Excavation.

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
  Units: hours
  Unit Cost: see below
  Unit Cost Adjustment Factor: see below
  Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
  Units: 1 lot
  Unit Cost: see below
  Unit Cost Adjustment Factor: see below
  Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at
once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Total Contaminated Soil to be removed 1217 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 1217 CY

The excavation cost was based on the excavation cost for the T-3/T-4 Project. Burdened cost based on the T-3/T-4 actuals is $171,487. For the 3,800 cubic yards of contaminated soil removed this yielded a unit cost of $45 per cubic yard of contaminated soil removed. This estimate includes the removal of overburden that might be on top of the contaminated soil. The hours for an environmental engineer from T-3/T-4 were 1.09 hours per cubic yard of contaminated soil. Likewise the hours for the following were assumed to be linearly proportional:

Health Physicists .47 hours per cubic yard
Environmental Operations .31 hours per cubic yard
Industrial Hygienists .31 hours per cubic yard
Radiological Control Technician 1.00 hour per cubic yard *

* Based on $50/cubic yard from T-3/T-4, assumes a labor rate of $50/hour

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 1.09 - E050 Environmental Engineer 1,327 Hours
Factor 0.47 - P080 Health Physicists 572 Hours
Factor 0.31 - Environmental Operations 377 Hours
Factor 0.31 - P090 Industrial Hygienists 377 Hours
Factor 1.00 - T050 Radiological Control Technician 1,217 Hours
Factor 45.23 - A5H Subcontracted Srvs 55,045 Dollars

D&D construction trade hours were calculated using the following methodology:

A5H subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.

RCT hours were calculated using the following methodology, unless they were already estimated.

For Site Preparation tasks - RCT hours were the same as D&D construction hours.
For all other tasks A5H subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under KG10H department code.

For this project the number of RCT hours was assumed to be the same as the number of health physics hours.

The dollars amounts calculated for D&D construction workers and RCTs were subtracted from the subcontractor dollars and the revised A5H dollar amount was entered into Best.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
Line Item 0400 - remove and clean debris

Estimator's Experience based generally on a base case of 700 cy.

Item Desc:
Remove and clean debris.

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
Units: hours
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
Units: 1 lot
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Total Contaminated Soil to be removed 1217 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 1217 CY

For the base case, it was assumed that about five cubic yards out of 700 cubic yards would be debris and would be segregated and cleaned. It was estimated that each cubic yard of debris would cost $1,000 or $5,000 total for 700 cubic yards. This yields a rate of $7.14 per cubic yard.

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 7.14 - A5H Subcontracted Srvs 8,689 Dollars
D&D construction trade hours were calculated using the following methodology:
A5H subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.
RCT hours were calculated using the following methodology, unless they were already estimated.
For Site Preparation tasks - RCT hours were the same as D&D construction hours.
For all other tasks A5H subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under KG10H department code.
The dollars amounts calculated for D&D construction workers and RCTs were subtracted from the subcontractor dollars and the revised A5H dollar amount was entered into Best.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

Resources

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Line Item 0600 - confirmation sampling

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc:
Confirmation Sampling.

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
Units: hours
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
Units: 1 lot
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Total Contaminated Soil to be removed 1217 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 1217 CY

The analytical costs were based on T-3/T-4, which cost $435,574 for 3800 cubic yards of contaminated soil removed. This yielded a unit rate of about $115/cubic yard. Based on estimator experience the cost of sampling including labor and materials was estimated to be 20% of that rate or about $23/ cubic yard.

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 114.62 - ASH Subcontracted Srvs (Analytical) 139,493 Dollars
Factor 22.924 - ASH Subcontracted Srvs 27,899 Dollars

D&D construction trade hours were calculated using the following methodology:
ASH subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.

RCT hours were calculated using the following methodology, unless they were already estimated.

For Site Preparation tasks - RCT hours were the same as D&D construction hours.
For all other tasks ASH subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under KG10H department code.

The dollars amounts calculated for D&D construction workers and RCTs were subtracted from the subcontractor dollars and the revised ASH dollar amount was entered into Best.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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### Line Item 0700 - prepare waste acceptance forms

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc:
Prepare Waste Acceptance Forms

Breakdown of Historical Data:
### Item: Site Labor to perform above individual tasks for T-3/T-4.
- Units: hours
- Unit Cost: see below
- Unit Cost Adjustment Factor: see below
- Revised Unit: see below

### Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
- Units: 1 lot
- Unit Cost: see below
- Unit Cost Adjustment Factor: see below
- Revised Unit: see below

### Basis for adjustment.
The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.5 factor to account for the fact that 2 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

T3/T4 hours 80 environmental engineer 20 hours

### Resources
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**Line Item 0800 - waste acceptance sampling**

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:**
Waste Acceptance Sampling

**Breakdown of Historical Data:**
- Item: Site Labor to perform above individual tasks for T-3/T-4.
  - Units: hours
  - Unit Cost: see below
  - Unit Cost Adjustment Factor: see below
  - Revised Unit: see below
- Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
  - Units: 1 lot
  - Unit Cost: see below
  - Unit Cost Adjustment Factor: see below
  - Revised Unit: see below

**Basis for adjustment.**
The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Because the waste acceptance sampling is difficult to predict and could vary significantly from project to project, it was assumed that about $800 worth of additional analysis would be required for 20 cubic yards which is the volume that can be placed in one roll-off. This yielded a unit rate of about $40/cubic yard. This sampling and analysis is in addition to the confirmational samples so the costs are not as great. It was assumed that this sampling would be more labor intensive so the sampling costs were estimated to be about 50% of the analytical costs or about $20/cubic yard.

Total Contaminated Soil to be removed 1217 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 1217 CY

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 40 - A5H Analytical 48,680 Dollars
Factor 20 - A5H Subcontracted Svrs 24,340 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
Estimator's Experience based generally on a base case of 700 cy.

Item Desc:
Field Oversight and Project Management

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
  Units: hours
  Unit Cost: see below
  Unit Cost Adjustment Factor: see below
  Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
  Units: 1 lot
  Unit Cost: see below
  Unit Cost Adjustment Factor: see below
  Revised Unit: see below

Basis for adjustment.  The costs were divided into fixed costs and variable costs.  The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization.  The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill.  The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.  The variable costs were calculated on a per cubic yard historical basis.  The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

It was assumed that a field manager would be needed for 150 nine-hour working days or about 33 weeks.  This work breaks down as follows:

Preparation Activities 50 working days
Field Activities - 80 working days
Demobilization - 20 working days
Total 150 nine-hour working days or 1350 hours

In addition it was estimated that technical staff, quality assurance, and project management would be required for the equivalent of ten additional weeks, which is 400 hours each.

Based on the base case of a 700 cubic yard removal project, these values yielded unit rates as follows
Hours Per Cubic Yard
Of Contaminated Soil
Field Manager 1.93
Technical Staff .57
Quality Assurance .57
Project Management 0.57

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Total Contaminated Soil to be removed 1217 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 1217 CY

Factor 1.93 - Environmental Engineer 2,349 Hours
Factor 0.57 - Technical Support 694 Hours
Factor 0.57 - Project Manager 694 Hours
Factor 0.57 - Quality Assurance 694 Hours
## Rocky Flats Closure Project

### Baseline Cost and Basis of Estimate

#### WBS No: 1GAC0504

#### Activity ID: 1GHE654250

#### Project: Project Baseline_Devl

#### WBS Filter: 1GAC

#### Activity Filter: *

#### Starts In FY: *

### Line Item 1000 - backfill

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**Trade Publication**

Means 1995, Site Work & Landscape Cost Data (page 34, 42, and 34)

**Item Desc:** Backfill.

**Breakdown of Historical Data:**

**Item:** Site Labor to perform above individual tasks for T-3/T-4.

- **Units:** hours
- **Unit Cost:** see below
- **Unit Cost Adjustment Factor:** see below
- **Revised Unit:** see below

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.

- **Units:** 1 lot
- **Unit Cost:** see below
- **Unit Cost Adjustment Factor:** see below
- **Revised Unit:** see below

Means (1995) Site Work & Landscape Cost Data as follows:

- **Common Fill:** $4.77/cubic yard (page 34 Borrow Bank Measure)
- **Hauling:** $3.98/cubic yard (page 42 2-mile round-trip, 6 cubic yard dump truck)
- **Backfilling:** $1.69/cubic yard (page 34)
- **Burden (43%):** $4.49/cubic yard
- **Total:** $14.23/cubic yard or about $15/cubic yard

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

- **Total Contaminated Soil to be removed:** 1217 CY
- **Total Soil for Thermal Desorption:** 0 CY
- **Offsite Waste Volume:** 1217 CY

**Factor 15 - ASH Subcontracted Srvs 18,255 Dollars**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

**Line Item 1100 - demobilization**

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**Estimator's Experience based generally on historical data for T-3/T4 Remediation.**

**Item Desc:** Demobilization.

**Breakdown of Historical Data:**

**Item:** Site Labor to perform above individual tasks for T-3/T-4.

- **Units:** hours
- **Unit Cost:** see below
Rocky Flats Closure Project
Baseline Cost and Basis of Estimate

WBS No: 1GAC0504
Activity ID: 1GHE654250

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.

- Units: 1 lot
- Unit Cost: see below
- Unit Cost Adjustment Factor: see below
- Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Demobilization: Based on the T-3/T-4 project, it was assumed that demobilization costs would cover demobilization for excavation activities also. The subcontractor cost for demobilization was about $95,000 for 3,800 cubic yards at the T-3/T-4 project. In addition it was estimated that the following hours were necessary:

- Environmental Engineer 300 hours
- Health Physicist 100 hours
- Manager 200 hours
- Industrial Hygiene 100 hours

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

- Factor 300 - Environmental Engineer 75 Hours
- Factor 100 - Health Physicists 25 Hours
- Factor 200 - Manager 50 Hours
- Factor 200 - P090 Industrial Hygienists 25 Hours
- Factor 95000 - ASH Subcontracted Srvs 23,750 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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### Line Item SYS - Contingency And Escalation

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OFFICIAL USE ONLY
### Line Item 0100 - develop report

**BOE**  
Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Item Desc:**  
Perform Data Analysis including GIS representation of data, Closeout Report, and associated project management.

**Breakdown of Cost Data:**

**Item:** Develop Documentation  
**Units:** hours  
**Unit Cost:** 320  
**Unit Cost Adjustment Factor:** none

**Required level of effort:**
- Environmental Engineer - 80 hours
- Environmental Scientist - 160 hours (GIS, SWD)
- Manager - 20 hours
- Administrative - 20 hours
- Cost Estimators - 20 hours

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**Line Item SYS - Contingency And Escalation**

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### Line Item 0100 - SAP Addenda

**BOE**  
Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Item Desc:**  

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**Total for Activity 1G50050100:**

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**WBS No:** 1GAC0505  
**Title:** Group 500-5 (Non D&D)  
**Activity ID:** 1G50050100  
**Description:** SAP Preparation - IHSS Group 500-5 (Non D&D)  
**Cost Risk:** 1  
**Schedule Risk:** 1

---

**Offical Use Only**
Preparation of SAP Addenda to Industrial Area Characterization Plan.

Breakdown of Cost Data:
Item: Preparation of SAP addenda
  Units: hours
  Unit Cost: 120
  Unit Cost Adjustment Factor: none
  Revised Unit Hours: 120

Basis for adjustment.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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Line Item 0200 - HASP Addenda
BOE

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

Item Desc:
Preparation of HASP addenda to Industrial Area Characterization Plan

Breakdown of Cost Data:
Item: Preparation of addenda for HASP.
  Units: hours
  Unit Cost: 140
  Unit Cost Adjustment Factor: none
  Revised Unit Hours: 140

Basis for adjustment.

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Line Item 0300 - QAP Addenda
BOE

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

Item Desc:
Preparation of SAP Addenda to Industrial Area Characterization Plan.

Breakdown of Cost Data:
Item: Preparation of QAP addenda
  Units: hours
  Unit Cost: 60
  Unit Cost Adjustment Factor: none
  Revised Unit Hours: 60

Basis for adjustment.
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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Item Desc:

Breakdown of Cost Data:
Item: Site Labor to perform above individual tasks for either Ryan's Pit or T-3/T-4.
- Units: hours
- Unit Cost: 130
- Unit Cost Adjust Factor: 0.25
- Revised Unit: 345 hours

Item: Subcontractors costs to perform above individual tasks for either Ryan's Pit or T-3/T-4.
- Units: 1 lot
- Unit Cost: $10K
- Unit Cost Adjust Factor: 0.25
- Revised Unit: $2.5K

Basis for adjustment. Hours and costs for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be characterized at once.

Procurement includes preparation of statement of work, proposal review (technical evaluation), and negotiations. Based on a T-3/T-4 burdened cost of $29,186.52. Assuming it is primarily labor hours (RMRS Environmental Engineer charging at $257.45 per hour) yields 508 hours which rounds to 510 total hours.

Davis Bacon Documentation: It was assumed that it would take an environmental engineer twenty-four hours to prepare a Davis Bacon cost estimate and to support the Davis-Bacon determination.

Subcontractor Health and Safety Plan: Costs for the health and safety plan are based on Ryan's Pit, which cost approximately $10,000. It was assumed that these are A5H dollars. In addition, it was assumed that a safety engineer, an industrial hygienist, and a radiological engineer would each provide one week (40 hours) of support for review and document preparation.

Radiological Work Permit: It was assumed that it would take a radiological control technician two working days (18 hours) to complete counting preparation and review.

Implementation Plan: It was estimated that this activity would take 13 weeks of time for engineers, scientists or equivalent to complete. This would include...
preparation of an implementation plan as required (Rocky Flats Cleanup Agreement, Appendix 3, Interim Guidance Document, Dated August 1977). In addition this includes all tasks related to documentation for the Integrated Work Control Program and Integrated Safety Management.

Ecology Survey/National Environmental Protection Act (NEPA) Support: It was estimated that this would take 40 hours for an ecologist. The activities include NEPA review and support in document preparation, site surveys to verify compliance with ecological regulations, categorical exclusions, and NEPA evaluations.

Utility Clearance/Soil Disturbance Permits: It was estimated based on experience that it would take the equivalent 2 weeks (80 hours) for technical staff to do utility surveys, prepare and review soil disturbance permits, and prepare authorizing documents for excavation.

The combined resources for procurement and field preparations are

Total Procurement and Field Preparation Hours

Environmental Engineer 1134 hours
Safety Engineer 40 hours
Industrial Hygiene 40 hours
Radiological Engineering 58 hours
Radiological Control Technician 18 hours
Ecologist/Life Scientist 40 hours
Manager 50 hours
Quality Assurance 29 hours
ASH Total $10,000

* On some projects these hours were assumed to be included in other tasks or part of this task under environmental engineer or one of the other job functions.

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

Factor 1134 - Environmental Engineer 283 Hours
Factor 40 - Safety Engineer 10 Hours
Factor 40 - Industrial Hygiene 10 Hours
Factor 58 - Radiological Engineering 14 Hours
Factor 18 - RCT 5 Hours
Factor 40 - Life Scientist 10 Hours
Factor 50 - Project Manager 13 Hours
Factor 10000 - ASH Subcontracted Services 2,500 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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Line Item SYS - Contingency And Escalation

BOE

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### Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

**WBS No:** 1GAC0505  
**Activity ID:** 1G50050120  
**Project:** Baseline Devl  
**WBS Filter:** 1GAC  
**Activity Filter:** *  
**Starts In FY:** *

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**Activity ID:** 1G50050140  
**Description:** Readiness Assessment - IHSS Group 500-5

**Schedule Risk:** 1  
**Cost Risk:** 1

### Line Item 0100 - readiness assessment

**BOE**  
Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation

**Item Desc:**  
Evaluate readiness of the field characterization team and plans.

**Breakdown of Cost Data:**  
**Item:** Site Labor to perform Readiness Assessment for T-3/T-4.  
Units: hours  
Unit Cost: 187  
Unit Cost Adjustment Factor: 0.25  
**Revised Unit:** 48

**Item:** Subcontractor costs to perform Readiness Assessment for T-3/T-4.  
Units: 1 lot  
Unit Cost: $4800  
Unit Cost Adjustment Factor: 0.25  
**Revised Unit:** $1200

It was estimated that subcontractor involvement would require 80 hours at $60/hour = $4,800. It was assumed that about 3 weeks of time was required for an environmental engineer or similar person in addition to 12 hours of project management, which yielded 132 hours. An additional 11 hours was added for management oversight. It was estimated that a radiological engineer (QA) and an industrial hygienist would be needed for 2.5 days each (22 hours).

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 projects will be conducted at once and only one of each fixed cost is needed for the group.

**Factor 132 - Environmental Engineer 33 Hours**  
**Factor 22 - Health Physicists 6 Hours**  
**Factor 11 - Manager 3 Hours**  
**Factor 22 - Quality Assurance 6 Hours**  
**Factor 4,800 - A5H Subcontracted Srvs 1,200 Dollars**  
20 hours of administrative time will also be required.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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**Rocky Flats Closure Project**

**Baseline Cost and Basis of Estimate**

**WBS Filter:** 1GAC

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**WBS No:** 1GAC0505

**Activity ID:** 1G50050140

**Project:** Baseline Devi

**WBS Filter:** 1GAC

**Activity Filter:** 

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**Description:** Field Sampling, Lab Analysis - IHSS Group 500-5

**Schedule Risk:** 1

**Cost Risk:** 1

**Total Cost:** 12,770

**Burden Cost:** 1,649

**Item Desc:**

- **collect surficial soil samples**
- **analyze samples**
- **project mgmt oversight**
- **Contingency And Escalation**

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

Breakdown of Cost Data:

- Item: Site Personnel for support of geoprobe samples
  - Units: hours
  - Unit Cost: 32
  - Unit Cost Adjustment Factor: none
  - Revised Unit Hours: 32

- Item: Kaiser-Hill/RMRS Geoprobe unit with 2 Technician crew
  - Item costs $100 per hour or $800 per 8-hour day
  - Units: dollars
  - Unit Cost: 800
  - Unit Cost Adjustment Factor: none
  - Revised Unit Hours: 800

Basis for adjustment:

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Resources**

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**Factors:**

- 8 hrs
- 60 estimated $/hr
### Line Item 0200 - analyze samples

**BOE**

**Vendor Quote**

**Email quote:** average cost from Kaiser-Hill ASD (V. Ideker).

**Item Desc:**

Analyze samples produced from geoprobe borings. It is anticipated that 3 samples from each boring will be collected. They will be analyzed for Metals, VOCs, SVOCs, PCBs, and radionuclides (est. 3 isotopes) with a 30 day TAT. This item is priced on a per sample basis. Per sample costs include DOT rad screen, bottle charge, shipping, and validation.

**Breakdown of Cost Data:**

- **Item:** Analyze samples at an offsite laboratory.
- **Units:** analysis
- **Unit Cost:** Metals $345, VOCs $280, SVOCs $440, PCBs and other analytes $150, and Radionuclides 3 isotopes $590 per each sample.
- **Unit Cost Adjustment Factor:** Must add: DOT rad screen $32/sample, bottle charge $7/sample, shipping $4.2/bottle, and validation per each: $17.30 VOA, $19.25 SVOC, $16.75 Metals, $5.95 PCB, and $15.60 Rad.
- **Revised Unit Hours:** Metals $405, VOCs $341, SVOCs $502, PCBs and other analytes $199, and Rad $649.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

#### Resources

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### Line Item 0300 - project mgmt oversight

**BOE**

**Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.**

**Item Desc:**

Project Management/Oversight. Based on half time for a Project Manager, Administrative staff, and Cost Estimator/Scheduler.

**Breakdown of Cost Data:**

- **Item:** Mgmt oversight
- **Units:** hours
- **Unit Cost:** none
- **Revised Unit Hours:** 12

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

#### Resources

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### Line Item SYS - Contingency And Escalation

**BOE**

**Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.**

**Item Desc:**

Project Management/Oversight. Based on half time for a Project Manager, Administrative staff, and Cost Estimator/Scheduler.

**Breakdown of Cost Data:**

- **Item:** Mgmt oversight
- **Units:** hours
- **Unit Cost:** none
- **Revised Unit Hours:** 12

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

#### Resources

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### Activity ID: 1G50050170

**Description:** Prepare Summary/NFA - IHSS Group 500-5

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### Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

- **WBS No:** 1GAC0505
- **Activity ID:** 1G50050170

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**Contingency And Escalation**

- **Baseline:** 1GAC
- **Activity Filter:** *
- **Starts In FY:** *

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#### Line Item 0100 - Develop Documentation

**Estimator's Experience:**

Estimate for summary report based on estimator's 16 years of experience performing and costing projects of similar size and scope.

**Item Desc:**

Perform Data Analysis including GIS representation of data, NFA Summary, Characterization Report, and associated project management. Disposition comments and finalize document.

**Resources**

- **Environmental Engineer:** 240 hrs - Evaluate & assemble existing data. Draft Report.
- **Computer Specialist:** 80 hrs - Identify & pull existing data from database.
- **GIS Specialist:** 80 hrs - Develop maps for Report. Print multiple copies.
- **Technical Editor:** 80 hrs - Complete initial and revised tech edits of Report.
- **Quality Assurance:** 60 hrs - Review
- **Environmental Engineer:** 40 hrs - Peer review
- **Management:** 48 hrs
- **Legal:** 8 hrs - Review
- **Administrative Support:** 40 hrs - Copy & assemble final documents, submit to records.

**Breakdown of Cost Data:**

- **Item:** Develop Documentation
- **Units:** Hours
- **Unit Cost:** $656
- **Revised Unit Hours:** 656
- **Basis for adjustment:** N/A

**Contingency And Escalation**

- **Baseline:** 1GAC
- **Activity Filter:** *
- **Starts In FY:** *

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Official Use Only
### Project Baseline Development

**WBS Filter**: 1GAC

**Activity Filter**: *

#### Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

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#### Line Item 0100 - PAM

**BOE**

Estimator's Experience based generally on historical data for Ryan's Pit

**Item Desc:**
Preparation of PAM or IM/IRA in support of source removal of previously characterized UBC.

**Proposed Action Memorandum:** A bottom-up estimate based on historical costs was used as the basis for the estimate. Based on Ryan's Pit (IHSS 108), the cost for the PAM was $50,000 (contractor costs). Assuming that labor rates at this time were approximately $75 (based on a cost center 217). The total labor for a PAM would be approximately 666 hours, which rounds to 700 hours. It was assumed that 10% would be required for managerial hours.

For a PAM the total labor hours are:

- **Environmental Engineer 700 Hours**
- **Manager 70 Hours**

**Factor 700 Environmental Engineer 175 hours**

**Factor 70 Manager 18 hours**

**Breakdown of Cost Data:**
- **Item:** Preparation of PAM for Ryan's Pit source removal action.
  - **Units:** hours
  - **Unit Cost:** $770
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit Hours:** 193

**Basis for adjustment.** Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

**Interim Measure/Interim Remedial Action Decision Document:** It was assumed that an IM/IRA Decision Document would take 75% more effort than a PAM or 1,166 hours, which rounds to 1200 hours. It was assumed that 10% of this labor would be required for managerial hours.

For an IM/IRA the total labor hours are

- **Environmental Engineer 1200 Hours**
- **Manager 120 Hours**

**Factor 1200 Environmental Engineer 300 hours**

**Factor 120 Manager 30 hours**

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### Line Item 0200 - SAP

**BOE**

Estimator's Experience based generally on historical data for Ryan's Pit

**Item Desc:**
Preparation of SAP in support of source removal of previously characterized UBC.

**Breakdown of Historical Data:**
- **Item:** Preparation of SAP for Ryan's Pit source removal action.
  - **Units:** hours
  - **Unit Cost:** $300
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit Hours:** 76

**Basis for adjustment.** Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of...
decision/planning documents are needed for the group.

Sampling and Analysis Plan: Based on the T-3/T-4 Sampling and Analysis Plan (SAP) it took 300 hours in total preparation time. It was assumed that 10% of this labor was for managerial hours (30 hours) and that the rest of the time, 270 hours, was for technical staff. It was assumed that these hours include all labor including quality assurance, secretarial support, graphics etc.

Original Hours 270 Environmental Engineer 68 hours
Original Hours 30 Manager 8 hours

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Estimator's Experience based generally on historical data for Ryan's Pit

Item Desc: Preparation of WMP in support of source removal of previously characterized UBC.

Breakdown of Historical Data:
- Item: Preparation of WMP for Ryan's Pit source removal action.
  - Units: hours
  - Unit Cost: $80
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit Hours: 20

Basis for adjustment: Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

Waste Management Plan: It was assumed that a waste management plan would be needed and that it would take no more than two weeks to prepare (80 hours).

Original Hours 80 Environmental Engineer 20 hours

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Line Item SYS - Contingency And Escalation

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Activity ID: 1G50050210 Description: Procurement and Field Prep - IHSS Grouping 500-5

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Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation


Breakdown of Cost Data:

Page 513 of 1121
6/23/00 9:21:49 AM OFFICIAL USE ONLY
Item: Site Labor to perform above individual tasks for either Ryan's Pit or T-3/T-4.
   Units: hours
   Unit Cost: 1380
   Unit Cost Adjustment Factor: 0.25
   Revised Unit: 345 hours

Item: Subcontractor costs to perform above individual tasks for either Ryan's Pit or T-3/T-4.
   Units: 1 lot
   Unit Cost: $10K
   Unit Cost Adjustment Factor: 0.25
   Revised Unit: $2.5K

Basis for adjustment. Hours and costs for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be characterized at once.

Procurement includes preparation of statement of work, proposal review (technical evaluation), and negotiations. Based on a T-3/T-4 burdened cost of $29,186.52. Assuming it is primarily labor hours (RMRS Environmental Engineer charging at $57.45 per hour) yields 508 hours which rounds to 510 total hours.

Davis Bacon Documentation: It was assumed that it would take an environmental engineer twenty-four hours to prepare a Davis Bacon cost estimate and to support the Davis-Bacon determination.

Subcontractor Health and Safety Plan: Costs for the health and safety plan are based on Ryan's Pit, which cost approximately $10,000. It was assumed that these are A5H dollars. In addition, it was assumed that a safety engineer, an industrial hygienist, and a radiological engineer would each provide one week (40 hours) of support for review and document preparation.

Radiological Work Permit: It was assumed that it would take a radiological control technician two working days (18 hours) to complete counting preparation and review.

Implementation Plan: It was estimated that this activity would take 13 weeks of time for engineers, scientists or equivalent to complete. This would include preparation of an implementation plan as required (Rocky Flats Cleanup Agreement, Appendix 3, Interim Guidance Document, Dated August 1977). In addition this includes all tasks related to documentation for the Integrated Work Control Program and Integrated Safety Management.

Ecology Survey/National Environmental Protection Act (NEPA) Support: It was estimated that this would take 40 hours for an ecologist. The activities include NEPA review and support in document preparation, site surveys to verify compliance with ecological regulations, categorical exclusions, and NEPA evaluations.

Utility Clearance/Soil Disturbance Permits: It was estimated based on experience that it would take the equivalent 2 weeks (80 hours) for technical staff to do utility surveys, prepare and review soil disturbance permits, and prepare authorizing documents for excavation.

The combined resources for procurement and field preparations are:

Total Procurement and Field Preparation Hours
- Environmental Engineer 1134 hours
- Safety Engineer 40 hours
- Industrial Hygiene 40 hours
- Radiological Engineering 58 hours
- Radiological Control Technician 18 hours
- Ecologist/Life Scientist 40 hours
- Manager 50 hours
- Quality Assurance* 29 hours
- A5H Total $10,000

* On some projects these hours were assumed to be included in other tasks or part of this task under environmental engineer or one of the other job functions.

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

Factor 1134 - Environmental Engineer 283 Hours
Factor 40 - Safety Engineer 10 Hours
Factor 40 - Industrial Hygiene 10 Hours
Factor 58 - Radiological Engineering 14 Hours
Factor 18 - RCT 5 Hours
Factor 40 - Life Scientist 10 Hours
Factor 50 - Project Manager 13 Hours
Factor 10000 - A5H Subcontracted Services 2,500 Dollars
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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### Activity ID: 1G50050240- Description: Readiness Assessment - IHSS Group 500-5

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Total for Activity 1G50050240: 116 3,306 4,821 2,841 10,968 1,027 11,995

### Line Item 0100 - readiness assessment

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Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation

Item Desc:
Evaluate readiness of the field characterization team and plans.

Breakdown of Cost Data:
Item: Site Labor to perform Readiness Assessment for T-3/T-4.
  Units: hours
  Unit Cost: $187
  Unit Cost Adjustment Factor: 0.25
  Revised Unit: 48

  Units: 1 lot
  Unit Cost: $4800
  Unit Cost Adjustment Factor: 0.25
  Revised Unit: $1200

It was estimated that subcontractor involvement would require 80 hours at $60/hour = $4,800. It was assumed that about 3 weeks of time was required for an
environmental engineer or similar person in addition to 12 hours of project management, which yielded 132 hours. An additional 11 hours was added for management oversight. It was estimated that a radiological engineer (QA) and an industrial hygienist would be needed for 2.5 days each (22 hours).

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 projects will be conducted at once and only one of each fixed cost is needed for the group.

Factor 132 - Environmental Engineer 33 Hours
Factor 22 - Health Physicists 6 Hours
Factor 11 - Manager 3 Hours
Factor 22 - Quality Assurance 6 Hours
Factor 4,800 - ASH Subcontracted Srvs 1,200 Dollars

20 hours of administrative time will also be required.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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Item Desc: Conduct perform Training in support of source removal action.

Breakdown of Cost Data:
- Item: Site Labor to perform above individual tasks for T-3/T-4.
  - Units: hours
  - Unit Cost: 132 Hours
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit: 33 hours

- Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
  - Units: 1 lot
  - Unit Cost: $12K
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit: $3K

Basis for adjustment. Costs for each UBC are divided by 4 to account for the fact that 4 UBCs will be remediated at once and only one Training is needed for the group.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### Activity Filter

**Starts In FY**

### WBS Filter

**1GAC**

### Activity ID

1G50050250

### Project

Baselined Devl

### WBS No.

1GAC0505

### Rocky Flats Closure Project

Baseline Cost and Basis of Estimate

---

**Line Item 0300 - pre-evolution meeting**

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:**

Conduct Pre-Evolution Meeting in support of source removal action

**Breakdown of Cost Data:**

**Item:** Site Labor to perform above individual tasks for T-3/T-4.

- **Units:** hours
- **Unit Cost:** 60 hours
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** 15 hours

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.

- **Units:** 1 lot
- **Unit Cost:** $6K
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** $1.5K

Basis for adjustment. Costs for each UBC are divided by 4 to account for the fact that 4 UBCs will be remediated at once and only one Pre-Evolution Meeting is needed for the group.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

### Resources

**Cost Element** | **Skill** | **Department** | **Curve** | **Quantity** | **Units** |
--- | --- | --- | --- | --- | --- |
750 | STRAIGHT TIME BASE | E050 ENVIRONMENTAL ENGINEERS | R100S RMRS Salaried | Linear | 15.00 Hours |
ASH | SUBCONTRACTED SRVS | 0000 NONE | K26S ER Programs | Linear | 1,268.64 Dollars |

---

### Line Item SYS - Contingency And Escalation

**BOE**

**Resources**

**Factors** 1725.09 Dollars

**Factors** 1115.74 Dollars

---

### Activity ID

1G50050250

**Description:** Remedial Action - IHSS Group 500-5

---

### Line Item 0100 - mobilization

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:**

Mobilization in support of remediation.

---

### Line Item 0200 - site prep

**BOE**

**Line Item 0300 - excavation

**BOE**

**Line Item 0400 - remove and clean debris

**BOE**

**Line Item 0500 - confirmation sampling

**BOE**

**Line Item 0600 - prepare waste acceptance forms

**BOE**

**Line Item 0700 - waste acceptance sampling

**BOE**

**Line Item 0800 - field oversight & project mgmt

**BOE**

**Line Item 0900 - backfill

**BOE**

**Line Item 1000 - mobilization**

**BOE**

**Line Item 1100 - demobilization

**BOE**

**Line Item SYS - Contingency And Escalation

**BOE**

**Total for Activity 1G50050250:**

**Total Cost** 141,618

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Breakdown of Cost Data:

Item: Site Labor to perform above individual tasks for T-3/T-4.
- Units: hours
- Unit Cost: 1,100
- Unit Cost Adjustment Factor: 0.25
- Revised Unit: 275

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
- Units: 1 lot
- Unit Cost: 184k
- Unit Cost Adjustment Factor: 0.25
- Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

T3/T4 hours 110 Health Physicists 27 Hours
T3/T4 hours 330 Manager 83 Hours
T3/T4 hours 550 Environmental Engineer 138 Hours
T3/T4 hours 110 Industrial Hygienist 27 Hours
T3/T4 subcontractor dollars 184,000 Subcontractor 46,000

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

Resources

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<th>Cost Element</th>
<th>Department</th>
<th>Skill</th>
<th>Curve</th>
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<tr>
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<td>hrs</td>
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Item Desc: Site Preparation including setting up fencing, trailer, etc.

Breakdown of Historical Data:

Item: Site Labor to perform above individual tasks for T-3/T-4.
- Units: hours
- Unit Cost: see below
- Unit Cost Adjustment Factor: see below
- Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
- Units: 1 lot
- Unit Cost: see below
- Unit Cost Adjustment Factor: see below
- Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.
once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

T3/T4 hours 120 Environmental Engineer 30 hours
T3/T4 dollars 30,000 Subcontracted Srvs 7,500 Dollars

D&D construction trade hours were calculated using the following methodology:

A5H subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.

RCT hours were calculated using the following methodology, unless they were already estimated.

For Site Preparation tasks - RCT hours were the same as D&D construction hours.
For all other tasks A5H subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under KG10H department code.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

### Resources

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### Line Item 0300 - excavation

**BOE**

Estimator's Experience based generally on historical data for T-3/T-4 Remediation.

**Item Desc:**

Excavation.

**Breakdown of Historical Data:**

**Item:** Site Labor to perform above individual tasks for T-3/T-4.

- Units: hours
- Unit Cost: see below
- Unit Cost Adjustment Factor: see below
- Revised Unit: see below

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.

- Units: 1 lot
- Unit Cost: see below
- Unit Cost Adjustment Factor: see below
- Revised Unit: see below

**Basis for adjustment.** The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and the only one of fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

**Total Contaminated Soil to be removed 3CY**

**Total Soil for Thermal Desorption 0 CY**

**Offsite Waste Volume 3 CY**

The excavation cost was based on the excavation cost for the T-3/T-4 Project. Burdened cost based on the T-3/T-4 actuals is $171,487. For the 3,800 cubic yards of contaminated soil removed this yielded a unit cost of $45 per cubic yard of contaminated soil removed. This estimate includes the removal of overburden that might be on top of the contaminated soil. The hours for an environmental engineer from T-3/T-4 were 1.09 hours per cubic yard of contaminated soil. Likewise the hours for the following were assumed to be linearly proportional:
Health Physicists .47 hours per cubic yard
Environmental Operations .31 hours per cubic yard
Industrial Hygienists 0.31 hours per cubic yard
Radiological Control Technician 1.00 hour per cubic yard *
* Based on $50/cubic yard from T-3/T-4, assumes a labor rate of $50/hour

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 1.09 - E050 Environmental Engineer 3 Hours
Factor 0.47 - P080 Health Physicists 1 Hours
Factor 0.31 - Environmental Operations 3 Hours
Factor 0.31 - P090 Industrial Hygienists 1 Hours
Factor 1.00 - T050 Radiological Control Technician 1 Hours
Factor 45.23 - A5H Subcontracted Svrs 136 Dollars

D&D construction trade hours were calculated using the following methodology:
A5H subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.
RCT hours were calculated using the following methodology, unless they were already estimated.
For Site Preparation tasks - RCT hours were the same as D&D construction hours.
For all other tasks A5H subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under KG10H department code.
For this project the number of RCT hours was assumed to be the same as the number of health physics hours.
The dollars amounts calculated for D&D construction workers and RCTs were subtracted from the subcontractor dollars and the revised A5H dollar amount was entered into Best.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

<table>
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<tr>
<th>Resources</th>
<th>Cost Element</th>
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**Line Item 0400 - remove and clean debris**

**BOE**

Estimator's Experience based generally on a base case of 700 cy.

**Item Desc:**
Remove and clean debris.

**Breakdown of Historical Data:**
Item:  Site Labor to perform above individual tasks for T-3/T-4.
Units: hours
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below
**WBS No:** 1GAC0505  
**Activity ID:** 1G50050250

### Baseline Cost and Basis of Estimate

**Project:** Rocky Flats Closure Project  
**Baseline Devl:**  
**WBS Filter:** 1GAC  
**Activity Filter:** *  
**Starts In FY:** *

**WBS No:** 1GAC0505  
**Activity ID:** 1G50050250

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.  
**Units:** 1 lot  
**Unit Cost:** see below  
**Unit Cost Adjustment Factor:** see below  
**Revised Unit:** see below

_Basis for adjustment._ The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

**Total Contaminated Soil to be removed:** 3 CY  
**Total Soil for Thermal Desorption:** 0 CY  
**Offsite Waste Volume:** 3 CY

For the base case, it was assumed that about five cubic yards out of 700 cubic yards would be debris and would be segregated and cleaned. It was estimated that each cubic yard of debris would cost $1,000 or $5,000 total for 700 cubic yards. This yields a rate of $7.14 per cubic yard.

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

**Factor 7.14 - A5H Subcontracted Svrs 21 Dollars**

D4D construction trade hours were calculated using the following methodology:

A5H subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D4D construction.

RCT hours were calculated using the following methodology, unless they were already estimated.

For Site Preparation tasks - RCT hours were the same as D4D construction hours.

For all other tasks A5H subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under KG10H department code.

The dollars amounts calculated for D4D construction workers and RCTs were subtracted from the subcontractor dollars and the revised A5H dollar amount was entered into Best.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

<table>
<thead>
<tr>
<th>Resources</th>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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**Factors:** 21  
**sub/c support - units per yard**

0.84576  
**Line Item 0600 - confirmation sampling**

**Item Desc:**  
**BOE**  
**Estimator’s Experience based generally on historical data for T-3/T4 Remediation.**

**Breakdown of Historical Data:**

**Item:** Site Labor to perform above individual tasks for T-3/T-4.  
**Units:** hours  
**Unit Cost:** see below  
**Unit Cost Adjustment Factor:** see below  
**Revised Unit:** see below

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.  
**Units:** 1 lot  
**Unit Cost:** see below  
**Unit Cost Adjustment Factor:** see below  
**Revised Unit:** see below

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Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Total Contaminated Soil to be removed 3 CY  
Total Soil for Thermal Desorption 0 CY  
Offsite Waste Volume 3 CY

The analytical costs were based on T-3/T-4, which cost $435,574 for 3800 cubic yards of contaminated soil removed. This yielded a unit rate of about $115/cubic yard. Based on estimator experience the cost of sampling including labor and materials was estimated to be 20% of that rate or about $23/ cubic yard.

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 114.62 - A5H Subcontracted Srvs (Analytical) 344 Dollars  
Factor 22.924 - A5H Subcontracted Srvs 69 Dollars

D&D construction trade hours were calculated using the following methodology:

A5H subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.

RCT hours were calculated using the following methodology, unless they were already estimated.

For Site Preparation tasks - RCT hours were the same as D&D construction hours.

For all other tasks A5H subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under KG10H department code.

The dollars amounts calculated for D&D construction workers and RCTs were subtracted from the subcontractor dollars and the revised A5H dollar amount was entered into Best.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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**Line Item 0700 - prepare waste acceptance forms**

*BOE*

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:**

Prepare Waste Acceptance Forms

**Breakdown of Historical Data:**

**Item:** Site Labor to perform above individual tasks for T-3/T-4.

- **Units:** hours
- **Unit Cost:** see below
- **Unit Cost Adjustment Factor:** see below
- **Revised Unit:** see below

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.

- **Units:** 1 lot
- **Unit Cost:** see below
- **Unit Cost Adjustment Factor:** see below
- **Revised Unit:** see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.5 factor to account for the fact that 2 UBCs will be remediated at
Once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

### T3/T4 hours
- 80 environmental engineer
- 20 hours

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### Line Item 0800 - Waste Acceptance Sampling

**Estimator’s Experience based generally on historical data for T-3/T-4 Remediation.**

Item Desc:
- Waste Acceptance Sampling

Breakdown of Historical Data:
- **Item:** Site Labor to perform above individual tasks for T-3/T-4.
  - Units: hours
  - Unit Cost: see below
  - Unit Cost Adjustment Factor: see below
  - Revised Unit: see below

- **Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
  - Units: 1 lot
  - Unit Cost: see below
  - Unit Cost Adjustment Factor: see below
  - Revised Unit: see below

Basis for adjustment:
- The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Because the waste acceptance sampling is difficult to predict and could vary significantly from project to project, it was assumed that about $800 worth of additional analysis would be required for 20 cubic yards which is the volume that can be placed in one roll-off. This yielded a unit rate of about $40/cubic yard. This sampling and analysis is in addition to the confirmational samples so the costs are not as great. It was assumed that this sampling would be more labor intensive so the sampling costs were estimated to be about 50% of the analytical costs or about $20/cubic yard.

- **Total Contaminated Soil to be removed:** 3 CY
- **Total Soil for Thermal Desorption:** 0 CY
- **Offsite Waste Volume:** 3 CY

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

**Factor 40 - ASH Analytical 120 Dollars**
**Factor 20 - ASH Subcontracted Svrs 60 Dollars**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### Breakdown of Historical Data:

**Item:** Site Labor to perform above individual tasks for T-3/T-4.
- **Units:** hours
- **Unit Cost:** see below
- **Unit Cost Adjustment Factor:** see below
- **Revised Unit:** see below

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
- **Units:** 1 lot
- **Unit Cost:** see below
- **Unit Cost Adjustment Factor:** see below
- **Revised Unit:** see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

It was assumed that a field manager would be needed for 150 nine-hour working days or about 33 weeks. This work breaks down as follows:

- Preparation Activities 50 working days
- Field Activities - 80 working days
- Demobilization - 20 working days

Total 150 nine-hour working days or 1350 hours

In addition it was estimated that technical staff, quality assurance, and project management would be required for the equivalent of ten additional weeks, which is 400 hours each.

Based on the base case of a 700 cubic yard removal project, these values yielded unit rates as follows:

- **Hours Per Cubic Yard**
  - Environmental Engineer 1.93 hours
  - Technical Support 0.57 hours
  - Project Manager 0.57 hours
  - Quality Assurance 0.57 hours

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

- Total Contaminated Soil to be removed 3 CY
- Total Soil for Thermal Desorption 0 CY
- Offsite Waste Volume 3 CY

| Factors | 1.93 - Environmental Engineer 6 Hours |
| Factors | 0.57 - Technical Support 2 Hours |
| Factors | 0.57 - Project Manager 2 Hours |
| Factors | 0.57 - Quality Assurance 2 Hours |

### Resources

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**Line Item 1000 - backfill**

Trade Publication
Means 1995, Site Work & Landscape Cost Data (page 34, 42, and 34)

**Item Desc:**
Breakdown of Historical Data:

Item: Site Labor to perform above individual tasks for T-3/T-4.
   Units: hours
   Unit Cost: see below
   Unit Cost Adjustment Factor: see below
   Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
   Units: 1 lot
   Unit Cost: see below
   Unit Cost Adjustment Factor: see below
   Revised Unit: see below

Means (1995) Site Work & Landscape Cost Data as follows:

Common Fill $ 4.77/cubic yard (page 34 Borrow Bank Measure)
Hauling $ 3.98/cubic yard (page 42 2-mile round-trip, 6 cubic yard dump truck)
Backfilling $ 1.69/cubic yard (page 34)
Burden (43%) $ 4.49/cubic yard
Total $14.23/cubic yard or about $15/cubic yard

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Total Contaminated Soil to be removed 3 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 3 CY
Factor 15 - A5H Subcontracted Srvs $45 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
subcontractor cost for demobilization was about $95,000 for 3,800 cubic yards at the T-3/T-4 project. In addition it was estimated that the following hours were necessary:

- Environmental Engineer 300 hours
- Health Physicist 100 hours
- Industrial Hygiene 100 hours

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

- Factor 300 - Environmental Engineer 75 Hours
- Factor 100 - Health Physicists 25 Hours
- Factor 200 - Manager 50 Hours
- Factor 100 - P090 Industrial Hygienists 25 Hours
- Factor 95000 - A5H Subcontracted Srvs 23,750 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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### Line Item SYS - Contingency And Escalation

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| Activity ID: 1G500S0270 | Description: Prepare Closeout Report - HSSS Group 500-5 | Cost Risk | 1 Schedule Risk | 1 |

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**Total for Activity 1G500S0270:**

320, 9,045, 0, 6,522, 15,567, 3,148, 18,714

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**Line Item 0100 - develop report**

**BOE**

- **Description:** Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

- **Item Desc:** Perform Data Analysis including GIS representation of data, Closeout Report, and associated project management.

- **Breakdown of Cost Data:**
  - Item: Develop Documentation
  - Units: hours
  - Unit Cost: 320
  - Unit Cost Adjustment Factor: none
  - Revised Unit Hours: 320
## Resources

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## Line Item SYS - Contingency And Escalation

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## Activity Detail

**Activity ID:** 1G50050270  
**Activity Description:** Planning - IHSS Group 500-6 (Non D&D)  
**WBS Filter:** 1GAC  
**Starts In FY:** *

### Notes
- **Required level of effort:**
  - Environmental Engineer - 80 hours
  - Environmental Scientist - 20 hours
  - Computer Specialist - 160 hours (GIS, SWD)
  - Manager - 20 hours
  - Administrative - 20 hours
  - Cost Estimators - 20 hours

### Breakdown of Cost Data:
- **Item:** Preparation of SAP addenda
- **Units:** hours
- **Unit Cost:** 120
- **Updated Unit Hours:** 120

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### Rocky Flats Closure Project
#### Baseline Cost and Basis of Estimate

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**Baseline Deviation**

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**Starts In FY**

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#### Line Item 0200 - HASP Addendum

**BOE**

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Item Desc:**
Preparation of HASP addenda to Industrial Area Characterization Plan

**Breakdown of Cost Data:**
- **Item:** Preparation of addenda for HASP.
- **Units:** hours
- **Unit Cost:** 140
- **Unit Cost Adjustment Factor:** none
- **Revised Unit Hours:** 140

**Factors**

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#### Line Item 0300 - QAP Addendum

**BOE**

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Item Desc:**
Preparation of QAP Addenda to Industrial Area Characterization Plan.

**Breakdown of Cost Data:**
- **Item:** Preparation of QAP addenda
- **Units:** hours
- **Unit Cost:** 60
- **Unit Cost Adjustment Factor:** none
- **Revised Unit Hours:** 60

**This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.**

**Factors**

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#### Line Item SYS - Contingency And Escalation

**BOE**

- **CON CONTINGENCY**
  - Factors: 1,538.79 Dollars
  - **ZDEPT:** No Department
  - **Curve:** Linear
  - **Quantity:** 1,538.79 Dollars

- **ESC ESCALATION**
  - Factors: 699.979 Dollars
  - **ZDEPT:** No Department
  - **Curve:** Linear
  - **Quantity:** 699.979 Dollars

**Activity ID:** 1GS0060120

**Description:** Procurement & Field Preparation - IHSS Grp 500-6

**Cost Risk:** 1
**Schedule Risk:** 1
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Total for Activity 1G50060120:

- BOE

**Estimator's Experience**

Based on 15 years of experience planning, estimating, and conducting projects of similar scope and size.

Item Desc:


Breakdown of Cost Data:

- **Item:** Site Labor to perform above individual tasks for either Ryan's Pit or T-3/T-4.
  - **Units:** hours
  - **Unit Cost:** 1380
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** 345 hours

- **Item:** Subcontractor costs to perform above individual tasks for either Ryan's Pit or T-3/T-4.
  - **Units:** 1 lot
  - **Unit Cost:** $10K
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** $2.5K

Total for Activity 1G50060120:

- **345**
- **10,637**
- **2,114**
- **2,467**
- **15,218**
- **18,973**
- **3,755**
- **2,467**

**Total Cost**
On some projects, these hours were assumed to be included in other tasks or part of this task under environmental engineer or one of the other job functions. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. Some factors include:

- Factor 1134 - Environmental Engineer 283 Hours
- Factor 40 - Safety Engineer 10 Hours
- Factor 40 - Industrial Hygiene 10 Hours
- Factor 58 - Radiological Engineering 14 Hours
- Factor 18 - RCT 5 Hours
- Factor 50 - Project Manager 13 Hours
- Factor 10000 - A5H Subcontracted Services 2,500 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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### Line Item SYS - Contingency And Escalation

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### Activity ID: 1G50060140 - Readiness Review - Group 500-6

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### Line Item 0100 - readiness assessment

- **BOE:** Estimator's Experience based on 15 years of experience planning, estimating and conducting projects of similar scope and size.
- **Item Desc:** Evaluate readiness of the field characterization team and plans.
- **Breakdown of Cost Data:**
  - **Units:** hours
  - **Unit Cost:** 187
It was estimated that subcontractor involvement would require 80 hours at $60/hour = $4,800. It was assumed that about 3 weeks of time was required for an environmental engineer or similar person in addition to 12 hours of project management, which yielded 132 hours. An additional 11 hours was added for management oversight. It was estimated that a radiological engineer (QA) and an industrial hygienist would be needed for 2.5 days each (22 hours).

20 hours of administrative time will also be required.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
Collection of geoprobe samples with the site geoprobe with two technicians. A site Environmental Engineer will direct the boring placement, log the borings; collect, containerize, package, and ship the samples; prepare field QC documentation, and prepare field notes on a full time basis. A site RCT will monitor the site for radiological contamination on a full time basis. Decon Operations staff will decon the vehicle and equipment when it leaves the work area on a half time basis. It is estimated that one 10' boring will be placed per 500 SF of building footprint (same as Bldg. 123 characterization) with 5 samples per 10' boring. It is estimated that one boring per eight hours can be completed.

Breakdown of Cost Data:

Item: Site Personnel for support of geoprobe samples
Units: hours
Unit Cost: 32
Unit Cost Adjustment Factor: none
Revised Unit Hours: 32

Item: Kaiser-Hill/RMRS Geoprobe unit with 2 Technician crew. Item costs $100 per hour or $800 per 8-hour day.
Units: dollars
Unit Cost: 800
Unit Cost Adjustment Factor: none
Revised Unit Hours: 800

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

Item Desc: Analyze samples produced from geoprobe borings. It is anticipated that 3 samples from each boring will be collected. They will be analyzed for Metals, VOCs, SVOCs, PCBs, and radionuclides (est. 3 isotopes) with a 30 day TAT. This item is priced on a per sample basis. Per sample costs include DOT rad screen, bottle charge, shipping, and validation.

Breakdown of Cost Data:

Item: Analyze samples at an offsite laboratory
Units: analysis
Unit Cost: Metals $345, VOCs $280, SVOCs $440, PCBs and other analytes $150, and Radonuclides 3 isotopes $590 per each sample.
Unit Cost Adjustment Factor: Must add: DOT rad screen $32/sample, bottle charge $7/sample, shipping $4.2/bottle, and validation per each: $17.30 VOA, $19.25 SVOC, $16.75 Metals, $5.95 PCB, and $15.60 Rad.
Revised Unit Hours: Metals $405, VOCs $341, SVOCs $502, PCBs and other analytes $199, and Rad $649.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

Item Desc: Analyze geoprobe samples. It is anticipated that 3 samples from each boring will be collected. They will be analyzed for Metals, VOCs, SVOCs, PCBs, and Radonuclides (est. 3 isotopes) with a 30 day TAT. This item is priced on a per sample basis. Per sample costs include DOT rad screen, bottle charge, shipping, and validation.

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Revised Unit Hours: Metals $405, VOCs $341, SVOCs $502, PCBs and other analytes $199, and Rad $649.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
**Line Item 0300 - project mgmt oversight**

**BOE**

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Item Desc:**
Project Management/Oversight. Based on half time for a Project Manager, Administrative staff, and Cost Estimator/Scheduler

**Breakdown of Cost Data:**
- **Item:** Mgmt oversight
  - **Units:** hours
  - **Unit Cost:** 12
  - **Unit Cost Adjustment Factor:** none
  - **Revised Unit Hours:** 12

**Basis for adjustment.**
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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### Factors
- Environmental Engineer: 45 hrs, $138/ea, $6,005.38
- SWD Technician: 10 hrs, $138/ea, $1,380
- GIS Technician: 15 hrs, $138/ea, $2,070
- Technical Editor: 15 hrs, $138/ea, $2,070
- QA: 4 hrs, $138/ea, $552
- Peer (2): 8 hrs, $138/ea, $1,104
- Compliance: 4 hrs, $138/ea, $552

**Line Item SYS - Contingency And Escalation**

**BOE**

### Resources

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### Factors
- 6605.38 Dollars
- 3004.71 Dollars

**Activity ID:** 1G50060170  **Description:** Prepare NFA - Group 500-6  **Cost Risk:** 1  **Schedule Risk:** 1

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Total for Activity 1G50060170:

- **Labor Hours Total:** 138
- **Labor Cost Total:** 4,164
- **Material/Sub Total:** 0
- **Contingency & Escalation:** 0
- **Total Prime Cost:** 5,180
- **Burden Cost:** 1,460
- **Total Cost:** 6,641

**Line Item 0100 - develop documentation**

**BOE**

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Item Desc:**
Perform Data Analysis including GIS representation of data, NFA Summary, and associated project management.

**Breakdown of Cost Data:**
- **Item:** Develop Documentation
  - **Units:** 138

**Environmental Engineer:** 45 hrs, Evaluate & assemble existing data. Draft Report.

**SMD Technician:** 10 hrs, Identify & pull existing data from database.

**GIS Technician:** 15 hrs, Develop maps for Report. Print multiple copies.

**Technical Editor:** 15 hrs, Complete initial and revised tech edits of Report.

**Technical Reviews**
- QA: 4 hrs, Review and comment per area of expertise.
- Peer (2): 8 hrs, Review and comment per area of expertise.
- Compliance: 4 hrs, Review and comment per area of expertise.
Environmental  4 hrs  Review and comment per area of expertise.  
Management (2)  8 hrs  Review and comment per area of expertise.  
Legal  4 hrs  Review and comment per area of expertise.  
Environmental  15 hrs  Disposition comments and finalize document.  
Administrative Support  6 hrs  Copy & assemble final documents, submit to records.  

Unit Cost Adjustment Factor:  none  
Revised Unit Hours:  138  
Basis for adjustment.  N/A  

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**Line Item 0100 - SAP Addenda**  
**BOE**  
Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.  
Item Desc:  
Preparation of SAP Addenda to Industrial Area Characterization Plan.  
Breakdown of Cost Data:
### Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

#### Activity ID: 1G50070100

**WBS No:** 1GAC0507

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This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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#### Line Item 0200 - HASP Addendum

**BOE**

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

<table>
<thead>
<tr>
<th>Item Desc:</th>
<th>Preparation of HASP addenda to Industrial Area Characterization Plan</th>
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<tr>
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<tr>
<td>Item: Preparation of addenda for HASP.</td>
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This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

#### Resources

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<th>Units</th>
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<td>RMRS Salaried</td>
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<tr>
<td>750</td>
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<td>M020</td>
<td>MANAGERS (GRADE 69 - 72)</td>
<td>R100S</td>
<td>RMRS Salaried</td>
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<td>RMRS Salaried</td>
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#### Line Item 0300 - QAP Addendum

**BOE**

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<td>Item: Preparation of QAP addenda</td>
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This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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## Rocky Flats Closure Project

### Baseline Cost and Basis of Estimate

- **WBS No:** 1GAC0507
- **Activity ID:** 1G50070100
- **Project:** Baseline Devi
- **Baseline Cost:** 1GAC
- **WBS Filter:** "*"
- **Activity Filter:** "*"
- **Starts In FY:** "*"

### WBS Filter: 1GAC

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### Line Item SYS - Contingency And Escalation

**BOE**

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**Factors:** 0.84576

**BOE:** 899.979 Dollars

### Activity ID: 1G50070120

**Description:** Procurement & Field Preparation - IHSS Grp 500-7

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<tr>
<th>Line Item</th>
<th>BOE Type</th>
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<th>Labor Hours Total</th>
<th>Labor Cost Total</th>
<th>Materials/Sub Cost</th>
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**Total for Activity 1G50070120:**

- **Labor Hours Total:** 10,637
- **Labor Cost Total:** 2,114
- **Materials/Sub Cost:** 2,467
- **Contingency & Escalation:** 0
- **Total Prime Cost:** 15,218
- **Burden Cost:** 3,755
- **Total Cost:** 18,973

### Line Item 0100 - field prep

**BOE:**

- **Description:** Preparation of radiological work permit, implementation plan, ecology survey/NEPA support, and utility clearance/soil disturbance permit.

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<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Quantity</th>
<th>Units</th>
<th>BOE Type</th>
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<th>Labor Cost Total</th>
<th>Materials/Sub Cost</th>
<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
<th>Burden Cost</th>
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<td>EE</td>
<td>345</td>
<td>10,637</td>
<td>2,114</td>
<td>0</td>
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<td>0</td>
<td>15,218</td>
<td>3,755</td>
<td>18,973</td>
</tr>
</tbody>
</table>

**Total for Activity 1G50070120:**

- **Labor Hours Total:** 10,637
- **Labor Cost Total:** 2,114
- **Materials/Sub Cost:** 2,467
- **Total Prime Cost:** 15,218
- **Burden Cost:** 3,755
- **Total Cost:** 18,973

---

**Breakdown of Cost Data:**

**Item:** Site labor to perform above individual tasks for either Ryan's Pit or T-3/T-4.
- **Units:** hours
- **Unit Cost:** $380
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** 345 hours

**Item:** Subcontractor costs to perform above individual tasks for either Ryan's Pit or T-3/T-4.
- **Units:** 1 lot
- **Unit Cost:** $10K
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** $2.5K

**Subcontractor Health and Safety Plan:** Costs for health and safety plan are based on Ryan's Pit, which cost approximately $10,000. It was assumed that these are ASH dollars.

**Radiological Work Permit:** It was assumed that it would take a radiological control technician two working days (18 hours) to complete counting preparation and review.

**Implementation Plan:** It was estimated that this activity would take 13 weeks of time for engineers, scientists or equivalent to complete. This would include preparation of an implementation plan as required (Rocky Flats Cleanup Agreement, Appendix 3, Interim Guidance Document, Dated August 1977). In addition this includes all tasks related to documentation for the Integrated Work Control Program and Integrated Safety Management.

**Ecology Survey/National Environmental Protection Act (NEPA) Support:** It was estimated that this would take 40 hours for an ecologist. The activities include NEPA review and support in document preparation, site surveys to verify compliance with ecological regulations, categorical exclusions, and NEPA evaluations.

**Utility Clearance/Soil Disturbance Permits:** It was estimated based on experience that it would take the equivalent 2 weeks (80 hours) for technical staff to...
do utility surveys, prepare and review soil disturbance permits, and prepare authorizing documents for excavation.

The combined resources for procurement and field preparations are

<table>
<thead>
<tr>
<th>Total Procurement and Field Preparation Hours</th>
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<tbody>
<tr>
<td>Environmental Engineer 1134 hours</td>
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<tr>
<td>Safety Engineer 40 hours</td>
</tr>
<tr>
<td>Industrial Hygiene 40 hours</td>
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<tr>
<td>Radiological Engineering 58 hours</td>
</tr>
<tr>
<td>Radiological Control Technician 18 hours</td>
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<tr>
<td>Ecologist/Life Scientist 40 hours</td>
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<tr>
<td>Manager 50 hours</td>
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<tr>
<td>Quality Assurance* 29 hours</td>
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<td>A$H Total $10,000</td>
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* On some projects these hours were assumed to be included in other tasks or part of this task under environmental engineer or one of the other job functions.

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

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<tr>
<th>Factor</th>
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<tr>
<td>40</td>
<td>Safety Engineer 10 Hours</td>
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<tr>
<td>58</td>
<td>Radiological Engineering 14 Hours</td>
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<td>18</td>
<td>RCT 5 Hours</td>
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<tr>
<td>10</td>
<td>Life Scientist 10 Hours</td>
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<tr>
<td>50</td>
<td>Project Manager 13 Hours</td>
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Factor 10000 - A$H Subcontracted Services 2,500 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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<tr>
<td>750</td>
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<td>750</td>
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<td>K265S ER Programs</td>
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<td>750</td>
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ASH SUBCONTRACTED SRVS 0000 NONE K265S ER Programs 2,114.40 Dollars

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<th>Quantity</th>
<th>Units</th>
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<td>Line Item</td>
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| Line 537 of 1121 6/23/00 9:21:54 AM OFFICIAL USE ONLY
### Rocky Flats Closure Project

#### Baseline Cost and Basis of Estimate

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**Line Item 0100 - readiness assessment**

**BOE**

- **Estimator's Experience** based on 15 years of experience planning, estimating and conducting projects of similar scope and size.

**Breakdown of Cost Data:**

- **Item:** Site Labor to perform Readiness Assessment for T-3/T-4.
  - **Units:** hours
  - **Unit Cost:** $187
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** 48

- **Item:** Subcontractor costs to perform Readiness Assessment for T-3/T-4.
  - **Units:** lot
  - **Unit Cost:** $4800
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** $1200

It was estimated that subcontractor involvement would require 80 hours at $60/hour = $4,800. It was assumed that about 3 weeks of time was required for an environmental engineer or similar person in addition to 12 hours of project management, which yielded 132 hours. An additional 11 hours was added for management oversight. It was estimated that a radiological engineer (QA) and an industrial hygienist would be needed for 2.5 days each (22 hours).

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 projects will be conducted at once and only one of each fixed cost is needed for the group.

- **Factor 132 - Environmental Engineer 33 Hours**
- **Factor 22 - Health Physicists 6 Hours**
- **Factor 11 - Manager 3 Hours**
- **Factor 22 - Quality Assurance 6 Hours**
- **Factor 4,800 - A$H Subcontracted Svrs 1,200 Dollars**

20 hours of administrative time will also be required.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
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**Line Item SYS - Contingency And Escalation**

**BOE**

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<th>Units</th>
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</table>
### Line Item 0100 - Collect Surficial Soil Samples

**Description:** Collect surficial soil samples. A site Environmental Engineer will direct the sample collection, containerize, package, and ship the samples; prepare field QC documentation, and prepare field notes on a full-time basis. A site RCT will monitor the site for radiological contamination on a full-time basis. A site Industrial Hygienist will implement the field portion of the HASP on a full-time basis.

**Breakdown of Cost Data:**
- **Item:** Site Personnel for support of sample collection
- **Units:** hours
- **Unit:** 20.00 each
- **Unit Cost Adjustment Factor:** none
- **Revised Unit Hours:** 24

**Resources**

<table>
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<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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<tr>
<td>750</td>
<td>STRAIGHT TIME BASE</td>
<td>E050</td>
<td>ENVIRONMENTAL ENGINEERS</td>
<td>R100S</td>
<td>RMRS Salaried</td>
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**Total for Activity 1G50070150:**

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</table>

### Line Item 0200 - Anaylze Samples (Radionuclide)

**Description:** Analyze samples produced from geoprobe borings. It is anticipated that 3 samples from each boring will be collected. They will be analyzed for Metals, VOCs, SVOCs, PCBs, and radionuclides (estimated 3 isotopes) with a 30-day TAT. This item is priced on a per-sample basis. Per-sample costs include DOT rad screen, bottle charge, shipping, and validation.

**Breakdown of Cost Data:**
- **Item:** Analyze samples at an offsite laboratory.
  - **Units:** analysis
  - **Unit Cost:** Metals $345, VOCs $280, SVOCs $440, PCBs and other analytes $150, and Radionuclides 3 isotopes $590 per each sample.
  - **Unit Cost Adjustment Factor:** Must add: DOT rad screen $32/sample, bottle charge $7/sample, shipping $4.2/bottle, and validation per each: $17.30 VOA, $19.25 SVOC, $16.75 Metals, $5.95 PCB, and $15.60 Rad.
  - **Revised Unit Hours:** Metals $405, VOCs $341, SVOCs $502, PCBs and other analytes $199, and Rad $649.

**Resources**

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### Line Item 0300 - Project Mgmt Oversight

**Description:** Project Management/Oversight. Based on half-time for a Project Manager, Administrative Staff, and Cost Estimator/Scheduler.

**Breakdown of Cost Data:**
- **Item:** Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Resources**

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<th>Cost Element</th>
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<td>0.84576</td>
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Breakdown of Cost Data:
Item: Mgmt oversight
Units: hours
Unit Cost: 12
Unit Cost Adjustment Factor: none
Revised Unit Hours: 12

Basis for adjustment.
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

Breakdown of Cost Data:
Item: Mgmt oversight
Units: hours
Unit Cost: 12
Unit Cost Adjustment Factor: none
Revised Unit Hours: 12

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

Item Desc: Perform Data Analysis including GIS representation of data, NFA Summary, and associated project management.

Breakdown of Cost Data:
Item: Develop Documentation
Units: Hours
Unit Cost: 138

Environmental Engineer 45 hrs Evaluate & assemble existing data. Draft Report.
SMD Technician 10 hrs Identify & pull existing data from database.
Technical Editor 15 hrs Complete initial and revised tech edits of Report.
Technical Reviews
QA 4 hrs Review and comment per area of expertise.
Peer (2) 8 hrs Review and comment per area of expertise.
Compliance 4 hrs Review and comment per area of expertise.
Environmental 4 hrs Review and comment per area of expertise.
Management (2) 8 hrs Review and comment per area of expertise.
Legal 4 hrs Review and comment per area of expertise.
Environmental Engineer 15 hrs Disposition comments and finalize document.
Administrative Support 6 hrs Copy & assemble final documents, submit to records.
### Resources

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<th>Curve</th>
<th>Quantity</th>
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<td>K265S ER Programs</td>
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### Line Item SYS - Contingency And Escalation

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### Activity ID: 1GFT611100

**Description:** SAP Preparation - IHSS Group 600-1 (B663)

**Line Item 0100 - SAP Addenda**

- **Description:** Preparation of SAP Addenda to Industrial Area Characterization Plan.
- **Breakdown of Cost Data:**
  - Units: hours
  - Hours: 120
  - Unit Cost Adjustment Factor: none
  - Revised Unit Hours: 120

**BOE**

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**Total for Activity 1GFT611100:**

|                      | 280 | 10,021 | 1,421 | 4,133 | 15,575 | 3,467 | 19,042 |

**Item Desc:**

Estimate based on Estimator's experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.
Project: Rocky Flats Closure Project  
Baseline Cost and Basis of Estimate

WBS No: 1GAC0601  
Activity ID: 1GFT611100

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Basis for adjustment.
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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<th>Units</th>
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<td>750 STRAIGHT TIME BASE</td>
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<td><strong>Factors</strong></td>
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<td>ASH SUBCONTRACTED SRVS</td>
<td>P070 COST ESTIMATORS PLANNERS AN</td>
<td>K265S ER Programs</td>
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**Line Item 0200 - HASP Addenda**

BOE  
Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

Item Desc:  
Preparation of HASP addenda to Industrial Area Characterization Plan

Breakdown of Cost Data:
- Item: Preparation of addenda for HASP.
- Units: hours
- Unit Cost: 140
- Unit Cost Adjustment Factor: none
- Revised Unit Hours: 140

Basis for adjustment.

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<td>M020 MANAGERS (GRADE 69 - 72)</td>
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**Line Item 0300 - QAP Addenda**

BOE  
Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

Item Desc:  
Preparation of SAP Addenda to Industrial Area Characterization Plan

Breakdown of Cost Data:
- Item: Preparation of QAP addenda
- Units: hours
- Unit Cost: 60
- Unit Cost Adjustment Factor: none
- Revised Unit Hours: 60

Basis for adjustment.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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<th>Curve</th>
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<td>42 estimated $/hr</td>
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### Rocky Flats Closure Project

#### Baseline Cost and Basis of Estimate

**Activity ID:** 1GFT611100

**Baseline Devl:**

**WBS Filter:** 1GAC

**Starts In FY:**

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**Line Item SYS - Contingency And Escalation**

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**Factors:**
- **CON:** 2990.09 Dollars
- **ESC:** 1143.27 Dollars

**Activity ID:** 1GFT611120

**Description:** Procurement and Field Prep - IHSS Group 600-1

**Capex:**

**Line Item 0100 - procurement & field prep**

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<th>Materials/Sub Cost</th>
<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
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**Total for Activity 1GFT611120:**

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<td>Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation</td>
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<tr>
<td>Procurement includes preparation of statement of work, proposal review (technical evaluation), and negotiations. Based on a T-3/T-4 burdened cost of $29,186.52. Assuming it is primarily labor hours (RMRS Environmental Engineer charging at $57.45 per hour) yields 508 hours which rounds to 510 total hours.</td>
<td></td>
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<tr>
<td>Davis Bacon Documentation: It was assumed that it would take an environmental engineer twenty-four hours to prepare a Davis Bacon cost estimate and to support the Davis-Bacon determination.</td>
<td></td>
</tr>
<tr>
<td>Subcontractor Health and Safety Plan: Costs for the health and safety plan are based on Ryan's Pit, which cost approximately $10,000. It was assumed that these are A5H dollars. In addition, it was assumed that a safety engineer, an industrial hygienist, and a radiological engineer would each provide one week (40 hours) of support for review and document preparation.</td>
<td></td>
</tr>
<tr>
<td>Radiological Work Permit: It was assumed that it would take a radiological control technician two working days (18 hours) to complete counting preparation and review.</td>
<td></td>
</tr>
<tr>
<td>Implementation Plan: It was estimated that this activity would take 13 weeks of time for engineers, scientists or equivalent to complete. This would include preparation of an implementation plan as required (Rocky Flats Cleanup Agreement, Appendix 3, Interim Guidance Document, Dated August 1977). In addition this includes all tasks related to documentation for the Integrated Work Control Program and Integrated Safety Management.</td>
<td></td>
</tr>
<tr>
<td>Ecology Survey/National Environmental Protection Act (NEPA) Support: It was estimated that this would take 40 hours for an ecologist. The activities include NEPA review and support in document preparation, site surveys to verify compliance with ecological regulations, categorical exclusions, and NEPA evaluations.</td>
<td></td>
</tr>
<tr>
<td>Utility Clearance/Soil Disturbance Permits: It was estimated based on experience that it would take the equivalent 2 weeks (80 hours) for technical staff to do utility surveys, prepare and review soil disturbance permits, and prepare authorizing documents for excavation.</td>
<td></td>
</tr>
</tbody>
</table>
The combined resources for procurement and field preparations are
Total Procurement and Field Preparation Hours
Environmental Engineer 1134 hours
Safety Engineer 40 hours
Industrial Hygiene 40 hours
Radiological Engineering 58 hours
Radiological Control Technician 18 hours
Ecologist/Life Scientist 40 hours
Manager 50 hours
Quality Assurance* 29 hours
ASH Total $10,000

* On some projects these hours were assumed to be included in other tasks or part of this task under environmental engineer or one of the other job functions.

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

Factor 1134 - Environmental Engineer 283 Hours
Factor 40 - Safety Engineer 10 Hours
Factor 40 - Industrial Hygiene 10 Hours
Factor 58 - Radiological Engineering 14 Hours
Factor 18 - RCT 5 Hours
Factor 40 - Life Scientist 10 Hours
Factor 50 - Project Manager 13 Hours
Factor 10000 - ASH Subcontracted Services 2,500 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
**Line Item 0100 - readiness assessment**

**BOE**

**Estimator's Experience based generally on historical data for Ryan’s Pit and T-3/T4 Remediation**

**Item Desc:**
Evaluate readiness of the field characterization team and plans.

**Breakdown of Cost Data:**

- **Item:** Site Labor to perform Readiness Assessment for T-3/T-4.
  - **Units:** hours
  - **Unit Cost:** $187
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** 48

- **Item:** Subcontractor costs to perform Readiness Assessment for T-3/T-4.
  - **Units:** 1 lot
  - **Unit Cost:** $4800
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** $1200

It was estimated that subcontractor involvement would require 80 hours at $60/hour = $4,800. It was assumed that about 3 weeks of time was required for an environmental engineer or similar person in addition to 12 hours of project management, which yielded 132 hours. An additional 11 hours was added for management oversight. It was estimated that a radiological engineer (QA) and an industrial hygienist would be needed for 2.5 days each (22 hours).

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 projects will be conducted at once and only one of each fixed cost is needed for the group.

- **Factor 132- Environmental Engineer 33 Hours**
- **Factor 22 - Health Physicists 6 Hours**
- **Factor 22 - Quality Assurance 6 Hours**
- **Factor 4,800 - ASH Subcontracted Srvs 1,200 Dollars**

20 hours of administrative time will also be required.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Resources**

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<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
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**Line Item SYS - Contingency And Escalation**

**BOE**

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Rocky Flats Closure Project
Baseline Cost and Basis of Estimate

WBS No: 1GAC0601
Activity ID: 1GFT61150
Description: Field Sampling, Lab Analysis - IHSS Group 600-1

Activity ID: 1GFT61150

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Total for Activity 1GFT61150:

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| Line Item 0200 - analyze samples |

BOE

Vendor Quote
Email quote:average cost from Kaiser-Hill ASD (V. Ideker).

Item Desc:
Analyze samples produced from geoprobe borings. It is anticipated that 3 samples from each boring will be collected. They will be analyzed for Metals, VOCs, SVOCs, PCBs, and radionuclides (est. 3 isotopes) with a 30 day TAT. This item is priced on a per sample basis. Per sample costs include DOT rad screen, bottle charge, shipping, and validation.

Breakdown of Cost Data:
- Item: Analyze samples at an offsite laboratory. Units: analysis
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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Factors: 2096 dollars

### Line Item 0300 - project mgmt oversight

**BOE**

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Item Desc:**

Project Management/Oversight. Based on half time for a Project Manager, Administrative staff, and Cost Estimator/Scheduler

**Breakdown of Cost Data:**

**Item:** Mgmt oversight

- **Units:** hours
- **Unit Cost:** 12
- **Unit Cost Adjustment Factor:** none
- **Revised Unit Hours:** 12

**Basis for adjustment:**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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Factors: 4 hrs

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Factors: 4 hrs

| ASH SUBCONTRACTED SRVS | 0170 | OTHER ADMINISTRATIVE & PROFE | K265S ER Programs | Linear | 142.09 | Dollars |

Factors: 4 hrs

### Line Item SYS - Contingency And Escalation

**BOE**

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Item Desc:**

Project Management/Oversight. Based on half time for a Project Manager, Administrative staff, and Cost Estimator/Scheduler

**Breakdown of Cost Data:**

**Item:** Mgmt oversight

- **Units:** hours
- **Unit Cost:** 12
- **Unit Cost Adjustment Factor:** none
- **Revised Unit Hours:** 12

**Basis for adjustment:**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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Factors: 6417.32 Dollars

| ESC ESCALATION | 0000 | NONE | ZDEPT No Department | Linear | 13,174.12 | Dollars |

Factors: 13174.1 Dollars

### Activity ID: 1GFT611170

**Description:** Prepare Summary/NFA - IHSS Group 600-1

**Cost Risk:** 1

**Schedule Risk:** 1

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Total for Activity 1GFT611170:

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### Line Item 01000 - develop documentation

**BOE**

Estimator's Experience:

Estimate for summary report based on estimator's 16 years of experience performing and costing projects of similar size and scope.

**Item Desc:**

Perform Data Analysis including GIS representation of data, NFA Summary, Characterization Report, and associated project management. Disposition comments and finalize document

### Rocky Flats Closure Project
#### Baseline Cost and Basis of Estimate

**Project ID:** 1GAC

**WBS Filter:** 1GAC

**Activity ID:** 1GFT611170

**Activity ID:** 1GFT611180

**Description:** Prepare Decision Document - IHSS Group 600-1

---

### Resources

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<th>Curve</th>
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<th>Units</th>
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**Breakdown of Cost Data:**
- **Item:** Develop Documentation
- **Units:** Hours
- **Unit Cost:** 656
- **Unit Cost Adjustment Factor:** none

**Line Item:** SYS - Contingency And Escalation

**BOE Resources**

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**Activity ID:** 1GFT611180

**Description:** Prepare Decision Document - IHSS Group 600-1

---

### Breakdown of Cost Data:
- **Item:** Develop Documentation
- **Units:** Hours
- **Unit Cost:** 656
- **Unit Cost Adjustment Factor:** none

**Line Item 0100 - PAM**

**Description:** Preparation of PAM or IM/IRA in support of source removal of previously characterized UBC

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**Line Item 0100 - PAM**

**Description:** Preparation of PAM or IM/IRA in support of source removal of previously characterized UBC

**Item Desc:**
- Preparation of PAM or IM/IRA in support of source removal of previously characterized UBC

---

**Line Item 0100 - PAM**

**BOE**

**Estimator's Experience based generally on historical data for Ryan's Pit**

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6/23/00 9:21:56 AM

OFFICIAL USE ONLY
Proposed Action Memorandum: A bottoms-up estimate based on historical costs was used as the basis for the estimate. Based on Ryan's Pit (IHSS 108), the cost for the PAM was $50,000 (contractor costs). Assuming that labor rates at this time were approximately $75 (based on a cost center 217). The total labor for a PAM would be approximately 666 hours, which rounds to 700 hours. It was assumed that 10% would be required for managerial hours.

For a PAM the total labor hours are:
- Environmental Engineer: 700 Hours
- Manager: 70 Hours

Breakdown of Cost Data:
- Item: Preparation of PAM for Ryan's Pit source removal action.
  - Units: hours
  - Unit Cost: 770
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit Hours: 193

Basis for adjustment. Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

Interim Measure/Interim Remedial Action Decision Document: It was assumed that an IM/IRA Decision Document would take 75% more effort than a PAM or 1,166 hours, which rounds to 1200 hours. It was assumed that 10% of this labor would be required for managerial hours.

For an IM/IRA the total labor hours are:
- Environmental Engineer: 1200 Hours
- Manager: 120 Hours

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Estimator’s Experience based generally on historical data for Ryan’s Pit

Item Desc:
Preparation of SAP in support of source removal of previously characterized UBC.

Breakdown of Historical Data:
- Item: Preparation of SAP for Ryan’s Pit source removal action.
  - Units: hours
  - Unit Cost: 300
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit Hours: 76

Basis for adjustment. Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.
### Rocky Flats Closure Project

#### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0601  
**Activity ID:** 1GFT611180  
**Project:** Baseline Devl  
**Baseline Devl**  
**WBS Filter:** 1GAC  
**Activity Filter:** *  
**Starts In FY:** *

**Item Desc:** Preparation of WMP in support of source removal of previously characterized UBC.

**Breakdown of Historical Data:**
- **Item:** Preparation of WMP for Ryan's Pit source removal action.
  - **Units:** hours
  - **Unit Cost:** $80
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit Hours:** 20

**Basis for adjustment:** Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

#### Resources

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<tr>
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<th>Department</th>
<th>Curve</th>
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**Factors:** 20 hrs

### Line Item SYS - Contingency And Escalation

**BOE Resources**

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**Factors:** 1128.02 dollars

### Activity ID: 1GFT611210

**Description:** Procurement and Field Prep - IHSS Grouping 600-1

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<th>Labor Cost Total</th>
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**Total for Activity 1GFT611210:**

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### Line Item 0100 - procurement & field prep

**BOE**

**Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation**

**Item Desc:**
- **Item:** Site Labor to perform above individual tasks for either Ryan's Pit or T-3/T-4.
  - **Units:** hours
  - **Unit Cost:** $1380
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** 345 hours

**Item:** Subcontractor costs to perform above individual tasks for either Ryan's Pit or T-3/T-4.

**Units:** 1 lot
**Unit Cost:** $10K
**Unit Cost Adjustment Factor:** 0.25
**Revised Unit:** $2.5K

**Basis for adjustment:** Hours and costs for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be characterized at once.

**Procurement includes preparation of statement of work, proposal review (technical evaluation), and negotiations. Based on a T-3/T-4 burdened cost of $29,186.52. Assuming it is primarily labor hours (RMRS Environmental Engineer charging at $57.45 per hour) yields 508 hours which rounds to 510 total hours.**

**Davis Bacon Documentation:** It was assumed that it would take an environmental engineer twenty-four hours to prepare a Davis Bacon cost estimate and to support the Davis-Bacon determination.

**Subcontractor Health and Safety Plan:** Costs for the health and safety plan are based on Ryan's Pit, which cost approximately $10,000. It was assumed that
these are A5H dollars. In addition, it was assumed that a safety engineer, an industrial hygienist, and a radiological engineer would each provide one week (40 hours) of support for review and document preparation.

Radiological Work Permit: It was assumed that it would take a radiological control technician two working days (18 hours) to complete counting preparation and review.

Implementation Plan: It was estimated that this activity would take 13 weeks of time for engineers, scientists or equivalent to complete. This would include preparation of an implementation plan as required (Rocky Flats Cleanup Agreement, Appendix 3, Interim Guidance Document, Dated August 1977). In addition this includes all tasks related to documentation for the Integrated Work Control Program and Integrated Safety Management.

Ecology Survey/National Environmental Protection Act (NEPA) Support: It was estimated that this would take 40 hours for an ecologist. The activities include NEPA review and support in document preparation, site surveys to verify compliance with ecological regulations, categorical exclusions, and NEPA evaluations.

Utility Clearance/Soil Disturbance Permits: It was estimated based on experience that it would take the equivalent 2 weeks (80 hours) for technical staff to do utility surveys, prepare and review soil disturbance permits, and prepare authorizing documents for excavation.

The combined resources for procurement and field preparations are

<table>
<thead>
<tr>
<th>Total Procurement and Field Preparation Hours</th>
</tr>
</thead>
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<tr>
<td>Environmental Engineer 1134 hours</td>
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<tr>
<td>Safety Engineer 40 hours</td>
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<tr>
<td>Industrial Hygiene 40 hours</td>
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<td>Radiological Engineering 58 hours</td>
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<td>Radiological Control Technician 18 hours</td>
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<td>Ecologist/Life Scientist 40 hours</td>
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<tr>
<td>Manager 50 hours</td>
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<td>Quality Assurance* 29 hours</td>
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<td>A5H Total $10,000</td>
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* On some projects these hours were assumed to be included in other tasks or part of this task under environmental engineer or one of the other job functions.

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

Factor 1134 - Environmental Engineer 283 Hours
Factor 40 - Safety Engineer 10 Hours
Factor 40 - Industrial Hygiene 10 Hours
Factor 58 - Radiological Engineering 14 Hours
Factor 18 - RCT 5 Hours
Factor 40 - Life Scientist 10 Hours
Factor 50 - Project Manager 13 Hours
Factor 10000 - A5H Subcontracted Services 2,500 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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<tr>
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<th>Cost Element</th>
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Rocky Flats Closure Project

Baseline Cost and Basis of Estimate

WBS No: 1GAC0601
Activity ID: 1GFT611210

Baseline Devi
WBS Filter: 1GAC
Activity Filter: *

Starts In FY: *

Factors 2500, sub/c support

Line Item 0100 - readiness assessment

Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation

Item Desc:
Evaluate readiness of the field characterization team and plans.

Breakdown of Cost Data:
Units: hours
Unit Cost: $187
Unit Cost Adjustment Factor: 0.25
Revised Unit: 48

Units: 1 lot
Unit Cost: $4800
Unit Cost Adjustment Factor: 0.25
Revised Unit: $1200

It was estimated that subcontractor involvement would require 80 hours at $60/hour = $4,800. It was assumed that about 3 weeks of time was required for an environmental engineer or similar person in addition to 12 hours of project management, which yielded 132 hours. An additional 11 hours was added for management oversight. It was estimated that a radiological engineer (QA) and an industrial hygienist would be needed for 2.5 days each (22 hours).

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 projects will be conducted at once and only one of each fixed cost is needed for the group.

Factor 132 - Environmental Engineer 33 Hours
Factor 22 - Health Physicists 6 Hours
Factor 11 - Manager 3 Hours
Factor 22 - Quality Assurance 6 Hours
Factor 4,800 - ASH Subcontracted Svrs 1,200 Dollars

20 hours of administrative time will also be required.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

**WBS No:** 1GAC0601  
**Activity ID:** 1GFT611240

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**Line Item 0200 - training**

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:**
Conduct perform Training in support of source removal action.

**Breakdown of Cost Data:**
- **Item**: Site Labor to perform above individual tasks for T-3/T-4.
  - **Units**: hours
  - **Cost**: 132 hours
  - **Unit Cost Adjustment Factor**: 0.25
  - **Revised Unit**: 33 hours
- **Item**: Subcontractor costs to perform above individual tasks for T-3/T-4.
  - **Units**: 1 lot
  - **Cost**: $12K
  - **Unit Cost Adjustment Factor**: 0.25
  - **Revised Unit**: $3K

**Resources**

**Line Item 0300 - pre-evolution meeting**

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:**
Conduct Pre-Evolution Meeting in support of source removal action.

**Breakdown of Cost Data:**
- **Item**: Site Labor to perform above individual tasks for T-3/T-4.
  - **Units**: hours
  - **Cost**: 60 hours
  - **Unit Cost Adjustment Factor**: 0.25
  - **Revised Unit**: 15 hours
- **Item**: Subcontractor costs to perform above individual tasks for T-3/T-4.
  - **Units**: 1 lot
  - **Cost**: $6K
  - **Unit Cost Adjustment Factor**: 0.25
  - **Revised Unit**: $1.5K

**Basis for adjustment.** Costs for each UBC are divided by 4 to account for the fact that 4 UBCs will be remediated at once and only one Pre-Evolution Meeting is needed for the group.
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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**Line Item SYS - Contingency And Escalation**

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**Activity ID:** 1GFT611250

**Description:** Remedial Action - IHSS Group 600-1

**BOE**

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Total for Activity 1GFT611250:

|                  | 1,476  | 49,383 | 92,811 | 86,249 | 228,442 | 17,442 | 245,884 |

**Line Item 0100 - mobilization**

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:**

Mobilization in support of remediation.

**Breakdown of Cost Data:**

**Item:** Site Labor to perform above individual tasks for T-3/T-4.

- **Units:** hours
- **Unit Cost:** 1.100
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** 275

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.

- **Units:** 1 lot
- **Unit Cost:** 184k
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** 46k

**Basis for adjustment.** The costs were divided into fixed costs and variable costs. The fixed costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

**T3/T4 hours 110 Health Physicists 27 Hours**

**T3/T4 hours 330 Manager 83 Hours**
Rocky Flats Closure Project
Baseline Cost and Basis of Estimate
WBS Filter
Baseline Devl
Project
WBS Filter
1GAC
Activity Filter

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

<table>
<thead>
<tr>
<th>Resources</th>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
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<th>Quantity</th>
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<td>Hours</td>
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</table>

Line Item 0200 - site prep

BOE

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc:
Site Preparation including setting up fencing, trailer, etc.

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
Units: hours
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
Units: 1 lot
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

T3/T4 hours 550 Environmental Engineer 138 Hours
T3/T4 hours 110 Industrial Hygienist 27 Hours
T3/T4 subcontractor dollars 184,000 Subcontractor 46,000

0.84576 (SYS 0614000厨房, 84576000 - System 6/23/00 9:21:58 AM Page 555 of 1121

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Resources

<table>
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<th>Cost Element</th>
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<td>750</td>
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This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

**Project**

Baseline Devl

**WBS Filter**

1GAC

**Activity Filter**

Remediation Steelworkers

**Starts In FY**

- **1GAC0601**
- **1GFT611250**

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<td>[SYS 061400], 84576000 - System</td>
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</table>

#### Line Item 0300 - excavation

**BOE**

**Estimator's Experience based generally on historical data for T-3/T4 Remediation.**

**Item Desc:**

- Excavation.

**Breakdown of Historical Data:**

**Item:** Site Labor to perform above individual tasks for T-3/T-4.

- **Units:** hours
- **Unit Cost:** see below
- **Unit Cost Adjustment Factor:** see below
- **Revised Unit:** see below

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.

- **Units:** 1 lot
- **Unit Cost:** see below
- **Unit Cost Adjustment Factor:** see below
- **Revised Unit:** see below

**Basis for adjustment.**

- The costs were divided into fixed costs and variable costs. The fixed costs include Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

**Total Contaminated Soil to be removed:** 133 CY

**Total Soil for Thermal Desorption:** 0 CY

**Offsite Waste Volume:** 133 CY

The excavation cost was based on the excavation cost for the T-3/T-4 Project. Burdened cost based on the T-3/T-4 actuals is $171,487. For the 3,800 cubic yards of contaminated soil removed this yielded a unit cost of $45 per cubic yard of contaminated soil removed. This estimate includes the removal of overburden that might be on top of the contaminated soil. The hours for an environmental engineer from T-3/T-4 were 1.09 hours per cubic yard of contaminated soil. Likewise the hours for the following were assumed to be linearly proportional:

- **Health Physicists:** 0.47 hours per cubic yard
- **Environmental Operations:** 0.31 hours per cubic yard
- **Industrial Hygienists:** 0.31 hours per cubic yard
- **Radiological Control Technician:** 1.00 hour per cubic yard

*Based on $50/cubic yard from T-3/T-4, assumes a labor rate of $50/hour*

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

<table>
<thead>
<tr>
<th>Factor</th>
<th>Description</th>
<th>Hours</th>
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<td>1.09</td>
<td>Environmental Engineer</td>
<td>145</td>
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<tr>
<td>0.47</td>
<td>Health Physicists</td>
<td>63</td>
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<td>0.31</td>
<td>Environmental Operations</td>
<td>41</td>
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<td>0.31</td>
<td>Industrial Hygienists</td>
<td>41</td>
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<td>1.00</td>
<td>Radiological Control Technician</td>
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<td>45.23</td>
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**D&D construction trade hours were calculated using the following methodology:**

ASH subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.

---

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RCT hours were calculated using the following methodology, unless they were already estimated.

For Site Preparation tasks - RCT hours were the same as D&D construction hours.

For all other tasks A5H subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under KG10H department code.

The dollars amounts calculated for D&D construction workers and RCTs were subtracted from the subcontractor dollars and the revised A5H dollar amount was entered into Best.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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<tr>
<td>750 STRAIGHT TIME BASE</td>
<td>M020 MANAGERS (GRADE 69 - 72)</td>
<td>R100S RMRS Salaried</td>
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<tr>
<td>750 STRAIGHT TIME BASE</td>
<td>P090 HEALTH PHYSICISTS</td>
<td>R100S RMRS Salaried</td>
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<td>63.00</td>
<td>Hours</td>
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<td>Factors: 63 hrs</td>
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<tr>
<td>750 STRAIGHT TIME BASE</td>
<td>P090 INDUSTRIAL HYGIENISTS</td>
<td>R100S RMRS Salaried</td>
<td>Linear</td>
<td>41.00</td>
<td>Hours</td>
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<tr>
<td>Factors: 41 hrs</td>
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<tr>
<td>750 STRAIGHT TIME BASE</td>
<td>T050 RADIATION CONTROL TECHNOLIGI</td>
<td>KG10H Remediation Steelworkers</td>
<td>Linear</td>
<td>133.00</td>
<td>Hours</td>
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<tr>
<td>750 STRAIGHT TIME BASE</td>
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**Line Item 0400 - remove and clean debris**

**BOE**

Estimator's Experience based generally on a base case of 700 cy.

**Item Desc:**
Remove and clean debris.

**Breakdown of Historical Data:**

- **Item:** Site Labor to perform above individual tasks for T-3/T-4.
  - **Units:** hours
  - **Unit Cost:** see below
  - **Unit Cost Adjustment Factor:** see below
  - **Revised Unit:** see below

- **Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
  - **Units:** 1 lot
  - **Unit Cost:** see below
  - **Unit Cost Adjustment Factor:** see below
  - **Revised Unit:** see below

**Basis for adjustment.** The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

**Total Contaminated Soil to be removed 133 CY**
**Total Soil for Thermal Desorption 0 CY**
**Offsite Waste Volume 133 CY**

For the base case, it was assumed that about five cubic yards out of 700 cubic yards would be debris and would be segregated and cleaned. It was estimated that each cubic yard of debris would cost $1,000 or $5,000 total for 700 cubic yards. This yields a rate of $7.14 per cubic yard.

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.
D&D construction trade hours were calculated using the following methodology:

A5H subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction. RCT hours were calculated using the following methodology, unless they were already estimated.

For Site Preparation tasks - RCT hours were the same as D&D construction hours. For all other tasks A5H subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under KG10H department code.

The dollars amounts calculated for D&D construction workers and RCTs were subtracted from the subcontractor dollars and the revised A5H dollar amount was entered into Best.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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<tr>
<td>750 STRAIGHT TIME BASE</td>
<td>T100 D&amp;D CONSTRUCTION TRADES (incl.</td>
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<td>Linear</td>
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<td>Factors</td>
<td>3 hrs</td>
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| A5H SUBCONTRACTED SRVS | 0000 NONE | K265S ER Programs | Linear | 651.24 Dollars |
| Factors | 770 sub/c support |

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc:
Confirmation Sampling.

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
Units: hours
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
Units: 1 lot
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Total Contaminated Soil to be removed 133 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 133 CY

The analytical costs were based on T-3/T-4, which cost $435,574 for 3800 cubic yards of contaminated soil removed. This yielded a unit rate of about $115/cubic yard. Based on estimator experience the cost of sampling including labor and materials was estimated to be 20% of that rate or about $23/ cubic yard.

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.
D&D construction trade hours were calculated using the following methodology:

A5H subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.

RCT hours were calculated using the following methodology, unless they were already estimated.

For Site Preparation tasks - RCT hours were the same as D&D construction hours.

For all other tasks A5H subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under KG10H department code.

The dollars amounts calculated for D&D construction workers and RCTs were subtracted from the subcontractor dollars and the revised A5H dollar amount was entered into Best.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
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<th>Curve</th>
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<th>Units</th>
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<tr>
<td>ASH SUBCONTRACTED SRVS</td>
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<td>NONE</td>
<td>K26S ER Programs</td>
<td>Linear</td>
<td>19.39 Dollars</td>
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<td>NONE</td>
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### Line Item 0700 - prepare waste acceptance forms

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:**
Prepare Waste Acceptance Forms

**Breakdown of Historical Data:**

**Item:** Site Labor to perform above individual tasks for T-3/T-4.
- **Units:** hours
- **Unit Cost:** see below
- **Unit Cost Adjustment Factor:** see below
- **Revised Unit:** see below

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
- **Units:** 1 lot
- **Unit Cost:** see below
- **Unit Cost Adjustment Factor:** see below
- **Revised Unit:** see below

**Basis for adjustment.** The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs were adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

**T3/T4 hours 80 environmental engineer 20 hours**

---

### Line Item 0800 - waste acceptance sampling

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:**
Waste Acceptance Sampling

**Breakdown of Historical Data:**

**Item:** Site Labor to perform above individual tasks for T-3/T-4.
- **Units:** hours
- **Unit Cost:** see below

---
Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Because the waste acceptance sampling is difficult to predict and could vary significantly from project to project, it was assumed that about $800 worth of additional analysis would be required for 20 cubic yards which is the volume that can be placed in one roll-off. This yielded a unit rate of about $40/cubic yard. This sampling and analysis is in addition to the confirmational samples so the costs are not as great. It was assumed that this sampling would be more labor intensive so the sampling costs were estimated to be about 50% of the analytical costs or about $20/cubic yard.

Total Contaminated Soil to be removed 133 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 133 CY
The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 40 - ASH Analytical 5,320 Dollars
Factor 20 - ASH Subcontracted Srvs 2,660 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
It was assumed that a field manager would be needed for 150 nine-hour working days or about 33 weeks. This work breaks down as follows:

- Preparation Activities: 50 working days
- Field Activities: 80 working days
- Demobilization: 20 working days
- Total: 150 nine-hour working days or 1350 hours

In addition, it was estimated that technical staff, quality assurance, and project management would be required for the equivalent of ten additional weeks, which is 400 hours each.

Based on the base case of a 700 cubic yard removal project, these values yielded unit rates as follows:

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<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Quantity</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours Per Cubic Yard</td>
<td>Field Manager</td>
<td>1.93</td>
<td></td>
</tr>
<tr>
<td>Of Contaminated Soil</td>
<td>Technical Staff</td>
<td>0.57</td>
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<tr>
<td></td>
<td>Quality Assurance</td>
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<td>Project Management</td>
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</table>

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates:

- Total Contaminated Soil to be removed: 133 CY
- Total Soil for Thermal Desorption: 0 CY
- Offsite Waste Volume: 133 CY

Factors:
- 1.93 - Environmental Engineer: 257 Hours
- 0.57 - Technical Support: 76 Hours
- 0.57 - Project Manager: 76 Hours
- 0.57 - Quality Assurance: 76 Hours

The means (1995) Site Work & Landscape Cost Data includes:

- Common Fill $ 4.77/cubic yard (page 34, Borrow Bank Measure)
- Hauling $ 3.98/cubic yard (page 42, 2-mile round-trip, 6 cubic yard dump truck)
Backfilling: $1.69/cubic yard (page 34)
Burden (43%) $4.49/cubic yard
Total $14.23/cubic yard or about $15/cubic yard

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 15 - A5H Subcontracted Srvs 1,995 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Line Item 1100 - demobilization

**BOE**

*Estimator's Experience based generally on historical data for T-3/T4 Remediation.*

**Item Desc:**
Demobilization.

**Breakdown of Historical Data:**

**Item:** Site Labor to perform above individual tasks for T-3/T-4.
- **Units:** hours
- **Unit Cost Adjustment Factor:** see below
- **Revised Unit:** see below

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
- **Units:** 1 lot
- **Unit Cost Adjustment Factor:** see below
- **Revised Unit:** see below

**Basis for adjustment.** The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Demobilization: Based on the T-3/T-4 project, it was assumed that demobilization costs would cover demobilization for excavation activities also. The subcontractor cost for demobilization was about $95,000 for 3,800 cubic yards at the T-3/T-4 project. In addition it was estimated that the following hours were necessary:

- Environmental Engineer 300 hours
- Health Physicist 100 hours
- Manager 200 hours
- Industrial Hygiene 100 hours

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

**Factor 300 - Environmental Engineer 75 Hours**
**Factor 100 - Health Physicists 25 Hours**
**Factor 200 - Manager 50 Hours**
**Factor 100 - P090 Industrial Hygienists 25 Hours**
**Factor 95000 - A5H Subcontracted Srvs 23,750 Dollars**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
## Rocky Flats Closure Project
### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0601  
**Activity ID:** 1GFT611250  
**Project:** Baseline Devi  
**WBS Filter:** 1GAC  
**Activity Filter:** *  
**Starts In FY:** *

### Line Item 0100 - develop report
#### Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites. (T-3/T-4 and others):**

**Item Desc:** Perform Data Analysis including GIS representation of data, Closeout Report, and associated project management.

**Required level of effort:**
- Environmental Engineer - 80 hours
- Environmental Scientist - 20 hours
- Computer Specialist - 160 hours (GIS, SWD)
- Manager - 20 hours
- Administrative - 20 hours
- Cost Estimators - 20 hours

**Breakdown of Cost Data:**
- Item: Develop Documentation
  - Units: hours
  - Unit Cost: 320
  - Unit Cost Adjustment Factor: none
  - Revised Unit Hours: 320

**Resources**

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**Total for Activity 1GFT611270:**
- Labor Total: 320
- Labor Cost Total: 9,045
- Materials/Sub Cost: 0
- Contingency & Escalation: 0
- Total Prime Cost: 9,045
- Burden Cost: 0
- Total Cost: 9,045
## Project: Denver, CO - Rocky Flats Closure Project
### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0601  
**Activity ID:** 1GFT611270  
**Activity Filter:** 1GAC  
**WBS Filter:** 1GAC

### Line Item 0100 - SAP Addendum

**Description:** Preparation of SAP Addenda to Industrial Area Characterization Plan.  
**Breakdown of Cost Data:**  
- **Item:** Preparation of SAP addenda  
  - **Units:** hours  
  - **Unit Cost:** 120  
  - **Unit Cost Adjustment Factor:** none  
  - **Revised Unit Hours:** 120  

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**Factors**  
- **80** hrs  
- **20** hrs  

**BOE**  
- **Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.**

### Line Item 0200 - HASP Addendum

**Description:** Preparation of HASP addenda to Industrial Area Characterization Plan.  
**Breakdown of Cost Data:**  
- **Item:** Preparation of HASP addenda  
  - **Units:** hours  
  - **Unit Cost:** 120  
  - **Unit Cost Adjustment Factor:** none  
  - **Revised Unit Hours:** 120  

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**Factors**  
- **20** hrs  

**BOE**  
- **Estimated cost per hour: 20.00**

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### Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

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#### Line Item 0300 - QAP Addendum

**BOE**

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

Item Desc:
Preparation of SAP Addenda to Industrial Area Characterization Plan.

Breakdown of Cost Data:
- Item: Preparation of QAP addenda
  - Units: hours
  - Unit Cost: 60
  - Unit Cost Adjustment Factor: none
  - Revised Unit Hours: 60

Basis for adjustment:
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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#### Line Item SYS - Contingency And Escalation

**BOE**

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#### Line Item 0100 - field prep

**BOE**

Estimator's Experience based on 15 years of experience planning, estimating, and conducting projects of similar scope and size.

Item Desc:

Breakdown of Cost Data:
- Item: Site Labor to perform above individual tasks for either Ryan’s Pit or T-3/T-4.
  - Units: hours
  - Unit Cost: 1380
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit: 345 hours

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Total for Activity 1GHF600220:

- 345 hours
- 10,637
- 2,114
- 2,249
- 2,249
- 15,000
- 3,000
- 18,000

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**Page 565 of 1121**

6/23/00 9:21:59 AM

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Rocky Flats Closure Project
Baseline Cost and Basis of Estimate

Item: Subcontractor costs to perform above individual tasks for either Ryan's Pit or T-3/T-4.
Units: 1 lot
Unit Cost: $10K
Unit Cost Adjustment Factor: 0.25
Revised Unit: $2.5K

Basis for adjustment. Hours and costs for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be characterized at once.

Procurement includes preparation of statement of work, proposal review (technical evaluation), and negotiations. Based on a T-3/T-4 burdened cost of $29,186.52. Assuming it is primarily labor hours (RMMS Environmental Engineer charging at $57.45 per hour) yields 508 hours which rounds to 510 total hours.

Davis Bacon Documentation: It was assumed that it would take an environmental engineer twenty-four hours to prepare a Davis Bacon cost estimate and to support the Davis-Bacon determination.

Subcontractor Health and Safety Plan: Costs for the health and safety plan are based on Ryan's Pit, which cost approximately $10,000. It was assumed that these are A5H dollars. In addition, it was assumed that a safety engineer, an industrial hygienist, and a radiological engineer would each provide one week (40 hours) of support for review and document preparation.

Radiological Work Permit: It was assumed that it would take a radiological control technician two working days (18 hours) to complete counting preparation and review.

Implementation Plan: It was estimated that this activity would take 13 weeks of time for engineers, scientists or equivalent to complete. This would include preparation of an implementation plan as required (Rocky Flats Cleanup Agreement, Appendix 3, Interim Guidance Document, Dated August 1977). In addition this includes all tasks related to documentation for the Integrated Work Control Program and Integrated Safety Management.

Ecology Survey/National Environmental Protection Act (NEPA) Support: It was estimated that this would take 40 hours for an ecologist. The activities include NEPA review and support in document preparation, site surveys to verify compliance with ecological regulations, categorical exclusions, and NEPA evaluations.

Utility Clearance/Soil Disturbance Permits: It was estimated based on experience that it would take the equivalent 2 weeks (80 hours) for technical staff to do utility surveys, prepare and review soil disturbance permits, and prepare authorizing documents for excavation.

The combined resources for procurement and field preparations are:
Total Procurement and Field Preparation Hours
- Environmental Engineer 1134 hours
- Safety Engineer 40 hours
- Industrial Hygiene 40 hours
- Radiological Engineering 58 hours
- Radiological Control Technician 18 hours
- Ecologist/Life Scientist 40 hours
- Manager 50 hours
- Quality Assurance* 29 hours
A5H Total $10,000

* On some projects these hours were assumed to be included in other tasks or part of this task under environmental engineer or one of the other job functions.

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

Factor 1134 - Environmental Engineer 283 Hours
Factor 40 - Safety Engineer 10 Hours
Factor 40 - Industrial Hygiene 10 Hours
Factor 58 - Radiological Engineering 14 Hours
Factor 18 - RCT 5 Hours
Factor 40 - Life Scientist 10 Hours
Factor 50 - Project Manager 13 Hours
Factor 10000 - A5H Subcontracted Services 2,500 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### Activity ID: 1GHF600240 - Readiness Review - Group 600-2

#### Description:
Evaluate readiness of the field characterization team and plans.

**Breakdown of Cost Data:**
- **Item:** Site Labor to perform Readiness Assessment for T-3/T-4.
  - **Units:** hours
  - **Unit Cost:** $187
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** 48

- **Item:** Subcontractor costs to perform Readiness Assessment for T-3/T-4.
  - **Units:** 1 lot
  - **Unit Cost:** $4800
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** $1200

It was estimated that subcontractor involvement would require 80 hours at $60/hour = $4,800. It was assumed that about 3 weeks of time was required for an environmental engineer or similar person in addition to 12 hours of project management, which yielded 132 hours. An additional 11 hours was added for management oversight. It was estimated that a radiological engineer (QA) and an industrial hygienist would be needed for 2.5 days each (22 hours).

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 projects will be conducted at once and only one of each fixed cost is needed for the group.

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**Line Item 0100 - readiness assessment**

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**Line Item SYS - Contingency And Escalation**

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**Line Item 0100 - readiness assessment**

**BOE**

Estimator's experience based on 15 years of experience planning, estimating, and conducting projects of similar scope and size.

**Item Desc:**
Evaluate readiness of the field characterization team and plans.

---

**Note:**

Copy and paste the data above into your document where needed.
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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<tr>
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<tr>
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<td>Total Cost</td>
<td>52,199</td>
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Total for Activity 1GHF600250:

| Line Item | 0200 | analyze samples | | |
| Quantity | 0000 | each | | |
| Units | 0000 | | | |
| BOE Type | 0200 | | | |
| Labor Hours/Unit | 0 | | | |
| Labor Hours Total | 0 | | | |
| Labor Cost Total | 0 | | | |
| Materials/Sub Cost | 0 | | | |
| Contingency & Escalation | 0 | | | |
| Total Prime Cost | 0 | | | |
| Burden Cost | 0 | | | |
| Total Cost | 0 | | | |

Total for Activity 1GHF600250: 1,160 49,933 27,639 50,791 128,363 17,777 145,740

**Resources**

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<td>R100S RMRS Salaried</td>
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<td>Hours</td>
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<td>NONE</td>
<td>K265S ER Programs</td>
<td>Linear</td>
<td>1,014.91</td>
<td>Dollars</td>
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<td>1200 Dollars</td>
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</table>

**Line Item 0100 - collect surficial soil samples**

Item Desc:
Collection of surficial soil samples. A site Environmental Engineer will direct the sample collection, containerize, package, and ship the samples; prepare field QC documentation, and prepare field notes on a full time basis. A site Industrial Hygieneist will implement the field portion of the HASP on a full time basis.

Breakdown of Cost Data:
Item: Site Personnel for support of sample collection
Units: hours
Unit Cost: 32
Unit Cost Adjustment Factor: none
Revised Unit Hours: 32

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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<td>8.00</td>
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<td>Factors:</td>
<td>8 hrs</td>
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</table>
Rocky Flats Closure Project
Baseline Cost and Basis of Estimate

WBS No: 1GAC0602
Activity ID: 1GHF600250
Project Baseline Devl
WBS Filter 1GAC
Activity Filter *

---

**Line Item 0200 - analyze samples**

**BOE**

Email quote: average cost from Kaiser-Hill ASD (V. Ideker).

Item Desc:
Analyze samples produced from geoprobe borings. It is anticipated that 3 samples from each boring will be collected. They will be analyzed for Metals, VOCs, SVOCs, PCBs, and radionuclides (est. 3 isotopes) with a 30 day TAT. This item is priced on a per sample basis. Per sample costs include DOT rad screen, bottle charge, shipping, and validation.

Breakdown of Cost Data:
- **Item:** Analyze samples at an offsite laboratory.
- **Units:** Analysis
- **Unit Cost:** Metals $345, VOCs $280, SVOCs $440, PCBs and other analytes $150, and Radionuclides 3 isotopes: $590 per each sample.
- **Unit Cost Adjustment Factor:** Must add: DOT rad screen $7/sample, bottle charge $4.2/bottle, and validation per each: $17.30 VOA, $19.25 SVOC, $16.75 Metals, $5.95 PCB, and $15.60 Rad.
- **Revised Unit Hours:** Metals $405, VOCs $341, SVOCs $502, PCBs and other analytes $199, and Rad $649.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Resources**

<table>
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<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
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<tr>
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</table>

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**Line Item 0300 - project mgmt oversight**

**BOE**

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

Item Desc:
Project Management/Oversight. Based on half time for a Project Manager, Administrative staff, and Cost Estimator/Scheduler.

Breakdown of Cost Data:
- **Item:** Mgmt oversight
- **Units:** Hours
- **Unit Cost:** 12
- **Unit Cost Adjustment Factor:** none
- **Revised Unit Hours:** 12

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Resources**

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<th>Units</th>
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<tr>
<td>750 STRAIGHT TIME BASE</td>
<td>G010</td>
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<td>MANAGERS (GRADE 69 - 72)</td>
<td>R100S RMRS Salaried</td>
<td>Linear</td>
<td>4.00 Hours</td>
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<td>Factors</td>
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<tr>
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<td>OTHER ADMINISTRATIVE &amp; PROFE</td>
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**Line Item SYS - Contingency And Escalation**

**BOE**

0.84576 [SYS 061400] .84576000 - System

**Resources**

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<td>ZDEPT No Department</td>
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## Rocky Flats Closure Project

### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0602  
**Project ID:** 1GHF600250  
**WBS Filter:** 1GAC  
**Activity Filter:**  

**Activity ID:** 1GHF600270  
**Description:** Prepare NFA - Group 600-2

### Factors

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<th>Schedule Risk</th>
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### Activity Details

**WBS No:** 1GAC0602  
**Baseline Cost and Basis of Estimate**  
**Activity ID:** 1GHF600270  
**Description:** Prepare NFA - Group 600-2

**Activity Filter:**

- Starts In FY

---

**Line Item 1010 - develop documentation**

**Description:** Develop Documentation

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<th>Description</th>
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### Resources

**Cost Element**

- STRAIGHT TIME BASE

**Skill**

- E050: ENVIRONMENTAL ENGINEERS  
- E110: QUALITY CONTROL ENGINEERS  
- G010: ADMINISTRATIVE ASSISTANTS  
- M020: MANAGERS (GRADE 69 - 72)  
- P060: COMPUTER SYSTEMS ANALYSTS  
- P160: TECHNICAL WRITERS AND EDITOR  
- P170: OTHER ADMINISTRATIVE & PROFE  
- K265S: MANAGERS (GRADE 69 - 72)  
- K109S: Env Sys, Stewardship & Compliance  
- K215S: INFORMATION RESOURCE MGT  
- K101S: General Counsel

**Department**

- RMRS Salaried  
- RMRS Salaried  
- RMRS Salaried  
- RMRS Salaried  
- RMRS Salaried  
- RMRS Salaried  
- RMRS Salaried  
- RMRS Salaried  

**Factors**

- 80 hrs  
- 4 hrs  
- 6 hrs  
- 4 hrs  
- 4 hrs  
- 25 hrs  
- 15 hrs  
- 4 hrs

---

**Breakdown of Cost Data:**

- **Item Desc:** Perform Data Analysis including GIS representation of data, NFA Summary, and associated project management.
- **Unit Cost:** 138
- **Unit Cost Adjustment Factor:** none

---

**Estimate:**

- Based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.
- This estimate was constructed based on actual hours required to complete previous NFA Reports (obtained from actual author) and professional judgement of level of effort required for remaining reports.

---

**Item Description:**

- Develop Documentation

- **Environmental Engineers:** 45 hrs  
- **SWD Technician:** 10 hrs  
- **GIS Technician:** 15 hrs  
- **Technical Editor:** 15 hrs  
- **Technical Reviews:**
  - QA: 4 hrs  
  - Peer (2): 8 hrs  
  - Compliance: 4 hrs  
  - Environmental: 4 hrs  
  - Management (2): 8 hrs  
  - Legal: 4 hrs  
- **Administrative Support:** 6 hrs  
- **Environmental Engineer:** 15 hrs  

- **Unit Cost Adjustment Factor:** none

---

**Revised Unit Hours:** 138

---

**Basis for adjustment:** N/A

---

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 project: Rocky Flats Closure Project

Baseline Cost and Basis of Estimate

WBS No: 1GAC0602

WBS Filter: 1GAC

Activity ID: 1GHF600270

Activity Filter: *

Starts In FY: *

Remediation, Industrial & Site Serv

ENVIRONMENTAL SCIENTISTS

Linear

4.00 Hours

Remediation, Industrial & Site Serv

ENVIRONMENTAL SCIENTISTS

Linear

8.00 Hours

WBS No: 1GAC0603

Title: Group 600-3 (B668)

Activity ID: 1GHF600300

Description: Planning HSS - Group 600-3 (B668)

Cost Risk: 1

Schedule Risk: 1

BOE

Line Item 0100 - SAP Addenda

Item Desc:
Preparation of SAP Addenda to Industrial Area Characterization Plan.

Breakdown of Cost Data:
Item: Preparation of SAP addenda
Units: hours
Unit Cost: 120
Unit Cost Adjustment Factor: none
Revised Unit Hours: 120

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

Resources

Cost Element | Skill | Quantity | Units | Department | Curve | Quantity | Units
---|---|---|---|---|---|---|---
750 | STRAIGHT TIME BASE | E050 | ENVIRONMENTAL ENGINEERS | R100S | RMRS Salaried | Linear | 80.00 | Hours
Factors | 80 hrs

750 | STRAIGHT TIME BASE | M020 | MANAGERS (GRADE 69 - 72) | R100S | RMRS Salaried | Linear | 20.00 | Hours
Factors | 20 hrs

ASH | SUBCONTRACTED SRVS | P070 | COST ESTIMATORS PLANNERS AN | K26S | ER Programs | Linear | 710.44 | Dollars
Factors | 0.84576 | [SYS 061400] | 84576000 - System

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### Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

#### WBS Filter: 1GAC

**Activity ID:** 1GHF600300

**WBS No.:** 1GAC0603

**Activity Filter:** *

**Starts In FY:** *

---

**Baseline Devl WBS Filter**

---

**Project:** Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

---

**WBS No.:** 1GAC0603

**Activity ID:** 1GHF600300

**WBS Filter:** 1GAC

**Activity Filter:** *

**Starts In FY:** *

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<td>RMRS Salaried</td>
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**Line Item 0300 - QAP Addenda**

**BOE**

Estimate based on Estimator’s Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Item Desc:**
Preparation of SAP Addenda to Industrial Area Characterization Plan.

**Breakdown of Cost Data:**
- **Item:** Preparation of QAP addenda
  - **Units:** hours
  - **Unit Cost:** 60
  - **Unit Cost Adjustment Factor:** none
  - **Revised Unit Hours:** 60

Basis for adjustment:

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

**Resources**

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<tr>
<td>Factors 40 hrs</td>
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**Line Item SYS - Contingency And Escalation**

**BOE**

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**Resources**

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**Activity ID:** 1GHF600320

**Description:** Procurement & Field Preparation - IHSS Grp 600-3

**Cost Risk:** 1

**Schedule Risk:** 1

---

**Line Item 0100 - field prep**

**BOE**

Estimator’s Experience based on 15 years of experience planning, estimating, and conducting projects of similar scope and size.

**Item Desc:**

**Breakdown of Cost Data:**
- **Item:** Site Labor to perform above individual tasks for either Ryan’s Pit or T-3/T-4.
  - **Units:** hours

---

**Line Item 0100 - field prep**

**BOE**

Total for Activity 1GHF600320:

---

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**OFFICIAL USE ONLY**
**Item:** Subcontractor costs to perform above individual tasks for either Ryan’s Pit or T-3/T-4.

<table>
<thead>
<tr>
<th>Units</th>
<th>Unit Cost</th>
<th>Unit Cost Adjustment Factor</th>
<th>Revised Unit</th>
</tr>
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<tbody>
<tr>
<td>1 lot</td>
<td>$10K</td>
<td>0.25</td>
<td>345 hours</td>
</tr>
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</table>

Basis for adjustment. Hours and costs for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be characterized at once.

Procurement includes preparation of statement of work, proposal review (technical evaluation), and negotiations. Based on a T-3/T-4 burdened cost of $29,186.52. Assuming it is primarily labor hours (RMRS Environmental Engineer charging at $57.45 per hour) yields 508 hours which rounds to 510 total hours.

Davis Bacon Documentation: It was assumed that it would take an environmental engineer twenty-four hours to prepare a Davis Bacon cost estimate and to support the Davis-Bacon determination.

Subcontractor Health and Safety Plan: Costs for the health and safety plan are based on Ryan’s Pit, which cost approximately $10,000. It was assumed that these are A5H dollars. In addition, it was assumed that a safety engineer, an industrial hygienist, and a radiological engineer would each provide one week (40 hours) of support for review and document preparation.

Radiological Work Permit: It was assumed that it would take a radiological control technician two working days (18 hours) to complete counting preparation and review.

Implementation Plan: It was estimated that this activity would take 13 weeks of time for engineers, scientists or equivalent to complete. This would include preperation of an implementation plan as required (Rocky Flats Cleanup Agreement, Appendix 3, Interim Guidance Document, Dated August 1977). In addition this includes all tasks related to documentation for the Integrated Work Control Program and Integrated Safety Management.

Ecology Survey/National Environmental Protection Act (NEPA) Support: It was estimated that this would take 40 hours for an ecologist. The activities include NEPA review and support in document preparation, site surveys to verify compliance with ecological regulations, categorical exclusions, and NEPA evaluations.

Utility Clearance/Soil Disturbance Permits: It was estimated based on experience that it would take the equivalent 2 weeks (80 hours) for technical staff to do utility surveys, prepare and review soil disturbance permits, and prepare authorizing documents for excavation.

The combined resources for procurement and field preparations are

<table>
<thead>
<tr>
<th>Total Procurement and Field Preparation Hours</th>
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</thead>
<tbody>
<tr>
<td>Environmental Engineer 1134 hours</td>
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<tr>
<td>Safety Engineer 40 hours</td>
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<tr>
<td>Industrial Hygiene 40 hours</td>
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<tr>
<td>Radiological Engineering 58 hours</td>
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<td>Radiological Control Technician 18 hours</td>
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<td>Ecologist/Life Scientist 40 hours</td>
</tr>
<tr>
<td>Manager 50 hours</td>
</tr>
<tr>
<td>Quality Assurance 29 hours</td>
</tr>
<tr>
<td>A5H Total $10,000</td>
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* On some projects these hours were assumed to be included in other tasks or part of this task under environmental engineer or one of the other job functions.

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

| Factor 1134 - Environmental Engineer 283 Hours |
| Factor 40 - Safety Engineer 10 Hours           |
| Factor 40 - Industrial Hygiene 10 Hours        |
| Factor 58 - Radiological Engineering 14 Hours  |
| Factor 18 - RCT 5 Hours                        |
| Factor 40 - Life Scientist 10 Hours            |
| Factor 50 - Project Manager 13 Hours           |
| Factor 10000 - A5H Subcontracted Services 2,500 Dollars |

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### Rocky Flats Closure Project

#### Baseline Cost and Basis of Estimate

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
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<th>Units</th>
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**Activity ID:** 1GHF600340

**Description:** Readiness Review - Group 600-3

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<th>Labor Hours Total</th>
<th>Labor Cost Total</th>
<th>Materials/Sub Cost</th>
<th>Contingency &amp; Escalation</th>
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#### Breakdown of Cost Data:

**Item 0100 - readiness assessment**

**Item Desc:**

Estimator's Experience based on 15 years of experience planning, estimating and conducting projects of similar scope and size.

**Breakdown of Cost Data:**

**Item:** Site Labor to perform Readiness Assessment for T-3/T-4.

- **Units:** hours
  - **Unit Cost:** 187
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** 48

**Item:** Subcontractor costs to perform Readiness Assessment for T-3/T-4.

- **Units:** 1 lot
  - **Unit Cost:** $4,800
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** $1200

It was estimated that subcontractor involvement would require 80 hours at $60/hour = $4,800. It was assumed that about 3 weeks of time was required for an environmental engineer or similar person in addition to 12 hours of project management, which yielded 132 hours. An additional 11 hours was added for management oversight. It was estimated that a radiological engineer (QA) and an industrial hygienist would be needed for 2.5 days each (22 hours).

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 projects will be conducted at once and only one of each fixed cost is needed for the group.
**Resources**

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**Line Item SYS - Contingency And Escalation**

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**Activity ID: 1GHF600350**

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**Total for Activity 1GHF600350:**

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<td>440</td>
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<td>0500</td>
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**Line Item 0100 - collect geoprobe samples**

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Item Desc:** Collection of geoprobe samples with the site geoprobe with two technicians. A site Environmental Engineer will direct the boring placement, log the borings; collect, containerize, package, and ship the samples; prepare field QC documentation, and prepare field notes on a full time basis. A site RCT will monitor the site for radiological contamination on a full time basis. A site Industrial Hygieneist will implement the field portion of the HASP on a full time basis. Decon Operations staff will decon the vehicle and equipment when it leaves the work area on a half time basis.

**Breakdown of Cost Data:**

**Item:** Site Personnel for support of geoprobe samples

**Units:** hours

**Unit Cost:** $32

**Unit Cost Adjustment Factor:** none

**Revised Unit Hours:** 32
**Item**: Kaiser-Hill/RMRS Geoprobe unit with 2 Technician crew. Item costs $100 per hour or $800 per 8-hour day.

- **Units**: dollars
- **Unit Cost**: $100
- **Unit Cost Adjustment Factor**: none
- **Revised Unit Hours**: 800

Basis for adjustment:

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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<th>Department</th>
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<td>R100S RMRS Salaried</td>
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<td>Hours</td>
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**Line Item 0200 - analyze samples (radionuclides)**

**Vendor Quote**

Email quote: average cost from Kaiser-Hill ASD (V. Ideker).

**Item Desc:**

Analyze samples produced from geoprobe borings. It is anticipated that 3 samples from each boring will be collected. They will be analyzed for Metals, VOCs, SVOCs, PCBs, and radionuclides (est. 3 isotopes) with a 30 day TAT. This item is priced on a per sample basis. Per sample costs include DOT rad screen, bottle charge, shipping, and validation.

**Breakdown of Cost Data:**

- **Item**: Analyze samples at an offsite laboratory.
- **Units**: analysis
- **Unit Cost**: Metals $345, VOCs $280, SVOCs $440, PCBs and other analytes $150, and Radionuclides 3 isotopes) $590 per each sample.
- **Unit Cost Adjustment Factor**: Must add: DOT rad screen $32/sample, bottle charge $7/sample, shipping $4.2/bottle, and validation per each: $17.30 VOA, $19.25 SVOC, $16.75 Metals, $5.95 PCB, and $15.60 Rad.
- **Revised Unit Hours**: Metals $405, VOCs $341, SVOCs $502, PCBs and other analytes $199, and Rad $649.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

<table>
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<tr>
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<th>Department</th>
<th>Curve</th>
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**Line Item 0300 - project mgmt oversight**

**Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.**

**Item Desc:**

Project Management/Oversight. Based on half time for a Project Manager, Administrative staff, and Cost Estimator/Scheduler.

**Breakdown of Cost Data:**

- **Item**: Mgmt oversight
- **Units**: hours
- **Unit Cost**: 12
- **Unit Cost Adjustment Factor**: none
- **Revised Unit Hours**: 12

Basis for adjustment:

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### Rocky Flats Closure Project
#### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0603  
**Activity ID:** 1GHF600350  
**Project:** Baseline Devl  
**WBS Filter:** 1GAC  
**Activity Filter:** *  
**Starts In FY:** *

#### Resources

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<th>Curve</th>
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<td>RMRS Salaried</td>
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**Factors**
- 4 hrs

**Cost Element**
- Line Item 0400 - analyze samples (vocs)
  - **BOE**
  - **Vendor Quote**
  - **Email quote:** average cost from Kaiser-Hill ASD (V. Ideker).
  - **Item Desc:**
    Analyze samples produced from geoprobe borings. It is anticipated that 3 samples from each boring will be collected. They will be anlyzed for Metals, VOCs, SVOCs, PCBs, and radionuclides (est. 3 isotopes) with a 30 day TAT. This item is priced on a per sample basis. Per sample costs include DOT rad screen, bottle charge, shipping, and validation.
  - **Breakdown of Cost Data:**
    - **Item:** Analyze samples at an offsite laboratory.
    - **Units:** analysis
    - **Unit Cost:** Metals $345, VOCs $280, SVOCs $440, PCBs and other analytes $150, and Radionuclides 3 isotopes $590 per each sample.
    - **Unit Cost Adjustment Factor:** Must add: DOT rad screen $32/sample, bottle charge $7/sample, shipping $4.2/bottle, and validation per each: $17.30 VOA, $19.25 SVOC, $15.60 PCB, and $5.95 Rad.
  - **Revised Unit Hours:** Metals $405, VOCs $341, SVOCs $502, PCBs and other analytes $199, and Rad $649.
  - **This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.**

**Resources**

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**Factors**
- 341 dollars

**Cost Element**
- Line Item 0500 - collect surficial soil samples
  - **BOE**
  - **Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.**
  - **Item Desc:**
    Collection of surficial soil samples. A site Environmental Engineer will direct the sample collection, containerize, package, and ship the samples; prepare field QC documentation, and prepare field notes on a full time basis. A site RCT will monitor the site for radiological contamination on a full time basis. A site Industrial Hygienest will implement the field portion of the HASP on a full time basis.
  - **Breakdown of Cost Data:**
    - **Item:** Site Personnel for support of sample collection
    - **Units:** hours
    - **Unit Cost:** 24
    - **Unit Cost Adjustment Factor:** none
    - **Revised Unit Hours:** 24

**Resources**

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<td>RMRS Salaried</td>
<td>Linear</td>
<td>8.00</td>
<td>Hours</td>
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<tr>
<td>750 STRAIGHT TIME BASE</td>
<td>P090 INDUSTRIAL HYGIENISTS</td>
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<td>KG10H Remediation Steelworkers</td>
<td>Linear</td>
<td>8.00</td>
<td>Hours</td>
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**Factors**
- 8 hrs

**Cost Element**
- Line Item SYS - Contingency And Escalation
  - **BOE**
  - **Estimate:**
    Contingency and escalation.

**Resources**

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<tr>
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**Factors**
- 73,598.1 Dollars
### Rocky Flats Closure Project

#### Baseline Cost and Basis of Estimate

**Project:** Rocky Flats Closure Project  
**Baseline Deviation:**  
**WBS Filter:** 1GAC  
**Activity Filter:**  
**Starts In FY:**

<table>
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#### Activity ID: 1GAC00603

**Description:** Prepare NFA - Group 600-3

**Cost:** 1GAC008370

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<th>Description</th>
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<th>Units</th>
<th>BOE Type</th>
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<th>Labor Cost Total</th>
<th>Material/Sub Cost</th>
<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
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Total for Activity 1GAC0060370:

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**Line Item 0100 - develop documentation**

**BOE Estimate:**

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites. This estimate was constructed based on actual hours required to complete previous NFA Reports (obtained from actual author) and professional judgement of level of effort required for remaining reports.

**Item Desc:**
Perform Data Analysis including GIS representation of data, NFA Summary, and associated project management.

**Breakdown of Cost Data:**

**Item:** Develop Documentation  
**Units:** Hours  
**Unit Cost:** 138  

- **Technical Editor** (15 hrs): Complete initial and revised tech edits of Report.
- **Technical Reviews**
  - QA (4 hrs): Review and comment per area of expertise.
  - Peer (2) (8 hrs): Review and comment per area of expertise.
  - Compliance (4 hrs): Review and comment per area of expertise.
  - Environmental (4 hrs): Review and comment per area of expertise.
  - Management (2) (8 hrs): Review and comment per area of expertise.
  - Legal (4 hrs): Review and comment per area of expertise.
- **Environmental Engineer** (15 hrs): Disposition comments and finalize document.
- **Administrative Support** (6 hrs): Copy & assemble final documents, submit to records.

**Unit Cost Adjustment Factor:** none  
**Revised Unit Hours:** 138  
**Basis for adjustment:** N/A

### Resources

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**Rocky Flats Closure Project**  
**Baseline Cost and Basis of Estimate**

**WBS No:** 1GAC0603  
**Activity ID:** 1GHE664100

**Description:** SAP Preparation - IHSS Group 600-4 (Non D&D)

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**Line Item 0100 - SAP Addenda**

*Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.*

**Item Desc:** Preparation of SAP Addenda to Industrial Area Characterization Plan.

**Breakdown of Cost Data:**
- Item: Preparation of SAP addenda
- Units: hours
- Unit Cost: 120
- Unit Cost Adjustment Factor: none
- Revised Unit Hours: 120

**Basis for adjustment:** This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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<th>Curve</th>
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**Line Item 0200 - HASP Addenda**

*Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.*

**Item Desc:** Preparation of HASP addenda to Industrial Area Characterization Plan.

**Breakdown of Cost Data:**
- Item: Preparation of addenda for HASP.
- Units: hours
- Unit Cost: 140
- Unit Cost Adjustment Factor: none
- Revised Unit Hours: 140

**Basis for adjustment:**
### Resources

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<th>Curve</th>
<th>Quantity</th>
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<td>R100S</td>
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#### Line Item 0300 - QAP Addenda

**BOE**

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

Item Desc:
Preparation of SAP Addenda to Industrial Area Characterization Plan.

Breakdown of Cost Data:
- Item: Preparation of QAP addenda
- Unit Cost: 60
- Unit Cost Adjustment Factor: none
- Revised Unit Hours: 60

Basis for adjustment.
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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#### Line Item SYS - Contingency And Escalation

**BOE**

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#### Line Item 0100 - procurement & field prep

**BOE**

Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation

Item Desc:

Breakdown of Cost Data:
- Item: Site Labor to perform above individual tasks for either Ryan's Pit or T-3/T-4.
- Units: hours
- Unit Cost: 1380
Item: Subcontractor costs to perform above individual tasks for either Ryan's Pit or T-3/T-4.
  Units: 1 lot
  Unit Cost: $10K
  Unit Cost Adjustment Factor: 0.25
  Revised Unit: $2.5K

Basis for adjustment. Hours and costs for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be characterized at once.

Procurement includes preparation of statement of work, proposal review (technical evaluation), and negotiations. Based on a T-3/T-4 burdened cost of $29,186.52. Assuming it is primarily labor hours (RMRS Environmental Engineer charging at $57.45 per hour) yields 508 hours which rounds to 510 total hours.  

Davis Bacon Documentation: It was assumed that it would take an environmental engineer twenty-four hours to prepare a Davis Bacon cost estimate and to support the Davis-Bacon determination.

Subcontractor Health and Safety Plan: Costs for the health and safety plan are based on Ryan's Pit, which cost approximately $10,000. It was assumed that these are A5H dollars. In addition, it was assumed that a safety engineer, an industrial hygienist, and a radiological engineer would each provide one week (40 hours) of support for review and document preparation.

Radiological Work Permit: It was assumed that it would take a radiological control technician two working days (18 hours) to complete counting preparation and review.

Implementation Plan: It was estimated that this activity would take 13 weeks of time for engineers, scientists or equivalent to complete. This would include preparation of an implementation plan as required (Rocky Flats Cleanup Agreement, Appendix 3, Interim Guidance Document, Dated August 1977). In addition this includes all tasks related to documentation for the Integrated Work Control Program and Integrated Safety Management.

Ecology Survey/National Environmental Protection Act (NEPA) Support: It was estimated that this would take 40 hours for an ecologist. The activities include NEPA review and support in document preparation, site surveys to verify compliance with ecological regulations, categorical exclusions, and NEPA evaluations.

Utility Clearance/Soil Disturbance Permits: It was estimated based on experience that it would take the equivalent 2 weeks (80 hours) for technical staff to do utility surveys, prepare and review soil disturbance permits, and prepare authorizing documents for excavation.

The combined resources for procurement and field preparations are:

<table>
<thead>
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<th>Total Procurement and Field Preparation Hours</th>
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<td>Environmental Engineer 1134 hours</td>
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<tr>
<td>Safety Engineer 40 hours</td>
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<tr>
<td>Industrial Hygiene 40 hours</td>
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<td>Radiological Engineering 58 hours</td>
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<td>Radiological Control Technician 18 hours</td>
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<td>Ecologist/Life Scientist 40 hours</td>
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<tr>
<td>Manager 50 hours</td>
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<tr>
<td>Quality Assurance* 29 hours</td>
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<tr>
<td>A5H Total $10,000</td>
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* On some projects these hours were assumed to be included in other tasks or part of this task under environmental engineer or one of the other job functions.

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

Factor 1134 - Environmental Engineer 283 Hours
Factor 40 - Safety Engineer 10 Hours
Factor 40 - Industrial Hygiene 10 Hours
Factor 50 - Radiological Engineering 14 Hours
Factor 18 - RCT 5 Hours
Factor 40 - Life Scientist 10 Hours
Factor 50 - Project Manager 13 Hours
Factor 10000 - A5H Subcontracted Services 2,500 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### Resources

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**Line Item SYS - Contingency And Escalation**

| BOE |
|-----------------|-----------------|-----------------|-----------------|
| Resource        | Skill           | Department       | Curve | Quantity | Units |
| 3295.57 CON CONTINGENCY | 0000 NONE | ZDEPT No Department | Linear | 3,295.57 | Dollars |
| 1260.07 ESC ESCALATION | 0000 NONE | ZDEPT No Department | Linear | 1,260.07 | Dollars |

**Activity ID: 1GHE664140**
**Description:** Readiness Assessment - IHSS Group 600-4

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**Line Item 0100 - readiness assessment**

**BOE**

*Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation*

**Item Desc:**
- Evaluate readiness of the field characterization team and plans.

**Breakdown of Cost Data:**

**Item:** Site Labor to perform Readiness Assessment for T-3/T-4.
- Units: hours
- Unit Cost: 187
- Unit Cost Adjustment Factor: 0.25
- Revised Unit: 48

**Item:** Subcontractor costs to perform Readiness Assessment for T-3/T-4.
- Units: 1 lot
- Unit Cost: $4800
- Unit Cost Adjustment Factor: 0.25
- Revised Unit: $1200

It was estimated that subcontractor involvement would require 80 hours at $60/hour = $4,800. It was assumed that about 3 weeks of time was required for an environmental engineer or similar person in addition to 12 hours of project management, which yielded 132 hours. An additional 11 hours was added for management oversight. It was estimated that a radiological engineer (QA) and an industrial hygienist would be needed for 2.5 days each (22 hours).

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 projects will be conducted at once and only one of each fixed cost is needed for the group.
Factor 132 - Environmental Engineer 33 Hours  
Factor 22 - Health Physicists 6 Hours  
Factor 11 - Manager 3 Hours  
Factor 22 - Quality Assurance 6 Hours  
Factor 4,800 - A5H Subcontracted Srvs 1,200 Dollars  
20 hours of administrative time will also be required.  
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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| Item Desc: | Collection of geoprobe samples with the site goeprobe with two technicians. A site Environmental Engineer will direct the boring placement, log the borings; collect, containerize, package, and ship the samples; prepare field QC documentation, and prepare field notes on a full time basis. A site RCT will monitor the site for radiological contamination on a full time basis. A site Industrial Hygieneist will implement the field portion of the HASP on a full time basis. Decon Operations staff will decon the vehicle and equipment when it leaves the work area on a half time basis. It is estimated that one 10' boring will be place per 500 SF of building footprint (same as Bldg. 123 characterization) with 5 samples per 10' boring. It is estimated that one boring per eight hours can be completed.  

Breakdown of Cost Data:  
Item: Site Personnel for support of geoprobe samples  
Units: hours  
Unit Cost: 32  
Unit Cost Adjustment Factor: none  
Revised Unit Hours: 32
### Resources

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<th>Quantity</th>
<th>Units</th>
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<tr>
<td>Item: Kaiser-Hill/RMRS Geoprobe unit with 2 Technician crew. Item costs $100 per hour or $800 per 8-hour day.</td>
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<td>Units: dollars</td>
<td>Unit Cost: $800</td>
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<td>Revised Unit Hours: 800</td>
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Basis for adjustment.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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### Line Item 0200 - analyze samples

**BOE**

Vendor Quote

Email quote: average cost from Kaiser-Hill ASD (V. Ideker).

**Item Desc:**

Analyze samples produced from geoprobe borings. It is anticipated that 3 samples from each boring will be collected. They will be analyzed for Metals, VOCs, SVOCs, PCBs, and radionuclides (est. 3 isotopes) with a 30-day TAT. This item is priced on a per-sample basis. Per-sample costs include DOT rad screen, bottle charge, shipping, and validation.

**Breakdown of Cost Data:**

- **Item:** Analyze samples at an offsite laboratory.
- **Units:** analysis
- **Unit Cost:** Metals $345, VOCs $280, SVOCs $440, PCBs and other analytes $150, and Radionuclides 3 isotopes: $590 per each sample.

**Unit Cost Adjustment Factor:** Must add: DOT rad screen $32/sample, bottle charge $7/sample, shipping $4.2/bottle, and validation per each: $17.30 VOA, $19.25 SVOC, $16.75 Metals, $5.95 PCB, and $15.60 Rad.

**Revised Unit Hours:** Metals $405, VOCs $341, SVOCs $502, PCBs and other analytes $199, and Rad $649.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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</table>

**Line Item 0300 - project mgmt oversight**

**BOE**

**Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.**

**Item Desc:**

Project Management/Oversight. Based on half-time for a Project Manager, Administrative staff, and Cost Estimator/Scheduler.

**Breakdown of Cost Data:**

- **Item:** Mgmt oversight
- **Units:** hours
- **Unit Cost:** 12
- **Unit Cost Adjustment Factor:** none
- **Revised Unit Hours:** 12

Basis for adjustment.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### Rocky Flats Closure Project
#### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0604  
**Activity ID:** 1GHE664150  
**WBS Filter:** 1GAC  
**Starts In FY:** *  

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### Line Item 0100 - develop documentation

**BOE**

**Estimator's Experience:**

Estimate for summary report based on estimator's 16 years of experience performing and costing projects of similar size and scope.

**Item Desc:**

Perform Data Analysis including GIS representation of data, NFA Summary, Characterization Report, and associated project management. Disposition comments and finalize document.

- **Environmental Engineer** 240 hrs Evaluate & assemble existing data. Draft Report.
- **Computer Specialist** 80 hrs Identify & pull existing data from database.
- **GIS Specialist** 80 hrs Develop maps for Report. Print multiple copies.
- **Technical Editor** 40 hrs Complete initial and revised tech edits of Report.
- **Quality Assurance** 60 hrs Review
- **Environmental Engineer** 40 hrs Peer review
- **Regulatory Compliance** 20 hrs Review
- **Legal** 8 hrs Review
- **Administrative Support** 40 hrs Copy & assemble final documents, submit to records.

**Breakdown of Cost Data:**

- **Item:** Develop Documentation
  - **Units:** Hours
  - **Unit Cost:** 656
  - **Unit Cost Adjustment Factor:** none
  - **Revised Unit Hours:** 656

**Basis for adjustment:** N/A

### Resources

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### Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

**Activity ID:** 1GHE664170

**Description:** Prepare Decision Document - IHSS Group 600-4

#### Line Item 0100 - PAM

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**Estimator's Experience based generally on historical data for Ryan's Pit**

**Item Desc:**

Preparation of of PAM or IM/IRA in support of source removal of previously characterized UBC.

Proposed Action Memorandum: A bottoms-up estimate based on historical costs was used as the basis for the estimate. Based on Ryan's Pit (IHSS 108), the cost for the PAM was $50,000 (contractor costs). Assuming that labor rates at this time were approximately $75 (based on a cost center 217). The total labor for a PAM would be approximately 666 hours, which rounds to 700 hours. It was assumed that 10% would be required for managerial hours.

For a PAM the total labor hours are:

- Environmental Engineer 700 Hours
- Manager 70 Hours

Factor 700 Environmental Engineer 175 hours
Factor 70 Manager 18 hours

Breakdown of Cost Data:

- Item: Preparation of PAM for Ryan's Pit source removal action.
- Units: hours
- Unit Cost: 770
- Unit Cost Adjustment Factor: 0.25
- Revised Unit Hours: 193

Basis for adjustment. Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

**Interim Measure/Interim Remedial Action Decision Document:** It was assumed that an IM/IRA Decision Document would take 75% more effort than a PAM or 1,166 hours, which rounds to 1200 hours. It was assumed that 10% of this labor would be required for managerial hours.

For an IM/IRA the total labor hours are:

- Environmental Engineer 1200 Hours
- Manager 240 Hours
### Rocky Flats Closure Project
#### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0604  
**Activity ID:** 1GHE664180

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#### Resources - Line Item 0200 - SAP

**BOE**

Estimator's Experience based generally on historical data for Ryan's Pit

**Item Desc:**
Preparation of SAP in support of source removal of previously characterized UBC.

**Breakdown of Historical Data:**
- Item: Preparation of SAP for Ryan's Pit source removal action.
- Units: hours
- Unit Cost: 300
- Unit Cost Adjustment Factor: 0.25
- Revised Unit Hours: 76

**Basis for adjustment.** Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

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#### Resources - Line Item 0300 - WMP

**BOE**

Estimator's Experience based generally on historical data for Ryan's Pit

**Item Desc:**
Preparation of WMP in support of source removal of previously characterized UBC.

**Breakdown of Historical Data:**
- Item: Preparation of WMP for Ryan's Pit source removal action.
- Units: hours
- Unit Cost: 80
- Unit Cost Adjustment Factor: 0.25
- Revised Unit Hours: 20

**Basis for adjustment.** Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

<table>
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#### Resources - Line Item SYS - Contingency And Escalation

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**Activity ID:** 1GHE664210  
**Description:** Procurement and Field Prep - IHSS Grouping 600-4

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### Baseline Cost and Basis of Estimate

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<td>Contingency And Escalation</td>
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#### Breakdown of Cost Data:

**Item: Site Labor to perform above individual tasks for either Ryan's Pit or T-3/T-4.**

- **Units:** hours
- **Unit Cost:** $138
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** 345 hours

**Item: Subcontractor costs to perform above individual tasks for either Ryan's Pit or T-3/T-4.**

- **Units:** 1 lot
- **Unit Cost:** $10K
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** $2.5K

**Basis for adjustment.** Hours and costs for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be characterized at once.

**Procurement includes preparation of statement of work, proposal review (technical evaluation), and negotiations.** Based on a T-3/T-4 burdened cost of $29,186.52. Assuming it is primarily labor hours (RMRS Environmental Engineer charging at $57.45 per hour) yields 508 hours which rounds to 510 total hours.

**Davis Bacon Documentation:** It was assumed that it would take an environmental engineer twenty-four hours to prepare a Davis Bacon cost estimate and to support the Davis-Bacon determination.

**Subcontractor Health and Safety Plan:** Costs for the health and safety plan are based on Ryan's Pit, which cost approximately $10,000. It was assumed that these are A5H dollars. In addition, it was assumed that a safety engineer, an industrial hygienist, and a radiological engineer would each provide one week (40 hours) of support for review and document preparation.

**Radiological Work Permit:** It was assumed that it would take a radiological control technician two working days (18 hours) to complete counting preparation and review.

**Implementation Plan:** It was estimated that this activity would take 13 weeks of time for engineers, scientists or equivalent to complete. This would include preparation of an implementation plan as required (Rocky Flats Cleanup Agreement, Appendix 3, Interim Guidance Document, Dated August 1977). In addition this includes all tasks related to documentation for the Integrated Work Control Program and Integrated Safety Management.

**Ecology Survey/National Environmental Protection Act (NEPA) Support:** It was estimated that this would take 40 hours for an ecologist. The activities include NEPA review and support in document preparation, site surveys to verify compliance with ecological regulations, categorical exclusions, and NEPA evaluations.

**Utility Clearance/Soil Disturbance Permits:** It was estimated based on experience that it would take the equivalent 2 weeks (80 hours) for technical staff to do utility surveys, prepare and review soil disturbance permits, and prepare authorizing documents for excavation.

The combined resources for procurement and field preparations are

**Total Procurement and Field Preparation Hours**

- Environmental Engineer 1134 hours
- Safety Engineer 40 hours
- Industrial Hygiene 40 hours
- Radiological Engineering 58 hours
- Radiological Control Technician 18 hours
- Ecologist/Life Scientist 40 hours
- Manager 50 hours
- Quality Assurance 29 hours
- A5H Total $10,000
* On some projects these hours were assumed to be included in other tasks or part of this task under environmental engineer or one of the other job functions.

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

Factor 1134 - Environmental Engineer 283 Hours
Factor 40 - Safety Engineer 10 Hours
Factor 40 - Industrial Hygiene 10 Hours
Factor 58 - Radiological Engineering 14 Hours
Factor 18 - RCT 5 Hours
Factor 40 - Life Scientist 10 Hours
Factor 10000 - A5H Subcontracted Services 2,500 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Consumer Price Index-Adjustment

0.84576 (SYS 061400). 84576000 - System

### Line Item 0100 - Readiness Assessment

**Description:** Readiness Assessment - IHSS Group 600-4

**BOE**

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<th>Description</th>
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<th>Burden Cost</th>
<th>Total Cost</th>
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Total for Activity 1GHE664240:

116  3,306  4,821  4,963  13,090  1,151  14,241

**Activity ID:** 1GHE664240

**Description:** Readiness Assessment - IHSS Group 600-4

**BOE**

**Estimator's Experience:** Based generally on historical data for Ryan's Pit and T-3/T4 Remediation

**Item Description:**

Evaluate readiness of the field characterization team and plans.

**Breakdown of Cost Data:**
### Rocky Flats Closure Project
#### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0604  
**Activity ID:** 1GHE664240

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<th>Quantity</th>
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<td><strong>SITE LABOR TO PERFORM INDIVIDUAL TASKS FOR T-3/T-4.</strong></td>
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<td><strong>Units:</strong></td>
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It was estimated that subcontractor involvement would require 80 hours at $60/hour = $4,800. It was assumed that about 3 weeks of time was required for an environmental engineer or similar person in addition to 12 hours of project management, which yielded 132 hours. An additional 11 hours was added for management oversight. It was estimated that a radiological engineer (QA) and an industrial hygienist would be needed for 2.5 days each (22 hours).

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 projects will be conducted at once and only one of each fixed cost is needed for the group.

Factor 132 - Environmental Engineer 33 Hours
Factor 22 - Health Physicists 6 Hours
Factor 11 - Manager 3 Hours
Factor 22 - Quality Assurance 6 Hours
Factor 4,800 - A5H Subcontracted Srvs 1,200 Dollars

20 hours of administrative time will also be required.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### Baseline Cost and Basis of Estimate

#### Rocky Flats Closure Project

**Activity ID:** 1GHE664240  
**WBS No:** 1GAC0604  
**Baseline Devl**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**BOE**

**Resources**

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**Line Item 0300 - pre-evolution meeting**

**Description:**

- Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:**

- Conduct Pre-Evolution Meeting in support of source removal action

- Breakdown of Cost Data:
  - Item: Site Labor to perform above individual tasks for T-3/T-4.
    - Units: hours
    - Unit Cost: $6K
    - Unit Cost Adjustment Factor: 0.25
    - Revised Unit: 15 hours
  - Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
    - Units: 1 lot
    - Unit Cost: $6K
    - Unit Cost Adjustment Factor: 0.25
    - Revised Unit: $1.5K

**Basis for adjustment.** Costs for each UBC are divided by 4 to account for the fact that 4 UBCs will be remediated at once and only one Pre-Evolution Meeting is needed for the group.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**BOE**

**Resources**

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<thead>
<tr>
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**Line Item SYS - Contingency And Escalation**

**BOE**

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### Line Items

**Activity ID:** 1GHE664250  
**Description:** Remedial Action - IHSS Group 600-4

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Rocky Flats Closure Project  
Baseline Cost and Basis of Estimate

WBS No: 1GAC0604  
Activity ID: 1GHE664250

Baseline Deviation

WBS Filter: 1GAC  
Activity Filter: *  
Starts In FY: *

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### Contingency And Escalation

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Total for Activity 1GHE664250:

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### Line Item 0100 - mobilization

**BOE**

**Estimator's Experience based generally on historical data for T-3/T4 Remediation.**

**Item Desc:**

Mobilization in support of remediation.

**Breakdown of Cost Data:**

**Item:** Site Labor to perform above individual tasks for T-3/T-4.

- **Units:** hours
- **Unit Cost:** 1,188
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** 275

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.

- **Units:** 1 lot
- **Unit Cost:** 184k
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** see below

**Basis for adjustment.** The costs were divided into fixed costs and variable costs. The fixed costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

- **T3/T4 hours 110**
- **Health Physicists 27 Hours**
- **Manager 83 Hours**
- **Environmental Engineer 138 Hours**
- **Industrial Hygienist 27 Hours**
- **Subcontractor dollars 184,000**

**This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.**

### Resources

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<th>Department</th>
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### Line Item 0200 - site prep

**BOE**

**Estimator's Experience based generally on historical data for T-3/T4 Remediation.**

**Item Desc:**

Site Preparation including setting up fencing, trailer, etc.

**Breakdown of Historical Data:**

**Item:** Site Labor to perform above individual tasks for T-3/T-4.

- **Units:** hours

---

*OFFICIAL USE ONLY*
Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
  Units: 1 lot
  Unit Cost: see below
  Unit Cost Adjustment Factor: see below
  Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

T3/T4 hours 120 Environmental Engineer 30 hours
T3/T4 dollars 30,000 Subcontracted Svrs 7,500 Dollars

D&D construction trade hours were calculated using the following methodology:

A5R subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.

RCT hours were calculated using the following methodology, unless they were already estimated.

For Site Preparation tasks - RCT hours were the same as D&D construction hours.
For all other tasks A5H subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under KG10H department code.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

<table>
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<th>Resources</th>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
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Line Item 0300 - excavation

BOE

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc:
Excavation.

Breakdown of Historical Data:

Item: Site Labor to perform above individual tasks for T-3/T-4.
  Units: hours
  Unit Cost: see below
  Unit Cost Adjustment Factor: see below
  Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
  Units: 1 lot
  Unit Cost: see below
  Unit Cost Adjustment Factor: see below
  Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste...
Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Total Contaminated Soil to be removed 556 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 556 CY

The excavation cost was based on the excavation cost for the T-3/T-4 Project. Burdened cost based on the T-3/T-4 actuals is $171,487. For the 3,800 cubic yards of contaminated soil removed this yielded a unit cost of $45 per cubic yard of contaminated soil removed. This estimate includes the removal of overburden that might be on top of the contaminated soil. The hours for an environmental engineer from T-3/T-4 were 1.09 hours per cubic yard of contaminated soil. Likewise the hours for the following were assumed to be linearly proportional:

Health Physicists .47 hours per cubic yard
Environmental Operations .31 hours per cubic yard
Industrial Hygienists 0.31 hours per cubic yard
Radiological Control Technicians 1.00 hour per cubic yard *

* Based on $50/cubic yard from T-3/T-4, assumes a labor rate of $50/hour

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 1.09 - E050 Environmental Engineer 606 Hours
Factor 0.47 - P080 Health Physicists 261 Hours
Factor 0.31 - Environmental Operations 172 Hours
Factor 0.31 - P090 Industrial Hygienists 172 Hours
Factor 1.00 - T050 Radiological Control Technician 556 Hours
Factor 45.23 - A5H Subcontracted Svrs 25,148 Dollars

D&D construction trade hours were calculated using the following methodology:

ASR subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.

RCT hours were calculated using the following methodology, unless they were already estimated.

For Site Preparation tasks - RCT hours were the same as D&D construction hours.
For all other tasks ASR subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under KG10H department code.

The dollars amounts calculated for D&D construction workers and RCTs were subtracted from the subcontractor dollars and the revised ASR dollar amount was entered into Best.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
Line Item 0400 - remove and clean debris

BOE

Estimator's Experience based generally on a base case of 700 cy.

Item Desc:
Remove and clean debris.

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
Units: hours
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
Units: 1 lot
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Total Contaminated Soil to be removed 556CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 556 CY

For the base case, it was assumed that about five cubic yards out of 700 cubic yards would be debris and would be segregated and cleaned. It was estimated that each cubic yard of debris would cost $1,000 or $5,000 total for 700 cubic yards. This yields a rate of $7.14 per cubic yard.

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 7.14 - A5H Subcontracted Srvs 3,970 Dollars

D&D construction trade hours were calculated using the following methodology:

A5H subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.

RCT hours were calculated using the following methodology, unless they were already estimated.

For Site Preparation tasks - RCT hours were the same as D&D construction hours.

For all other tasks A5H subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under KG10H department code.

The dollars amounts calculated for D&D construction workers and RCTs were subtracted from the subcontractor dollars and the revised A5H dollar amount was entered into Best.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
Breakdown of Historical Data:

Item: Site Labor to perform above individual tasks for T-3/T-4.
Units: hours
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
Units: 1 lot
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Total Contaminated Soil to be removed 556 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 556 CY

The analytical costs were based on T-3/T-4, which cost $435,574 for 3800 cubic yards of contaminated soil removed. This yielded a unit rate of about $115/cubic yard. Based on estimator experience the cost of sampling including labor and materials was estimated to be 20% of that rate or about $23/ cubic yard.

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 114.62 - ASH Subcontracted Srvs (Analytical) 63,729 Dollars
Factor 22.924 - ASH Subcontracted Srvs 12,745 Dollars

D&D construction trade hours were calculated using the following methodology:

ASH subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.

RCT hours were calculated using the following methodology, unless they were already estimated.

For Site Preparation tasks - RCT hours were the same as D&D construction hours.
For all other tasks ASH subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under KG10H department code.

The dollars amounts calculated for D&D construction workers and RCTs were subtracted from the subcontractor dollars and the revised ASH dollar amount was entered into Best.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

Resources

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Line Item 0700 - prepare waste acceptance forms

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc:
Prepare Waste Acceptance Forms

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
**Rocky Flats Closure Project**

*Baseline Cost and Basis of Estimate*

**WBS No:** 1GAC0604  
**Activity ID:** 1GHE664250

**Activity Filter:** *  
**Due In FY:** *

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**Estimator's Experience based generally on historical data for T-3/T-4 Remediation.**

**Breakdown of Historical Data:**

**Item:** Waste Acceptance Sampling

- **Unit Cost:** see below
- **Unit Cost Adjustment Factor:** see below
- **Revised Unit:** see below

**Item:** Site Labor to perform above individual tasks for T-3/T-4.

- **Units:** hours
- **Unit Cost:** see below
- **Unit Cost Adjustment Factor:** see below
- **Revised Unit:** see below

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.

- **Units:** 1 lot
- **Unit Cost:** see below
- **Unit Cost Adjustment Factor:** see below
- **Revised Unit:** see below

---

**Basis for adjustment.** The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

---

**T3/T4 hours 80 environmental engineer 20 hours**

**Total Contaminated Soil to be removed 556 CY**

**Total Soil for Thermal Desorption 0 CY**

**Offsite Waste Volume 556 CY**

---

**This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.**
Estimator's Experience based generally on a base case of 700 cy.

Field Oversight and Project Management

Breakdown of Historical Data:
- Item: Site Labor to perform above individual tasks for T-3/T-4.
  - Units: hours
  - Unit Cost: see below
  - Unit Cost Adjustment Factor: see below
  - Revised Unit: see below

- Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
  - Units: 1 lot
  - Unit Cost: see below
  - Unit Cost Adjustment Factor: see below
  - Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

It was assumed that a field manager would be needed for 150 nine-hour working days or about 33 weeks. This work breaks down as follows:

Preparation Activities - 50 working days
Field Activities – 80 working days
Demobilization - 20 working days
Total 150 nine-hour working days or 1350 hours

In addition it was estimated that technical staff, quality assurance, and project management would be required for the equivalent of ten additional weeks, which is 400 hours each.

Based on the base case of a 700 cubic yard removal project, these values yielded unit rates as follows

Hours Per Cubic Yard
- Of Contaminated Soil
- Field Manager 1.93
- Technical Staff .57
- Quality Assurance .57
- Project Management 0.57

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Total Contaminated Soil to be removed 556 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 556 CY

Factor 1.93 - Environmental Engineer 1073 Hours
Factor 0.57 - Technical Support 317 Hours
Factor 0.57 - Project Manager 317 Hours
Factor 0.57 - Quality Assurance 317 Hours

Resources

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6/23/00 9:22:06 AM OFFICIAL USE ONLY
WBS No: 1GAC0604
Activity ID: 1GHE664250

Rocky Flats Closure Project
Baseline Cost and Basis of Estimate

**Line Item 1000 - backfill**

**BOE**

Trade Publication
Means 1995, Site Work & Landscape Cost Data (page 34, 42, and 34)

Item Desc:
Backfill.

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
   Units: hours
   Unit Cost: see below
   Unit Cost Adjustment Factor: see below
   Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
   Units: 1 lot
   Unit Cost: see below
   Unit Cost Adjustment Factor: see below
   Revised Unit: see below

Means (1995) Site Work & Landscape Cost Data as follows:
Common Fill $ 4.77/cubic yard (page 34 Borrow Bank Measure)
Hauling $ 3.98/cubic yard (page 42 2-mile round-trip, 6 cubic yard dump truck)
Backfilling $ 1.69/cubic yard (page 34)
Burden (43%) $ 4.49/cubic yard
Total $14.23/cubic yard or about $15/cubic yard

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 15 - A5H Subcontracted Srvs 8,340 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Line Item 1100 - demobilization**

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc:
Demobilization.

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
   Units: hours
   Unit Cost: see below
   Unit Cost Adjustment Factor: see below
   Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
   Units: 1 lot

---

**Resources**

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Factors 15 units per yard in crates

0.84576 [SYS 061400], 84576000 - System
### Resources

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### Line Item SYS - Contingency And Escalation

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### Total for Activity 1GHE664270:

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### Notes:
- The costs were divided into fixed costs and variable costs. The fixed costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.
- Demobilization: Based on the T-3/T-4 project, it was assumed that demobilization costs would cover demobilization for excavation activities also. The subcontractor cost for demobilization was about $95,000 for 3,800 cubic yards at the T-3/T-4 project. In addition it was estimated that the following hours were necessary:
  - Environmental Engineer 300 hours
  - Health Physicist 100 hours
  - Manager 200 hours
  - Industrial Hygienist 100 hours

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

**Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.**
Perform Data Analysis including GIS representation of data, Closeout Report, and associated project management.

Breakdown of Cost Data:
- Item: Develop Documentation
  - Units: hours
  - Unit Cost: 320
  - Revised Unit Hours: 320
  - Basis for adjustment.

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**Line Item SYS - Contingency And Escalation**

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**Line Item 0100 - SAP Addenda**

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

Item Desc:
- Preparation of SAP Addenda to Industrial Area Characterization Plan.

Breakdown of Cost Data:
- Item: Preparation of SAP addenda
  - Units: hours
  - Unit Cost: 120
  - Revised Unit Hours: 120
  - Basis for adjustment.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
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#### Line Item 0200 - HASP Addendum

**BOE**

- **Item Desc:** Preparation of HASP addenda to Industrial Area Characterization Plan

- **Breakdown of Cost Data:**
  - Item: Preparation of addenda for HASP
  - Units: hours
  - Unit Cost: 140
  - Unit Cost Adjustment Factor: none
  - Revised Unit Hours: 140

- **Basis for adjustment:** Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

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#### Line Item 0300 - QAP Addendum

**BOE**

- **Item Desc:** Preparation of SAP Addenda to Industrial Area Characterization Plan

- **Breakdown of Cost Data:**
  - Item: Preparation of QAP addenda
  - Units: hours
  - Unit Cost: 60
  - Unit Cost Adjustment Factor: none
  - Revised Unit Hours: 60

- **Basis for adjustment:** Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

- **Other estimated cost reductions:**

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#### Line Item SYS - Contingency And Escalation

**BOE**

- **Item Desc:**

- **Breakdown of Cost Data:**
  - Item: Preparation of QAP addenda
  - Units: hours
  - Unit Cost: 60
  - Unit Cost Adjustment Factor: none
  - Revised Unit Hours: 60

- **Basis for adjustment:**

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0.84576 [SYS 061400].84576000 - System

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**Rocky Flats Closure Project**

**Baseline Cost and Basis of Estimate**

- **Project:** Baseline Devl
- **WBS Filter:** 1GAC
- **Activity Filter:** *  
- **Starts In FY:** *

**WBS No:** 1GAC0605

**Activity ID:** 1G60050100

**Description:** Procurement & Field Preparation - IHSS Grp 600-5

**Schedule Risk:** 1  
**Cost Risk:** 1

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**Total for Activity 1G60050120:** 345 10,837 2,114 2,467 15,218 3,755 18,973

**Line Item 0100 - Field Prep**

**Estimator's Experience:** Based on 15 years of experience planning, estimating, and conducting projects of similar scope and size.

**Item Desc:** Prepare Radiological Work Permit, Implementation Plan, Ecology Survey/NEPA Support, and Utility Clearance/Soil Disturbance Permit.

**Breakdown of Cost Data:**

**Item:** Site Labor to perform above individual tasks for either Ryan's Pit or T-3/T-4.
- **Units:** hours
- **Unit Cost:** $1380
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** 345 hours

**Item:** Subcontractor costs to perform above individual tasks for either Ryan's Pit or T-3/T-4.
- **Units:** 1 lot
- **Unit Cost:** $10K
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** $2.5K

**Basis for adjustment:** Hours and costs for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be characterized at once.

**Procurement includes:** preparation of statement of work, proposal review (technical evaluation), and negotiations. Based on a T-3/T-4 burdened cost of $29,186.52. Assuming it is primarily labor hours (RMRS Environmental Engineer charging at $57.45 per hour) yields 508 hours which rounds to 510 total hours.

**Davis Bacon Documentation:** It was assumed that it would take an environmental engineer twenty-four hours to prepare a Davis Bacon cost estimate and to support the Davis-Bacon determination.

**Subcontractor Health and Safety Plan:** Costs for the health and safety plan are based on Ryan's Pit, which cost approximately $10,000. It was assumed that these are A5H dollars. In addition, it was assumed that a safety engineer, an industrial hygienist, and a radiological engineer would each provide one week (40 hours) of support for review and document preparation.

**Radiological Work Permit:** It was assumed that it would take a radiological control technician two working days (18 hours) to complete counting preparation and review.

**Implementation Plan:** It was estimated that this activity would take 13 weeks of time for engineers, scientists or equivalent to complete. This would include preparation of an implementation plan as required (Rocky Flats Cleanup Agreement, Appendix 3, Interim Guidance Document, Dated August 1997). In addition this includes all tasks related to documentation for the Integrated Work Control Program and Integrated Safety Management.

**Ecology Survey/National Environmental Protection Act (NEPA) Support:** It was estimated that this would take 40 hours for an ecologist. The activities include NEPA review and support in document preparation, site surveys to verify compliance with ecological regulations, categorical exclusions, and NEPA evaluations.

**Utility Clearance/Soil Disturbance Permits:** It was estimated based on experience that it would take the equivalent 2 weeks (80 hours) for technical staff to do utility surveys, prepare and review soil disturbance permits, and prepare authorizing documents for excavation.

**The combined resources for procurement and field preparations are:**

- Total Procurement and Field Preparation Hours
  - Environmental Engineer 1134 hours
  - Safety Engineer 40 hours
  - Industrial Hygiene 40 hours
Radiological Engineering 58 hours
Radiological Control Technician 18 hours
Ecologist/Life Scientist 40 hours
Manager 50 hours
Quality Assurance* 29 hours
A5K Total $10,000

* On some projects these hours were assumed to be included in other tasks or part of this task under environmental engineer or one of the other job functions.

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

Factor 1134 - Environmental Engineer 283 Hours
Factor 40 - Safety Engineer 10 Hours
Factor 40 - Industrial Hygiene 10 Hours
Factor 58 - Radiological Engineering 14 Hours
Factor 18 - RCT 5 Hours
Factor 40 - Life Scientist 10 Hours
Factor 50 - Project Manager 13 Hours
Factor 10000 - A5K Subcontracted Services 2,500 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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### BOE

Estimator's Experience based on 15 years of experience planning, estimating and conducting projects of similar scope and size.
### Breakdown of Cost Data:

**Item:** Site Labor to perform Readiness Assessment for T-3/T-4.
- **Units:** hours
- **Unit Cost:** 187
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** 48

**Item:** Subcontractor costs to perform Readiness Assessment for T-3/T-4.
- **Units:** 1 lot
- **Unit Cost:** $4800
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** $1200

It was estimated that subcontractor involvement would require 80 hours at $60/hour = $4,800. It was assumed that about 3 weeks of time was required for an environmental engineer or similar person in addition to 12 hours of project management, which yielded 132 hours. An additional 11 hours was added for management oversight. It was estimated that a radiological engineer (QA) and an industrial hygienist would be needed for 2.5 days each (22 hours).

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 projects will be conducted at once and only one of each fixed cost is needed for the group.

- Factor 132 - Environmental Engineer 33 Hours
- Factor 22 - Health Physicists 6 Hours
- Factor 11 - Manager 3 Hours
- Factor 4,800 - A5H Subcontracted Svrs 1,200 Dollars

20 hours of administrative time will also be required.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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### Line Item SYS - Contingency And Escalation

**BOE**

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### Activity ID: 1G60050140
- Description: Field Characterization - Group 600-5

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Baseline Cost and Basis of Estimate

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Activity Filter: *
Years In FY: *

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Total for Activity 1G60050150:

- 800
- 24,966
- 13,820
- 7,114
- 10,425
- 8,813
- 54,714

Line Item 0200 - analyze samples (radionuclide)

**BOE**

**Item Desc:**
Collection of surficial soil samples. A site Environmental Engineer will direct the sample collection, containerize, package, and ship the samples; prepare field QC documentation, and prepare field notes on a full time basis. A site RCT will monitor the site for radiological contamination on a full time basis.

**Breakdown of Cost Data:**
- Item: Sample Personnel for support of sample collection
- Units: hours
- Unit Cost: 32
- Unit Cost Adjustment Factor: none
- Revised Unit Hours: 32

**Resources**

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Line Item 0300 - project mgmt oversight

**BOE**

**Item Desc:**
Project Management/Oversight. Based on half time for a Project Manager, Administrative staff, and Cost Estimator/Scheduler

**Breakdown of Cost Data:**
- Item: Mgmt oversight
- Units: hours
- Unit Cost: 12
- Unit Cost Adjustment Factor: none

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Line Item 0100 - collect surficial soil samples**

**BOE**

**Item Desc:**
Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Breakdown of Cost Data:**
- Item: Site Personnel for support of sample collection
- Units: hours
- Unit Cost: 32
- Unit Cost Adjustment Factor: none
- Revised Unit Hours: 32

**Resources**

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Revised Unit Hours: 12
Basis for adjustment.
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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Breakdown of Cost Data:

Item: Develop Documentation
Units: Hours
Unit Cost: 138

Environmental Engineer 45 hrs Evaluate & assemble existing data. Draft Report.
SMD Technician 10 hrs Identify & pull existing data from database.
Technical Editor 15 hrs Complete initial and revised tech edits of Report.
Technical Reviews
QA 4 hrs Review and comment per area of expertise.
Peer (2) 8 hrs Review and comment per area of expertise.
Compliance 4 hrs Review and comment per area of expertise.
Environmental 4 hrs Review and comment per area of expertise.
Management (2) 8 hrs Review and comment per area of expertise.
Legal 4 hrs Review and comment per area of expertise.
Environmental Engineer 15 hrs Disposition comments and finalize document.
Administrative Support 6 hrs Copy & assemble final documents, submit to records.

Unit Cost Adjustment Factor: none
Revised Unit Hours: 138
Basis for adjustment. N/A
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### WBS Filter: 1GAC  
### Activity Filter: * 

#### Activity ID: 1G60060100  
#### Description: Planning IHSS - Group 600-6 (Non D&D)  

#### Line Item 0100 - SAP Addenda  
- **Description:** Preparation of IHSS - Group 600-6 (Non D&D)  
  - **Quantity:** 100  
  - **Units:** each  
  - **BOE Type:** EE  
  - **Labor Hours/Unit:** 100  
  - **Labor Hours:** 3,434  
  - **Labor Cost:** 1,212  
  - **Materials/Sub Cost:** 2,239  
  - **Burden Cost:** 3,537  
  - **Total Cost:** 17,218

#### Line Item 0200 - HASP Addendum  
- **Description:** Preparation of HASP Addendum  
  - **Quantity:** 100  
  - **Units:** each  
  - **BOE Type:** EE  
  - **Labor Hours/Unit:** 140  
  - **Labor Hours:** 5,040  
  - **Labor Cost:** 1,908  
  - **Materials/Sub Cost:** 2,100  
  - **Burden Cost:** 7,312  
  - **Total Cost:** 13,680

#### Line Item 0300 - QAP Addendum  
- **Description:** Preparation of QAP Addendum  
  - **Quantity:** 40  
  - **Units:** each  
  - **BOE Type:** EE  
  - **Labor Hours/Unit:** 40  
  - **Labor Hours:** 1,182  
  - **Labor Cost:** 417  
  - **Materials/Sub Cost:** 2,310  
  - **Burden Cost:** 1,893  
  - **Total Cost:** 4,144

#### Line Item SYS - Contingency And Escalation  
- **Description:** Preparation of SAP Addenda to Industrial Area Characterization Plan.  
  - **Quantity:** 1  
  - **Units:** each  
  - **BOE Type:** EE  
  - **Labor Hours/Unit:** 0  
  - **Labor Hours:** 0  
  - **Labor Cost:** 0  
  - **Materials/Sub Cost:** 0  
  - **Burden Cost:** 0  
  - **Total Cost:** 2,239

#### Total for Activity 1G60060100:  
- **Quantity:** 280  
- **Units:** each  
- **BOE Type:** EE  
- **Labor Hours/Unit:** 0  
- **Labor Hours:** 10,021  
- **Labor Cost:** 13,680  
- **Materials/Sub Cost:** 1,421  
- **Burden Cost:** 2,239  
- **Total Cost:** 17,218

**Comment:**  
- **Estimate based on estimator's experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.**  
- **Item Desc:** Preparation of SAP Addenda to Industrial Area Characterization Plan.  
- **Breakdown of Cost Data:**  
  - **Item:** Preparation of SAP addenda  
  - **Units:** hours  
  - **Unit Cost:** 120  
  - **Unit Cost Adjustment Factor:** none  
  - **Revised Unit Hours:** 120  
  - **Basis for adjustment:**  
  - **This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.**
### Resources

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**Line Item 0200 - HASP Addendum**

**BOE**

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Item Desc:**

Preparation of HASP addenda to Industrial Area Characterization Plan

**Breakdown of Cost Data:**

- Item: Preparation of addenda for HASP
- Units: hours
- Unit Cost: 140
- Unit Cost Adjustment Factor: none
- Revised Unit Hours: 140

**Basis for adjustment.**

### Resources

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**Line Item 0300 - QAP Addendum**

**BOE**

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Item Desc:**

Preparation of QAP addenda to Industrial Area Characterization Plan.

**Breakdown of Cost Data:**

- Item: Preparation of QAP addenda
- Units: hours
- Unit Cost: 60
- Unit Cost Adjustment Factor: none
- Revised Unit Hours: 60

**Basis for adjustment.**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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**Line Item SYS - Contingency And Escalation**

**BOE**

### Resources

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6/23/00 9:22:08 AM

OFFICIAL USE ONLY
### Activity ID: 1G60060100
#### Description: Procurement & Field Preparation - IHSS Grp 600-6

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**Total for Activity 1G60060120:**

| Total | 345 | 10,637 | 2,114 | 2,467 | 15,218 | 3,755 | 18,973 |

**BOE Estimator's Experience:**

Based on 15 years of experience planning, estimating, and conducting projects of similar scope and size. 

**Item Desc:**


**Breakdown of Cost Data:**

- **Item:** Site Labor to perform above individual tasks for either Ryan's Pit or T-3/T-4.
  - Units: hours
  - Unit Cost: $1380
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit: 345 hours

- **Item:** Subcontractor costs to perform above individual tasks for either Ryan's Pit or T-3/T-4.
  - Units: 1 lot
  - Unit Cost: $10,000
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit: $2,500

**Basis for adjustment.** Hours and costs for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be characterized at once.

**Procurement includes preparation of statement of work, proposal review (technical evaluation), and negotiations.** Based on a T-3/T-4 burdened cost of $29,186.52. Assuming it is primarily labor hours (RMRS Environmental Engineer charging at $57.45 per hour) yields 508 hours which rounds to 510 total hours.

**Davis Bacon Documentation:** It was assumed that it would take an environmental engineer twenty-four hours to prepare a Davis Bacon cost estimate and to support the Davis-Bacon determination.

**Subcontractor Health and Safety Plan:** Costs for the health and safety plan are based on Ryan's Pit, which cost approximately $10,000. It was assumed that these are A5H dollars. In addition, it was assumed that a safety engineer, an industrial hygienist, and a radiological engineer would each provide one week (40 hours) of support for review and document preparation.

**Radiological Work Permit:** It was assumed that it would take a radiological control technician two working days (18 hours) to complete counting preparation and review.

**Implementation Plan:** It was estimated that this activity would take 13 weeks of time for engineers, scientists or equivalent to complete. This would include preparation of an implementation plan as required (Rocky Flats Cleanup Agreement, Appendix 3, Interim Guidance Document, Dated August 1977). In addition this includes all tasks related to documentation for the Integrated Work Control Program and Integrated Safety Management.

**Ecology Survey/National Environmental Protection Act (NEPA) Support:** It was estimated that this would take 40 hours for an ecologist. The activities include NEPA review and support in document preparation, site surveys to verify compliance with ecological regulations, categorical exclusions, and NEPA evaluations.

**Utility Clearance/Soil Disturbance Permits:** It was estimated based on experience that it would take the equivalent 2 weeks (80 hours) for technical staff to do utility surveys, prepare and review soil disturbance permits, and prepare authorizing documents for excavation.

The combined resources for procurement and field preparations are:

- Total Procurement and Field Preparation Hours
  - Environmental Engineer 1134 hours
  - Safety Engineer 40 hours
  - Industrial Hygiene 40 hours
Radiological Engineering 58 hours
Radiological Control Technician 18 hours
Ecologist/Life Scientist 40 hours
Manager 50 hours
Quality Assurance* 29 hours
A56 Total $10,000

* On some projects these hours were assumed to be included in other tasks or part of this task under environmental engineer or one of the other job functions.

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

Factor 1134 - Environmental Engineer 283 Hours
Factor 40 - Safety Engineer 10 Hours
Factor 40 - Industrial Hygiene 10 Hours
Factor 58 - Radiological Engineering 14 Hours
Factor 18 - RCT 5 Hours
Factor 40 - Life Scientist 10 Hours
Factor 50 - Project Manager 13 Hours
Factor 10000 - A56 Subcontracted Services 2,500 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
Evaluate readiness of the field characterization team and plans.

**Breakdown of Cost Data:**

**Item:** Site Labor to perform Readiness Assessment for T-3/T-4.
- **Units:** hours
- **Unit Cost:** $187
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** 48

**Item:** Subcontractor costs to perform Readiness Assessment for T-3/T-4.
- **Units:** 1 lot
- **Unit Cost:** $4800
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** $1200

It was estimated that subcontractor involvement would require 80 hours at $60/hour = $4,800. It was assumed that about 3 weeks of time was required for an environmental engineer or similar person in addition to 12 hours of project management, which yielded 132 hours. An additional 11 hours was added for management oversight. It was estimated that a radiological engineer (QA) and an industrial hygienist would be needed for 2.5 days each (22 hours).

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 projects will be conducted at once and only one of each fixed cost is needed for the group.

**Factor 132 - Environmental Engineer 33 Hours**
**Factor 22 - Health Physicists 6 Hours**
**Factor 22 - Quality Assurance 6 Hours**
**Factor 4,800 - ASH Subcontracted Srvs, 1,200 Dollars**

20 hours of administrative time will also be required.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Resources**

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**ASH SUBCONTRACTED Srvs** 1200 Dollars

**Line Item SYS - Contingency And Escalation**

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**Activity ID: 1G60060150**
**Description:** Field Characterization - Group 600-6

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### Project Baseline Development

**WBS Filter:** 1GAC

#### WBS Filter: 1GAC

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#### Activity Details:

**Activity ID:** 1G60060150

**Activity Filter:**

- **Starts In FY:** 2000

**Items:**

- **Activity Details:**
  - **Line Item 0100 - Collect Surficial Soil Samples**
  - **Line Item 0200 - Analyze Samples (Pesticides/herbicides)**
  - **Line Item 0300 - Project Mgmt Oversight**

**Resources & Cost Element:**

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**Line Item 0100 - Collect Surficial Soil Samples**

- **Item Desc:**
  - Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

  **Collection of surficial soil samples.** A site Environmental Engineer will direct the sample collection, containerize, package, and ship the samples; prepare field QC documentation, and prepare field notes on a full-time basis. A site RCT will monitor the site for radiological contamination on a full-time basis. A site Industrial Hygienist will implement the field portion of the HASP on a full-time basis.

  **Breakdown of Cost Data:**
  - **Item:** Site Personnel for support of sample collection
  - **Units:** hours
  - **Unit Cost:** 32
  - **Unit Cost Adjustment Factor:** none
  - **Revised Unit Hours:** 32

**Line Item 0200 - Analyze Samples (Pesticides/herbicides)**

- **Item Desc:**
  - Analyze samples produced from geoprobe borings. It is anticipated that 3 samples from each boring will be collected. They will be analyzed for Metals, VOCs, SVOCs, PCBs, and radionuclides (est. 3 isotopes) with a 30 day TAT. This item is priced on a per sample basis. Per sample costs include DOT rad screen, bottle charge, shipping, and validation.

  **Breakdown of Cost Data:**
  - **Item:** Analyze samples at an offsite laboratory.
  - **Unit Cost:** Metals $345, VOCs $280, SVOCs $440, PCBs and other analytes $150, and Radionuclides 3 isotopes) $590 per each sample.
  - **Unit Cost Adjustment Factor:** Must add: DOT rad screen $32/sample, bottle charge $7/sample, shipping $4.2/bottle, and validation per each: $17.30 VOA, $19.25 SVOC, $16.75 Metals, $5.95 PCB, and $15.60 Rad.
  - **Revised Unit Hours:** Metals $405, VOCs $341, SVOCs $502, PCBs and other analytes $199, and Rad $649.

  This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Line Item 0300 - Project Mgmt Oversight**

- **Item Desc:**
  - Project Management/Oversight. Based on half time for a Project Manager, Administrative staff, and Cost Estimator/Scheduler

  **Breakdown of Cost Data:**
  - **Item:** Mgmt oversight
  - **Units:** hours
  - **Unit Cost:** 12

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**Resources**

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**Line Item SYS - Contingency And Escalation**

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**BOE Resources**

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**Line Item 0100 - develop documentation**

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**Line Item 0100 - develop documentation Total for Activity 1G60060170:**

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**Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.**

This estimate was constructed based on actual hours required to complete previous NFA Reports (obtained from actual author) and professional judgement of level of effort required for remaining reports.

**Item Desc:**
Perform Data Analysis including GIS representation of data, NFA Summary, and associated project management.

**Breakdown of Cost Data:**
- **Units:** Hours
- **Unit Cost:** 138
  - Environmental Engineer: 45 hrs Evaluate & assemble existing data. Draft Report.
  - SWD Technician: 10 hrs Identify & pull existing data from database.
  - Technical Editor: 15 hrs Complete initial and revised tech edits of Report.
  - Technical Reviews: QA - 4 hrs Review and comment per area of expertise.
    - Peer (2): 8 hrs Review and comment per area of expertise.
    - Compliance: 4 hrs Review and comment per area of expertise.
    - Environmental: 4 hrs Review and comment per area of expertise.
    - Management (2): 8 hrs Review and comment per area of expertise.
    - Legal: 4 hrs Review and comment per area of expertise.
    - Environmental Engineer: 15 hrs Disposition comments and finalize document.
    - Administrative Support: 6 hrs Copy & assemble final documents, submit to records.
- **Unit Cost Adjustment Factor:** none
- **Revised Unit Hours:** 138

**Basis for adjustment:** N/A
Rocky Flats Closure Project
Baseline Cost and Basis of Estimate

WBS No: 1GAC0606
Activity ID: 1G60060170

Project Baseline Devi
WBS Filter: 1GAC
Activity Filter: *
Starts in FY: *

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Total for Activity 1GER167100:
280 | 10,021 | 1,421 | 2,037 | 13,479 | 2,826 | 16,304 |

Line Item 0100 - SAP Addenda

BOE

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

Item Desc:
Preparation of SAP Addenda to Industrial Area Characterization Plan.

Breakdown of Cost Data:
Item: Preparation of SAP addenda
Units: hours
Unit Cost: 120
Unit Cost Adjustment Factor: none
Revised Unit Hours: 120

Basis for adjustment:
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

Line Item SYS - Contingency And Escalation

BOE

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WBS No: 1GAC0606
Title: Group 700-1 (B709)
Activity ID: 1GER167100
Description: B708 SAP Preparation - IHSS Group 700-1

Page 615 of 1121
6/23/00 9:22:09 AM
OFFICIAL USE ONLY
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**Line Item 0200 - HASP Addenda**

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

Item Desc:
Preparation of HASP addenda to Industrial Area Characterization Plan

Breakdown of Cost Data:
- Item: Preparation of addenda for HASP.
- Units: hours
- Unit Cost: 140
- Unit Cost Adjustment Factor: none
- Revised Unit Hours: 140

Basis for adjustment.

**Resources**

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**Line Item 0300 - QAP Addenda**

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

Item Desc:
Preparation of QAP Addenda to Industrial Area Characterization Plan.

Breakdown of Cost Data:
- Item: Preparation of QAP addenda
- Units: hours
- Unit Cost: 60
- Unit Cost Adjustment Factor: none
- Revised Unit Hours: 60

Basis for adjustment.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Resources**

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**Line Item SYS - Contingency And Escalation**

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

Item Desc:
Preparation of SYS Addenda to Industrial Area Characterization Plan.

Breakdown of Cost Data:
- Item: Preparation of SYS addenda
- Units: hours
- Unit Cost: 140
- Unit Cost Adjustment Factor: none
- Revised Unit Hours: 140

Basis for adjustment.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Resources**

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Baseline Cost and Basis of Estimate

Rocky Flats Closure Project

Baseline Devi

Project Filter

WBS Filter 1GAC

Activity Filter

Starts In FY

WBS No: 1GAC0701

Activity ID: 1GER167100

Baseline Cost and Basis of Estimate

WBS Filter 1GAC

Activity Filter

Starts In FY

Factors 667.296 Dollars

Factors 1369.89 Dollars

Activity ID: 1GER167120

Description: Procurement and Field Prep - IHSS Group 700-1

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Total for Activity 1GER167120:

|                | 345 | 10,637 | 2,114 | 2,249 | 15,000 | 3,000 | 18,000 |

Line Item 0100 - procurement & field prep

BOE

Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation

Item Desc:

Breakdown of Cost Data:

Item: Site Labor to perform above individual tasks for either Ryan's Pit or T-3/T-4.

Units: hours
Unit Cost: 1380
Unit Cost Adjustment Factor: 0.25
Revised Unit: 345 hours

Item: Subcontractor costs to perform above individual tasks for either Ryan's Pit or T-3/T-4.

Units: 1 lot
Unit Cost: $10K
Unit Cost Adjustment Factor: 0.25
Revised Unit: $2.5K

Basis for adjustment. Hours and costs for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be characterized at once.

Procurement includes preparation of statement of work, proposal review (technical evaluation), and negotiations. Based on a T-3/T-4 burdened cost of $29,186.52. Assuming it is primarily labor hours (RMRS Environmental Engineer charging at $57.45 per hour) yields 508 hours which rounds to 510 total hours.

Davis Bacon Documentation: It was assumed that it would take an environmental engineer twenty-four hours to prepare a Davis Bacon cost estimate and to support the Davis-Bacon determination.

Subcontractor Health and Safety Plan: Costs for the health and safety plan are based on Ryan's Pit, which cost approximately $10,000. It was assumed that these are A5H dollars. In addition, it was assumed that a safety engineer, an industrial hygienist, and a radiological engineer would each provide one week (40 hours) of support for review and document preparation.

Radiological Work Permit: It was assumed that it would take a radiological control technician two working days (18 hours) to complete counting preparation and review.

Implementation Plan: It was estimated that this activity would take 13 weeks of time for engineers, scientists or equivalent to complete. This would include preparation of an implementation plan as required (Rocky Flats Cleanup Agreement, Appendix 3, Interim Guidance Document, Dated August 1977). In addition this includes all tasks related to documentation for the Integrated Work Control Program and Integrated Safety Management.

Ecology Survey/National Environmental Protection Act (NEPA) Support: It was estimated that this would take 40 hours for an ecologist. The activities include NEPA review and support in document preparation, site surveys to verify compliance with ecological regulations, categorical exclusions, and NEPA evaluations.

Utility Clearance/Soil Disturbance Permits: It was estimated based on experience that it would take the equivalent 2 weeks (80 hours) for technical staff to do utility surveys, prepare and review soil disturbance permits, and prepare authorizing documents for excavation.

The combined resources for procurement and field preparations are Total Procurement and Field Preparation Hours

Environmental Engineer 1134 hours
Safety Engineer 40 hours  
Industrial Hygiene 40 hours  
Radiological Engineering 58 hours  
Radiological Control Technician 18 hours  
Ecologist/Life Scientist 40 hours  
Manager 50 hours  
Quality Assurance 29 hours  
ASH Total $10,000  

* On some projects these hours were assumed to be included in other tasks or part of this task under environmental engineer or one of the other job functions.

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

Factor 1134 - Environmental Engineer 283 Hours  
Factor 40 - Safety Engineer 10 Hours  
Factor 40 - Industrial Hygiene 10 Hours  
Factor 58 - Radiological Engineering 14 Hours  
Factor 18 - RCT 5 Hours  
Factor 40 - Life Scientist 10 Hours  
Factor 10000 - ASH Subcontracted Services 2,500 Dollars  

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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### Line Item SYS - Contingency And Escalation

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Boe

**Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation**

**Item Desc:**
Evaluate readiness of the field characterization team and plans.

**Breakdown of Cost Data:**

**Item:** Site Labor to perform Readiness Assessment for T-3/T-4.
- Units: hours
  - Unit Cost: 187
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit: 48

**Item:** Subcontractor costs to perform Readiness Assessment for T-3/T-4.
- Units: 1 lot
  - Unit Cost: $4800
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit: $1200

It was estimated that subcontractor involvement would require 80 hours at $60/hour = $4,800. It was assumed that about 3 weeks of time was required for an environmental engineer or similar person in addition to 12 hours of project management, which yielded 132 hours. An additional 11 hours was added for management oversight. It was estimated that a radiological engineer (QA) and an industrial hygienist would be needed for 2.5 days each (22 hours).

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 projects will be conducted at once and only one of each fixed cost is needed for the group.

**Factor 132 - Environmental Engineer 33 Hours**
**Factor 22 - Health Physicists 6 Hours**
**Factor 11 - Manager 3 Hours**
**Factor 22 - Quality Assurance 6 Hours**
**Factor 4,800 - A5H Subcontracted Svrs 1,200 Dollars**

20 hours of administrative time will also be required.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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**Official Use Only**

Page 619 of 1121
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**Line Item 0100 - collect geoprobe samples**

**BOE**

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Item Desc:**
Collection of geoprobe samples with the site geoprobe with two technicians. A site Environmental Engineer will direct the boring placement, log the borings; collect, containerize, package, and ship the samples; prepare field QC documentation, and prepare field notes on a full time basis. A site RCT will monitor the site for radiological contamination on a full time basis. A site Industrial Hygienist will implement the field portion of the HASP on a full time basis. It is estimated that one 10' boring will be place per 500 SF of building footprint (same as Bldg. 123 characterization) with 5 samples per 10' boring. It is estimated that one boring per eight hours can be completed.

**Breakdown of Cost Data:**

**Item:** Site Personnel for support of geoprobe samples

- **Units:** hours
- **Unit Cost:** 32
- **Unit Cost Adjustment Factor:** none
- **Revised Unit Hours:** 32

**Item:** Kaiser-Hill/MMRS Geoprobe unit with 2 Technician crew. Item costs $100 per hour or $800 per 8-hour day.

- **Units:** dollars
- **Unit Cost:** 800
- **Unit Cost Adjustment Factor:** none
- **Revised Unit Hours:** 800

**Basis for adjustment.**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Resources**

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**Line Item 0200 - analyze samples**

**BOE**

Vendor Quote
Email quote:average cost from Kaiser-Hill ASD (V. Ideker).

**Item Desc:**
Analyze samples produced from geoprobe borings. It is anticipated that 5 samples from each boring will be collected. They will be analyzed for Metals, VOCs, SVOCs, PCBs, and radionuclides (est. 3 isotopes) with a 30 day TAT. This item is priced on a per sample basis. Per sample costs include DOT rad screen, bottle charge, shipping, and validation.

**Breakdown of Cost Data:**

**Item:** Analyze samples at an offsite laboratory.

- **Units:** analysis
- **Unit Cost:** Metals $345, VOCs $280, SVOCs $440, PCBs and other analytes $150, and Radionuclides 3 isotopes) $590 per each sample.
- **Unit Cost Adjustment Factor:** Must add: DOT rad screen $32/sample, bottle charge $7/sample, shipping $4.2/bottle, and validation per each: $17.30 VOA, $19.25 SVOC, $16.75 Metals, $5.95 PCB, and $15.60 Rad.
Revised Unit Hours: Metals $405, VOCs $341, SVOCs $502, PCBs and other analytes $199, and Rad $649.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Activity ID: 1GER167170
**Description:** Prepare Summary/NFA - IHSS Group 700-1

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Estimator's Experience:
Estimate for summary report based on estimator's 16 years of experience performing and costing projects of similar size and scope.

**Item Desc:**
Perform Data Analysis including GIS representation of data, NFA Summary, Characterization Report, and associated project management. Disposition comments and finalize document.

- Computer Specialist 80 hrs Identify & pull existing data from database.
- GIS Specialist 80 hrs Develop maps for Report. Print multiple copies.
- Technical Editor 40 hrs Complete initial and revised tech edits of Report.
### Breakdown of Cost Data:
- **Item:** Develop Documentation
- **Units:** Hours
- **Unit Cost:** $656
- **Unit Cost Adjustment Factor:** None
- **Revised Unit Hours:** 656

### Resources

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**Total for Activity 1GER167180:**
- **Labor:** 289 hours
- **Total Cost:** $14,369
- **Burden Cost:** $3,057
- **Total:** $17,426

### Line Item 0100 - PAM

**Estimator's Experience based generally on historical data for Ryan's Pit**

**Item Descr:** Preparation of PAM or IM/IRA in support of source removal of previously characterized UBC.

**Proposed Action Memorandum:** A bottoms-up estimate based on historical costs was used as the basis for the estimate. Based on Ryan's Pit (IHSS 108), the cost for the PAM was $50,000 (contractor costs). Assuming that labor rates at this time were approximately $75 (based on a cost center 217). The total labor for a PAM would be approximately 666 hours, which rounds to 700 hours. It was assumed that 10% would be required for managerial hours.
For a PAM the total labor hours are:

Environmental Engineer 700 Hours
Manager 70 Hours
Factor 70 Environmental Engineer 175 hours
Factor 70 Manager 18 hours

Breakdown of Cost Data:
- Item: Preparation of PAM for Ryan's Pit source removal action.
  - Units: hours
  - Unit Cost: 770
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit Hours: 193

Basis for adjustment. Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

Interim Measure/Interim Remedial Action Decision Document: It was assumed that an IM/IRA Decision Document would take 75% more effort than a PAM or 1,166 hours, which rounds to 1200 hours. It was assumed that 10% of this labor would be required for managerial hours.

For an IM/IRA the total labor hours are

Environmental Engineer 1200 Hours
Manager 120 Hours
Factor 1200 Environmental Engineer 300 hours
Factor 120 Manager 30 hours

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Line Item 0200 - SAP
BOE
Estimator's Experience based generally on historical data for Ryan’s Pit

Item Desc:
Preparation of SAP in support of source removal of previously characterized UBC.

Breakdown of Historical Data:
- Item: Preparation of SAP for Ryan's Pit source removal action.
  - Units: hours
  - Unit Cost: 300
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit Hours: 76

Basis for adjustment. Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

Resources

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Line Item 0300 - WMP
BOE
Estimator's Experience based generally on historical data for Ryan’s Pit

Item Desc:
Preparation of WMP in support of source removal of previously characterized UBC.
### Breakdown of Historical Data:

- **Item:** Preparation of WMP for Ryan's Pit source removal action.
  - Units: hours
  - Unit Cost: $80
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit Hours: 20

Basis for adjustment: Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

### Breakdown of Cost Data:

- **Item:** Site Labor to perform above individual tasks for either Ryan's Pit or T-3/T-4.
  - Units: hours
  - Unit Cost: 1380
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit: 345 hours

- **Item:** Subcontractor costs to perform above individual tasks for either Ryan's Pit or T-3/T-4.
  - Units: 1 lot
  - Unit Cost: $10K
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit: $2.5K

Basis for adjustment: Hours and costs for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be characterized at once.

### Procurement includes preparation of statement of work, proposal review (technical evaluation), and negotiations. Based on a T-3/T-4 burdened cost of $29,186.52. Assuming it is primarily labor hours (RMRS Environmental Engineer charging at $57.45 per hour) yields 508 hours which rounds to 510 total hours.

### Decorative Information:

- **Davis Bacon Documentation:** It was assumed that it would take an environmental engineer twenty-four hours to prepare a Davis Bacon cost estimate and to support the Davis-Bacon determination.
- **Subcontractor Health and Safety Plan:** Costs for the health and safety plan are based on Ryan's Pit, which cost approximately $10,000. It was assumed that these are A5H dollars. In addition, it was assumed that a safety engineer, an industrial hygienist, and a radiological engineer would each provide one week (40 hours) of support for review and document preparation.
Radiological Work Permit: It was assumed that it would take a radiological control technician two working days (18 hours) to complete counting preparation and review.

Implementation Plan: It was estimated that this activity would take 13 weeks of time for engineers, scientists or equivalent to complete. This includes preparation of an implementation plan as required (Rocky Flats Cleanup Agreement, Appendix 3, Interim Guidance Document, Dated August 1977). In addition this includes all tasks related to documentation for the Integrated Work Control Program and Integrated Safety Management.

Ecology Survey/National Environmental Protection Act (NEPA) Support: It was estimated that this would take 40 hours for an ecologist. The activities include NEPA review and support in document preparation, site surveys to verify compliance with ecological regulations, categorical exclusions, and NEPA evaluations.

Utility Clearance/Soil Disturbance Permits: It was estimated based on experience that it would take the equivalent 2 weeks (80 hours) for technical staff to do utility surveys, prepare and review soil disturbance permits, and prepare authorizing documents for excavation.

The combined resources for procurement and field preparations are:

**Total Procurement and Field Preparation Hours**

- Environmental Engineer 1134 hours
- Safety Engineer 40 hours
- Industrial Hygiene 40 hours
- Radiological Engineering 58 hours
- Radiological Control Technician 18 hours
- Ecologist/Life Scientist 40 hours
- Manager 50 hours
- Quality Assurance* 29 hours
- ASH Total $10,000

* On some projects these hours were assumed to be included in other tasks or part of this task under environmental engineer or one of the other job functions.

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

- Factor 1134 - Environmental Engineer 283 Hours
- Factor 40 - Safety Engineer 10 Hours
- Factor 40 - Industrial Hygiene 10 Hours
- Factor 58 - Radiological Engineering 14 Hours
- Factor 18 - RCT 5 Hours
- Factor 40 - Life Scientist 10 Hours
- Factor 50 - Project Manager 13 Hours
- Factor 10000 - ASH Subcontracted Services 2,500 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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### Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

**WBS No:** 1GAC0701

**Activity ID:** 1GER167210

**Project:** Baseline Devl

**WBS Filter:** 1GAC

**Activity Filter:**

**Starts In FY:**

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### Activity 1GER167240 - Description: Readiness Assessment - IHSS Group 700-1

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**Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation**

**Item Desc:**
Evaluate readiness of the field characterization team and plans.

**Breakdown of Cost Data:**
- **Item:** Site Labor to perform Readiness Assessment for T-3/T-4.
  - Units: hours
  - Unit Cost: 187
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit: 48

- **Item:** Subcontractor costs to perform Readiness Assessment for T-3/T-4.
  - Units: 1 lot
  - Unit Cost: $4800
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit: $1200

It was estimated that subcontractor involvement would require 80 hours at $60/hour = $4,800. It was assumed that about 3 weeks of time was required for an environmental engineer or similar person in addition to 12 hours of project management, which yielded 132 hours. An additional 11 hours was added for management oversight. It was estimated that a radiological engineer (QA) and an industrial hygienist would be needed for 2.5 days each (22 hours).

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 projects will be conducted at once and only one of each fixed cost is needed for the group.

**Factor 132:** Environmental Engineer 33 Hours
**Factor 22:** Health Physicists 6 Hours
**Factor 11:** Manager 3 Hours
**Factor 22:** Quality Assurance 6 Hours
**Factor 4,800:** A5H Subcontracted Srvs 1,200 Dollars

20 hours of administrative time will also be required.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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### Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

**WBS No:** 1GAC0701  
**Activity ID:** 1GER167240

#### WBS Filter 1GAC

**Project:** Baseline Devl  
**Activity Filter:** *

#### Activity Filter*

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### Line Item 0200 - Training

**BOE**

**Estimator's Experience based generally on historical data for T-3/T4 Remediation.**

**Item Desc:** Conduct Training in support of source removal action.

**Breakdown of Cost Data:**

- **Item:** Site Labor to perform above individual tasks for T-3/T-4.  
  - **Units:** hours  
  - **Unit Cost:** 132 Hours  
  - **Unit Cost Adjustment Factor:** 0.25  
  - **Revised Unit:** 33 hours

- **Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.  
  - **Units:** 1 lot  
  - **Unit Cost:** $12K  
  - **Unit Cost Adjustment Factor:** 0.25  
  - **Revised Unit:** $3K

**Basis for adjustment.** Costs for each UBC are divided by 4 to account for the fact that 4 UBCs will be remediated at once and only one Training is needed for the group.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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### Resources

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### Line Item 0300 - Pre-Evolution Meeting

**BOE**

**Estimator's Experience based generally on historical data for T-3/T4 Remediation.**

**Item Desc:** Conduct Pre-Evolution Meeting in support of source removal action.

**Breakdown of Cost Data:**

- **Item:** Site Labor to perform above individual tasks for T-3/T-4.  
  - **Units:** hours  
  - **Unit Cost:** 60 hours  
  - **Unit Cost Adjustment Factor:** 0.25  
  - **Revised Unit:** 15 hours

- **Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.  
  - **Units:** 1 lot  
  - **Unit Cost:** $6K  
  - **Unit Cost Adjustment Factor:** 0.25  
  - **Revised Unit:** $1.5K

**Basis for adjustment.** Costs for each UBC are divided by 4 to account for the fact that 4 UBCs will be remediated at once and only one Pre-Evolution Meeting is needed for the group.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
## Rocky Flats Closure Project

### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0701  
**Activity ID:** 1GER167240  
**Baseline Devl:**  
**WBS Filter:** 1GAC  
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**Starts In FY:** *

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### Activity ID: 1GER167250

**Description:** Remedial Action - IHSS Group 700-1

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Total for Activity 1GER167250: 926 31,823 75,495 101,734 209,052 11,262 220,314

### Breakdown of Cost Data:

**Item:** Site Labor to perform above individual tasks for T-3/T-4.  
- **Units:** hours  
- **Unit Cost:** 1,100  
- **Unit Cost Adjustment Factor:** 0.25  
- **Revised Unit:** 275  
- **Basis for adjustment:** The costs were divided into fixed costs and variable costs. The fixed costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

- **T3/T4 hours 110 Health Physicists 27 Hours**  
- **T3/T4 hours 330 Manager 83 Hours**  
- **T3/T4 hours 550 Environmental Engineer 138 Hours**  
- **T3/T4 hours 110 Industrial Hygienist 27 Hours**

---

Official Use Only
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
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Estimated's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc:
- Site Preparation including setting up fencing, trailer, etc.

Breakdown of Historical Data:
- Item: Site Labor to perform above individual tasks for T-3/T-4.
  - Units: hours
  - Unit Cost: see below
  - Unit Cost Adjustment Factor: see below
  - Revised Unit: see below

- Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
  - Units: 1 lot
  - Unit Cost: see below
  - Unit Cost Adjustment Factor: see below
  - Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

T3/T4 hours 120 Environmental Engineer 30 hours
T3/T4 dollars 30,000 Subcontracted Srvs 7,500 Dollars
D&D construction trade hours were calculated using the following methodology:
- A5H subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.

RCT hours were calculated using the following methodology, unless they were already estimated.
For Site Preparation tasks - RCT hours were the same as D&D construction hours.
For all other tasks A5H subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under KG10H department code.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### Line Item 0300 - excavation

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

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#### Breakdown of Historical Data:

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<td>Units: hours</td>
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<td>Unit Cost:</td>
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<table>
<thead>
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<th>Item: Subcontractor costs to perform above individual tasks for T-3/T-4.</th>
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<td>Unit Cost Adjustment Factor:</td>
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#### Basis for adjustment:

The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

- **Total Contaminated Soil to be removed:** 56 CY
- **Total Soil for Thermal Desorption:** 0 CY
- **Offsite Waste Volume:** 56 CY

The excavation cost was based on the excavation cost for the T-3/T-4 Project. Burdened cost based on the T-3/T-4 actuals is $171,487. For the 3,800 cubic yards of contaminated soil removed this yielded a unit cost of $45 per cubic yard of contaminated soil removed. This estimate includes the removal of overburden that might be on top of the contaminated soil. The hours for an environmental engineer from T-3/T-4 were 1.09 hours per cubic yard of contaminated soil. Likewise the hours for the following were assumed to be linearly proportional:

- Health Physicists .47 hours per cubic yard
- Environmental Operations .47 hours per cubic yard
- Industrial Hygienists 0.31 hours per cubic yard
- Radiological Control Technician 1.00 hour per cubic yard

* Based on $50/cubic yard from T-3/T-4, assumes a labor rate of $50/hour

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

- Factor 1.09 - E050 Environmental Engineer 61 Hours
- Factor 0.47 - F080 Health Physicists 26 Hours
- Factor 0.47 - Environmental Operations 26 Hours
- Factor 0.31 - F090 Industrial Hygienists 17 Hours
- Factor 1.00 - T050 Radiological Control Technician Linear 56 Hours
- Factor 45.23 - A5H Subcontracted Srvs 2,533 Dollars

D&D construction trade hours were calculated using the following methodology:

- A5H subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.

RCT hours were calculated using the following methodology, unless they were already estimated.

For Site Preparation tasks - RCT hours were the same as D&D construction hours.
For all other tasks A5H subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under KG10H department code. The dollars amounts calculated for D&D construction workers and RCTs were subtracted from the subcontractor dollars and the revised A5H dollar amount was entered into Best. This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
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| Factors 2052

Line Item 0400 - remove and clean debris

Estimator’s Experience based generally on a base case of 700 cy.

Item Desc:
Remove and clean debris.

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
Units: hours
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
Units: 1 lot
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Total Contaminated Soil to be removed 56 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 56 CY

For the base case, it was assumed that about five cubic yards out of 700 cubic yards would be debris and would be segregated and cleaned. It was estimated that each cubic yard of debris would cost $1,000 or $5,000 total for 700 cubic yards. This yields a rate of $7.14 per cubic yard.

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 7.14 - A5H Subcontracted Svrs 400 Dollars
Resources

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Line Item 0600 - confirmation sampling

BOE

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc:
Confirmation Sampling.

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
Units: hours
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
Units: 1 lot
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Total Contaminated Soil to be removed 56 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 56 CY

The analytical costs were based on T-3/T-4, which cost $435,574 for 3800 cubic yards of contaminated soil removed. This yielded a unit rate of about $115/cubic yard. Based on estimator experience the cost of sampling including labor and materials was estimated to be 20% of that rate or about $23/ cubic yard.

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 114.62 - ASH Subcontracted Srvs (Analytical) 6,419 Dollars
Factor 22.924 - ASH Subcontracted Srvs 1,285 Dollars

D&D construction trade hours were calculated using the following methodology:
ASH subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.

D&D construction trade hours were calculated using the following methodology:
ASH subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.
RCT hours were calculated using the following methodology, unless they were already estimated.

For Site Preparation tasks – RCT hours were the same as D&D construction hours. For all other tasks A5H subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under KG10H department code.

The dollars amounts calculated for D&D construction workers and RCTs were subtracted from the subcontractor dollars and the revised A5H dollar amount was entered into Best.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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**Line Item 0700 - prepare waste acceptance forms**

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc: Prepare Waste Acceptance Forms

Breakdown of Historical Data:

- **Item:** Site Labor to perform above individual tasks for T-3/T-4.
  - Units: hours
  - Unit Cost: see below
  - Unit Cost Adjustment Factor: see below
  - Revised Unit: see below

- **Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
  - Units: 1 lot
  - Unit Cost: see below
  - Unit Cost Adjustment Factor: see below
  - Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

T3/T4 hours 80 environmental engineer 20 hours

**Resources**

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<th>Cost Element</th>
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<th>Department</th>
<th>Curve</th>
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**Line Item 0800 - waste acceptance sampling**

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc: Waste Acceptance Sampling

Breakdown of Historical Data:

- **Item:** Site Labor to perform above individual tasks for T-3/T-4.
  - Units: hours
  - Unit Cost: see below
  - Unit Cost Adjustment Factor: see below
  - Revised Unit: see below

- **Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Because the waste acceptance sampling is difficult to predict and could vary significantly from project to project, it was assumed that about $800 worth of additional analysis would be required for 20 cubic yards which is the volume that can be placed in one roll-off. This yielded a unit rate of about $40/cubic yard. This sampling and analysis is in addition to the confirmational samples so the costs are not as great. It was assumed that this sampling would be more labor intensive so the sampling costs were estimated to be about 50% of the analytical costs or about $20/cubic yard.

Total Contaminated Soil to be removed 56 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 56 CY

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 40 - A5H Analytical 2,240 Dollars
Factor 20 - A5H Subcontracted Srvs 1,120 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
Demobilization - 20 working days
Total 150 nine-hour working days or 1350 hours

In addition it was estimated that technical staff, quality assurance, and project management would be required for the equivalent of ten additional weeks, which is 400 hours each.

Based on the base case of a 700 cubic yard removal project, these values yielded unit rates as follows

Hours Per Cubic Yard
- Field Manager 1.93
- Technical Staff 0.57
- Quality Assurance 0.57
- Project Management 0.57

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Total Contaminated Soil to be removed 56 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 56 CY

Factor 1.93 - Environmental Engineer 108 Hours
Factor 0.57 - Technical Support 32 Hours
Factor 0.57 - Project Manager 32 Hours
Factor 0.57 - Quality Assurance 32 Hours

Total Cost Element: STRAIGHT TIME BASE
Skill: ENVIRONMENTAL ENGINEERS
Department: RMRS Salaried
Curve: Linear
Quantity: 1.93 Hours
Factors: 1.93 units per yard

Total Cost Element: STRAIGHT TIME BASE
Skill: QUALITY CONTROL ENGINEERS
Department: ER Programs
Curve: Linear
Quantity: 0.57 Hours
Factors: 0.57 units per yard

Total Cost Element: STRAIGHT TIME BASE
Skill: MANAGERS (GRADE 69 - 72)
Department: RMRS Salaried
Curve: Linear
Quantity: 0.57 Hours
Factors: 0.57 units per yard

Total Cost Element: STRAIGHT TIME BASE
Skill: ENVIRONMENTAL SCIENTISTS
Department: RMRS Salaried
Curve: Linear
Quantity: 0.57 Hours
Factors: 0.57 units per yard

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The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

**Factor 15 - ASH Subcontracted Svrs 840 Dollars**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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**Resources**

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</table>

**Breakdown of Historical Data:**

- **Item:** Site Labor to perform above individual tasks for T-3/T-4.
  - **Units:** hours
  - **Unit Cost:** see below
  - **Unit Cost Adjustment Factor:** see below
  - **Revised Unit:** see below

- **Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
  - **Units:** 1 lot
  - **Unit Cost:** see below
  - **Unit Cost Adjustment Factor:** see below
  - **Revised Unit:** see below

**Basis for adjustment:** The costs were divided into fixed costs and variable costs. The fixed costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

**Demobilization:** Based on the T-3/T-4 project, it was assumed that demobilization costs would cover demobilization for excavation activities also. The subcontractor cost for demobilization was about $95,000 for 3,800 cubic yards at the T-3/T-4 project. In addition it was estimated that the following hours were necessary:

- **Environmental Engineer 300 hours**
- **Health Physicist 100 hours**
- **Manager 200 hours**
- **Industrial Hygiene 100 hours**

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

- **Factor 300 - Environmental Engineer 75 Hours**
- **Factor 100 - Health Physicists 25 Hours**
- **Factor 200 - Manager 50 Hours**
- **Factor 100 - P090 Industrial Hygienists 25 Hours**
- **Factor 95000 - ASH Subcontracted Svrs 23,750 Dollars**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
## Rocky Flats Closure Project
### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0701  
**Activity ID:** 1GER167250  
**Baseline Devi**  
**WBS Filter** 1GAC  
**Starts In FY**  

### Activity ID: 1GER167270
**Description:** Prepare Closeout Report - IHSS Group 700-1

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**Total for Activity 1GER167270:**

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**Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites. (T-3/T-4 and others)**

**Item Desc:**
Perform Data Analysis including GIS representation of data, Closeout Report, and associated project management.

**Required level of effort:**
- Environmental Engineer - 80 hours
- Environmental Scientist - 160 hours (GIS, SWD)
- Manager - 20 hours
- Administrative - 20 hours
- Cost Estimators - 20 hours

**Breakdown of Cost Data:**
- Item: Develop Documentation
  - Units: hours
  - Unit Cost: 320
  - Unit Cost Adjustment Factor: none
  - Revised Unit Hours: 320

## Resources

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**Line Item SYS - Contingency And Escalation**

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**Line Item 0100 - develop report**

**BOE**

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**Rocky Flats Closure Project**

**Baseline Cost and Basis of Estimate**

**WBS Filter**: 1GAC

**Activity ID**: 1GER674100

**Title**: Group 700-2 (B707)

**Description**: B707 SAP Preparation - IHSS Group 700-2

**Line Item 0100 - SAP Addenda**

- **BOE**: Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

- **Item Desc**:
  - Preparation of SAP Addenda to Industrial Area Characterization Plan.

- **Breakdown of Cost Data**:
  - Item: Preparation of SAP addenda
  - Units: hours
  - Unit Cost: 120
  - Unit Cost Adjustment Factor: none
  - Revised Unit Hours: 120

- **Basis for adjustment**: This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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**Line Item 0200 - HASP Addenda**

- **BOE**: Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

- **Item Desc**:
  - Preparation of HASP addenda to Industrial Area Characterization Plan

- **Breakdown of Cost Data**:
  - Item: Preparation of addenda for HASP.
  - Units: hours
  - Unit Cost: 140
  - Unit Cost Adjustment Factor: none
  - Revised Unit Hours: 140

**Resources**

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### Rocky Flats Closure Project
#### Baseline Cost and Basis of Estimate

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**Starts In FY:** -  

**WBS No:** 1GAC0702  
**Baseline Devl:** -  

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**Project:**  

**Baseline Cost and Basis of Estimate**

**WBS Filter:** 1GAC  
**Starts In FY:** -  

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**Activity ID:** 1GER674100  
**Description:** Procurement and Field Prep - IHSS Group 700-2  
**Cost Risk:** 1  
**Schedule Risk:** 1

**Line Item 0300 - QAP Addenda**

**BOE**  

*Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.*

**Item Desc:**
Preparation of SAP Addenda to Industrial Area Characterization Plan.

**Breakdown of Cost Data:**
- **Item:** Preparation of QAP addenda
  - **Units:** hours
  - **Unit Cost:** 60
  - **Unit Cost Adjustment Factor:** none
  - **Revised Unit Hours:** 60

**Basis for adjustment:**
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Line Item 0300 - QAP Addenda**

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**BOE**

**Resources**

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**Line Item SYS - Contingency And Escalation**

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**Line Item 0100 - Procurement & Field Prep**

**BOE**

*Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation*

**Item Desc:**

**Breakdown of Cost Data:**
- **Item:** Site Labor to perform above individual tasks for either Ryan's Pit or T-3/T-4.
  - **Units:** hours
  - **Unit Cost:** 1380
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit Hours:** 345

**Item:** Subcontractor costs to perform above individual tasks for either Ryan's Pit or T-3/T-4.
- **Units:** 1 lot
  - **Unit Cost:** $10K
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** $2.5K

---

**OKR**

**Page 639 of 1121**

6/23/00 9:22:14 AM  
OFFICIAL USE ONLY
Basis for adjustment. Hours and costs for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be characterized at once.

Procurement includes preparation of statement of work, proposal review (technical evaluation), and negotiations. Based on a T-3/T-4 burdened cost of $29,186.52. Assuming it is primarily labor hours (RMRS Environmental Engineer charging at $57.45 per hour) yields 508 hours which rounds to 510 total hours.

Davis Bacon Documentation: It was assumed that it would take an environmental engineer twenty-four hours to prepare a Davis Bacon cost estimate and to support the Davis-Bacon determination.

Subcontractor Health and Safety Plan: Costs for the health and safety plan are based on Ryan's Pit, which cost approximately $10,000. It was assumed that these are A5H dollars. In addition, it was assumed that a safety engineer, an industrial hygienist, and a radiological engineer would each provide one week (40 hours) of support for review and document preparation.

Radiological Work Permit: It was assumed that it would take a radiological control technician two working days (18 hours) to complete counting preparation and review.

Implementation Plan: It was estimated that this activity would take 13 weeks of time for engineers, scientists or equivalent to complete. This would include preparation of an implementation plan as required (Rocky Flats Cleanup Agreement, Appendix 3, Interim Guidance Document, Dated August 1977). In addition this includes all tasks related to documentation for the Integrated Work Control Program and Integrated Safety Management.

Ecology Survey/National Environmental Protection Act (NEPA) Support: It was estimated that this would take 40 hours for an ecologist. The activities include NEPA review and support in document preparation, site surveys to verify compliance with ecological regulations, categorical exclusions, and NEPA evaluations.

Utility Clearance/Soil Disturbance Permits: It was estimated based on experience that it would take the equivalent 2 weeks (80 hours) for technical staff to do utility surveys, prepare and review soil disturbance permits, and prepare authorizing documents for excavation.

The combined resources for procurement and field preparations are

<table>
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<td>Ecologist/Life Scientist 40 hours</td>
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<td>Manager 50 hours</td>
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* On some projects these hours were assumed to be included in other tasks or part of this task under environmental engineer or one of the other job functions.

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

| Factor 1134 – Environmental Engineer 283 Hours |
| Factor 40 – Safety Engineer 10 Hours |
| Factor 40 – Industrial Hygiene 10 Hours |
| Factor 58 – Radiological Engineering 14 Hours |
| Factor 18 – RCT 5 Hours |
| Factor 40 – Life Scientist 10 Hours |
| Factor 50 – Project Manager 13 Hours |
| Factor 10000 – A5H Subcontracted Services 2,500 Dollars |

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### Rocky Flats Closure Project

#### Baseline Cost and Basis of Estimate

**Project:** Baseline Devl

**WBS Filter:** 1GAC

**Activity Filter:** *

**Activity ID:** 1GER674120

**Description:** Readiness Assessment - IHSS Group 700-2

---

**Line Item 0100 - readiness assessment**

**Description:** Estimate's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation

**Item Desc:**
Evaluate readiness of the field characterization team and plans.

**Breakdown of Cost Data:**
- **Item:** Site Labor to perform Readiness Assessment for T-3/T-4.
  - **Units:** hours
  - **Unit Cost:** $60/hour
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** 48

**Item:** Subcontractor costs to perform Readiness Assessment for T-3/T-4.
  - **Units:** 1 lot
  - **Unit Cost:** $4800
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** $1200

**Item:** Radiological Engineer (QA) and Industrial Hygienist.

**Item:** Manager 3 Hours.

**Item:** Quality Assurance 6 Hours.

**Item:** ASH Subcontracted Srvs 1,200 Dollars.

**Burden Costs:**
- **Boe Type:** EE
- **Units:** 1
- **Burden Cost:** $532

**Total Cost:** $3,925

---

**Line Item 000 - Contingency And Escalation**

**Cost Element:** CON CONTINGENCY

**Department:** ZDEPT

**Contingency And Escalation:**
- **Factors:** 736.69 Dollars
- **Units:** 0000
- **Quantity:** 0

**Boe Type:** No Department

**Total Cost:** $1512.35

---

**Line Item 0100 - readiness assessment**

**Description:**
- **Units:** 48
- **Unit Cost:** $187
- **Unit Cost Adjustment Factor:** 0.25

**Total Cost:** $3,925

---

**Note:**
- The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 projects will be conducted at once and only one of each fixed cost is needed for the group.
- Factor 132 - Environmental Engineer 33 Hours
- Factor 22 - Health Physicists 6 Hours
- Factor 11 - Manager 3 Hours
- Factor 22 - Quality Assurance 6 Hours
- Factor 4,800 - ASH Subcontracted Srvs 1,200 Dollars

---

**Additional Notes:**
- 20 hours of administrative time will also be required.
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
<th>Factors</th>
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<tbody>
<tr>
<td>750 STRAIGHT TIME BASE</td>
<td>E050</td>
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<td>PMRS Salaried</td>
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**Line Item SYS - Contingency And Escalation**

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<th>Quantity</th>
<th>Units</th>
<th>Factors</th>
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**Line Item 0100 - collect geoprobe samples**

- **Item Desc:** Collection of geoprobe samples with the site goeprobe with two technicians. A site Environmental Engineer will direct the boring placement, log the borings; collect, containerize, package, and ship the samples; prepare field QC documentation, and prepare field notes on a full time basis. A site RCT will monitor the site for radiological contamination on a full time basis. A site Industrial Hygieneist will implement the field portion of the HASP on a full time basis. Decon Operations staff will decon the vehicle and equipment when it leaves the work area on a half time basis. It is estimated that one 10' boring will be place per 500 SF of building footprint (same as Bldg. 123 characterization) with 5 samples per 10' boring. It is estimated that one boring per eight hours can be completed.

- **Breakdown of Cost Data:**
  - **Item:** Site Personnel for support of geoprobe samples
    - Units: hours
    - Unit Cost: 25
    - Unit Cost Adjustment Factor: none
    - Revised Unit Hours: 25
  - **Item:** Kaiser-Hill/PMRS Geoprobe unit with 2 Technician crew. It item costs $100 per hour or $800 per 8-hour day.
    - Units: dollars
    - Unit Cost: 800
    - Unit Cost Adjustment Factor: none
    - Revised Unit Hours: 800

---

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6/23/00 9:22:15 AM OFFICIAL USE ONLY
The characterization effort was reduced by 50% because these are newer buildings with new processes and better controls so that spills are less likely and UBC less likely than at Building 123.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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<tr>
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**Cost Element: Line Item 0200 - analyze samples**

**BOE**

Vendor Quote:

Email quote: average cost from Kaiser-Hill ASD (V. Ideker).

**Item Desc:**

Analyze samples produced from geoprobe borings. It is anticipated that 5 samples from each boring will be collected. They will be analyzed for Metals, VOCs, SVOCs, PCBs, and radionuclides (est. 3 isotopes) with a 30 day TAT. This item is priced on a per sample basis. Per sample costs include DOT rad screen, bottle charge, shipping, and validation.

**Breakdown of Cost Data:**

- **Unit Cost:** Metals $345, VOCs $280, SVOCs $440, PCBs and other analytes $150, and Radionuclides (3 isotopes) $590 per each sample.
- **Unit Cost Adjustment Factor:** Must add: DOT rad screen $32/sample, bottle charge $7/sample, shipping $4.2/bottle, and validation per each: $17.30 VOA, $19.25 SVOC, $16.75 Metals, $5.95 PCB, and $15.60 Rad.
- **Revised Unit Costs:** Metals $405, VOCs $341, SVOCs $502, PCBs and other analytes $199, and Rad $649.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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<tr>
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**Cost Element: Line Item 0300 - project mgmt oversight**

**BOE**

**Item Desc:**

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Breakdown of Cost Data:**

- **Unit Cost:** Mgmt oversight
- **Units:** hours
- **Unit Cost:** 12
- **Unit Cost Adjustment Factor:** none
- **Revised Unit Costs:** 12

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### Rocky Flats Closure Project
#### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0702  
**Activity ID:** 1GER674150  
**Project:** Baseline Devi  
**WBS Filter:** 1GAC  
**Activity Filter:**  

#### WBS Filter

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#### Activity ID: 1GER674170
**Description:** Prepare Summary/NFA - IHSS Group 700-2

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Total for Activity 1GER674170: 656 | 19,024 | 0 | 9,420 | 28,444 | 6,145 | 34,588 |

### preparation of documentation

**BOE**

- **Resources**
  - **Cost Element**  
  - **Skill**  
  - **Department**  
  - **Curve**  
  - **Quantity**  
  - **Units**  

#### Cost Element

- **Contingency And Escalation**

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#### Factors

- **70111.6 Dollars**
- **143932 Dollars**

### Breakdown of Cost Data:

- **Item:** Develop Documentation  
  - **Units:** Hours  
  - **Unit Cost:** 656  
  - **Unit Cost Adjustment Factor:** none  
  - **Revised Unit Hours:** 656

### Basis for adjustment: N/A

### Resources

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</table>

#### Factors

- **280.00 Hours**
- **60.00 Hours**
- **40.00 Hours**
- **48.00 Hours**

---

**Estimator's Experience:**

Estimate for summary report based on estimator's 16 years of experience performing and costing projects of similar size and scope.

**Item Description:**

- **Perform Data Analysis including GIS representation of data, NFA Summary, Characterization Report, and associated project management. Disposition comments and finalize document.**

- **Environmental Engineer 240 hrs** Evaluate & assemble existing data. Draft Report.
- **Computer Specialist 80 hrs** Identify & pull existing data from database.
- **GIS Specialist 80 hrs** Develop maps for Report. Print multiple copies.
- **Technical Editor 40 hrs** Complete initial and revised tech edits of Report.
- **Quality Assurance 60 hrs** Review
- **Environmental Engineer 40 hrs** Peer review
- **Regulatory Compliance 20 hrs** Review
- **Management 48 hrs** Review
- **Legal 8 hrs** Review
- **Administrative Support 40 hrs** Copy & assemble final documents, submit to records.

**Breakdown of Cost Data:***

- **Item:** Develop Documentation  
  - **Units:** Hours  
  - **Unit Cost:** 656  
  - **Unit Cost Adjustment Factor:** none  
  - **Revised Unit Hours:** 656

**Basis for adjustment: N/A**
### Line Item 0100 - PAM

**Description:** Preparation of PAM for Ryan's Pit source removal action.

**Units:** hours

**Unit Cost:** $770

**Unit Cost Adjustment Factor:** 0.25

**Revised Unit Hours:** 193

Breakdown of Cost Data:
- **Item:** Preparation of PAM for Ryan's Pit source removal action.
- **Units:** hours
- **Unit Cost:** $770
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit Hours:** 193

**Basis for adjustment:** Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

### Resources

<table>
<thead>
<tr>
<th>Line Item</th>
<th>Description</th>
<th>Quantity</th>
<th>Units</th>
<th>Labor Hours/Unit</th>
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<th>Labor Cost Total</th>
<th>Material/Sub Cost</th>
<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
<th>Burden Cost</th>
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<td>6,135</td>
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<tr>
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</table>

Total for Activity 1GER674180: 289 hours

**Estimated Experience based generally on historical data for Ryan's Pit**

**Item Description:** Preparation of PAM or IM/IRA in support of source removal of previously characterized UBC.

**Proposed Activity Memorandum:** A bottoms-up estimate based on historical costs was used as the basis for the estimate. Based on Ryan's Pit (IHSS 108), the cost for the PAM was $50,000 (contractor costs). Assuming that labor rates at this time were approximately $75 (based on a cost center 217). The total labor for a PAM would be approximately 666 hours, which rounds to 700 hours. It was assumed that 10% would be required for managerial hours.

For a PAM the total labor hours are:

- Environmental Engineer 700 Hours
- Manager 70 Hours

**Factor 700 Environmental Engineer 175 hours**

**Factor 70 Manager 18 hours**

**Breakdown of Cost Data:**
- **Item:** Preparation of PAM for Ryan's Pit source removal action.
- **Units:** hours
- **Unit Cost:** $770
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit Hours:** 193

**Basis for adjustment:** Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.
# Rocky Flats Closure Project

## Baseline Cost and Basis of Estimate

**Project**
- Baseline Devl

**WBS Filter**
- 1GAC

**Activity Filter**
- *

**Starts In FY**
- *

### Line Item 0200 - SAP

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<tr>
<td><strong>Item Desc:</strong></td>
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<tr>
<td>Preparation of SAP in support of source removal of previously characterized UBC.</td>
</tr>
<tr>
<td><strong>Breakdown of Historical Data:</strong></td>
</tr>
<tr>
<td><strong>Item:</strong> Preparation of SAP for Ryan's Pit source removal action.</td>
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<tr>
<td><strong>Units:</strong> hours</td>
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<td><strong>Unit Cost:</strong> 300</td>
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<td><strong>Unit Cost Adjustment Factor:</strong> 0.25</td>
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<td><strong>Revised Unit Hours:</strong> 76</td>
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<tr>
<td><strong>Basis for adjustment:</strong> Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.</td>
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### Resources

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### Line Item 0300 - WMP

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<tr>
<td><strong>Item Desc:</strong></td>
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<tr>
<td>Preparation of WMP in support of source removal of previously characterized UBC.</td>
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<td><strong>Breakdown of Historical Data:</strong></td>
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<tr>
<td><strong>Item:</strong> Preparation of WMP for Ryan's Pit source removal action.</td>
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<td><strong>Units:</strong> hours</td>
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<td><strong>Unit Cost:</strong> 80</td>
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### Resources

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### Line Item SYS - Contingency And Escalation

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<tr>
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### Resources

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### Activity ID: 1GER674210

**Description:** Procurement and Field Prep - IHSS Grouping 700-2

| Cost Risk | 1 |
| Schedule Risk | 1 |

### Line Item 0100 - procurement & field prep

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<tr>
<td><strong>Item Desc:</strong></td>
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<tr>
<td>Prepare Statement of Work, Conflict of Interest Documentation, Proposal Technical Evaluation, Contract Negotiations, Davis-Bacon Determination,</td>
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### Line Item 0100 - procurement & field prep

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Breakdown of Cost Data:

Item: Site Labor to perform above individual tasks for either Ryan's Pit or T-3/T-4.
- Units: hours
- Unit Cost: 1380
- Unit Cost Adjustment Factor: 0.25
- Revised Unit: 345 hours

Item: Subcontractor costs to perform above individual tasks for either Ryan's Pit or T-3/T-4.
- Units: 1 lot
- Unit Cost: $10K
- Unit Cost Adjustment Factor: 0.25
- Revised Unit: $2.5K

Basis for adjustment. Hours and costs for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be characterized at once.

Procurement includes preparation of statement of work, proposal review (technical evaluation), and negotiations. Based on a T-3/T-4 burdened cost of $29,186.52. Assuming it is primarily labor hours (RMRS Environmental Engineer charging at $57.45 per hour) yields 508 hours which rounds to 510 total hours.

Davis Bacon Documentation: It was assumed that it would take an environmental engineer twenty-four hours to prepare a Davis Bacon cost estimate and to support the Davis-Bacon determination.

Subcontractor Health and Safety Plan: Costs for the health and safety plan are based on Ryan's Pit, which cost approximately $10,000. It was assumed that these are A5H dollars. In addition, it was assumed that a safety engineer, an industrial hygienist, and a radiological engineer would each provide one week (40 hours) of support for review and document preparation.

Radiological Work Permit: It was assumed that it would take a radiological control technician two working days (18 hours) to complete counting preparation and review.

Implementation Plan: It was estimated that this activity would take 13 weeks of time for engineers, scientists or equivalent to complete. This would include preparation of an implementation plan as required (Rocky Flats Cleanup Agreement, Appendix 3, Interim Guidance Document, Dated August 1977). In addition this includes all tasks related to documentation for the Integrated Work Control Program and Integrated Safety Management.

Ecology Survey/National Environmental Protection Act (NEPA) Support: It was estimated that this would take 40 hours for an ecologist. The activities include NEPA review and support in document preparation, site surveys to verify compliance with ecological regulations, categorical exclusions, and NEPA evaluations.

Utility Clearance/Soil Disturbance Permits: It was estimated based on experience that it would take the equivalent 2 weeks (80 hours) for technical staff to do utility surveys, prepare and review soil disturbance permits, and prepare authorizing documents for excavation.

The combined resources for procurement and field preparations are

<table>
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<tr>
<th>Total Procurement and Field Preparation Hours</th>
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<tr>
<td>Environmental Engineer 1134 hours</td>
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<tr>
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<td>Industrial Hygiene 40 hours</td>
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<td>Radiological Control Technician 18 hours</td>
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<td>Quality Assurance 29 hours</td>
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<td>A5H Total $10,000</td>
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* On some projects these hours were assumed to be included in other tasks or part of this task under environmental engineer or one of the other job functions.

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

Factor 1134 - Environmental Engineer 283 Hours
Factor 40 - Safety Engineer 10 Hours
Factor 40 - Industrial Hygiene 10 Hours
Factor 58 - Radiological Engineering 14 Hours
### Resources

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<th>Units</th>
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#### Line Item SYS - Contingency And Escalation

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### Activity ID: 1GER674240

**Description:** Readiness Assessment - IHSS Group 700-2

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<th>Materials/Sub Cost</th>
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**Total for Activity 1GER674240:**

|             | 116 | 3,306 | 4,821 | 7,875 | 16,003 | 1,151 | 17,153 |

### Line Item 0100 - readiness assessment

**BOE**

**Item Desc:**

Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation

**Breakdown of Cost Data:**

- **Item:** Site Labor to perform Readiness Assessment for T-3/T4.
- **Units:** hours
- **Unit Cost:** 187
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** 48

- **Item:** Subcontractor costs to perform Readiness Assessment for T-3/T4.
- **Units:** 1 lot
- **Unit Cost:** $4800
It was estimated that subcontractor involvement would require 80 hours at $60/hour = $4,800. It was assumed that about 3 weeks of time was required for an environmental engineer or similar person in addition to 12 hours of project management, which yielded 132 hours. An additional 11 hours was added for management oversight. It was estimated that a radiological engineer (QA) and an industrial hygienist would be needed for 2.5 days (22 hours).

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 projects will be conducted at once and only one of each fixed cost is needed for the group.

- Factor 132 - Environmental Engineer 33 Hours
- Factor 22 - Health Physicists 6 Hours
- Factor 11 - Manager 3 Hours
- Factor 22 - Quality Assurance 6 Hours
- Factor 4,800 - A5H Subcontracted Srvs 1,200 Dollars

20 hours of administrative time will also be required.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
**Line Item 0300 - pre-evolution meeting**

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:**

Conduct Pre-Evolution Meeting in support of source removal action

**Breakdown of Cost Data:**

- **Item:** Site Labor to perform above individual tasks for T-3/T-4.
  - **Units:** hours
  - **Unit Cost:** 60 hours
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** 15 hours

- **Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
  - **Units:** lot
  - **Unit Cost:** $6K
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** $1.5K

Basis for adjustment. Costs for each UBC are divided by 4 to account for the fact that 4 UBCs will be remediated at once and only one Pre-Evolution Meeting is needed for the group.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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**Line Item SYS - Contingency And Escalation**

**BOE**

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**Activity ID:** 1GER674250  
**Description:** Remedial Action - IHSS Group 700-2

---

### Table of Line Items

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**Total for Activity 1GER674250:**

7,518  244,745  279,337  523,623  1,047,704  86,248  1,133,952
### Line Item 0100 - mobilization

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:**
Mobilization in support of remediation.

**Breakdown of Cost Data:**

**Item:** Site Labor to perform above individual tasks for T-3/T-4.

- **Units:** hours
- **Unit Cost:** 1,100
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** 275

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.

- **Units:** 1 lot
- **Unit Cost:** 184k
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** see below

**Basis for adjustment.** The costs were divided into fixed costs and variable costs. The fixed costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

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<thead>
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<td>330 Manager</td>
<td>83 Hours</td>
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<td>550 Environmental Engineer</td>
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<td>110 Industrial Hygienist</td>
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This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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<td>sub/c support</td>
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**Line Item 0200 - site prep**

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:**
Site Preparation including setting up fencing, trailer, etc.

**Breakdown of Historical Data:**

**Item:** Site Labor to perform above individual tasks for T-3/T-4.

- **Units:** hours
- **Unit Cost:** see below
- **Unit Cost Adjustment Factor:** see below
- **Revised Unit:** see below

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.

- **Units:** 1 lot
- **Unit Cost:** see below
Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

T3/T4 hours 120 Environmental Engineer 30 hours
T3/T4 dollars 30,000 Subcontracted Srvs 7,500 Dollars (81% Subcontract = $6075/19% D&D Construction)

D&D construction trade hours represent 19% of the subcontract services dollars and were calculated using the following methodology:

A5H subcontracted dollars were multiplied by .19, the result was divided by $60/hr to determine the number of hours allocated to D&D construction.

For Site Preparation tasks - RCT hours were the same as D&D construction hours.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
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<th>Units</th>
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<td>Remediation Steelworkers</td>
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<td>Hours</td>
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<td>T100 D&amp;D CONSTRUCTION TRADES (incl. ER Programs)</td>
<td>Construction</td>
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<td>23.00</td>
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<td>K265S</td>
<td>Line Item 0300 - excavation</td>
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BOE

Item Desc:
Excavation.

Breakdown of Historical Data:

- **Item**: Site Labor to perform above individual tasks for T-3/T-4.
  - Units: hours
  - Unit Cost: see below
  - Unit Cost Adjustment Factor: see below
  - Revised Unit: see below

- **Item**: Subcontractor costs to perform above individual tasks for T-3/T-4.
  - Units: 1 lot
  - Unit Cost: see below
  - Unit Cost Adjustment Factor: see below
  - Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Total Contaminated Soil to be removed 998 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 998 CY

The excavation cost was based on the excavation cost for the T-3/T-4 Project. Burdened cost based on the T-3/T-4 actuals is $171,487. For the 3,800 cubic yards of contaminated soil removed this yielded a unit cost of $45 per cubic yard of contaminated soil removed. This estimate includes the removal of...
overburden that might be on top of the contaminated soil. The hours for an environmental engineer from T-3/T-4 were 1.09 hours per cubic yard of contaminated soil. Likewise the hours for the following were assumed to be linearly proportional:

Health Physicists, .47 hours per cubic yard
Environmental Operations, .31 hours per cubic yard
Industrial Hygienists, 0.31 hours per cubic yard
Radiological Control Technician, 1.00 hour per cubic yard

* Based on $50/cubic yard from T-3/T-4, assumes a labor rate of $50/hour

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 1.09 - E050 Environmental Engineer 1088 Hours
Factor 0.47 - P080 Health Physicists 469 Hours
Factor 0.31 - Environmental Operations 309 Hours
Factor 0.31 - P090 Industrial Hygienists 309 Hours
Factor 1.00 - T050 Radiological Control Technician 998 Hours
Factor 45.23 - A5H Subcontracted Srvs 45,140 Dollars (81% subcontract services = $36563/19% D&D construction)

D&D construction trade hours represent 19% of the subcontract dollars and were calculated using the following methodology:

A5H subcontracted dollars were multiplied by .19, the result was divided by $60/hr to determine the number of hours allocated to D&D construction.

The dollars amounts calculated for D&D construction workers was subtracted from the subcontractor dollars and the revised A5H dollar amount was entered into Best.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

<table>
<thead>
<tr>
<th>Resources</th>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
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<td>R100S</td>
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<td>MANAGERS (GRADE 69 - 72)</td>
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<td>HEALTH PHYSICISTS</td>
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<td>RMRS Salaried</td>
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<td>RMRS Salaried</td>
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Line Item 0400 - remove and clean debris

BOE Estimator's Experience based generally on a base case of 700 cy.

Item Desc:
Remove and clean debris.

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
Units: hours
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
Units: 1 lot
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Total Contaminated Soil to be removed 998 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 998 CY

For the base case, it was assumed that about five cubic yards out of 700 cubic yards would be debris and would be segregated and cleaned. It was estimated that each cubic yard of debris would cost $1,000 or $5,000 total for 700 cubic yards. This yields a rate of $7.14 per cubic yard.

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

D&D construction trade hours represent 19% of the subcontract dollars and were calculated using the following methodology:

A5H subcontracted dollars were multiplied by .19, the result was divided by $60/hr to determine the number of hours allocated to D&D construction.

The dollars amount calculated for D&D construction workers was subtracted from the subcontractor dollars and the revised A5H dollar amount was entered into Best.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
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### Line Item 0600 - confirmation sampling

BOE

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc:

Confirmation Sampling.

Breakdown of Historical Data:

Item: Site Labor to perform above individual tasks for T-3/T-4.

Units: hours

Unit Cost: see below

Unit Cost Adjustment Factor: see below

Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.

Units: 1 lot

Unit Cost: see below

Unit Cost Adjustment Factor: see below

Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Total Contaminated Soil to be removed 998 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 998 CY
The analytical costs were based on T-3/T-4, which cost $435,574 for 3800 cubic yards of contaminated soil removed. This yielded a unit rate of about $115/cubic yard. Based on estimator experience the cost of sampling including labor and materials was estimated to be 20% of that rate or about $23/cubic yard.

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 114.62 - A5H Subcontracted Srvs (Analytical) 114,391 Dollars
Factor 22.924 - A5H Subcontracted Srvs 22,878 Dollars

D&D construction trade hours were calculated using the following methodology:

A5H subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.

RCT hours were calculated using the following methodology, unless they were already estimated.

For Site Preparation tasks - RCT hours were the same as D&D construction hours.

For all other tasks A5H subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under KG10H department code.

The dollars amounts calculated for D&D construction workers and RCTs were subtracted from the subcontractor dollars and the revised A5H dollar amount was entered into Best.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

<table>
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<tr>
<th>Cost Element</th>
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### Line Item 0700 - prepare waste acceptance forms

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:** Prepare Waste Acceptance Forms

**Breakdown of Historical Data:**

**Item:** Site Labor to perform above individual tasks for T-3/T-4.

- **Units:** hours
- **Unit Cost:** see below
- **Unit Cost Adjustment Factor:** see below
- **Revised Unit:** see below

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.

- **Units:** 1 lot
- **Unit Cost:** see below
- **Unit Cost Adjustment Factor:** see below
- **Revised Unit:** see below

**Basis for adjustment.** The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

**T3/T4 hours 80 environmental engineer 20 hours**

<table>
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<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
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<th>Units</th>
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### Line Item 0800 - waste acceptance sampling

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:** Waste Acceptance Sampling

**Breakdown of Historical Data:**
- **Item:** Site Labor to perform above individual tasks for T-3/T-4.
  - **Units:** hours
  - **Unit Cost:** see below
  - **Unit Cost Adjustment Factor:** see below
  - **Revised Unit:** see below

- **Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
  - **Units:** 1 lot
  - **Unit Cost:** see below
  - **Unit Cost Adjustment Factor:** see below
  - **Revised Unit:** see below

**Basis for adjustment.** The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Because the waste acceptance sampling is difficult to predict and could vary significantly from project to project, it was assumed that about $800 worth of additional analysis would be required for 20 cubic yards which is the volume that can be placed in one roll-off. This yielded a unit rate of about $40/cubic yard. This sampling and analysis is in addition to the confirmational samples so the costs are not as great. It was assumed that this sampling would be more labor intensive so the sampling costs were estimated to be about 50% of the analytical costs or about $20/cubic yard.

**Total Contaminated Soil to be removed:** 998 CY
**Total Soil for Thermal Desorption:** 0 CY
**Offsite Waste Volume:** 998 CY

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

**Factor 40 - A5H Analytical 39,920 Dollars**
**Factor 20 - A5H Subcontracted Svrs 19,960 Dollars**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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### Line Item 0900 - field oversight & project mgmt

Estimator's Experience based generally on a base case of 700 cy.

**Item Desc:** Field Oversight and Project Management

**Breakdown of Historical Data:**
- **Item:** Site Labor to perform above individual tasks for T-3/T-4.
  - **Units:** hours
  - **Unit Cost:** see below
  - **Unit Cost Adjustment Factor:** see below
  - **Revised Unit:** see below

- **Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

It was assumed that a field manager would be needed for 150 nine-hour working days or about 33 weeks. This work breaks down as follows:

- Preparation Activities: 50 working days
- Field Activities: 80 working days
- Demobilization: 20 working days

Total 150 nine-hour working days or 1350 hours

In addition it was estimated that technical staff, quality assurance, and project management would be required for the equivalent of ten additional weeks, which is 400 hours each.

Based on the base case of a 700 cubic yard removal project, these values yielded unit rates as follows:

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<th>Hours Per Cubic Yard</th>
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<th>Technical Staff</th>
<th>Quality Assurance</th>
<th>Project Manager</th>
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<td>.57</td>
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The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

- Total Contaminated Soil to be removed 998 CY
- Total Soil for Thermal Desorption 0 CY
- Offsite Waste Volume 998 CY

**Factors**

| Factor 1.93 - Environmental Engineer | 1,926 Hours |
| Factor 0.57 - Technical Support | 569 Hours |
| Factor 0.57 - Project Manager | 569 Hours |

**Line Item 1000 - backfill**

**Trade Publication**

Means 1995, Site Work & Landscape Cost Data (page 34, 42, and 34)

**Item Desc:**

Backfill.

**Breakdown of Historical Data:**

- Unit: Site Labor to perform above individual tasks for T-3/T-4.
- Units: hours
  - Unit Cost: see below
  - Unit Cost Adjustment Factor: see below
  - Revised Unit: see below

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
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<th>Curve</th>
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<tr>
<td>750 STRAIGHT TIME BASE</td>
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<tr>
<td>750 STRAIGHT TIME BASE</td>
<td>M020 MANAGERS (GRADE 69 - 72)</td>
<td>R100S RMRS Salaried</td>
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<td>Curve</td>
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<td>Units</td>
</tr>
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**Line Item 1100 - demobilization**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:**
- Demobilization.

**Breakdown of Historical Data:**

- **Item:** Site Labor to perform above individual tasks for T-3/T-4.
  - **Units:** hours
  - **Unit Cost:** see below
  - **Unit Cost Adjustment Factor:** see below
  - **Revised Unit:** see below

- **Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
  - **Units:** 1 lot
  - **Unit Cost:** see below
  - **Unit Cost Adjustment Factor:** see below
  - **Revised Unit:** see below

**Basis for adjustment.** The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Form, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Demobilization: Based on the T-3/T-4 project, it was assumed that demobilization costs would cover demobilization for excavation activities also. The subcontractor cost for demobilization was about $95,000 for 3,800 cubic yards at the T-3/T-4 project. In addition it was estimated that the following hours were necessary:

- Environmental Engineer 300 hours
- Health Physicist 100 hours
- Manager 200 hours
- Industrial Hygiene 100 hours

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

**Factor 300 - Environmental Engineer 75 Hours**
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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<th>Skill</th>
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<th>Units</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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| RMRS Salaried           | ENVIRONMENTAL ENGINEERS | 80.00 | 0.00  | Linear | 1.00 | 320 | 0
| RMRS Salaried           | MANAGERS (GRADE 69 - 72) | 50.00 | 0.00  | Linear | 1.00 | 320 | 0
| RMRS Salaried           | HEALTH PHYSICISTS | 25.00 | 0.00  | Linear | 1.00 | 320 | 0
| ASH SUBCONTRACTED SRVS  | NONE             | 23750    | 750   | Linear | 1.00 | 0 | 0

### Line Item SYS - Contingency And Escalation

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<th>Materials/Sub Cost</th>
<th>Contingency &amp; Escalation</th>
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Total for Activity 1GER674270:

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### Rocky Flats Closure Project
#### Baseline Cost and Basis of Estimate

**Activity ID:** 1GER674270  
**WBS Filter:** 1GAC  
**Activity Filter:** *  
**Starts In FY:** *

**WBS No:** 1GAC0702  
**Title:** Rocky Flats Closure Project  
**Activity ID:** 1GER673100  
**Description:** SAP Preparation - IHSS Group 700-3 (B776/7)

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#### Line Item SYS - Contingency And Escalation

**BOE Resources**

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#### Line Item 0100 - SAP Addenda

**Item Desc:** Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Breakdown of Cost Data:**

- Item: Preparation of SAP Addenda to Industrial Area Characterization Plan.

- Units: hours

- Unit Cost: 120

- Unit Cost Adjustment Factor: none

**Basis for adjustment:**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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#### Line Item 0200 - HASP Addenda

**Item Desc:** Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

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#### Line Item 0300 - QAP Addenda

**Item Desc:** Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

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#### Line Item SYS - Contingency And Escalation

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### Total for Activity 1GER673100:

- Total Labor Hours: 280
- Total Labor Cost: 10,021
- Total Material/ Sub Cost: 1,421
- Total Contingency & Escalation: 4,133
- Total Prime Cost: 15,575
- Total Cost: 19,042

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### Line Item 0100 - SAP Addenda

**BOE Resources**

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### Line Item 0200 - HASP Addenda

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### Line Item 0300 - QAP Addenda

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### Line Item SYS - Contingency And Escalation

**BOE Resources**

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### Total for Activity 1GER673100:

- Total Labor Hours: 280
- Total Labor Cost: 10,021
- Total Material/ Sub Cost: 1,421
- Total Contingency & Escalation: 4,133
- Total Prime Cost: 15,575
- Total Cost: 19,042
Breakdown of Cost Data:
Item: Preparation of addenda for HASP.
Units: hours
Unit Cost: 140
Unit Cost Adjustment Factor: none
Revised Unit Hours: 140

Breakdown of Cost Data:
Item: Preparation of QAP addenda
Units: hours
Unit Cost: 60
Unit Cost Adjustment Factor: none
Revised Unit Hours: 60

BOE
Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

Item Desc:
Preparation of QAP Addenda to Industrial Area Characterization Plan.

Breakdown of Cost Data:
Item: Preparation of QAP addenda
Units: hours
Unit Cost: 60
Unit Cost Adjustment Factor: none
Revised Unit Hours: 60

Line Item 0300 - QAP Addenda
BOE
Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

Item Desc:
Preparation of SAP Addenda to Industrial Area Characterization Plan.

Breakdown of Cost Data:
Item: Preparation of QAP addenda
Units: hours
Unit Cost: 60
Unit Cost Adjustment Factor: none
Revised Unit Hours: 60

BOE
Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation

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<td>0</td>
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Total for Activity 1GER673120:
345 | 10,637 | 2,114 | 4,556 | 17,307 | 20,987 |

Line Item 0100 - procurement & field prep
BOE
Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation

Breakdown of Cost Data:

Item: Site Labor to perform above individual tasks for either Ryan's Pit or T-3/T-4.
- Units: hours
- Unit Cost: 1380
- Unit Cost Adjustment Factor: 0.25
- Revised Unit: 345 hours

Item: Subcontractor costs to perform above individual tasks for either Ryan's Pit or T-3/T-4.
- Units: 1 lot
- Unit Cost: $10K
- Unit Cost Adjustment Factor: 0.25
- Revised Unit: $2.5K

Basis for adjustment. Hours and costs for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be characterized at once.

Procurement includes preparation of statement of work, proposal review (technical evaluation), and negotiations. Based on a T-3/T-4 burdened cost of $29,186.52. Assuming it is primarily labor hours (RMRS Environmental Engineer charging at $57.45 per hour) yields 508 hours which rounds to 510 total hours.

Davis Bacon Documentation: It was assumed that it would take an environmental engineer twenty-four hours to prepare a Davis Bacon cost estimate and to support the Davis-Bacon determination.

Subcontractor Health and Safety Plan: Costs for the health and safety plan are based on Ryan's Pit, which cost approximately $10,000. It was assumed that these are A5H dollars. In addition, it was assumed that a safety engineer, an industrial hygienist, and a radiological engineer would each provide one week (40 hours) of support for review and document preparation.

Radiological Work Permit: It was assumed that it would take a radiological control technician two working days (18 hours) to complete counting preparation and review.

Implementation Plan: It was estimated that this activity would take 13 weeks of time for engineers, scientists or equivalent to complete. This would include preparation of an implementation plan as required (Rocky Flats Cleanup Agreement, Appendix 3, Interim Guidance Document, Dated August 1977). In addition this includes all tasks related to documentation for the Integrated Work Control Program and Integrated Safety Management.

Ecology Survey/National Environmental Protection Act (NEPA) Support: It was estimated that this would take 40 hours for an ecologist. The activities include NEPA review and support in document preparation, site surveys to verify compliance with ecological regulations, categorical exclusions, and NEPA evaluations.

Utility Clearance/Soil Disturbance Permits: It was estimated based on experience that it would take the equivalent 2 weeks (80 hours) for technical staff to do utility surveys, prepare and review soil disturbance permits, and prepare authorizing documents for excavation.

The combined resources for procurement and field preparations are

Total Procurement and Field Preparation Hours

- Environmental Engineer 1134 hours
- Safety Engineer 40 hours
- Industrial Hygiene 40 hours
- Radiological Engineering 58 hours
- Radiological Control Technician 18 hours
- Ecologist/Life Scientist 40 hours
- Manager 50 hours
- Quality Assurance* 29 hours
- ASK Total $10,000

* On some projects these hours were assumed to be included in other tasks or part of this task under environmental engineer or one of the other job functions.

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

Factor 1134 - Environmental Engineer 283 Hours
## Rocky Flats Closure Project
### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0703

**Baseline Devl:** 1GAC

**Activity ID:** 1GER673120

**Activity Filter:** *  
**WBS Filter:** 1GAC

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This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Activity ID:

**Description:** Readiness Assessment - IHSS Group 700-3

**Cost Risk:** 1  
**Schedule Risk:** 1

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### Line Item 0100 - readiness assessment

**BOE**

Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation

**Item Desc:**
Evaluate readiness of the field characterization team and plans.

**Breakdown of Cost Data:**

- **Item:** Site Labor to perform Readiness Assessment for T-3/T-4.
  - **Units:** hours
  - **Unit Cost:** $187
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** 48

- **Item:** Subcontractor costs to perform Readiness Assessment for T-3/T-4.
  - **Units:** 1 lot
  - **Unit Cost:** $4800
It was estimated that subcontractor involvement would require 80 hours at $60/hour = $4,800. It was assumed that about 3 weeks of time was required for an environmental engineer or similar person in addition to 12 hours of project management, which yielded 132 hours. An additional 11 hours was added for management oversight. It was estimated that a radiological engineer (QA) and an industrial hygienist would be needed for 2.5 days each (22 hours).

Factor 132 - Environmental Engineer 33 Hours
Factor 22 - Health Physicists 6 Hours
Factor 11 - Manager 3 Hours
Factor 22 - Quality Assurance 6 Hours
Factor 4,800 - ASH Subcontracted Srvs 1,200 Dollars

20 hours of administrative time will also be required.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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### Line Item SYS - Contingency And Escalation

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### Activity ID: 1GER673150

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</table>

Total for Activity 1GER673150: 10,528 313,682 3,359,622 1,048,502 4,721,806 108,534 4,830,340

### Line Item 0100 - collect geoprobe samples

| BOE | Collect geoprobe samples with the site geoprobe with two technicians. A site Environmental Engineer will direct the boring placement, log the borings; collect, containerize, package, and ship the samples; prepare field QC documentation, and prepare field notes on a full time basis. A site RCT will monitor the site for radiological contamination on a full time basis. A site Industrial Hygienist will implement the field portion of the HASP on a full time basis. Decon Operations staff will decon the vehicle and equipment when it leaves the work area on a half time basis. It is estimated that one 10' boring
will be place per 500 SF of building footprint (same as Bldg. 123 characterization) with 5 samples per 10' boring. It is estimated that one boring per eight hours can be completed. Sampling frequency was based on the Building 123 characterization, however field sampling was reduced by 50% because of the newer building and processes involved, and the lesser likelihood of contamination.

Breakdown of Cost Data:
- **Item:** Site Personnel for support of geoprobe samples
  - Units: hours
  - Unit Cost: 32
  - Revised Unit Hours: 32

- **Item:** Kaiser-Hill/RMRS Geoprobe unit with 2 Technician crew. Item costs $100 per hour or $800 per 8-hour day.
  - Units: dollars
  - Unit Cost: 800
  - Revised Unit Hours: 800

Basis for adjustment.
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

<table>
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### Line Item 0200 - analyze samples

**BOE**

Vendor Quote

Email quote:average cost from Kaiser-Hill ASD (V. Ideker).

**Item Desc:**
Analyze samples produced from geoprobe borings. It is anticipated that 5 samples from each boring will be collected. They will be anlyzed for Metals, VOCs, SVOCs, PCBs, and radionuclides(est. 3 isotopes) with a 30 day TAT. This item is priced on a per sample basis. Per sample costs include DOT rad screen, bottle charge, shipping, and validation.

Breakdown of Cost Data:
- **Item:** Analyze samples at an offsite laboratory.
  - Units: analysis
  - Unit Cost: Metals $345, VOCs $280, SVOCs $440, PCBs and other analytes $150, and Radionuclides 3 isotopes) $590 per each sample.
  - Unit Cost Adjustment Factor: Must add: DOT rad screen $32/sample, bottle charge $7/sample, shipping $4.2/bottle, and validation per each: $17.30 VOA, $19.25 SVOC, $16.75 Metals, $5.95 PCB, and $15.60 Rad.
  - Revised Unit Hours: Metals $405, VOCs $341, SVOCs $502, PCBs and other analytes $199, and Rad $649.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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### Line Item 0300 - project mgmt oversight

**BOE**

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Item Desc:**
Project Management/Oversight. Based on half time for a Project Manager, Administrative staff, and Cost Estimator/Scheduler
### Breakdown of Cost Data:

**Item:** Mgmt oversight
**Units:** hours
**Unit Cost:** 12
**Unit Cost Adjustment Factor:** none
**Revised Unit Hours:** 12

Basis for adjustment.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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### BOE Resources

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### Line Item 0100 - develop documentation

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**Total for Activity 1GER673170:**

- 656
- 19,024
- 0
- 4,775
- 4,775
- 0
- 4,775

### Line Item 0100 - develop documentation

**BOE: Estimator’s Experience:**

*Estimate for summary report based on estimator’s 16 years of experience performing and costing projects of similar size and scope.*

**Item Desc:**

- Perform Data Analysis including GIS representation of data, NFA Summary, Characterization Report, and associated project management. Disposition comments and finalize document.

  - Computer Specialist 80 hrs: Identify & pull existing data from database.
  - Technical Editor 40 hrs: Complete initial and revised tech edits of Report.
  - Quality Assurance 60 hrs: Review
  - Environmental Engineer 40 hrs: Peer review
  - Regulatory Compliance 20 hrs: Review
  - Management 48 hrs: Review
  - Legal 8 hrs: Review
  - Administrative Support 40 hrs: Copy & assemble final documents, submit to records.

**Breakdown of Cost Data:**

- **Item:** Develop Documentation
  - Units: Hours
  - Unit Cost: 656
  - Unit Cost Adjustment Factor: none
  - Revised Unit Hours: 656
  - Basis for adjustment: N/A
### Resources

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### BOE

<table>
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<tr>
<th>BOE</th>
<th>Estimator's Experience based generally on historical data for Ryan's Pit</th>
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Proposed Action Memorandum: A bottom-up estimate based on historical costs was used as the basis for the estimate. Based on Ryan's Pit (IHSS 108), the cost for the PAM was $50,000 (contractor costs). Assuming that labor rates at this time were approximately $75 (based on a cost center 217). The total labor for a PAM would be approximately 666 hours, which rounds to 700 hours. It was assumed that 10% would be required for managerial hours.

For a PAM the total labor hours are:

- Environmental Engineer 700 Hours
- Manager 70 Hours
- Factor 700 Environmental Engineer 175 hours
- Factor 70 Manager 18 hours

Breakdown of Cost Data:
- Item: Preparation of PAM for Ryan's Pit source removal action.
  - Units: hours
  - Unit Cost: 770
  - Revised Unit Hours: 193

Total for Activity 1GER673180:

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Total for Activity 1GER673180: 289, 9,164, 0, 1,677, 10,841, 2,584, 13,426
Basis for adjustment. Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

### Resources

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<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
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#### Line Item 0200 - SAP

**BOE**

Estimator's Experience based generally on historical data for Ryan's Pit

**Item Desc:** Preparation of SAP in support of source removal of previously characterized UBC.

**Breakdown of Historical Data:**
- **Item:** Preparation of SAP for Ryan's Pit source removal action.  
  **Units:** hours  
  **Unit Cost:** $300  
  **Unit Cost Adjustment Factor:** 0.25  
  **Revised Unit Hours:** 75

Basis for adjustment. Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

### Resources

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#### Line Item 0300 - WMP

**BOE**

Estimator's Experience based generally on historical data for Ryan's Pit

**Item Desc:** Preparation of WMP in support of source removal of previously characterized UBC.

**Breakdown of Historical Data:**
- **Item:** Preparation of WMP for Ryan's Pit source removal action.  
  **Units:** hours  
  **Unit Cost:** $80  
  **Unit Cost Adjustment Factor:** 0.25  
  **Revised Unit Hours:** 20

Basis for adjustment. Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

### Resources

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#### Line Item SYS - Contingency And Escalation

**BOE**

Estimator's Experience based generally on historical data for Ryan's Pit

**Item Desc:** Preparation of WMP in support of source removal of previously characterized UBC.

**Breakdown of Historical Data:**
- **Item:** Preparation of WMP for Ryan's Pit source removal action.  
  **Units:** hours  
  **Unit Cost:** $549.477  
  **Unit Cost Adjustment Factor:** 0.25  
  **Revised Unit Hours:** 1128.02

Basis for adjustment. Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

### Resources

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### Activity Details

**Activity ID:** 1GER673210

**Description:** Procurement and Field Prep - IHSS Grouping 700-3

**Cost Risk:** 1

**Schedule Risk:** 1

### Line Item Details

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<th>Burden Cost</th>
<th>Total Cost</th>
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OFFICIAL USE ONLY
### Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

**WBS No:** 1GAC0703  
**Activity ID:** 1GER673210  
**Basis for preparation:** Activity Filter 1GAC, starts in FY 0100

<table>
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**Total for Activity 1GER673210:** 345 10,637 2,114 6,922 19,673 3,546 23,219

**Line Item 0100 - procurement & field prep**

**Estimator's Experience** based generally on historical data for Ryan's Pit and T-3/T-4 Remediation


**Breakdown of Cost Data:**
- **Item:** Site Labor to perform above individual tasks for either Ryan's Pit or T-3/T-4.
  - Units: hours
  - Unit Cost: 1380
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit: 345 hours

- **Item:** Subcontractor costs to perform above individual tasks for either Ryan's Pit or T-3/T-4.
  - Units: 1 lot
  - Unit Cost: $10K
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit: $2.5K

**Breakdown of Cost Data for each CUC are multiplied by 0.25 to account for the fact that 4 UBCs will be characterized at once.**

**Procurement** includes preparation of statement of work, proposal review (technical evaluation), and negotiations. Based on a T-3/T-4 burdened cost of $29,186.52. Assuming it is primarily labor hours (RMRS Environmental Engineer charging at $57.45 per hour) yields 508 hours which rounds to 510 total hours.

**Davis Bacon Documentation:** It was assumed that it would take an environmental engineer twenty-four hours to prepare a Davis Bacon cost estimate and to support the Davis-Bacon determination.

**Subcontractor Health and Safety Plan:** Costs for the health and safety plan are based on Ryan's Pit, which cost approximately $10,000. It was assumed that these are A5H dollars. In addition, it was assumed that a safety engineer, an industrial hygienist, and a radiological engineer would each provide one week (40 hours) of support for review and document preparation.

**Radiological Work Permit:** It was assumed that it would take a radiological control technician two working days (18 hours) to complete counting preparation and review.

**Implementation Plan:** It was estimated that this activity would take 13 weeks of time for engineers, scientists or equivalent to complete. This would include preparation of an implementation plan as required (Rocky Flats Cleanup Agreement, Appendix 3, Interim Guidance Document, Dated August 1977). In addition this includes all tasks related to documentation for the Integrated Work Control Program and Integrated Safety Management.

**Ecology Survey/National Environmental Protection Act (NEPA) Support:** It was estimated that this would take 40 hours for an ecologist. The activities include NEPA review and support in document preparation, site surveys to verify compliance with ecological regulations, categorical exclusions, and NEPA evaluations.

**Utility Clearance/Soil Disturbance Permits:** It was estimated based on experience that it would take the equivalent 2 weeks (80 hours) for technical staff to do utility surveys, prepare and review soil disturbance permits, and prepare authorizing documents for excavation.

**The combined resources for procurement and field preparations are**

<table>
<thead>
<tr>
<th>Total Procurement and Field Preparation Hours</th>
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<tbody>
<tr>
<td>Environmental Engineer 1134 hours</td>
</tr>
<tr>
<td>Safety Engineer 40 hours</td>
</tr>
<tr>
<td>Industrial Hygiene 40 hours</td>
</tr>
<tr>
<td>Radiological Engineering 58 hours</td>
</tr>
<tr>
<td>Radiological Control Technician 18 hours</td>
</tr>
<tr>
<td>Ecologist/Life Scientist 40 hours</td>
</tr>
<tr>
<td>Manager 50 hours</td>
</tr>
<tr>
<td>Quality Assurance 29 hours</td>
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<tr>
<td>A5H Total $10,000</td>
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Rocky Flats Closure Project
Baseline Cost and Basis of Estimate

WBS No: 1GAC0703
Activity ID: 1GER673210

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

<table>
<thead>
<tr>
<th>Factor</th>
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<td>hrs</td>
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<td>Factor 40</td>
<td>Safety Engineer 10 Hours</td>
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<td>Factor 58</td>
<td>Radiological Engineering 14 Hours</td>
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<td>Factor 18</td>
<td>RCT 5 Hours</td>
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<td>Factor 50</td>
<td>Project Manager 13 Hours</td>
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<td>Factor 10000</td>
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This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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<thead>
<tr>
<th>Line Item</th>
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<th>BOE Type</th>
<th>Labor Hours/Unit</th>
<th>Labor Hours Total</th>
<th>Labor Cost Total</th>
<th>Material/Sub Cost</th>
<th>Contingency &amp; Escalation</th>
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<th>Burden Cost</th>
<th>Total Cost</th>
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<tbody>
<tr>
<td>0100</td>
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<td>EE</td>
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<td>training</td>
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<td>0300</td>
<td>pre-evolution meeting</td>
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<td>1,712</td>
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<tr>
<td>SYS</td>
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</table>

Total for Activity 1GER673240:

116 | 3,306 | 4,821 | 4,963 | 13,090 | 1,151 | 14,241

Line Item 0100 - readiness assessment

BOE

Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation

Item Desc:
Evaluate readiness of the field characterization team and plans.

Breakdown of Cost Data:
It was estimated that subcontractor involvement would require 80 hours at $60/hour = $4,800. It was assumed that about 3 weeks of time was required for an environmental engineer or similar person in addition to 12 hours of project management, which yielded 132 hours. An additional 11 hours was added for management oversight. It was estimated that a radiological engineer (QA) and an industrial hygienist would be needed for 2.5 days each (22 hours).

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 projects will be conducted at once and only one of each fixed cost is needed for the group.

Factor 132 - Environmental Engineer 33 Hours
Factor 22 - Health Physicists 6 Hours
Factor 11 - Manager 3 Hours
Factor 22 - Quality Assurance 6 Hours
Factor 4,800 - A5H Subcontracted Srvs 1,200 Dollars

20 hours of administrative time will also be required.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
Basis for adjustment. Costs for each UBC are divided by 4 to account for the fact that 4 UBCs will be remediated at once and only one Pre-Evolution Meeting is needed for the group.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

Resources

<table>
<thead>
<tr>
<th>Cost Element</th>
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<th>Department</th>
<th>Curve</th>
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<th>Units</th>
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Line Item 0300 - Pre-Evolution Meeting

BOE

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc:
Conduct Pre-Evolution Meeting in support of source removal action

Breakdown of Cost Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
  Units: hours
  Unit Cost: 60 hours
  Unit Cost Adjustment Factor: 0.25
  Revised Unit: 15 hours

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
  Units: 1 lot
  Unit Cost: $6K
  Unit Cost Adjustment Factor: 0.25
  Revised Unit: $1.5K

Basis for adjustment. Costs for each UBC are divided by 4 to account for the fact that 4 UBCs will be remediated at once and only one Pre-Evolution Meeting is needed for the group.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

Resources

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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<tr>
<td>750 STRAIGHT TIME BASE</td>
<td>E050 ENVIRONMENTAL ENGINEERS</td>
<td>R100S RMRS Salaried</td>
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<td>Hours</td>
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<tr>
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Line Item SYS - Contingency And Escalation

BOE

Resources

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<th>Curve</th>
<th>Quantity</th>
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Activity ID: 1GER673250  Description: Remedial Action - IHSS Grouping 700-3  Cost Risk 2  Schedule Risk 3
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<th>Quantity</th>
<th>Units</th>
<th>Cost Element</th>
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<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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<td>Waste Acceptance Sampling</td>
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<td>cy</td>
<td>Line Item 0100 - mobilization</td>
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<td>BOE</td>
<td>Mobilization in support of remediation.</td>
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<td>each</td>
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<td>Hours</td>
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<td>1GER673250</td>
<td>Contingency And Escalation</td>
<td>1,000</td>
<td>each</td>
<td>BOE</td>
<td>BOE</td>
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**Resources**

<table>
<thead>
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<th>Department</th>
<th>Curve</th>
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<td>750 STRAIGHT TIME BASE</td>
<td>P080 HEALTH PHYSICISTS</td>
<td>R100S BOE</td>
<td>Linear</td>
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<td>750 STRAIGHT TIME BASE</td>
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<td>K26S ER Programs</td>
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**Line Item 0200 - site prep**

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<tr>
<td><strong>BOE</strong></td>
<td>27 hrs</td>
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</tbody>
</table>

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc:
Site Preparation including setting up fencing, trailer, etc.

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3-T-4.
Units: hours
Project Baseline_Devl
WBS Filter 1GAC
Activity Filter

Rocky Flats Closure Project
Baseline Cost and Basis of Estimate

WBS No: 1GAC0703
Activity ID: 1GER673250

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
Units: 1 lot
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

T3/T4 hours 120 Environmental Engineer 30 hours
T3/T4 dollars 30,000 Subcontracted Srvs 7,500 Dollars (81% subcontract / 19% D&D construction workers)

D&D construction trade hours represent 19% of the subcontract dollars and were calculated using the following methodology:

A5K subcontracted dollars were multiplied by .19, the result was divided by $60/hr to determine the number of hours allocated to D&D construction.

For Site Preparation tasks - RCT hours were the same as D&D construction hours.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

<table>
<thead>
<tr>
<th>Resources</th>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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<tr>
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<tr>
<td>750</td>
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<td>T050</td>
<td>RADIATION CONTROL TECHNOLOGIST</td>
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<tr>
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Line Item 0300 - excavation

BOE Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc: Excavation.

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
Units: hours
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
Units: 1 lot
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.
Total Contaminated Soil to be removed 14,679 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 14,679 CY

The excavation cost was based on the excavation cost for the T-3/T-4 Project. Burdened cost based on the T-3/T-4 actuals is $171,487. For the 3,800 cubic yards of contaminated soil removed this yielded a unit cost of $45 per cubic yard of contaminated soil removed. This estimate includes the removal of overburden that might be on top of the contaminated soil. The hours for an environmental engineer from T-3/T-4 were 1.09 hours per cubic yard of contaminated soil. Likewise the hours for the following were assumed to be linearly proportional:

- Health Physicists .47 hours per cubic yard
- Environmental Operations .31 hours per cubic yard
- Radiological Control Technician 1.00 hour per cubic yard

* Based on $50/cubic yard from T-3/T-4, assumes a labor rate of $50/hour

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 1.09 - E050 Environmental Engineer 16,000 Hours
Factor 0.47 - P080 Health Physicists 6,899 Hours
Factor 0.31 - P090 Industrial Hygienists 4,551 Hours
Factor 1.00 - T050 Radiological Control Technician 14,679 Hours
Factor 45.23 - A5H Subcontracted Svrs 663,931 Dollars (81% subcontract services / 19% D&D construction workers)

D&D construction trade hours represent 19% of the subcontracted dollars and were calculated using the following methodology:

A5H subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.

The dollars amount calculated for D&D construction workers was subtracted from the subcontractor dollars.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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<tbody>
<tr>
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<td>750 STRAIGHT TIME BASE</td>
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<td>R100S RMRS Salaried</td>
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<td>Hours</td>
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<tr>
<td>750 STRAIGHT TIME BASE</td>
<td>P080 HEALTH PHYSICISTS</td>
<td>R100S RMRS Salaried</td>
<td>Linear</td>
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<td>Hours</td>
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<td>KG10H Remediation Steelworkers</td>
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### Line Item 0400 - remove and clean debris

**BOE**

Estimator's Experience based generally on a base case of 700 cy.  
Item Desc: Remove and clean debris.  

Breakdown of Historical Data:  
**Item:** Site Labor to perform above individual tasks for T-3/T-4.  
**Units:** hours  
**Unit Cost:** see below  
**Unit Cost Adjustment Factor:** see below  
**Revised Unit:** see below
Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
  Units: 1 lot
  Unit Cost: see below
  Unit Cost Adjustment Factor: see below
  Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Total Contaminated Soil to be removed 14,679 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 14,679 CY

For the base case, it was assumed that about five cubic yards out of 700 cubic yards would be debris and would be segregated and cleaned. It was estimated that each cubic yard of debris would cost $1,000 or $5,000 total for 700 cubic yards. This yields a rate of $7.14 per cubic yard.

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 7.14 – A5H Subcontracted Srvs 104,808 Dollars (81% subcontracted services / 19% D&D construction workers)

D&D construction trade hours were calculated using the following methodology:

A5H subcontracted dollars were multiplied by .19, the result was divided by $60/hr to determine the number of hours allocated to D&D construction.

The dollars amount calculated for D&D construction workers was subtracted from the subcontractor dollars.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

<table>
<thead>
<tr>
<th>Resources</th>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
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Line Item 0600 - confirmation sampling
BOE

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc:
Confirmation Sampling.

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
  Units: hours
  Unit Cost: see below
  Unit Cost Adjustment Factor: see below
  Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
  Units: 1 lot
  Unit Cost: see below
  Unit Cost Adjustment Factor: see below
  Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.
Total Contaminated Soil to be removed 14,679 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 14,679 CY

The analytical costs were based on T-3/T-4, which cost $435,574 for 3800 cubic yards of contaminated soil removed. This yielded a unit rate of about $115/cubic yard. Based on estimator experience the cost of sampling including labor and materials was estimated to be 20% of that rate or about $23/ cubic yard.

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

**Cost Element** | **Skill** | **Department** | **Curve** | **Quantity** | **Units**
--- | --- | --- | --- | --- | ---
ASH | SUBCONTRACTED SRVS | 0000 | NONE | K265S | ER Programs | Linear | 19.39 | Dollars
Factors | 22.924 | units per yard | 0.84576 | [SYS 061400] 84576000 - System
ASH | SUBCONTRACTED SRVS | 0000 | NONE | K267S | Analytical Laboratory Services | Linear | 96.94 | Dollars
Factors | 114.62 | units per yard | 0.84576 | [SYS 061400] 84576000 - System

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

**Line Item 0700 - waste acceptance forms**

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc:
Prepare Waste Acceptance Forms

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
  Units: hours
  Unit Cost: see below
  Unit Cost Adjustment Factor: see below
  Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
  Units: 1 lot
  Unit Cost: see below
  Unit Cost Adjustment Factor: see below
  Revised Unit: see below

Line Item 0800 - waste acceptance sampling

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc:
Waste Acceptance Sampling

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
  Units: hours
  Unit Cost: see below
### Rocky Flats Closure Project

#### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0703  
**Activity ID:** 1GER673250

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**Line Item 0900 - field oversight & project mgmt**

**BOE**

**Estimator's Experience based generally on a base case of 700 cy.**

**Item Desc:**

Field Oversight and Project Management

**Breakdown of Historical Data:**

**Item:** Site Labor to perform above individual tasks for T-3/T-4.

<table>
<thead>
<tr>
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<td>Unit Cost Adjustment Factor:</td>
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**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.

<table>
<thead>
<tr>
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</tr>
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<tr>
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**Basis for adjustment.** The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Because the waste acceptance sampling is difficult to predict and could vary significantly from project to project, it was assumed that about $800 worth of additional analysis would be required for 20 cubic yards which is the volume that can be placed in one roll-off. This yielded a unit rate of about $40/cubic yard. This sampling and analysis is in addition to the confirmational samples so the costs are not as great. It was assumed that this sampling would be more labor intensive so the sampling costs were estimated to be about 50% of the analytical costs or about $20/cubic yard.

Total Contaminated Soil to be removed 14,679 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 14,679 CY

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 40 - ASH Analytical 587,160 Dollars
Factor 20 - ASH Subcontracted Svrs 293,580 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
It was assumed that a field manager would be needed for 150 nine-hour working days or about 33 weeks. This work breaks down as follows:

- Preparation Activities: 50 working days
- Field Activities: 80 working days
- Demobilization: 20 working days

Total 150 nine-hour working days or 1350 hours

In addition it was estimated that technical staff, quality assurance, and project management would be required for the equivalent of ten additional weeks, which is 400 hours each.

Based on the base case of a 700 cubic yard removal project, these values yielded unit rates as follows:

- Hours Per Cubic Yard
- Of Contaminated Soil
- Field Manager: 1.93
- Technical Staff: 0.57
- Quality Assurance: 0.57
- Project Management: 0.57

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Total Contaminated Soil to be removed: 14,679 CY
Total Soil for Thermal Desorption: 14,679 CY

Factor 1.93 - Environmental Engineer: 28,330 Hours
Factor 0.57 - Technical Support: 8,367 Hours
Factor 0.57 - Project Manager: 8,367 Hours
Factor 0.57 - Quality Assurance: 8,367 Hours

Trade Publication
Means 1995, Site Work & Landscape Cost Data (page 34, 42, and 34)

Item Desc: Backfill.
Means (1995) Site Work & Landscape Cost Data as follows:

- Common Fill $ 4.77/cubic yard (page 34 Borrow Bank Measure)
- Hauling $ 3.98/cubic yard (page 42 2-mile round-trip, 6 cubic yard dump truck)
- Backfilling $ 1.69/cubic yard (page 34)
- Burden (43%) $ 4.49/cubic yard

Total $14.53/cubic yard or about $15/cubic yard

The factor for each skill is multiplied by the number of cubic yards of waste to develop estimates.

Factor 15 - A5H Subcontracted Srvs: 220,185 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
BoE

Line Item 1100 - demobilization

Item Desc: Demobilization.

Breakdown of Historical Data:

Item: Site Labor to perform above individual tasks for T-3/T-4.
- Units: hours
- Unit Cost: see below
- Unit Cost Adjustment Factor: see below
- Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
- Units: 1 lot
- Unit Cost: see below
- Unit Cost Adjustment Factor: see below
- Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Demobilization: Based on the T-3/T-4 project, it was assumed that demobilization costs would cover demobilization for excavation activities also. The subcontractor cost for demobilization was about $95,000 for 3,800 cubic yards at the T-3/T-4 project. In addition it was estimated that the following hours were necessary:

- Environmental Engineer 300 hours
- Health Physicist 100 hours
- Manager 200 hours
- Industrial Hygiene 100 hours

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

- Factor 300 - Environmental Engineer 75 Hours
- Factor 100 - Health Physicists 25 Hours
- Factor 200 - Manager 50 Hours
- Factor 100 - P090 Industrial Hygienists 25 Hours
- Factor 95000 - ASH Subcontracted Svrs 23,750 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### Line Item SYS - Contingency And Escalation

#### BOE Resources

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Total for Activity 1GER673270:

- Labor Hours Total: 320
- Labor Cost Total: 9,045
- Materials/Sub Cost: 0
- Contingency & Escalation: 0
- Total Prime Cost: 10,350
- Burden Cost: 0
- Total Cost: 10,350

### Estimates

**Description:** Prepare Closeout Report - IHSS Group 700-3

*Estimate based on estimator's experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites (T-3/T-4 and others)*

**Item Desc:**

- Perform Data Analysis including GIS representation of data, Closeout Report, and associated project management.

**Required level of effort:**

- Environmental Engineer - 80 hours
- Environmental Scientist - 80 hours
- Computer Specialist - 60 hours (GIS, SWD)
- Manager - 20 hours
- Administrative - 20 hours
- Cost Estimators - 20 hours

**Breakdown of Cost Data:**

- Item: Develop Documentation
- Units: hours
- Unit Cost: 320
- Unit Cost Adjustment Factor: none
- Revised Unit Hours: 320

### Resources

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**WBS No:** 1GAC0703  
**Title:** Rocky Flats Closure Project - Baseline Cost and Basis of Estimate  
**Activity ID:** 1GER673250  
**Baseline Devl:** 

---

**WBS No:** 1GAC0704  
**Title:** Group 700-4 (B771/4)
### WBS Filter: 1GAC
### Activity ID: 1GHE674100
### Description: SAP Preparation - IHSS Group 700-4 (B771/74)

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**Total for Activity 1GHE674100:**

- Labor Hours: 280
- Labor Cost: 10,021
- Materials/Sub Cost: 1,421
- Total Cost: 12,301

### Line Item 0100 - SAP Addenda

**BOE Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.**

- Item Desc: Preparation of SAP Addenda to Industrial Area Characterization Plan.
- Breakdown of Cost Data:
  - Item: Preparation of SAP addenda
    - Units: hours
    - Unit Cost: 120
  - Unit Cost Adjustment Factor: none
  - Revised Unit Hours: 120
- Basis for adjustment:
  - This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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### Line Item 0200 - HASP Addenda

**BOE Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.**

- Item Desc: Preparation of HASP addenda to Industrial Area Characterization Plan.
- Breakdown of Cost Data:
  - Item: Preparation of addenda for HASP.
    - Units: hours
    - Unit Cost: 140
  - Unit Cost Adjustment Factor: none
  - Revised Unit Hours: 140
- Basis for adjustment:

### Resources

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**Line Item 0300 - QAP Addenda**

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Item Desc:**
Preparation of SAP Addenda to Industrial Area Characterization Plan.

**Breakdown of Cost Data:**
- **Item:** Preparation of QAP addenda
  - **Units:** hours
  - **Unit Cost:** 60
  - **Unit Cost Adjustment Factor:** none
  - **Revised Unit Hours:** 60

**Basis for adjustment:**
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Resources**

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**Factors**
- **ASH:** 40 hrs
- **SUBCONTRACTED SRVS:** 20 hrs estimated $/hr

**Line Item SYS - Contingency And Escalation**

**Resources**

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**Factors**
- **CON:** 1.00 ea
- **ESC:** 1.00 ea

**Activity ID:** 1GHE674120

**Description:** Procurement and Field Prep - IHSS Group 700-4

**Line Item 0100 - procurement & field prep**

**Item Desc:**

**Breakdown of Cost Data:**
- **Item:** Site Labor to perform above individual tasks for either Ryan's Pit or T-3/T-4.
  - **Units:** hours
  - **Unit Cost:** 1380
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** 345 hours

**Item:** Subcontractor costs to perform above individual tasks for either Ryan's Pit or T-3/T-4.
- **Units:** 1 lot
- **Unit Cost:** $10K
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** $2.5K

**Basis for adjustment:**
Hours and costs for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be characterized at once.

**Procurement includes preparation of statement of work, proposal review (technical evaluation), and negotiations. Based on a T-3/T-4 burdened cost of**
Assuming it is primarily labor hours (RMRS Environmental Engineer charging at $57.45 per hour) yields 508 hours which rounds to 510 total hours.

Davis Bacon Documentation: It was assumed that it would take an environmental engineer twenty-four hours to prepare a Davis Bacon cost estimate and to support the Davis-Bacon determination.

Subcontractor Health and Safety Plan: Costs for the health and safety plan are based on Ryan's Pit, which cost approximately $10,000. It was assumed that these are A5H dollars. In addition, it was assumed that a safety engineer, an industrial hygienist, and a radiological engineer would each provide one week (40 hours) of support for review and document preparation.

Radiological Work Permit: It was assumed that it would take a radiological control technician two working days (18 hours) to complete counting preparation and review.

Implementation Plan: It was estimated that this activity would take 13 weeks of time for engineers, scientists or equivalent to complete. This would include preparation of an implementation plan as required (Rocky Flats Cleanup Agreement, Appendix J, Interim Guidance Document, Dated August 1977). In addition this includes all tasks related to documentation for the Integrated Work Control Program and Integrated Safety Management.

Ecology Survey/National Environmental Protection Act (NEPA) Support: It was estimated that this would take 40 hours for an ecologist. The activities include NEPA review and support in document preparation, site surveys to verify compliance with ecological regulations, categorical exclusions, and NEPA evaluations.

Utility Clearance/Soil Disturbance Permits: It was estimated based on experience that it would take the equivalent 2 weeks (80 hours) for technical staff to do utility surveys, prepare and review soil disturbance permits, and prepare authorizing documents for excavation.

The combined resources for procurement and field preparations are

Total Procurement and Field Preparation Hours

Environmental Engineer 1134 hours
Safety Engineer 40 hours
Industrial Hygiene 40 hours
Radiological Engineering 58 hours
Radiological Control Technician 18 hours
Ecologist/Life Scientist 40 hours
Manager 50 hours
Quality Assurance* 29 hours
A5H Total $10,000

* On some projects these hours were assumed to be included in other tasks or part of this task under environmental engineer or one of the other job functions.

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

Factor 1134 – Environmental Engineer 283 Hours
Factor 40 – Safety Engineer 10 Hours
Factor 40 – Industrial Hygiene 10 Hours
Factor 58 – Radiological Engineering 14 Hours
Factor 18 – RCT 5 Hours
Factor 40 – Life Scientist 10 Hours
Factor 50 – Project Manager 13 Hours
Factor 10000 – A5H Subcontracted Services 2,500 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

- **WBS No:** 1GAC0704
- **Activity ID:** 1GHE674120
- **Project:** Rocky Flats Closure Project
- **Baseline Devl:** WBS Filter: 1GAC

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#### Activity ID: 1GHE674140

**Description:** Readiness Assessment - IHSS Group 700-4

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**Total for Activity 1GHE674140:**

|                | 68 | 1,015 | 3,803 |

#### Breakdown of Cost Data:

- **Item Desc:** Evaluate readiness of the field characterization team and plans.

- **Item:** Site Labor to perform Readiness Assessment for T-3/T-4.
  - **Units:** hours
  - **Unit Cost:** 187
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** 48

- **Item:** Subcontractor costs to perform Readiness Assessment for T-3/T-4.
  - **Units:** 1 lot
  - **Unit Cost:** $4800
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** $1200

**Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation**

20 hours of administrative time will also be required.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

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**Activity ID:** 1GHE674140  
**Description:** Field Sampling, Lab Analysis - IHSS Group 700-4

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**Total for Activity 1GHE674150:**  
7,232 | 215,477 | 2,307,826 | 197,536 | 2,720,839 | 95,843 | 2,816,681

**Line Item 0100 - collect geoprobe samples**

**BOE**

*Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.*

**Item Desc:**

Collection of geoprobe samples with the site geoprobe with two technicians. A site Environmental Engineer will direct the boring placement, log the borings; collect, containerize, package, and ship the samples; prepare field QC documentation, and prepare field notes on a full time basis. A site RCT will monitor the site for radiological contamination on a full time basis. A site Industrial Hygienist will implement the field portion of the HASP on a full time basis. Decon Operations staff will decon the vehicle and equipment when it leaves the work area on a half time basis. It is estimated that one 10' boring will be placed per 500 SF of building footprint (same as Bldg. 123 characterization) with 5 samples per 10' boring. It is estimated that one boring per eight hours can be completed. Sampling frequency was based on the Building 123 characterization, however field sampling was reduced by 50% because of the newer building and processes involved, and the lesser likelihood of contamination. Sampling frequency was based on the Building 123 characterization, however field sampling was reduced by 50% because of the newer building and processes involved, and the lesser likelihood of contamination.

**Breakdown of Cost Data:*

- **Item:** Site Personnel for support of geoprobe samples  
  **Units:** hours  
  **Unit Cost:** 32  
  **Unit Cost Adjustment Factor:** none  
  **Revised Unit Hours:** 32

- **Item:** Kaiser-Hill/RMRS Geoprobe unit with 2 Technician crew. Item costs $100 per hour or $800 per 8-hour day.  
  **Units:** dollars  
  **Unit Cost:** 800  
  **Unit Cost Adjustment Factor:** none  
  **Revised Unit Hours:** 800

**Basis for adjustment:**

*This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.*
**Rocky Flats Closure Project**

**Baseline Cost and Basis of Estimate**

**Project:** Baseline Dev

**WBS Filter:** 1GAC

**Starts In FY:** *

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### Line Item 0200 - analyze samples

**BOE**

Vendor Quote

**Item Desc:**

Analyze samples produced from geoprobe borings. It is anticipated that 5 samples from each boring will be collected. They will be analyzed for Metals, VOCs, SVOCs, PCBs and other analytes $150, and Radionuclides (est. 3 isotopes) $590 each.

**Breakdown of Cost Data:**

- **Item:** Analyze samples at an offsite laboratory.
- **Units:** analysis
- **Unit Cost:** Metals $345, VOCs $280, SVOCs $440, PCBs and other analytes $150, and Radionuclides 3 isotopes) $590 per each sample.

**Unit Cost Adjustment Factor:** Must add: DOT rad screen $32/sample, bottle charge $7/sample, shipping $4.2/bottle, and validation per each: $17.30 VOA, $19.25 SVOC, $16.75 Metals, $5.95 PCB, and $15.60 Rad.

**Revised Unit Hours:** Metals $405, VOCs $341, SVOCs $502, PCBs and other analytes $199, and Rad $649.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Line Item 0300 - project mgmt oversight

**BOE**

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Item Desc:**

Project Management/Oversight. Based on half time for a Project Manager, Administrative staff, and Cost Estimator/Scheduler

**Breakdown of Cost Data:**

- **Item:** Mgmt oversight
- **Units:** hours
- **Unit Cost:** 12
- **Unit Cost Adjustment Factor:** none
- **Revised Unit Hours:** 12

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
**Rocky Flats Closure Project**

**Baseline Cost and Basis of Estimate**

### Line Item SYS - Contingency And Escalation

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**Activity ID:** 1GHE674170

**Description:** Prepare Summary/NFA - IHSS Group 700-4

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**Estimator's Experience:**
Estimate for summary report based on estimator's 16 years of experience performing and costing projects of similar size and scope.

Item Desc:
Perform Data Analysis including GIS representation of data, NFA Summary, Characterization Report, and associated project management. Disposition comments and finalize document

Computer Specialist 80 hrs Identify & pull existing data from database.
GIS Specialist 80 hrs Develop maps for Report. Print multiple copies.
Technical Editor 40 hrs Complete initial and revised tech edits of Report.
Quality Assurance 60 hrs Review
Environmental Engineer 40 hrs Peer review
Regulatory Compliance 20 hrs Review
Management 48 hrs Review
Legal 8 hrs Review
Administrative Support 40 hrs Copy & assemble final documents, submit to records.

Breakdown of Cost Data:
Item: Develop Documentation
Units: Hours
Unit Cost: 656
Unit Cost Adjustment Factor: none
Revised Unit Hours: 656
Basis for adjustment: N/A

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6/23/00 9:22:23 AM
### Line Item SYS - Contingency And Escalation

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**Activity ID:** 1GHE674180  **Description:** Prepare Decision Document - IHSS Group 700-4

**Cost Risk** | 1 | **Schedule Risk** | 1

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**Total for Activity 1GHE674180:**

- Labor Hours: 289
- Labor Cost: 9,164
- Total Cost: 11,017
- Burden Cost: 3,235
- Total Cost: 14,252

### Line Item 0100 - PAM

**BOE**

**Estimator's Experience based generally on historical data for Ryan's Pit**

**Item Desc:**
Preparation of of PAM or IM/IRA in support of source removal of previously characterized UBC.

**Proposed Action Memorandum:** A bottoms-up estimate based on historical costs was used as the basis for the estimate. Based on Ryan's Pit (IHSS 108), the cost for the PAM was $50,000 (contractor costs). Assuming that labor rates at this time were approximately $75 (based on a cost center 217). The total labor for a PAM would be approximately 666 hours, which rounds to 700 hours. It was assumed that 10% would be required for managerial hours.

For a PAM the total labor hours are:
- Environmental Engineer 700 Hours
- Manager 70 Hours
- Factor 700 Environmental Engineer 175 hours
- Factor 70 Manager 18 hours

**Breakdown of Cost Data:**
- Item: Preparation of PAM for Ryan's Pit source removal action.
  - Units: hours
  - Unit Cost: 770
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit Hours: 193

**Basis for adjustment.** Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

### Resources

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Quantity</th>
<th>Units</th>
<th>Curve</th>
<th>Department</th>
<th>BOE Type</th>
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</thead>
<tbody>
<tr>
<td>750 STRAIGHT TIME BASE</td>
<td>E050 ENVIRONMENTAL ENGINEERS</td>
<td>R100S RMRS Salaried</td>
<td>Linear</td>
<td>175.00</td>
<td>Hours</td>
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</tr>
<tr>
<td>750 STRAIGHT TIME BASE</td>
<td>M020 MANAGERS (GRADE 69 - 72)</td>
<td>R100S RMRS Salaried</td>
<td>Linear</td>
<td>18.00</td>
<td>Hours</td>
<td></td>
</tr>
</tbody>
</table>

**Estimator's Experience based generally on historical data for Ryan's Pit**

**Item Desc:**
Preparation of SAP in support of source removal of previously characterized UBC.

**Breakdown of Historical Data:**
- Item: Preparation of SAP for Ryan's Pit source removal action.
**Rocky Flats Closure Project**  
**Baseline Cost and Basis of Estimate**

**WBS No:** 1GAC0704  
**Activity ID:** 1GHE674180  
**WBS Filter:** 1GAC  
**Activity Filter:** *  
**Starts In FY:** *

---

### Resources

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<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
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<td>R100S RMRS Salaried</td>
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<td>Line Item SYS - Contingency And Escalation</td>
<td>E050 ENVIRONMENTAL ENGINEERS</td>
<td>R100S RMRS Salaried</td>
<td>Linear</td>
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<td>20 Hours</td>
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---

### Breakdown of Cost Data:

**Line Item 0100 - procurement & field prep**

- **Item Desc:** Estimator's Experience based generally on historical data for Ryan's Pit.

- **Breakdown of Historical Data:**
  - **Item:** Preparation of WMP for Ryan's Pit source removal action.
  - **Units:** hours
  - **Unit Cost:** $80
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit Hours:** 20

- **Basis for adjustment:** Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

---

**Line Item 0100 - procurement & field prep**

- **Description:** Procurement and Field Prep - HSS Grouping 700-4

---

**Activity ID:** 1GHE674210

- **Description:** Procurement and Field Prep - HSS Grouping 700-4

---

**Total for Activity 1GHE674210:**

- **Units:** 345
- **Labor Hours:** 10,637
- **Labor Cost:** 2,114
- **Total Cost:** 17,307
- **Burden Cost:** 3,680
- **Total Cost:** 20,987

---

**Total for Activity 1GHE674210:**

- **Units:** 345
- **Labor Hours:** 10,637
- **Labor Cost:** 2,114
- **Total Cost:** 17,307
- **Burden Cost:** 3,680
- **Total Cost:** 20,987

---

**Activity 1GHE674210**

- **Description:** Procurement and Field Prep - HSS Grouping 700-4

---

**Line Item 0100 - procurement & field prep**

- **BOE Type:**  
- **Labor Hours:**  
- **Labor Cost:**  
- **Contingency & Escalation:**  
- **Total Prime Cost:**  
- **Total Cost:**  
- **Burden Cost:**  
- **Total Cost:** 

---

**Line Item 0100 - procurement & field prep**

- **Item Desc:** Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation.

- **Breakdown of Cost Data:**
  - **Item:** Site Labor to perform above individual tasks for either Ryan's Pit or T-3/T-4.
  - **Units:** hours
  - **Unit Cost:** $1380
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** 345 hours
**Item:**  Subcontractor costs to perform above individual tasks for either Ryan's Pit or T-3/T-4.

<table>
<thead>
<tr>
<th>Units:</th>
<th>1 lot</th>
</tr>
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<tbody>
<tr>
<td>Unit Cost:</td>
<td>$10K</td>
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<td>Unit Cost Adjustment Factor:</td>
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<tr>
<td>Revised Unit:</td>
<td>$2.5K</td>
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Basis for adjustment. Hours and costs for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be characterized at once.

Procurement includes preparation of statement of work, proposal review (technical evaluation), and negotiations. Based on a T-3/T-4 burdened cost of $29,186.52. Assuming it is primarily labor hours (RMRS Environmental Engineer charging at $57.45 per hour) yields 508 hours which rounds to 510 total hours.

Davis Bacon Documentation: It was assumed that it would take an environmental engineer twenty-four hours to prepare a Davis Bacon cost estimate and to support the Davis-Bacon determination.

Subcontractor Health and Safety Plan: Costs for the health and safety plan are based on Ryan's Pit, which cost approximately $10,000. It was assumed that these are A5H dollars. In addition, it was assumed that a safety engineer, an industrial hygienist, and a radiological engineer would each provide one week (40 hours) of support for review and document preparation.

Radiological Work Permit: It was assumed that it would take a radiological control technician two working days (18 hours) to complete counting preparation and review.

Implementation Plan: It was estimated that this activity would take 13 weeks of time for engineers, scientists or equivalent to complete. This would include preparation of an implementation plan as required (Rocky Flats Cleanup Agreement, Appendix 3, Interim Guidance Document, Dated August 1977). In addition this includes all tasks related to documentation for the Integrated Work Control Program and Integrated Safety Management.

Ecology Survey/National Environmental Protection Act (NEPA) Support: It was estimated that this would take 40 hours for an ecologist. The activities include NEPA review and support in document preparation, site surveys to verify compliance with ecological regulations, categorical exclusions, and NEPA evaluations.

Utility Clearance/Soil Disturbance Permits: It was estimated based on experience that it would take the equivalent 2 weeks (80 hours) for technical staff to do utility surveys, prepare and review soil disturbance permits, and prepare authorizing documents for excavation.

The combined resources for procurement and field preparations are

**Total Procurement and Field Preparation Hours**

<table>
<thead>
<tr>
<th>Role</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Environmental Engineer</td>
<td>1134</td>
</tr>
<tr>
<td>Safety Engineer</td>
<td>40</td>
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<td>Industrial Hygiene</td>
<td>40</td>
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<td>Radiological Engineering</td>
<td>58</td>
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<tr>
<td>Radiological Control Technician</td>
<td>18</td>
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<tr>
<td>Ecologist/Life Scientist</td>
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<tr>
<td>Manager</td>
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<td>Quality Assurance*</td>
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<td>A5H Total</td>
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</table>

* On some projects these hours were assumed to be included in other tasks or part of this task under environmental engineer or one of the other job functions.

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

<table>
<thead>
<tr>
<th>Factor</th>
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<td>40 - Safety Engineer</td>
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<tr>
<td>58 - Radiological Engineering</td>
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<td>18 - RCT</td>
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<td>40 - Life Scientist</td>
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<td>10000 - A5H Subcontracted Services</td>
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This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
Line Item SYS - Contingency And Escalation

BOE

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<th>Skill</th>
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Activity ID: 1GHE674240  Description: Readiness Assessment - IHSS Group 700-4

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<th>Materials/Sub Cost</th>
<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
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SYS Contingency And Escalation

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Total for Activity 1GHE674240:

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</table>

Line Item 0100 - readiness assessment

BOE

Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation

Item Desc:
Evaluate readiness of the field characterization team and plans.

Breakdown of Cost Data:
Item: Site Labor to perform Readiness Assessment for T-3/T-4.
Units: hours
Unit Cost: $187
Unit Cost Adjustment Factor: 0.25
Revised Unit: 48

Units: 1 lot
Unit Cost: $4,800
Unit Cost Adjustment Factor: 0.25
Revised Unit: $1200

It was estimated that subcontractor involvement would require 80 hours at $60/hour = $4,800. It was assumed that about 3 weeks of time was required for an environmental engineer or similar person in addition to 12 hours of project management, which yielded 132 hours. An additional 11 hours was added for management oversight. It was estimated that a radiological engineer (QA) and an industrial hygienist would be needed for 2.5 days each (22 hours).

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 projects will be conducted at once and only one of each fixed cost is needed for.
### Resources

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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#### Cost Element

#### 0200 - training

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:**

Conduct perform Training in support of source removal action.

**Breakdown of Cost Data:**

- **Item:** Site Labor to perform above individual tasks for T-3/T-4.
  - **Units:** hours
  - **Unit Cost:** 133 Hours
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** 33 hours

- **Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
  - **Units:** 1 lot
  - **Unit Cost:** $12K
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** $3K

**Basis for adjustment.** Costs for each UBC are divided by 4 to account for the fact that 4 UBCs will be remediated at once and only one Training is needed for the group.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

**Line Item 0200 - training**

**BOE**

**Estimator's Experience based generally on historical data for T-3/T4 Remediation.**

**Item Desc:**

Conduct perform Training in support of source removal action.

**Breakdown of Cost Data:**

- **Item:** Site Labor to perform above individual tasks for T-3/T-4.
  - **Units:** hours
  - **Unit Cost:** 133 Hours
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** 33 hours

- **Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
  - **Units:** 1 lot
  - **Unit Cost:** $12K
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** $3K

**Basis for adjustment.** Costs for each UBC are divided by 4 to account for the fact that 4 UBCs will be remediated at once and only one Training is needed for the group.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

**Line Item 0300 - pre-evolution meeting**

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:**
Conduct Pre-Evolution Meeting in support of source removal action

Breakdown of Cost Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
- Units: hours
  - Unit Cost: 60 hours
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit: 15 hours

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
- Units: 1 lot
  - Unit Cost: $6K
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit: $1.5K

Basis for adjustment. Costs for each UBC are divided by 4 to account for the fact that 4 UBCs will be remediated at once and only one Pre-Evolution Meeting is needed for the group.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>750</td>
<td>STRAIGHT TIME BASE</td>
<td>E050 ENVIRONMENTAL ENGINEERS</td>
<td>R100S RMRS Salaried</td>
<td>Linear</td>
<td>15.00 Hours</td>
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### ASH SUBCONTRACTED SRVS

<table>
<thead>
<tr>
<th>Item Desc: Mobilization in support of remediation.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item: Site Labor to perform above individual tasks for T-3/T-4.</td>
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<tr>
<td>Units: hours</td>
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### Line Item 0100 - mobilization

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Item: Site Labor to perform above individual tasks for T-3/T-4.</td>
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### ActivityID: 1GHE674250

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<th>Quantity</th>
<th>Units</th>
<th>BOE Type</th>
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<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
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<td>0</td>
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**Total for Activity 1GHE674250:**
- 70,719
- 2,286,422
- 2,230,214
- 1,242,837
- 5,761,472
- 767,320
- 6,528,793
Project: Rocky Flats Closure Project  
Baseline Cost and Basis of Estimate

WBS No: 1GAC0704
Activity ID: 1GHE674250

Baseline Devl
WBS Filter: 1GAC
Activity Filter: *

Unit Cost: 1,100
Unit Cost Adjustment Factor: 0.25
Revised Unit: 275

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
Units: 1 lot
Unit Cost: 184k
Unit Cost Adjustment Factor: 0.25
Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

T3/T4 hours 110 Health Physicists 27 Hours
T3/T4 hours 330 Manager 83 Hours
T3/T4 hours 550 Environmental Engineer 138 Hours
T3/T4 hours 110 Industrial Hygienist 27 Hours
T3/T4 subcontractors dollars 184,000 Subcontractor 46,000

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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Line Item 0200 - site prep

BOE

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc:
Site Preparation including setting up fencing, trailer, etc.

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
Units:  hours
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
Units: 1 lot
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

T3/T4 hours 120 Environmental Engineer 30 hours
T3/T4 dollars 30,000 Subcontracted Svrs 7,500 Dollars (81% subcontracted services / 19% D&D construction workers)

D&D construction trade hours represent 19% of the subcontract dollars and were calculated using the following methodology:

A5K subcontracted dollars were multiplied by .19, the result was divided by $60/hr to determine the number of hours allocated to D&D construction.

For Site Preparation tasks - RCT hours were the same as D&D construction hours.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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Line Item 0300 - excavation

Item Desc:
Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
  Units: hours
  Unit Cost: see below
  Unit Cost Adjustment Factor: see below
  Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
  Units: 1 lot
  Unit Cost: see below
  Unit Cost Adjustment Factor: see below
  Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Total Contaminated Soil to be removed 10,045 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 10,045 CY

The excavation cost was based on the excavation cost for the T-3/T-4 Project. Burdened cost based on the T-3/T-4 actuals is $171,487. For the 3,800 cubic yards of contaminated soil removed this yielded a unit cost of $45 per cubic yard of contaminated soil removed. This estimate includes the removal of overburden that might be on top of the contaminated soil. The hours for an environmental engineer from T-3/T-4 were 1.09 hours per cubic yard of contaminated soil. Likewise the hours for the following were assumed to be linearly proportional:

Health Physicists .47 hours per cubic yard
Environmental Operations .31 hours per cubic yard
Industrial Hygienists 0.31 hours per cubic yard
Radiological Control Technician 1.00 hour per cubic yard

* Based on $50/cubic yard from T-3/T-4, assumes a labor rate of $50/hour
The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

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Resources

Line Item 0400 - remove and clean debris

BOE

Estimator's Experience based generally on a base case of 700 cy.

Item Desc:
Remove and clean debris.

Total Contaminated Soil to be removed 10,045 CY
Total Soil for Thermal Desorption 0 CY
Offsets Waste Volume 10,045 CY

For the base case, it was assumed that about five cubic yards out of 700 cubic yards would be debris and would be segregated and cleaned. It was estimated that each cubic yard of debris would cost $1,000 or $5,000 total for 700 cubic yards. This yields a rate of $7.14 per cubic yard.

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 7.14 - ASH Subcontracted Srvs 71,721 Dollars (81% subcontracted services/19% D&D construction workers)

D&D construction trade hours represent 19% of the subcontract dollars and were calculated using the following methodology:
ASH subcontracted dollars were multiplied by .19, the result was divided by $60/hr to determine the number of hours allocated to D&D construction.

The dollars amount calculated for D&D construction workers was subtracted from the subcontractor dollars.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
**BOE**

**Line Item 0600 - confirmation sampling**

**Estimator's Experience based generally on historical data for T-3/T4 Remediation.**

**Item Desc:**
Confirmation Sampling.

**Breakdown of Historical Data:**

- **Item:** Site Labor to perform above individual tasks for T-3/T-4.
  - **Units:** hours
  - **Unit Cost:** see below
  - **Unit Cost Adjustment Factor:** see below
  - **Revised Unit:** see below

- **Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
  - **Units:** 1 lot
  - **Unit Cost:** see below
  - **Unit Cost Adjustment Factor:** see below
  - **Revised Unit:** see below

**Basis for adjustment.** The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

- **Total Contaminated Soil to be removed 10045 CY**
- **Total Soil for Thermal Desorption 0 CY**
- **Offsite Waste Volume 10,045 CY**

The analytical costs were based on T-3/T-4, which cost $435,574 for 3800 cubic yards of contaminated soil removed. This yielded a unit rate of about $115/cubic yard. Based on estimator experience the cost of sampling including labor and materials was estimated to be 20% of that rate or about $23/ cubic yard.

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

- **Factor 114.62 - A5H Subcontracted Srvs (Analytical) 1,151,358 Dollars**
- **Factor 22.924 - A5H Subcontracted Srvs 230,272 Dollars**

D&D construction trade hours were calculated using the following methodology:

A5H subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.

RCT hours were calculated using the following methodology, unless they were already estimated.

For Site Preparation tasks - RCT hours were the same as D&D construction hours.

For all other tasks A5H subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under KG10H department code.

The dollars amounts calculated for D&D construction workers and RCTs were subtracted from the subcontractor dollars and the revised A5H dollar amount was entered into Best.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
Line Item 0700 - prepare waste acceptance forms

BOE

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc:
Prepare Waste Acceptance Forms

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
Units: hours
Unit Cost: 80
Unit Cost Adjustment Factor: .25
Revised Unit: 20

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

T3/T4 hours 80 environmental engineer 20 hours

Resources

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Line Item 0800 - waste acceptance sampling

BOE

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc:
Waste Acceptance Sampling

Breakdown of Historical Data:
Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
Units: 1 lot
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Because the waste acceptance sampling is difficult to predict and could vary significantly from project to project, it was assumed that about $800 worth of additional analysis would be required for 20 cubic yards which is the volume that can be placed in one roll-off. This yielded a unit rate of about $40/cubic yard. This sampling and analysis is in addition to the confirmational samples so the costs are not as great. It was assumed that this sampling would be more labor intensive so the sampling costs were estimated to be about 50% of the analytical costs or about $20/cubic yard.

Total Contaminated Soil to be removed 10,045 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 10,045 CY

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 40 - ASH Analytical 401,800 Dollars
Factor 20 - ASH Subcontracted Srvs 200,900 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
Estimator's Experience based generally on a base case of 700 cy.

Item Desc:
Field Oversight and Project Management

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
Units: hours
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

It was assumed that a field manager would be needed for 150 nine-hour working days or about 33 weeks. This work breaks down as follows:

Preparation Activities 50 working days
Field Activities – 80 working days
Demobilization – 20 working days
Total 150 nine-hour working days or 1350 hours

In addition it was estimated that technical staff, quality assurance, and project management would be required for the equivalent of ten additional weeks, which is 400 hours each.

Based on the base case of a 700 cubic yard removal project, these values yielded unit rates as follows:

Hours Per Cubic Yard Of Contaminated Soil
Field Manager 1.93
Technical Staff .57
Quality Assurance .57
Project Management 0.57

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Total Contaminated Soil to be removed 10,045 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 10,045 CY

Factor 1.93 – Environmental Engineer 19,387 Hours
Factor 0.57 – Technical Support 5,726 Hours
Factor 0.57 – Project Manager 5,726 Hours
Factor 0.57 – Quality Assurance 5,726 Hours

Resources

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**Rocky Flats Closure Project**  
Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0704  
**Activity ID:** 1GHE674250  
**WBS Filter:** 1GAC  
**Activity Filter:** *  
**Starts In FY:**  *

---

**Line Item 1000 - backfill**

**BOE**  
Trade Publication: Means 1995, Site Work & Landscape Cost Data (page 34, 42, and 34)

**Item Desc:** Backfill.

**Breakdown of Historical Data:**
- **Item:** Site Labor to perform above individual tasks for T-3/T-4.  
  - Units: hours  
  - Unit Cost: see below  
  - Unit Cost Adjustment Factor: see below  
  - Revised Unit: see below

- **Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.  
  - Units: 1 lot  
  - Unit Cost: see below  
  - Unit Cost Adjustment Factor: see below  
  - Revised Unit: see below

**Means (1995) Site Work & Landscape Cost Data as follows:**
- Common Fill $ 4.77/cubic yard (page 34 Borrow Bank Measure)
- Hauling $ 3.98/cubic yard (page 42 2-mile round-trip, 6 cubic yard dump truck)
- Backfilling $ 1.69/cubic yard (page 34)
- Burden (43%) $ 4.49/cubic yard
- Total $14.23/cubic yard or about $15/cubic yard

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

**Factor 15 - ASH Subcontracted Srvs 150,675 Dollars**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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**Line Item 1100 - demobilization**

**BOE**  
Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Breakdown of Historical Data:**
- **Item:** Site Labor to perform above individual tasks for T-3/T-4.  
  - Units: hours  
  - Unit Cost: see below  
  - Unit Cost Adjustment Factor: see below  
  - Revised Unit: see below

- **Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.  
  - Units: 1 lot  
  - Unit Cost: see below  
  - Unit Cost Adjustment Factor: see below  
  - Revised Unit: see below

**Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.**
Demobilization: Based on the T-3/T-4 project, it was assumed that demobilization costs would cover demobilization for excavation activities also. The subcontractor cost for demobilization was about $95,000 for 3,800 cubic yards at the T-3/T-4 project. In addition it was estimated that the following hours were necessary:

- Environmental Engineer 300 hours
- Health Physicist 100 hours
- Manager 200 hours
- Industrial Hygiene 100 hours

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

Factor 300 - Environmental Engineer 75 Hours
Factor 100 - Health Physicists 25 Hours
Factor 200 - Manager 50 Hours
Factor 100 - P990 Industrial Hygienists 25 Hours
Factor 95000 - A5H Subcontracted Srvs 23,750 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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### Line Item SYS - Contingency And Escalation

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### Activity: 1GHE674270

**Description:** Prepare Closeout Report - IHSS Group 700-4

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Total for Activity 1GHE674270:

- Labor Hours Total: 320
- Labor Cost Total: 9,045
- Material/ Sub Cost: 0
- Contingency & Escalation: 0
- Total Prime Cost: 10,700
- Burden Cost: 2,551
- Total Cost: 13,251

### Line Item 0100 - develop report

**BOE**

- Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites. (T-3/T-4 and others)

**Item Desc:**

Perform Data Analysis including GIS representation of data, Closeout Report, and associated project management.

**Required level of effort:**

- Environmental Engineer - 80 hours
- Environmental Scientist - 20 hours
- Computer Specialist - 160 hours (GIS, SWD)
- Manager - 20 hours
- Administrative - 20 hours
Cost Estimators - 20 hours

Breakdown of Cost Data:
Item: Develop Documentation
Units: hours
Unit Cost: 320
Unit Cost Adjustment Factor: none
Revised Unit Hours: 320

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Line Item SYS - Contingency And Escalation

| WBS No: | 1GAC0705
Title: | Group 700-5 (B770)
Activity ID: | 1GHE675100
Description: | SAP Preparation - IHSS Group 700-5 (B770)
| | Cost Risk | 2
Schedule Risk | 3

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Total for Activity 1GHE675100:
280 | 10,021 | 1,421 | 2,262 | 13,703 | 3,547 | 17,241

Line Item 0100 - SAP Addenda

Estimate based on Estimator’s Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

Item Desc:
Preparation of SAP Addenda to Industrial Area Characterization Plan.

Breakdown of Cost Data:
Item: Preparation of SAP addenda
Units: hours
Unit Cost: 120
Unit Cost Adjustment Factor: none
Revised Unit Hours: 120

Basis for adjustment.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
**Rocky Flats Closure Project**

**Baseline Cost and Basis of Estimate**

**WBS No:** 1GAC0705  
**Activity ID:** 1GHE675100

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**Line Item SYS - Contingency And Escalation**

**Resources**

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*OFFICIAL USE ONLY*
**Rocky Flats Closure Project**

**Baseline Cost and Basis of Estimate**

**WBS No:** 1GAC0705  
**Activity ID:** 1GHE675100

---

**CON** CONTINGENCY 0000 NONE ZDEPT No Department  
**Factors** 1561.86 Dollars

**ESC** ESCALATION 0000 NONE ZDEPT No Department  
**Factors** 699.979 Dollars

**Activity ID:** 1GHE675120  
**Description:** Procurement and Field Prep - IHSS Group 700-5

---

**Line Item 0100 - procurement & field prep**

**BOE**

Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation.

**Item Desc:**


**Breakdown of Cost Data:**

**Item:** Site Labor to perform above individual tasks for either Ryan's Pit or T-3/T-4.
- **Units:** hours
- **Unit Cost:** $1380
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** 345 hours

**Item:** Subcontractor costs to perform above individual tasks for either Ryan's Pit or T-3/T-4.
- **Units:** 1 lot
- **Unit Cost:** $10K
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** $2.5K

**Basis for adjustment.** Hours and costs for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be characterized at once.

Procurement includes preparation of statement of work, proposal review (technical evaluation), and negotiations. Based on a T-3/T-4 burdened cost of $29,186.52. Assuming it is primarily labor hours (RMRS Environmental Engineer charging at $57.45 per hour) yields 508 hours which rounds to 510 total hours.

Davis Bacon Documentation: It was assumed that it would take an environmental engineer twenty-four hours to prepare a Davis Bacon cost estimate and to support the Davis-Bacon determination.

Subcontractor Health and Safety Plan: Costs for the health and safety plan are based on Ryan's Pit, which cost approximately $10,000. It was assumed that these are A5H dollars. In addition, it was assumed that a safety engineer, an industrial hygienist, and a radiological engineer would each provide one week (40 hours) of support for review and document preparation.

Radiological Work Permit: It was assumed that it would take a radiological control technician two working days (18 hours) to complete counting preparation and review.

Implementation Plan: It was estimated that this activity would take 13 weeks of time for engineers, scientists or equivalent to complete. This would include preparation of an implementation plan as required (Rocky Flats Cleanup Agreement, Appendix 3, Interim Guidance Document, Dated August 1977). In addition this includes all tasks related to documentation for the Integrated Work Control Program and Integrated Safety Management.

Ecology Survey/National Environmental Protection Act (NEPA) Support: It was estimated that this would take 40 hours for an ecologist. The activities include NEPA review and support in document preparation, site surveys to verify compliance with ecological regulations, categorical exclusions, and NEPA evaluations.

Utility Clearance/Soil Disturbance Permits: It was estimated based on experience that it would take the equivalent 2 weeks (80 hours) for technical staff to do utility surveys, prepare and review soil disturbance permits, and prepare authorizing documents for excavation.

The combined resources for procurement and field preparations are Total Procurement and Field Preparation Hours

Environmental Engineer 1134 hours

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**Line Item**

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<th>Quantity</th>
<th>Units</th>
<th>BOE Type</th>
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**Total for Activity 1GHE675120:**

- Labor Hours: 345
- Labor Cost Total: 10,637
- Labor Cost: 2,114
- Contingency & Escalation: 0
- Total Prime Cost: 12,751
- Burden Cost: 3,755
- Total Cost: 16,506

---

**6/23/00 9:22:27 AM OFFICIAL USE ONLY**
### Rocky Flats Closure Project
#### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0705  
**Activity ID:** 1GHE675120

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**Total for Activity 1GHE675140:**

- Labor Hours Total: 68
- Labor Cost Total: 1,887
- Material/ Sub Cost: 1,015
- Contingency & Escalation: 533
- Total Prime Cost: 3,436
- Burden Cost: 666
- Total Cost: 4,102

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### Resources

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**Factors:**

- 283 hrs
- 10 hrs
- 13 hrs
- 14 hrs
- 10 hrs
- 10 hrs
- 5 hrs

**Line Item SYS - Contingency And Escalation**

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**Activity ID:** 1GHE675140

- **Description:** Readiness Assessment - IHSS Group 700-5
- **Cost Risk:** 1
- **Schedule Risk:** 1

---

*On some projects these hours were assumed to be included in other tasks or part of this task under environmental engineer or one of the other job functions.*

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

- Factor 1134 - Environmental Engineer 283 Hours
- Factor 40 - Safety Engineer 10 Hours
- Factor 40 - Industrial Hygiene 10 Hours
- Factor 58 - Radiological Engineering 14 Hours
- Factor 18 - RCT 5 Hours
- Factor 50 - Project Manager 13 Hours
- Factor 10000 - ASH Subcontracted Services 2,500 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
Line Item 0100 - readiness assessment

Estimator’s Experience based generally on historical data for Ryan’s Pit and T-3/T4 Remediation.

Item Desc:
Evaluate readiness of the field characterization team and plans.

Breakdown of Cost Data:
Item: Site Labor to perform Readiness Assessment for T-3/T-4.
Units: hours
Unit Cost: 187
Unit Cost Adjustment Factor: 0.25
Revised Unit: 48

Units: 1 lot
Unit Cost: $4800
Unit Cost Adjustment Factor: 0.25
Revised Unit: $1200

It was estimated that subcontractor involvement would require 80 hours at $60/hour = $4,800. It was assumed that about 3 weeks of time was required for an environmental engineer or similar person in addition to 12 hours of project management, which yielded 132 hours. An additional 11 hours was added for management oversight. It was estimated that a radiological engineer (QA) and an industrial hygienist would be needed for 2.5 days each (22 hours).

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 projects will be conducted at once and only one of each fixed cost is needed for the group.

Factor 132 - Environmental Engineer 33 Hours
Factor 22 - Health Physicists 6 Hours
Factor 11 - Manager 3 Hours
Factor 22 - Quality Assurance 6 Hours
Factor 4,800 - ASH Subcontracted Srvs, 1,200 Dollars

20 hours of administrative time will also be required.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

**Resources**

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**Line Item SYS - Contingency And Escalation**

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**Activity ID:** 1GHE675150  **Description:** Field Sampling, Lab Analysis - IHSS Group 700-5  **Cost Risk:** 3  **Schedule Risk:** 3
### Rocky Flats Closure Project

#### Baseline Cost and Basis of Estimate

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<td>1GHE675150</td>
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<td>Analyze samples</td>
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<td>Project mgmt oversight</td>
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#### Line Item 1000 - Collect Geoprobe Samples

**BOE**

- **Item Desc:**
  - Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

- **Breakdown of Cost Data:**
  - **Item:** Site Personnel for support of geoprobe samples
  - **Units:** hours
  - **Unit Cost:** 32
  - **Unit Cost Adjustment Factor:** none
  - **Revised Unit Hours:** 32

  - **Item:** Kaiser-Hill/RMRS Geoprobe unit with 2 Technician crew.
  - **Item Cost:** $100 per hour or $800 per 8-hour day.
  - **Units:** dollars
  - **Unit Cost:** 800
  - **Unit Cost Adjustment Factor:** none
  - **Revised Unit Hours:** 800

**Resources**

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#### Line Item 0200 - Analyze Samples

**BOE**

- **Item Desc:**
  - Analyze samples produced from geoprobe borings. It is anticipated that 5 samples from each boring will be collected. They will be analyzed for Metals, VOCs, SVOCs, PCBs, and radionuclides (est. 3 isotopes) with a 30 day TAT. This item is priced on a per sample basis. Per sample costs include DOT rad screen, bottle charge, shipping, and validation.

- **Breakdown of Cost Data:**
  - **Item:** Analyze samples at an offsite laboratory.
  - **Units:** analysis
  - **Unit Cost:** Metals $345, VOCs $280, SVOCs $440, PCBs and other analytes $150, and Radionuclides 3 isotopes $590 per each sample.
  - **Unit Cost Adjustment Factor:** Must add: DOT rad screen $32/sample, bottle charge $7/sample, shipping $4.2/bottle, and validation per each: $17.30 VOA, $19.25 SVOC, $16.75 Metals, $5.95 PCB, and $15.60 Rad.
Revised Unit Hours: Metals $405, VOCs $341, SVOCs $502, PCBs and other analytes $199, and Rad $649.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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Factors 2096 dollars

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### Line Item 0300 - project mgmt oversight

**BOE**

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Item Desc:**

Project Management/Oversight. Based on half time for a Project Manager, Administrative staff, and Cost Estimator/Scheduler

**Breakdown of Cost Data:**

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**Basis for adjustment:**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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Factors 4 hrs

### Line Item SYS - Contingency And Escalation

**BOE**

Cost Element: CON

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Factors 13095.2 Dollars

### Line Item 0100 - develop documentation

**BOE**

Estimator’s Experience:

Estimate for summary report based on estimator’s 16 years of experience performing and costing projects of similar size and scope.

**Item Desc:**

Perform Data Analysis including GIS representation of data, NFA Summary, Characterization Report, and associated project management. Disposition comments and finalize document.


Computer Specialist 80 hrs Identify & pull existing data from database.

GIS Specialist 80 hrs Develop maps for Report. Print multiple copies.

Technical Editor 40 hrs Complete initial and revised tech edits of Report.

**Line Item 0100 - develop documentation**

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Project: Baseline Cost and Basis of Estimate

WBS Filter: 1GAC
Activity Filter: * Sucre Is FY *

Rocky Flats Closure Project

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WBS No: 1GAC0705

Breakdown of Cost Data:
- Item: Develop Documentation
- Units: Hours
- Unit Cost: $656
- Revised Unit Hours: 656
- Basis for adjustment: N/A

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Line Item 0100 - PAM

Estimator's Experience based generally on historical data for Ryan's Pit

Preparation of PAM or IM/IRA in support of source removal of previously characterized UBC.

Line Item 0200 - SAP

Prepared Action Memorandum: A bottoms-up estimate based on historical costs was used as the basis for the estimate. Based on Ryan's Pit (IHSS 108), the cost for the PAM was $50,000 (contractor costs). Assuming that labor rates at this time were approximately $75 (based on a cost center 217). The total labor for a PAM would be approximately 666 hours, which rounds to 700 hours. It was assumed that 10% would be required for managerial hours.
For a PAM the total labor hours are:

Environmental Engineer 700 Hours
Manager 70 Hours
Factor 700 Environmental Engineer 175 hours
Factor 70 Manager 18 hours

Breakdown of Cost Data:
Item: Preparation of PAM for Ryan's Pit source removal action.
  Units: hours
  Unit Cost: 770
  Unit Cost Adjustment Factor: 0.25
  Revised Unit Hours: 193

Basis for adjustment. Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

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**Line Item 0200 - SAP**

BOE

Estimator's Experience based generally on historical data for Ryan's Pit

Item Desc:
Preparation of SAP in support of source removal of previously characterized UBC.

Breakdown of Historical Data:
Item: Preparation of SAP for Ryan's Pit source removal action.
  Units: hours
  Unit Cost: 300
  Unit Cost Adjustment Factor: 0.25
  Revised Unit Hours: 76

Basis for adjustment. Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

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**Line Item 0300 - WMP**

BOE

Estimator's Experience based generally on historical data for Ryan's Pit

Item Desc:
Preparation of WMP in support of source removal of previously characterized UBC.

Breakdown of Historical Data:
Item: Preparation of WMP for Ryan's Pit source removal action.
  Units: hours
  Unit Cost: 80
  Unit Cost Adjustment Factor: 0.25
  Revised Unit Hours: 20

Basis for adjustment. Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.
### Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

**WBS Filter**

1GAC

**Activity Filter**

*  

**Starts In FY**

- *

#### Line Item SYS - Contingency And Escalation

**BOE Resources**

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**Activity ID:** 1GHE675210  
**Description:** Procurement and Field Prep - HSS Group 700-5

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**Total for Activity 1GHE675210:**

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**BOE:**

- **Estimator's Experience:** based generally on historical data for Ryan's Pit and T-3/T4 Remediation

**Item Desc:**


**Breakdown of Cost Data:**

- **Item:** Site Labor to perform above individual tasks for either Ryan's Pit or T-3/T-4.
  - **Units:** 345 hours
  - **Unit Cost:** 1380
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** 345 hours

- **Item:** Subcontractor costs to perform above individual tasks for either Ryan's Pit or T-3/T-4.
  - **Units:** 1 lot
  - **Unit Cost:** $10K
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** $2.5K

**Basis for adjustment:** Hours and costs for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be characterized at once.

**Procurement** includes preparation of statement of work, proposal review (technical evaluation), and negotiations. Based on a T-3/T-4 burdened cost of $29,186.52. Assuming it is primarily labor hours (RMRS Environmental Engineer charging at $57.45 per hour) yields 508 hours which rounds to 510 total hours.

**Davis Bacon Documentation:** It was assumed that it would take an environmental engineer twenty-four hours to prepare a Davis Bacon cost estimate and to support the Davis-Bacon determination.

**Subcontractor Health and Safety Plan:** Costs for the health and safety plan are based on Ryan's Pit, which cost approximately $10,000. It was assumed that these are A5H dollars. In addition, it was assumed that a safety engineer, an industrial hygienist, and a radiological engineer would each provide one week (40 hours) of support for review and document preparation.

**Radiological Work Permit:** It was assumed that it would take a radiological control technician two working days (18 hours) to complete counting preparation and review.

**Implementation Plan:** It was estimated that this activity would take 13 weeks of time for engineers, scientists or equivalent to complete. This would include preparation of an implementation plan as required (Rocky Flats Cleanup Agreement, Appendix 3, Interim Guidance Document, Dated August 1977). In addition this includes all tasks related to documentation for the Integrated Work Control Program and Integrated Safety Management.

**Ecology Survey/National Environmental Protection Act (NEPA) Support:** It was estimated that this would take 40 hours for an ecologist. The activities include NEPA review and support in document preparation, site surveys to verify compliance with ecological regulations, categorical exclusions, and NEPA evaluations.

**Utility Clearance/Soil Disturbance Permits:** It was estimated based on experience that it would take the equivalent 2 weeks (80 hours) for technical staff to...
do utility surveys, prepare and review soil disturbance permits, and prepare authorizing documents for excavation.

The combined resources for procurement and field preparations are
Total Procurement and Field Preparation Hours

Environmental Engineer 1134 hours
Safety Engineer 40 hours
Industrial Hygienist 10 Hours
Radiological Engineering 58 hours
Radiological Control Technician 18 hours
Ecologist/Life Scientist 40 hours
Manager 50 hours
Quality Assurance* 29 hours
A$H Total $10,000

* On some projects these hours were assumed to be included in other tasks or part of this task under environmental engineer or one of the other job functions.

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

Factor 1134 - Environmental Engineer 283 Hours
Factor 40 - Safety Engineer 10 Hours
Factor 40 - Industrial Hygienist 10 Hours
Factor 58 - Radiological Engineering 14 Hours
Factor 18 - RCT 5 Hours
Factor 40 - Life Scientist 10 Hours
Factor 50 - Project Manager 13 Hours
Factor 10000 - A$H Subcontracted Services 2,500 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
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### Rocky Flats Closure Project

#### Baseline Cost and Basis of Estimate

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### Line Item 0100 - readiness assessment

**BOE**

**Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation.**

**Item Desc:**

Evaluate readiness of the field characterization team and plans.

**Breakdown of Cost Data:**

**Item:** Site Labor to perform Readiness Assessment for T-3/T-4.

- **Units:** hours
- **Unit Cost:** 187
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** 48

**Item:** Subcontractor costs to perform Readiness Assessment for T-3/T-4.

- **Units:** 1 lot
- **Unit Cost:** $4800
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** $1200

It was estimated that subcontractor involvement would require 80 hours at $60/hour = $4,800. It was assumed that about 3 weeks of time was required for an environmental engineer or similar person in addition to 12 hours of project management, which yielded 132 hours. An additional 11 hours was added for management oversight. It was estimated that a radiological engineer (QA) and an industrial hygienist would be needed for 2.5 days each (22 hours).

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 projects will be conducted at once and only one of each fixed cost is needed for the group.

**Factor 132 - Environmental Engineer 33 Hours**

**Factor 22 - Health Physicists 6 Hours**

**Factor 11 - Manager 3 Hours**

**Factor 22 - Quality Assurance 6 Hours**

**Factor 4,800 - A5H Subcontracted Srvs 1,200 Dollars**

20 hours of administrative time will also be required.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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**Line Item 0200 - training**

BOE

**Estimator's Experience based generally on historical data for T-3/T4 Remediation.**

**Item Desc:**

**BOE**

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Page 714 of 1121  
6/23/00 9:22:28 AM OFFICIAL USE ONLY
Conduct perform Training in support of source removal action.

Breakdown of Cost Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
  Units: hours
  Unit Cost: 132 Hours
  Unit Cost Adjustment Factor: 0.25
  Revised Unit: 33 hours

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
  Units: 1 lot
  Unit Cost: $12K
  Unit Cost Adjustment Factor: 0.25
  Revised Unit: $3K

Basis for adjustment. Costs for each UBC are divided by 4 to account for the fact that 4 UBCs will be remediated at once and only one Training is needed for the group.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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**Line Item 0030 - pre-evolution meeting**

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Breakdown of Cost Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
  Units: hours
  Unit Cost: 60 hours
  Unit Cost Adjustment Factor: 0.25
  Revised Unit: 15 hours

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
  Units: 1 lot
  Unit Cost: $6K
  Unit Cost Adjustment Factor: 0.25
  Revised Unit: $1.5K

Basis for adjustment. Costs for each UBC are divided by 4 to account for the fact that 4 UBCs will be remediated at once and only one Pre-Evolution Meeting is needed for the group.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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**Line Item SYS - Contingency And Escalation**

**BOE**

Resources

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### Rocky Flats Closure Project

**Project:** Baseline Devi

**Baseline Cost and Basis of Estimate:**

#### WBS Filter

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#### Activity ID

**Activity ID:** 1GHE675240

**Description:** Remedial Action - IHSS Group 700-5

**Activity ID:** 1GHE675250

**Description:** Remedial Action - IHSS Group 700-5

---

#### Line Item 0100 - mobilization

**BOE**

- **Type:** EE
- **Labor Hours/Unit:** 275
- **Labor Cost (Total):** 10,321
- **Materials/Sub Cost:** 38,905
- **Contingency & Escalation:** 0
- **Total Prime Cost:** 49,226
- **Burden Cost:** 2,911
- **Total Cost:** 52,137

**Resources**

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**Item Description:**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Breakdown of Cost Data:**

- **Item:** Site Labor to perform above individual tasks for T-3/T-4.
  - **Units:** hours
  - **Unit Cost:** 1,100
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** 275

- **Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
  - **Units:** 1 lot
  - **Unit Cost:** 184k
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** see below

**Basis for adjustment:** The costs were divided into fixed costs and variable costs. The fixed costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

**T3/T4 hours**

- 110 Health Physicists 27 Hours
- 330 Manager 83 Hours
- 550 Environmental Engineer 138 Hours
- 110 Industrial Hygienist 27 Hours
- 14,000 Subcontractor 46,000

**This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.**
Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc:
Site Preparation including setting up fencing, trailer, etc.

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
  Units: hours
  Unit Cost: see below
  Unit Cost Adjustment Factor: see below
  Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
  Units: 1 lot
  Unit Cost: see below
  Unit Cost Adjustment Factor: see below
  Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

T3/T4 hours 120 Environmental Engineer 30 hours
T3/T4 dollars 30,000 Subcontracted Srvs 7,500 Dollars (81% subcontracted services/19% D&D construction workers)

D&D construction trade hours represent 19% of the subcontract dollars and were calculated using the following methodology:

A5H subcontracted dollars were multiplied by .19, the result was divided by $60/hr to determine the number of hours allocated to D&D construction.

RCT hours were the same as D&D construction hours.

The dollar amount calculated for D&D construction workers was subtracted from the subcontractor dollars.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Total Contaminated Soil to be removed 29 CY

Total Soil for Thermal Desorption 0 CY

Offsite Waste Volume 29 CY

The excavation cost was based on the excavation cost for the T-3/T-4 Project. Burdened cost based on the T-3/T-4 actuals is $171,487. For the 3,800 cubic yards of contaminated soil removed this yielded a unit cost of $45 per cubic yard of contaminated soil removed. This estimate includes the removal of overburden that might be on top of the contaminated soil. The hours for an environmental engineer from T-3/T-4 were 1.09 hours per cubic yard of contaminated soil. Likewise the hours for the following were assumed to be linearly proportional:

Health Physicists .47 hours per cubic yard
Environmental Operations .31 hours per cubic yard
Industrial Hygienists 0.31 hours per cubic yard
Radiological Control Technician 1.00 hour per cubic yard *

* Based on $50/cubic yard from T-3/T-4, assumes a labor rate of $50/hour

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

D&D construction trade hours represent 19% of the subcontract dollars and were calculated using the following methodology:

A5H subcontracted dollars were multiplied by .19, the result was divided by $60/hr to determine the number of hours allocated to D&D construction.

The dollars amount calculated for D&D construction workers was subtracted from the subcontractor dollars entered into the estimate.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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WBS Filter: 1GAC
Activity Filter: *
Starts In FY: *

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**Line Item 0400 - remove and clean debris**

**BOE**

Estimator's Experience based generally on a base case of 700 cy.

- **Item Desc:** Remove and clean debris.
- **Breakdown of Historical Data:**
  - Item: Site Labor to perform above individual tasks for T-3/T-4.
    - Units: hours
    - Unit Cost: see below
    - Unit Cost Adjustment Factor: see below
    - Revised Unit: see below
  - Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
    - Units: 1 lot
    - Unit Cost: see below
    - Unit Cost Adjustment Factor: see below
    - Revised Unit: see below

- **Basis for adjustment:** The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

- **Total Contaminated Soil to be removed:** 29 CY
- **Total Soil for Thermal Desorption:** 0 CY
- **Offsite Waste Volume:** 29 CY

For the base case, it was assumed that about five cubic yards out of 700 cubic yards would be debris and would be segregated and cleaned. It was estimated that each cubic yard of debris would cost $1,000 or $5,000 total for 700 cubic yards. This yields a rate of $7.14 per cubic yard.

- **The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.**

- **Factor 7.14 - ASH Subcontracted Srvs 207 Dollars (81% subcontracted services/19% D&D construction workers)**

- **D&D construction trade hours represent 19% of the subcontract dollars and were calculated using the following methodology:**

- **ASH subcontracted dollars were multiplied by .19, the result was divided by $60/hr to determine the number of hours allocated to D&D construction.**

- The dollar amount calculated for D&D construction workers was subtracted from the subcontractor dollars entered into the estimate.

- **This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.**

**Line Item 0600 - confirmation sampling**

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

- **Item Desc:** Confirmation Sampling.
Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
   Units: hours
   Unit Cost: see below
   Unit Cost Adjustment Factor: see below
   Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
   Units: 1 lot
   Unit Cost: see below
   Unit Cost Adjustment Factor: see below
   Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Total Contaminated Soil to be removed 29 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 29 CY

The analytical costs were based on T-3/T-4, which cost $435,574 for 3800 cubic yards of contaminated soil removed. This yielded a unit rate of about $115/yard. Based on estimator experience the cost of sampling including labor and materials was estimated to be 20% of that rate or about $23/ cubic yard.

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 114.62 - A5H Subcontracted Srvs (Analytical) 3,324 Dollars
Factor 22.924 - A5H Subcontracted Srvs 665 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

T3/T4 hours 80 environmental engineer 20 hours

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**Factors**
- 20 hrs

**Line Item 0800 - waste acceptance sampling**

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:**
Waste Acceptance Sampling

**Breakdown of Historical Data:**
**Item:** Site Labor to perform above individual tasks for T-3/T-4.
- **Units:** hours
- **Unit Cost:** see below
- **Unit Cost Adjustment Factor:** see below
- **Revised Unit:** see below

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
- **Units:** 1 lot
- **Unit Cost:** see below
- **Unit Cost Adjustment Factor:** see below
- **Revised Unit:** see below

**Basis for adjustment.** The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Because the waste acceptance sampling is difficult to predict and could vary significantly from project to project, it was assumed that about $800 worth of additional analysis would be required for 20 cubic yards which is the volume that can be placed in one roll-off. This yielded a unit rate of about $40/cubic yard. This sampling and analysis is in addition to the confirmational samples so the costs are not as great. It was assumed that this sampling would be more labor intensive so the sampling costs were estimated to be about 50% of the analytical costs or about $20/cubic yard.

Total Contaminated Soil to be removed 29 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 29 CY

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

**Factor 40** - ASH Analytical 1160 Dollars
**Factor 20** - ASH Subcontracted Srvs 580 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Resources**

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<tr>
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<td>40 units per yard in crates (analytical)</td>
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**Line Item 0900 - field oversight & project mgmt**

**BOE**

Estimator's Experience based generally on a base case of 700 cy.

**Item Desc:**
Field Oversight and Project Management
Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
  Units: hours
  Unit Cost: see below
  Unit Cost Adjustment Factor: see below
  Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
  Units: 1 lot
  Unit Cost: see below
  Unit Cost Adjustment Factor: see below
  Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

It was assumed that a field manager would be needed for 150 nine-hour working days or about 33 weeks. This work breaks down as follows:
Preparation Activities 50 working days
Field Activities – 80 working days
Demobilization – 20 working days
Total 150 nine-hour working days or 1350 hours

In addition it was estimated that technical staff, quality assurance, and project management would be required for the equivalent of ten additional weeks, which is 400 hours each.

Based on the base case of a 700 cubic yard removal project, these values yielded unit rates as follows

<table>
<thead>
<tr>
<th>Item Description</th>
<th>Hours Per Cubic Yard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Field Manager</td>
<td>1.93</td>
</tr>
<tr>
<td>Technical Staff</td>
<td>0.57</td>
</tr>
<tr>
<td>Quality Assurance</td>
<td>0.57</td>
</tr>
<tr>
<td>Project Management</td>
<td>0.57</td>
</tr>
</tbody>
</table>

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

| Total Contaminated Soil to be removed | 29 CY |
| Total Soil for Thermal Desorption    | 0 CY  |
| Offsite Waste Volume                 | 29 CY |

<table>
<thead>
<tr>
<th>Factor</th>
<th>Skill Description</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factor 1.93</td>
<td>Environmental Engineer</td>
<td>56 Hours</td>
</tr>
<tr>
<td>Factor 0.57</td>
<td>Technical Support</td>
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<tr>
<td>Factor 0.57</td>
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<td>Factor 0.57</td>
<td>Quality Assurance</td>
<td>17 Hours</td>
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### Resources

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<th>Line Item 1000 - backfill</th>
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<tr>
<td>BOE</td>
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<tr>
<td>Trade Publication</td>
</tr>
<tr>
<td>Means 1995, Site Work &amp; Landscape Cost Data (page 34, 42, and 34)</td>
</tr>
</tbody>
</table>
Backfill.

Means (1995) Site Work & Landscape Cost Data as follows:

Common Fill $ 4.77/cubic yard (page 34 Borrow Bank Measure)
Hauling $ 3.98/cubic yard (page 42 2-mile round-trip, 6 cubic yard dump truck)
Backfilling $ 1.69/cubic yard (page 34)
Burden (43%) $ 4.49/cubic yard
Total $14.23/cubic yard or about $15/cubic yard

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 15 - ASH Subcontracted Srvs 435 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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<tr>
<th>Cost Element</th>
<th>Skill</th>
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Item Desc: Demobilization.

Breakdown of Historical Data:

Item: Site Labor to perform above individual tasks for T-3/T-4.
- Units: hours
- Unit Cost: see below
- Unit Cost Adjustment Factor: see below
- Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
- Units: 1 lot
- Unit Cost: see below
- Unit Cost Adjustment Factor: see below
- Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Demobilization: Based on the T-3/T-4 project, it was assumed that demobilization costs would cover demobilization for excavation activities also. The subcontractor cost for demobilization was about $95,000 for 3,800 cubic yards at the T-3/T-4 project. In addition it was estimated that the following hours were necessary:

Environmental Engineer 300 hours
Health Physicist 100 hours
Manager 200 hours
Industrial Hygiene 100 hours

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

Factor 300 - Environmental Engineer 75 Hours
Factor 100 - Health Physicist 25 Hours
Factor 200 - Manager 50 Hours
Factor 100 - P090 Industrial Hygienists 25 Hours
Factor 95000 - ASH Subcontracted Srvs 23,750 Dollars

0.84576  [SYS 061400].84576000 - System
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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<td>RMRS Salaried</td>
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<td>Hours</td>
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<td>25 hrs</td>
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#### Line Item SYS - Contingency And Escalation

**BOE**

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#### Activity ID: 1GHE675270

*Description:* Prepare Closeout Report - HSS Group 700-5

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<th>Labor Cost Total</th>
<th>Materials/ Sub Cost</th>
<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
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### Item Description:

**Item Desc:**

Perform Data Analysis including GIS representation of data, Closeout Report, and associated project management.

**Required Level of Effort:**

- Environmental Engineer - 80 hours
- Environmental Scientist - 20 hours
- Computer Specialist - 160 hours (GIS, SWD)
- Manager - 20 hours
- Administrative - 20 hours
- Cost Estimator - 20 hours

**Breakdown of Cost Data:**

- Item: Develop Documentation
  - Units: hours
  - Unit Cost: 320
  - Unit Cost Adjustment Factor: none
  - Revised Unit Hours: 320

### Resources

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<td>RMRS Salaried</td>
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## Rocky Flats Closure Project

### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0705  
**Activity ID:** 1GHE675270  
**Project:** Baseline Devl  
**Baseline Devl Filter:** 1GAC  
**WBS Filter:** *  
**Activity Filter:** *

#### WBS No: 1GAC0705  
**Title:** Group 700-6 (B713)  
**Activity ID:** 1G70060100  
**Description:** Planning - IHSS Group 700-6 (B713)

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<th>Contingency &amp; Escalation</th>
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Total for Activity 1G70060100:  
280 | 10,021 | 1,421 | 2,037 | 13,479 | 2,526 | 16,305

### Resources

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<th>Units</th>
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<td>Linear</td>
<td>1,113.35</td>
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#### Line Item 0100 - SAP Addenda

**BOE**  
Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Item Desc:**  
Preparation of SAP Addenda to Industrial Area Characterization Plan.

**Breakdown of Cost Data:**  
- **Item:** Preparation of SAP addenda  
- **Units:** hours  
- **Unit Cost:** 120  
- **Unit Cost Adjustment Factor:** none  
- **Revised Unit Hours:** 120

**Basis for adjustment:**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

#### Resources

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#### Line Item 0200 - HASP Addendum

**BOE**  
Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Item Desc:**  
Preparation of HASP addenda to Industrial Area Characterization Plan.

**Breakdown of Cost Data:**  
- **Item:** Preparation of addenda for HASP.  
- **Units:** hours

**BOE**  
Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Item Desc:**  
Preparation of HASP addenda to Industrial Area Characterization Plan.

**Breakdown of Cost Data:**  
- **Item:** Preparation of addenda for HASP.  
- **Units:** hours

**Factors:**  
- 20 hrs

**Factors:**  
- 42 estimated $/hr

**Factors:**  
- 20 hrs

**Factors:**  
- 0.84576 [SYS 061400].84576000 - System

---

Page 725 of 1121  
6/23/00 9:22:30 AM  
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### Rocky Flats Closure Project
#### Baseline Cost and Basis of Estimate

- **WBS No:** 1GAC0706
- **Activity ID:** 1G70060100

**Basics for adjustment:**
- Unit Cost: 140
- Unit Cost Adjustment Factor: none
- Revised Unit Hours: 140

**Resources**

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**Line Item 0300 - QAP Addendum**

**Item Desc:**
Preparation of SAP Addenda to Industrial Area Characterization Plan.

**Breakdown of Cost Data:**
- Item: Preparation of QAP addenda
  - Units: hours
  - Unit Cost: 60
  - Unit Cost Adjustment Factor: none
  - Revised Unit Hours: 60

**Basis for adjustment:**
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Resources**

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**Line Item SYS - Contingency And Escalation**

**Item Desc:**
Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Breakdown of Cost Data:**
- Item: Preparation of QAP addenda
  - Units: hours
  - Unit Cost: 60
  - Unit Cost Adjustment Factor: none
  - Revised Unit Hours: 60

**Basis for adjustment:**
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Resources**

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**Activity ID: 1G70060120**

**Item Desc:**

**Line Item 0100 - field prep**

**Item Desc:**
Estimator's Experience based on 15 years of experience planning, estimating, and conducting projects of similar scope and size.

**Breakdown of Cost Data:**
- Item: Preparation of QAP addenda
  - Units: hours
  - Unit Cost: 60
  - Unit Cost Adjustment Factor: none
  - Revised Unit Hours: 60

**Basis for adjustment:**
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
Breakdown of Cost Data:

Item: Site Labor to perform above individual tasks for either Ryan's Pit or T-3/T-4.
  Units: hours
  Unit Cost: 1380
  Unit Cost Adjustment Factor: 0.25
  Revised Unit: 345 hours

Item: Subcontractor costs to perform above individual tasks for either Ryan's Pit or T-3/T-4.
  Units: 1 lot
  Unit Cost: $10K
  Unit Cost Adjustment Factor: 0.25
  Revised Unit: $2.5K

Basis for adjustment. Hours and costs for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be characterized at once.

Procurement includes preparation of statement of work, proposal review (technical evaluation), and negotiations. Based on a T-3/T-4 burdened cost of $29,186.52. Assuming it is primarily labor hours (RMRS Environmental Engineer charging at $57.45 per hour) yields 508 hours which rounds to 510 total hours.

Davis Bacon Documentation: It was assumed that it would take an environmental engineer twenty-four hours to prepare a Davis Bacon cost estimate and to support the Davis-Bacon determination.

Subcontractor Health and Safety Plan: Costs for the health and safety plan are based on Ryan's Pit, which cost approximately $10,000. It was assumed that these are A5H dollars. In addition, it was assumed that a safety engineer, an industrial hygienist, and a radiological engineer would each provide one week (40 hours) of support for review and document preparation.

Radiological Work Permit: It was assumed that it would take a radiological control technician two working days (18 hours) to complete counting preparation and review.

Implementation Plan: It was estimated that this activity would take 13 weeks of time for engineers, scientists or equivalent to complete. This would include preparation of an implementation plan as required (Rocky Flats Cleanup Agreement, Appendix J, Interim Guidance Document, Dated August 1977). In addition this includes all tasks related to documentation for the Integrated Work Control Program and Integrated Safety Management.

Ecology Survey/National Environmental Protection Act (NEPA) Support: It was estimated that this would take 40 hours for an ecologist. The activities include NEPA review and support in document preparation, site surveys to verify compliance with ecological regulations, categorical exclusions, and NEPA evaluations.

Utility Clearance/Soil Disturbance Permits: It was estimated based on experience that it would take the equivalent 2 weeks (80 hours) for technical staff to do utility surveys, prepare and review soil disturbance permits, and prepare authorizing documents for excavation.

The combined resources for procurement and field preparations are

Total Procurement and Field Preparation Hours

Environmental Engineer 1134 hours
Safety Engineer 40 hours
Industrial Hygiene 40 hours
Radiological Engineering 58 hours
Radiological Control Technician 18 hours
Ecologist/Life Scientist 40 hours
Manager 50 hours
Quality Assurance* 29 hours
A5H Total $10,000

* On some projects these hours were assumed to be included in other tasks or part of this task under environmental engineer or one of the other job functions.

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

Factor 1134 - Environmental Engineer 283 Hours
Factor 40 - Safety Engineer 10 Hours
Factor 40 - Industrial Hygiene 10 Hours
Factor 58 - Radiological Engineering 14 Hours
Factor 18 - RCT 5 Hours
Factor 40 - Life Scientist 10 Hours
Factor 50 - Project Manager 13 Hours
Rocky Flats Closure Project  
Baseline Cost and Basis of Estimate

**Baseline_ID:** 1G70060120  
**Activity Filter:** 1GAC  
**Starts In FY:** * 

**WBS Filter:** 1GAC  
**WBS No:** 1GAC0706

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**BOE**

**Estimator's Experience based on 15 years of experience planning, estimating and conducting projects of similar scope and size.**

**Item Desc:** Evaluate readiness of the field characterization team and plans.

**Breakdown of Cost Data:**

**Item:** Site Labor to perform Readiness Assessment for T-3/T-4.

- **Units:** hours
- **Unit Cost:** $60/hour
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** 48

**Item:** Subcontractor costs to perform Readiness Assessment for T-3/T-4.

- **Units:** 1 lot
- **Unit Cost:** $4800
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** $1200

It was estimated that subcontractor involvement would require 80 hours at $60/hour = $4,800. It was assumed that about 3 weeks of time was required for an environmental engineer or similar person in addition to 12 hours of project management, which yielded 132 hours. An additional 11 hours was added for management oversight. It was estimated that a radiological engineer (QA) and an industrial hygienist would be needed for 2.5 days each (22 hours).
The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 projects will be conducted at once and only one of each fixed cost is needed for the group.

Factor 132 - Environmental Engineer 33 Hours
Factor 22 - Health Physicists 6 Hours
Factor 11 - Manager 3 Hours
Factor 22 - Quality Assurance 6 Hours
Factor 4,800 - A5H Subcontracted Svrs 1,200 Dollars

20 hours of administrative time will also be required.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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### Line Item SYS - Contingency And Escalation

| BOE |
|-----------------|------|-------------|-------|----------|-------|
| 000 CON CONTINGENCY | 0000 NONE | ZDEPT No Department | Linear | 160.64 | Dollars |
| Factors 160.64 Dollars |
| 000 ESC ESCALATION | 0000 NONE | ZDEPT No Department | Linear | 329.78 | Dollars |

## Schedule Risk 1

- **Activity ID:** 1G70060150
- **Description:** Field Characterization - Group 700-6
- **Cost Risk:** 1
- **Schedule Risk:** 1

### Line Item 0100 - collect surficial soil samples

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Total for Activity 1G70060150: 4,384, 130,621, 36,787, 113,867, 281,276, 45,456, 326,732

### Line Item 0100 - collect surficial soil samples

**BOE**

- **Description:** Field Characterization - Group 700-6

**Item Desc:**
Collection of surficial soil samples. A site Environmental Engineer will direct the sample collection, containerize, package, and ship the samples; prepare field QC documentation, and prepare field notes on a full time basis. A site Industrial Hygienist will implement the field portion of the HASP on a full time basis.

**Breakdown of Cost Data:**
- **Item:** Site Personnel for support of sample collection
  - Units: hours
  - Unit Cost: 24
  - Unit Cost Adjustment Factor: none
### Rocky Flats Closure Project

#### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC00706  
**Activity ID:** 1G70060150

**Revised Unit Hours:** 24

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**Line Item 0200 - analyze samples (chromium)**

**BOE**  
Vendor Quote  
Email quote: average cost from Kaiser-Hill ASD (V. Ideker).

**Item Desc:**  
Analyze samples produced from geoprobe borings. It is anticipated that 3 samples from each boring will be collected. They will be analyzed for Metals. This item is priced on a per sample basis. Per sample costs include DOT rad screen, bottle charge, shipping, and validation.

**Breakdown of Cost Data:**  
- **Item:** Analyze samples at an offsite laboratory.  
- **Units:** analysis  
- **Unit Cost:** Metals $345 per each sample.  
- **Unit Cost Adjustment Factor:** Must add: DOT rad screen $32/sample, bottle charge $7/sample, shipping $4.2/bottle, and validation per each: $17.30 VOA, $19.25 SVOC, $16.75 Metals, $5.95 PCB, and $15.60 Rad.

**Revised Unit Hours:** Metals $405/sample.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Line Item 0300 - project mgmt oversight**

**BOE**  
Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Item Desc:**  
Project Management/Oversight. Based on half time for a Project Manager, Administrative staff, and Cost Estimator/Scheduler

**Breakdown of Cost Data:**  
- **Item:** Mgmt oversight  
- **Units:** hours  
- **Unit Cost:** 12  
- **Unit Cost Adjustment Factor:** none  
- **Revised Unit Hours:** 12

**Basis for adjustment:** This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Line Item 0400 - analyze samples (potassium)**

**BOE**  
Vendor Quote  
Email quote: average cost from Kaiser-Hill ASD (V. Ideker).

**Item Desc:**  
6/23/00 9:22:31 AM  
OFFICIAL USE ONLY
Analyze samples produced from geoprobe borings. It is anticipated that 3 samples from each boring will be collected. They will be analyzed for potassium. This item is priced on a per sample basis. Per sample costs include DOT rad screen, bottle charge, shipping, and validation.

Breakdown of Cost Data:
- Item: Analyze samples at an offsite laboratory.
  - Units: analysis
  - Cost: PCBs and other industrial hygiene $150 per each sample.
  - Unit Cost Adjustment Factor: Must add: DOT rad screen $32/sample, bottle charge $7/sample, shipping $4.2/bottle, and validation per each: $5.95 PCB, and $15.60 Rad.
  - Revised Unit Hours: PCBs and other industrial hygiene $214.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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**Line Item 0100 - develop documentation**

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Total for Activity 1G70060170: 138 | 4,164 | 0 | 3,003 | 7,167 | 1,449 | 8,616 |

**Line Item 0100 - develop documentation**

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

This estimate was constructed based on actual hours required to complete previous NFA Reports (obtained from actual author) and professional judgement of level of effort required for remaining reports.

Item Desc: Perform Data Analysis including GIS representation of data, NFA Summary, and associated project management.

Breakdown of Cost Data:
- Item: Develop Documentation
  - Units: Hours
  - Unit Cost: 138

### Resources

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## Project Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0706  
**Activity ID:** 1G70060170

### WBS Filter 1GAC

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**Schedule Risk:** 3  
**Cost Risk:** 2  
**Burden Cost:** 3,537  
**Total Cost:** 5,356

### Line Item 0100 - SAP Addenda

- **Description:** Preparation of SAP Addenda.  
- **Units:** hours  
- **Cost:** $4,144  
- **Schedule Risk:** 3

### Line Item 0200 - HASP Addenda

- **Description:** Preparation of HASP Addenda.  
- **Units:** hours  
- **Cost:** $5,040  
- **Schedule Risk:** 3

### Line Item 0000 - QAP Addenda

- **Description:** Preparation of QAP Addenda.  
- **Units:** hours  
- **Cost:** $1,182  
- **Schedule Risk:** 3

### Line Item SYS - Contingency And Escalation

- **Description:** Preparation of SAP Addenda to Industrial Area Characterization Plan.  
- **Units:** hours  
- **Cost:** $2,262  
- **Schedule Risk:** 3

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

**OFFICIAL USE ONLY**
### Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

**WBS No:** 1GAC0707  
**Activity ID:** 1GER677100

**Cost Element** | **Skill** | **Department** | **Curve** | **Quantity** | **Units** |
--- | --- | --- | --- | --- | --- |
750 | STRAIGHT TIME BASE | E050 | ENVIRONMENTAL ENGINEERS | R100S | RMRS Salaried | Linear | 80.00 | Hours |
**Factors:** 80 hrs |
750 | STRAIGHT TIME BASE | M020 | MANAGERS (GRADE 69 - 72) | R100S | RMRS Salaried | Linear | 20.00 | Hours |
**Factors:** 20 hrs |
750 | STRAIGHT TIME BASE | P070 | COST ESTIMATORS PLANNERS AN | K265S | ER Programs | Linear | 710.44 | Dollars |
**Factors:** 20 hrs 42 estimated $/hr |

---

**Line Item 0200 - HASP Addenda**

**BOE**  
Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Item Desc:** Preparation of HASP addenda to Industrial Area Characterization Plan.

**Breakdown of Cost Data:**
- **Item:** Preparation of addenda for HASP.
- **Units:** hours
- **Unit Cost:** 140
- **Unit Cost Adjustment Factor:** none
- **Revised Unit Hours:** 140

**Basis for adjustment:**

---

**Line Item 0300 - QAP Addenda**

**BOE**  
Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Item Desc:** Preparation of QAP addenda to Industrial Area Characterization Plan.

**Breakdown of Cost Data:**
- **Item:** Preparation of QAP addenda.
- **Units:** hours
- **Unit Cost:** 60
- **Unit Cost Adjustment Factor:** none
- **Revised Unit Hours:** 60

**Basis for adjustment:**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

**Line Item SYS - Contingency And Escalation**

**BOE**  
0.84576 [SYS 061400] .84576000 - System
### Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

**WBS No:** 1GAC0707  
**Activity ID:** 1GER677100

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**Line Item 0100 - procurement & field prep**

**BOE**  
Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation

**Item Desc:**  

**Breakdown of Cost Data:**

- **Item:** Site Labor to perform above individual tasks for either Ryan's Pit or T-3/T-4.  
  - Units: hours  
  - Unit Cost: 1,380  
  - Unit Cost Adjustment Factor: 0.25  
  - Revised Unit: 345 hours

- **Item:** Subcontractor costs to perform above individual tasks for either Ryan's Pit or T-3/T-4.  
  - Units: 1 lot  
  - Unit Cost: $10K  
  - Unit Cost Adjustment Factor: 0.25  
  - Revised Unit: $2.5K

**Basis for adjustment.** Hours and costs for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be characterized at once.

**Procurement includes preparation of state of work, proposal review (technical evaluation), and negotiations.** Based on a T-3/T-4 burdened cost of $29,186.52. Assuming it is primarily labor hours (RMRS Environmental Engineer charging at $57.45 per hour) yields 508 hours which rounds to 510 total hours.

**Davis Bacon Documentation:** It was assumed that it would take an environmental engineer twenty-four hours to prepare a Davis Bacon cost estimate and to support the Davis-Bacon determination.

**Subcontractor Health and Safety Plan:** Costs for the health and safety plan are based on Ryan's Pit, which cost approximately $10,000. It was assumed that these are A5H dollars. In addition, it was assumed that a safety engineer, an industrial hygienist, and a radiological engineer would each provide one week (40 hours) of support for review and document preparation.

**Radiological Work Permit:** It was assumed that it would take a radiological control technician two working days (18 hours) to complete counting preparation and review.

**Implementation Plan:** It was estimated that this activity would take 13 weeks of time for engineers, scientists or equivalent to complete. This would include preparation of an implementation plan as required (Rocky Flats Cleanup Agreement, Appendix 3, Interim Guidance Document, Dated August 1977). In addition this includes all tasks related to documentation for the Integrated Work Control Program and Integrated Safety Management.

**Ecology Survey/National Environmental Protection Act (NEPA) Support:** It was estimated that this would take 40 hours for an ecologist. The activities include NEPA review and support in document preparation, site surveys to verify compliance with ecological regulations, categorical exclusions, and NEPA evaluations.

**Utility Clearance/Soil Disturbance Permits:** It was estimated based on experience that it would take the equivalent 2 weeks (80 hours) for technical staff to do utility surveys, prepare and review soil disturbance permits, and prepare authorizing documents for excavation.

The combined resources for procurement and field preparations are Total Procurement and Field Preparation Hours Environmental Engineer 1,134 hours.
## Rocky Flats Closure Project

### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0707  
**Activity ID:** 1GER677120

**Safety Engineer** 40 hours  
**Industrial Hygiene** 40 hours  
**Radiological Engineering** 58 hours  
**Radiological Control Technician** 18 hours  
**Ecologist/Life Scientist** 29 hours  
*AS5 Total $10,000

* On some projects these hours were assumed to be included in other tasks or part of this task under environmental engineer or one of the other job functions.

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

**Factor 1134** - Environmental Engineer 283 Hours  
**Factor 40** - Safety Engineer 10 Hours  
**Factor 40** - Industrial Hygiene 10 Hours  
**Factor 58** - Radiological Engineering 14 Hours  
**Factor 18** - RCT 5 Hours  
**Factor 40** - Life Scientist 10 Hours  
**Factor 50** - Project Manager 13 Hours  
**Factor 10000** - AS5 Subcontracted Services 2,500 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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### Line Item SYS - Contingency And Escalation

**BOE Resources**

**Factors** 0.84576 (SYS 061400) .84576000 - System

### Activity ID: 1GER677140

**Description:** Readiness Assessment - IHSS Group 700-7  
**Cost Risk:** 1  
**Schedule Risk:** 1

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**Total for Activity 1GER677140:**  
68 | 1,887 | 1,015 | 533 | 3,436 | 666 | 4,102
**Line Item 0100 - readiness assessment**

**BOE**

Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation.

**Activity Set**

- **Item Desc:** Evaluate readiness of the field characterization team and plans.

**Breakdown of Cost Data:**

**Item:** Site Labor to perform Readiness Assessment for T-3/T-4.
- **Units:** hours
- **Unit Cost:** $187
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** 48

**Item:** Subcontractor costs to perform Readiness Assessment for T-3/T-4.
- **Units:** 1 lot
- **Unit Cost:** $4800
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** $1200

**Note:** It was estimated that subcontractor involvement would require 80 hours at $60/hour = $4,800. It was assumed that about 3 weeks of time was required for an environmental engineer or similar person in addition to 12 hours of project management, which yielded 132 hours. An additional 11 hours was added for management oversight. It was estimated that a radiological engineer (QA) and an industrial hygienist would be needed for 2.5 days each (22 hours).

**Fixed Costs:** The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 projects will be conducted at once and only one of each fixed cost is needed for the group.

- **Factor 132 - Environmental Engineer:** 33 Hours
- **Factor 22 - Health Physicists:** 6 Hours
- **Factor 11 - Manager:** 3 Hours
- **Factor 22 - Quality Assurance:** 6 Hours
- **Factor 4,800 - A5H Subcontracted Srvs:** 1,200 Dollars

**Administrative Time:** 20 hours of administrative time will also be required.

*This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.*

---

**Resources**

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**Line Item SYS - Contingency And Escalation**

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**Activity ID:** 1GER677140 **Description:** Field Sampling, Lab Analysis - IHSS Group 700-7

**Cost Risk:** 2 **Schedule Risk:** 3

---

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### Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

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### Baseline Deviation

**WBS Filter:** 1GAC

**Activity Filter:**

- **Starts In FY:**

#### WBS No: 1GAC0707

**Activity ID:** 1GER677150

#### Line Item 0100 - collect geoprobe samples

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**BOE:**

- **Vendor Quote:**

#### Line Item 0200 - analyze samples

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**BOE:**

- **Vendor Quote:**

#### Line Item 0300 - project mgmt oversight

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**BOE:**

- **Vendor Quote:**

---

**Description:**

**Item Desc:**

- **Line Item 0100 - collect geoprobe samples**
  - Collection of geoprobe samples with two technicians. A site Environmental Engineer will direct the boring placement, log the borings; collect, containerize, package, and ship the samples; prepare field QC documentation, and prepare field notes on a full time basis. A site RCT will monitor the site for radiological contamination on a full time basis. A site Industrial Hygienist will implement the field portion of the HASP on a full time basis. It is estimated that one 10' boring will be placed per 500 SF of building footprint (same as Bldg. 123 characterization) with 5 samples per 10' boring. It is estimated that one boring per eight hours can be completed.

**Breakdown of Cost Data:**

- **Item: Site Personnel for support of geoprobe samples**
  - **Units:** hours
  - **Unit Cost:** 32
  - **Unit Cost Adjustment Factor:** none
  - **Revised Unit Hours:** 32

- **Item: Kaiser-Hill/RMRS Geoprobe unit with 2 Technician crew. Item costs $100 per hour or $800 per 8-hour day.**
  - **Units:** dollars
  - **Unit Cost:** 800
  - **Unit Cost Adjustment Factor:** none
  - **Revised Unit Hours:** 800

**Basis for adjustment:**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

**Description:**

**Item Desc:**

- **Line Item 0200 - analyze samples**
  - Average cost from Kaiser-Hill ASD (V. Ideker).
  - Analyze samples produced from geoprobe borings. It is anticipated that 5 samples from each boring will be collected. They will be analyzed for Metals, VOCs, SVOCs, PCBs, and radionuclides (est. 3 isotopes) with a 30 day TAT. This item is priced on a per sample basis. Per sample costs include DOT rad screen, bottle charge, shipping, and validation.

**Breakdown of Cost Data:**

- **Item: Analyze samples at an offsite laboratory.**
  - **Unit Cost:** Metals $345, VOCs $280, SVOCs $440, PCBs and other analytes $150, and Radionuclides 3 isotopes) $590 per each sample.
  - **Unit Cost Adjustment Factor:** Must add: DOT rad screen $32/sample, bottle charge $7/sample, shipping $4.2/bottle, and validation per each: $17.30 VOA, $19.25 SVOC, $16.75 Metals, $5.95 PCB, and $15.60 Rad.
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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```
Estimate based on Estimator's Experience of more than 10 years of experience performing and costing projects of similar size and scope.  
Item Desc:  
Project Management/Oversight. Based on half time for a Project Manager, Administrative staff, and Cost Estimator/Scheduler  
Breakdown of Cost Data:  
Item: Mgmt oversight  
Units: hours  
Unit Cost: 12  
Unit Cost Adjustment Factor: none  
Revised Unit Hours: 12  
Basis for adjustment.  
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.  
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Estimate based on Estimator's Experience of more than 10 years of experience performing and costing projects of similar size and scope.  
Item Desc:  
Project Management/Oversight. Based on half time for a Project Manager, Administrative staff, and Cost Estimator/Scheduler  
Breakdown of Cost Data:  
Item: Mgmt oversight  
Units: hours  
Unit Cost: 12  
Unit Cost Adjustment Factor: none  
Revised Unit Hours: 12  
Basis for adjustment.  
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.  
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```
Estimate based on Estimator's Experience of more than 10 years of experience performing and costing projects of similar size and scope.  
Item Desc:  
Project Management/Oversight. Based on half time for a Project Manager, Administrative staff, and Cost Estimator/Scheduler  
Breakdown of Cost Data:  
Item: Mgmt oversight  
Units: hours  
Unit Cost: 12  
Unit Cost Adjustment Factor: none  
Revised Unit Hours: 12  
Basis for adjustment.  
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.  
```

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```
Estimate based on Estimator's Experience of more than 10 years of experience performing and costing projects of similar size and scope.  
Item Desc:  
Perform Data Analysis including GIS representation of data, NFA Summary, Characterization Report, and associated project management. Disposition comments and finalize document.  
Item: Data Analysis  
Units: hours  
Unit Cost: 80  
Unit Cost Adjustment Factor: none  
Revised Unit Hours: 80  
Basis for adjustment.  
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.  
```

| Activity ID: 1GER677170 | Description: Prepare Summary/NFA - IHSS Group 700-7 | Cost Risk | 1 | Schedule Risk | 1 |
|--------------------------|--------------------------------------------------------|-----------|-----------|-----------|
| Line Item | Quantity | Units | BOE | Labor Hours/Unit | Labor Hours Total | Labor Cost Total | Materials/Sub Cost | Contingency Escalation | Total Prime Cost | Burden Cost | Total Cost |
| 0100 | develop documentation | 1.00 | each | EE | 656 | 656 | 19,024 | 0 | 0 | 19,024 | 6,623 | 25,646 |
| SYS | Contingency And Escalation | 1.00 | each | EE | 0 | 0 | 0 | 5,643 | 5,643 | 0 | 5,643 |
| Total for Activity 1GER677170: | 656 | 19,024 | 0 | 5,643 | 24,667 | 6,623 | 31,290 |

```
Estimate based on Estimator's Experience of more than 10 years of experience performing and costing projects of similar size and scope.  
Item Desc:  
Perform Data Analysis including GIS representation of data, NFA Summary, Characterization Report, and associated project management. Disposition comments and finalize document.  
Item: Data Analysis  
Units: hours  
Unit Cost: 80  
Unit Cost Adjustment Factor: none  
Revised Unit Hours: 80  
Basis for adjustment.  
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.  
```

| Activity ID: 1GER677170 | Description: Prepare Summary/NFA - IHSS Group 700-7 | Cost Risk | 1 | Schedule Risk | 1 |
|--------------------------|--------------------------------------------------------|-----------|-----------|-----------|
| Line Item | Quantity | Units | BOE | Labor Hours/Unit | Labor Hours Total | Labor Cost Total | Materials/Sub Cost | Contingency Escalation | Total Prime Cost | Burden Cost | Total Cost |
| 0100 | develop documentation | 1.00 | each | EE | 656 | 656 | 19,024 | 0 | 0 | 19,024 | 6,623 | 25,646 |
| SYS | Contingency And Escalation | 1.00 | each | EE | 0 | 0 | 0 | 5,643 | 5,643 | 0 | 5,643 |
| Total for Activity 1GER677170: | 656 | 19,024 | 0 | 5,643 | 24,667 | 6,623 | 31,290 |
### Breakdown of Cost Data:

- **Item:** Develop Documentation
- **Units:** Hours
- **Unit Cost:** 656
- **Unit Cost Adjustment Factor:** None
- **Revised Unit Hours:** 656
- **Basis for adjustment:** N/A

### Cost Element Details:

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### Activity Details:

- **Activity ID:** 1GER677180
- **Description:** Prepare Decision Document - IHSS Group 700-7
- **Cost Risk:** 2
- **Schedule Risk:** 3
- **Total Cost:** 15,479

### Line Item 0100 - PAM

**Description:** Preparation of of PAM or IM/IRA in support of source removal of previously characterized UBC.

- **Quantity:** 1.00 each
- **Units:** EE
- **Labor Hours/Unit:** 193
- **Material:** 6,135
- **Total Prime Cost:** 2,123
- **Burden Cost:** 3,143
- **Total Cost:** 8,258

### Line Item 0200 - SAP

- **Quantity:** 1.00 each
- **Units:** EE
- **Labor Hours/Unit:** 76
- **Material:** 2,438
- **Total Prime Cost:** 844
- **Burden Cost:** 3,281

### Line Item 0300 - WMP

- **Quantity:** 1.00 each
- **Units:** EE
- **Labor Hours/Unit:** 20
- **Material:** 591
- **Total Prime Cost:** 205
- **Burden Cost:** 796

### Total for Activity 1GER677180:

- **Total Labor Hours:** 289
- **Total Labor Cost:** 9,164
- **Total Materials/ Sub Cost:** 3,143
- **Total Prime Cost:** 12,307
- **Total Burden Cost:** 3,171

**Total Cost:** 15,479
For a PAM the total labor hours are:

Environmental Engineer 700 Hours
Manager 70 Hours
Factor 700 Environmental Engineer 175 hours
Factor 70 Manager 18 hours

Breakdown of Cost Data:
- Item: Preparation of PAM for Ryan's Pit source removal action.
  - Units: hours
  - Unit Cost: 770
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit Hours: 193

Basis for adjustment. Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

Interim Measure/Interim Remedial Action Decision Document: It was assumed that an IM/IRA Decision Document would take 75% more effort than a PAM or 1,166 hours, which rounds to 1200 hours. It was assumed that 10% of this labor would be required for managerial hours.

For an IM/IRA the total labor hours are:

Environmental Engineer 1200 Hours
Manager 120 Hours
Factor 1200 Environmental Engineer 300 hours
Factor 120 Manager 30 hours

Resources

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Line Item 0200 - SAP

BOE

Estimator's Experience based generally on historical data for Ryan's Pit

Item Desc:
Preparation of SAP in support of source removal of previously characterized UBC.

Breakdown of Historical Data:
- Item: Preparation of SAP for Ryan's Pit source removal action.
  - Units: hours
  - Unit Cost: 300
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit Hours: 76

Basis for adjustment. Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

Resources

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Line Item 0300 - WMP

BOE

Estimator's Experience based generally on historical data for Ryan's Pit

Item Desc:
Preparation of WMP in support of source removal of previously characterized UBC.
Breakdown of Historical Data:
Item: Preparation of WMP for Ryan's Pit source removal action.
Units: hours
Unit Cost: 80
Unit Cost Adjustment Factor: 0.25
Revised Unit Hours: 20

Basis for adjustment. Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

Cost Element | Skill | Department | Curve | Quantity | Units
--- | --- | --- | --- | --- | ---
750 | STRAIGHT TIME BASE | E050 ENVIRONMENTAL ENGINEERS | R100S RMRS Salaried | Linear | 20.00 Hours

Factors 20 hrs

Line Item SYS - Contingency And Escalation
BOE

Cost Element | Skill | Department | Curve | Quantity | Units
--- | --- | --- | --- | --- | ---
CON CONTINGENCY | 0000 | NONE | ZDEPT No Department | Linear | 2,200.92 Dollars
ESC ESCALATION | 0000 | NONE | ZDEPT No Department | Linear | 942.53 Dollars

Factors 2200.92 Dollars 942.53 Dollars

Activity ID: 1GER677210 Description: Procurement and Field Prep - IHSS Grouping 700-7 Cost Risk 1 Schedule Risk 1

Line Item 0100 - procurement & field prep
BOE

Quantity | Units | BOE Type | Labor Hours/Unit | Labor Hours Total | Labor Cost Total | Materials/ Sub Cost | Contingency & Escalation | Total Prime Cost | Burden Cost | Total Cost
--- | --- | --- | --- | --- | --- | --- | --- | --- | --- | ---
1.00 | each | EE | 345 | 345 | 10,637 | 2,114 | 0 | 12,751 | 3,261 | 16,013

Line Item SYS - Contingency And Escalation
BOE

Quantity | Units | BOE Type | Labor Hours/Unit | Labor Hours Total | Labor Cost Total | Materials/ Sub Cost | Contingency & Escalation | Total Prime Cost | Burden Cost | Total Cost
--- | --- | --- | --- | --- | --- | --- | --- | --- | --- | ---
1.00 | ea | EE | 0 | 0 | 0 | 0 | 0 | 15,954 | 3,261 | 19,215

Total for Activity 1GER677210: 345 10,637 2,114 3,202 15,954 3,261 19,215

Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation

Item Desc:

Breakdown of Cost Data:
Item: Site Labor to perform above individual tasks for either Ryan's Pit or T-3/T-4.
Units: hours
Unit Cost: 1380
Unit Cost Adjustment Factor: 0.25
Revised Unit: 345 hours

Item: Subcontractor costs to perform above individual tasks for either Ryan's Pit or T-3/T-4.
Units: 1 lot
Unit Cost: $10K
Unit Cost Adjustment Factor: 0.25
Revised Unit: $2.5K

Basis for adjustment. Hours and costs for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be characterized at once.

Procurement includes preparation of statement of work, proposal review (technical evaluation), and negotiations. Based on a T-3/T-4 burdened cost of $29,186.52. Assuming it is primarily labor costs (RMRS Environmental Engineer charging at $57.45 per hour) yields 508 hours which rounds to 510 total hours.

Davis Bacon Documentation: It was assumed that it would take an environmental engineer twenty-four hours to prepare a Davis Bacon cost estimate and to support the Davis-Bacon determination.

Subcontractor Health and Safety Plan: Costs for the health and safety plan are based on Ryan’s Pit, which cost approximately $10,000. It was assumed that these are A5H dollars. In addition, it was assumed that a safety engineer, an industrial hygienist, and a radiological engineer would each provide one week (40 hours) of support for review and document preparation.
Radiological Work Permit: It was assumed that it would take a radiological control technician two working days (18 hours) to complete counting preparation and review.

Implementation Plan: It was estimated that this activity would take 13 weeks of time for engineers, scientists or equivalent to complete. This would include preparation of an implementation plan as required (Rocky Flats Cleanup Agreement, Appendix 3, Interim Guidance Document, Dated August 1977). In addition, this includes all tasks related to documentation for the Integrated Work Control Program and Integrated Safety Management.

Ecology Survey/National Environmental Protection Act (NEPA) Support: It was estimated that this would take 40 hours for an ecologist. The activities include NEPA review and support in document preparation, site surveys to verify compliance with ecological regulations, categorical exclusions, and NEPA evaluations.

Utility Clearance/Soil Disturbance Permits: It was estimated based on experience that it would take the equivalent 2 weeks (80 hours) for technical staff to do utility surveys, prepare and review soil disturbance permits, and prepare authorizing documents for excavation.

The combined resources for procurement and field preparations are:

Total Procurement and Field Preparation Hours

Environmental Engineer 1134 hours
Safety Engineer 40 hours
Industrial Hygiene 40 hours
Radiological Engineering 58 hours
Radiological Control Technician 18 hours
Ecologist/Life Scientist 40 hours
Manager 50 hours
Quality Assurance* 29 hours
A5H Total $10,000

* On some projects these hours were assumed to be included in other tasks or part of this task under environmental engineer or one of the other job functions.

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

Factor 1134 - Environmental Engineer 283 Hours
Factor 40 - Safety Engineer 10 Hours
Factor 40 - Industrial Hygiene 10 Hours
Factor 58 - Radiological Engineering 14 Hours
Factor 18 - RCT 5 Hours
Factor 40 - Life Scientist 10 Hours
Factor 50 - Project Manager 13 Hours
Factor 10000 - A5H Subcontracted Services 2,500 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### Line Item SYS - Contingency And Escalation

#### Resources

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#### Line Item 0100 - readiness assessment

**Description:** Evaluate readiness of the field characterization team and plans.

**Breakdown of Cost Data:**

- **Item:** Site Labor to perform Readiness Assessment for T-3/T-4.
  - Units: hours
  - Unit Cost: 187
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit: 48

- **Item:** Subcontractor costs to perform Readiness Assessment for T-3/T-4.
  - Units: 1 lot
  - Unit Cost: $4800
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit: $1200

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 projects will be conducted at once and only one of each fixed cost is needed for the group.

- **Factor 132 - Environmental Engineer 33 Hours**
- **Factor 22 - Health Physicists 6 Hours**
- **Factor 11 - Manager 3 Hours**
- **Factor 22 - Quality Assurance 6 Hours**
- **Factor 4,800 - A5H Subcontracted Srvs 1,200 Dollars**

20 hours of administrative time will also be required.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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Line Item 0200 - training

**BOE**

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**Factors**

- 3 hrs
- 6 hrs

**Breakdown of Cost Data:**

- **Item:** Site Labor to perform above individual tasks for T-3/T-4.
  - Units: hours
  - Unit Cost: 132 Hours
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit: 33 hours

- **Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
  - Units: 1 lot
  - Unit Cost: $12K
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit: $3K

**Basis for adjustment:**

Costs for each UBC are divided by 4 to account for the fact that 4 UBCs will be remediated at once and only one Training is needed for the group.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

**Resources**

**Line Item 0300 - pre-evolution meeting**

**BOE**

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**Factors**

- 39 hrs
- 3000 sub/c support

**Breakdown of Cost Data:**

- **Item:** Site Labor to perform above individual tasks for T-3/T-4.
  - Units: hours
  - Unit Cost: 60 hours
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit: 15 hours

- **Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
  - Units: 1 lot
  - Unit Cost: $6K
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit: $1.5K

**Basis for adjustment:**

Costs for each UBC are divided by 4 to account for the fact that 4 UBCs will be remediated at once and only one Pre-Evolution Meeting is needed for the group.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
## Rocky Flats Closure Project

### Baseline Cost and Basis of Estimate

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Total for Activity 1GER677250: 21,655, 701,878, 715,788, 232,982, 1,650,648, 201,627, 1,852,275

### Resources

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### Breakdown of Cost Data:

- **0100 mobilization**: Estimator's Experience based generally on historical data for T-3/T4 Remediation.

  **Item Desc**: Mobilization in support of remediation.

  **Breakdown of Cost Data**:

  **Item**: Site Labor to perform above individual tasks for T-3/T-4.

  - **Units**: hours
  - **Unit Cost**: 1,100
  - **Unit Cost Adjustment Factor**: 0.25
  - **Revised Unit**: 275

  **Item**: Subcontractor costs to perform above individual tasks for T-3/T-4.

  - **Units**: 1 lot
  - **Unit Cost**: 184k
  - **Unit Cost Adjustment Factor**: 0.25
  - **Revised Unit**: see below

### Basis for adjustment:

The costs were divided into fixed costs and variable costs. The fixed costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

**T3/T4 hours 110 Health Physicists 27 Hours**

**T3/T4 hours 330 Manager 83 Hours**

**T3/T4 hours 550 Environmental Engineer 138 Hours**

**T3/T4 hours 110 Industrial Hygienist 27 Hours**
### Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

**WBS Filter:** 1GAC  
**Activity Filter:** *  
**Starts In FY:** *

#### Resources

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#### Line Item 0200 - site prep

**Item Desc:**  
Estimator's Experience based generally on historical data for T-3/T4 Remediation.  

**Breakdown of Historical Data:**  
**Item:** Site Preparation including setting up fencing, trailer, etc.  
**Units:** hours  
**Unit Cost:** see below  
**Unit Cost Adjustment Factor:** see below  
**Revised Unit:** see below  

**Item:** Subcontractor costs to perform above individual tasks for T-3/T4.  
**Units:** 1 lot  
**Unit Cost:** see below  
**Unit Cost Adjustment Factor:** see below  
**Revised Unit:** see below  

**Basis for adjustment.** The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.  

T3/T4 hours 120 Environmental Engineer 30 hours  
T3/T4 dollars 30,000 Subcontracted Svrs 7,500 Dollars  

D&D construction trade hours were calculated using the following methodology:  
A5H subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.  
RCT hours were calculated using the following methodology, unless they were already estimated.  
For Site Preparation tasks - RCT hours were the same as D&D construction hours.  
For all other tasks A5H subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under KG10H department code.  

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
## Line Item 0300 - excavation

**BOE**

*Estimator's Experience based generally on historical data for T-3/T4 Remediation.*

**Item Desc:**

- Excavation.

**Breakdown of Historical Data:**

- **Item:** Site Labor to perform above individual tasks for T-3/T-4.
  - **Units:** hours
  - **Unit Cost:** see below
  - **Unit Cost Adjustment Factor:** see below
  - **Revised Unit:** see below

- **Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
  - **Units:** 1 lot
  - **Unit Cost:** see below
  - **Unit Cost Adjustment Factor:** see below
  - **Revised Unit:** see below

**Basis for adjustment:** The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

- **Total Contaminated Soil to be removed:** 3,022 CY
- **Total Soil for Thermal Desorption:** 0 CY
- **Offsite Waste Volume:** 3,022 CY

The excavation cost was based on the excavation cost for the T-3/T-4 Project. Burdened cost based on the T-3/T-4 actuals is $171,487. For the 3,800 cubic yards of contaminated soil removed this yielded a unit cost of $45 per cubic yard of contaminated soil removed. This estimate includes the removal of overburden that might be on top of the contaminated soil. The hours for an environmental engineer from T-3/T-4 were 1.09 hours per cubic yard of contaminated soil. Likewise the hours for the following were assumed to be linearly proportional:

- Health Physicists: 0.47 hours per cubic yard
- Environmental Operations: 0.31 hours per cubic yard
- Industrial Hygienists: 0.31 hours per cubic yard
- Radiological Control Technician: 1.00 hour per cubic yard

*Based on $50/cubic yard from T-3/T-4, assumes a labor rate of $50/hour

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

- Factor 1.09 - E050 Environmental Engineer 3,294 Hours
- Factor 0.47 - F080 Health Physicists 1,480 Hours
- Factor 0.31 - Environmental Operations 937 Hours
- Factor 0.31 - F090 Industrial Hygienists 937 Hours
- Factor 1.00 - T050 Radiological Control Technician 3,022 Hours
- Factor 45.23 - A5H Subcontracted Srvs 136,685 Dollars

D&D construction trade hours were calculated using the following methodology:

- A5H subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.

RCT hours were calculated using the following methodology, unless they were already estimated.

- For Site Preparation tasks - RCT hours were the same as D&D construction hours.
For all other tasks A5H subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under KG10H department code.

The dollars amounts calculated for D&D construction workers and RCTs were subtracted from the subcontractor dollars and the revised A5H dollar amount was entered into Best.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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Line Item 0400 - remove and clean debris

Item Desc: Remove and clean debris.

Breakdown of Historical Data:

Item: Site Labor to perform above individual tasks for T-3/T-4.
Units: hours
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
Units: 1 lot
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

For the base case, it was assumed that about five cubic yards out of 700 cubic yards would be debris and would be segregated and cleaned. It was estimated that each cubic yard of debris would cost $1,000 or $5,000 total for 700 cubic yards. This yields a rate of $7.14 per cubic yard.

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.
D&D construction trade hours were calculated using the following methodology:

A5H subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.

RCT hours were calculated using the following methodology, unless they were already estimated.

For Site Preparation tasks - RCT hours were the same as D&D construction hours.

For all other tasks A5H subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under KG10H department code.

The dollars amounts calculated for D&D construction workers and RCTs were subtracted from the subcontractor dollars and the revised A5H dollar amount was entered into Best.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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Line Item 0600 - confirmation sampling

BOE

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc:
Confimation Sampling.

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
Units: hours
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
Units: 1 lot
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Total Contaminated Soil to be removed 3,022 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 3,022 CY

The analytical costs were based on T-3/T-4, which cost $435,574 for 3800 cubic yards of contaminated soil removed. This yielded a unit rate of about $115/cubic yard. Based on estimator experience the cost of sampling including labor and materials was estimated to be 20% of that rate or about $23/ cubic yard.

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 114.62 - A5H Subcontracted Srvs (Analytical) 346,381 Dollars
Factor 22.924 - A5H Subcontracted Srvs 69,276 Dollars

D&D construction trade hours were calculated using the following methodology:

A5H subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.
RCT hours were calculated using the following methodology, unless they were already estimated.

For Site Preparation tasks - RCT hours were the same as D&D construction hours.
For all other tasks ASH subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under KG10H department code.

The dollars amounts calculated for D&D construction workers and RCTs were subtracted from the subcontractor dollars and the revised ASH dollar amount was entered into Best.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

**Resources**

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**Line Item 0700 - prepare waste acceptance forms**

**BOE**

**Estimator's Experience based generally on historical data for T-3/T4 Remediation.**

**Item Desc:**
Prepare Waste Acceptance Forms

**Breakdown of Historical Data:**

**Item:** Site Labor to perform above individual tasks for T-3/T-4.
- **Units:** hours
  - **Unit Cost:** see below
  - **Unit Cost Adjustment Factor:** see below
  - **Revised Unit:** see below

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
- **Units:** 1 lot
  - **Unit Cost:** see below
  - **Unit Cost Adjustment Factor:** see below
  - **Revised Unit:** see below

**Basis for adjustment.** The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

**T3/T4 hours 80 environmental engineer 20 hours**

---

**Resources**

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**Line Item 0800 - waste acceptance sampling**

**BOE**

**Estimator's Experience based generally on historical data for T-3/T4 Remediation.**

**Item Desc:**
Waste Acceptance Sampling

**Breakdown of Historical Data:**

**Item:** Site Labor to perform above individual tasks for T-3/T-4.
- **Units:** hours
  - **Unit Cost:** see below
  - **Unit Cost Adjustment Factor:** see below
  - **Revised Unit:** see below

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Because the waste acceptance sampling is difficult to predict and could vary significantly from project to project, it was assumed that about $800 worth of additional analysis would be required for 20 cubic yards which is the volume that can be placed in one roll-off. This yielded a unit rate of about $40/cubic yard. This sampling and analysis is in addition to the confirmational samples so the costs are not as great. It was assumed that this sampling would be more labor intensive so the sampling costs were estimated to be about 50% of the analytical costs or about $20/cubic yard.

Total Contaminated Soil to be removed 3,022 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 3,022 CY

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 40 - ASH Analytical 120,880 Dollars
Factor 20 - ASH Subcontracted Svrs 60,440 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
Demobilization - 20 working days
Total 150 nine-hour working days or 1350 hours

In addition it was estimated that technical staff, quality assurance, and project management would be required for the equivalent of ten additional weeks, which is 400 hours each.

Based on the base case of a 700 cubic yard removal project, these values yielded unit rates as follows:

Hours Per Cubic Yard
Of Contaminated Soil Field Manager 1.93
Technical Staff .57
Quality Assurance .57
Project Management 0.57

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Total Contaminated Soil to be removed 3,022 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 3,022 CY

Factor 1.93 - Environmental Engineer 5,832 Hours
Factor 0.57 - Technical Support 1,722 Hours
Factor 0.57 - Project Manager 1,722 Hours
Factor 0.57 - Quality Assurance 1,722 Hours

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Line Item 1000 - backfill

Trade Publication
Means 1995, Site Work & Landscape Cost Data (page 34, 42, and 34)

Item Desc: Backfill.

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
  Units: hours
  Unit Cost: see below
  Unit Cost Adjustment Factor: see below
  Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
  Units: 1 lot
  Unit Cost: see below
  Unit Cost Adjustment Factor: see below
  Revised Unit: see below

Means (1995) Site Work & Landscape Cost Data as follows:

Common Fill $ 4.77/cubic yard (page 34 Borrow Bank Measure)
Hauling $ 3.98/cubic yard (page 42 2-mile round-trip, 6 cubic yard dump truck)
Backfilling $ 1.69/cubic yard (page 34)
Burden (43%) $ 4.49/cubic yard
Total $14.23/cubic yard or about $15/cubic yard
The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 15 - A5H Subcontracted Srvs 45,330 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Demobilization: Based on the T-3/T-4 project, it was assumed that demobilization costs would cover demobilization for excavation activities also. The subcontractor cost for demobilization was about $95,000 for 3,800 cubic yards at the T-3/T-4 project. In addition it was estimated that the following hours were necessary:

Environmental Engineer 300 hours
Health Physicist 100 hours
Manager 200 hours
Industrial Hygiene 100 hours

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

Factor 300 - Environmental Engineer 75 Hours
Factor 100 - Health Physicists 25 Hours
Factor 200 - Manager 50 Hours
Factor 100 - P090 Industrial Hygienists 25 Hours
Factor 95000 - A5H Subcontracted Srvs 23,750 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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# Rocky Flats Closure Project

## Baseline Cost and Basis of Estimate

### Project: Rocky Flats Closure Project
### WBS Filter: 1GAC
### Activity Filter: *

#### Baseline Deviation

**WBS No:** 1GAC0707  
**Activity ID:** 1GER677250

### Activity Details

- **Starts In FY:** *

#### Activity Cost Breakdown

**Activity ID:** 1GER677270  
**Description:** Prepare Closeout Report - IHSS Group 700-7

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**Total for Activity 1GER677270:**  
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**Activity Details:**  
**Cost Risk:** 1  
**Schedule Risk:** 1

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**Item Desc:**  
Perform Data Analysis including GIS representation of data, Closeout Report, and associated project management.

**Required level of effort:**  
- Environmental Engineer - 80 hours
- Environmental Scientist - 20 hours
- Computer Specialist - 160 hours (GIS, SWD)
- Manager - 20 hours
- Administrative - 20 hours

**Breakdown of Cost Data:**
- Item: Develop Documentation
- Unit Cost: 320
- Unit Cost Adjustment Factor: none
- Revised Unit Hours: 320
### Line Item SYS - Contingency And Escalation

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### WBS No: 1GAC0708  Title: Group 700-8 (750 Pad)  Activity ID: 1G70080000

**Description:** Planning - IHSS Group 700-8 (750 Pad)

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**Total for Activity 1G70080000:**

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### Line Item 0100 - SAP Addenda

**Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.**

**Item Desc:**
Preparation of SAP Addenda to Industrial Area Characterization Plan.

**Breakdown of Cost Data:**
- Item: Preparation of SAP addenda
  - Units: hours
  - Unit Cost: 120
  - Unit Cost Adjustment Factor: none
  - Revised Unit Hours: 120

**Basis for adjustment:**
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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**Line Item 0200 - HASP Addenda

**Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.**

**Item Desc:**
Preparation of HASP addenda to Industrial Area Characterization Plan.

**Breakdown of Cost Data:**
- Item: Preparation of addenda for HASP.
  - Units: hours
  - Unit Cost: 140
  - Unit Cost Adjustment Factor: none
  - Revised Unit Hours: 140

**Basis for adjustment:**
## Rocky Flats Closure Project

### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0708  
**Activity ID:** 1G70080000  
**Project:** Baseline Devl  
**WBS Filter:** 1GAC  
**Activity Filter:** *

### Details

**Line Item 0300 - QAP Addenda**

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**Resources**

- **Line Item 0300 - QAP Addenda**
  - **BOE**: Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.
  - **Item Desc**: Preparation of SAP Addenda to Industrial Area Characterization Plan.
  - **Breakdown of Cost Data**:
    - **Units**: hours
    - **Unit Cost**: $60
    - **Unit Cost Adjustment Factor**: none
    - **Revised Unit Hours**: 60
  - **Basis for adjustment**: This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Line Item SYS - Contingency And Escalation

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### Activity ID: 1G70080020

**Description**: Procurement & Field Preparation - IHSS Grp 700-8  
**Cost Risk**: 1  
**Schedule Risk**: 1

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**Total for Activity 1G70080020:**

- **Cost Elements**:
  - **Labor Hours Total**: 345
  - **Labor Cost Total**: 10,637
  - **Materials/ Sub Cost**: 2,114
  - **Contingency & Escalation**: 0
  - **Total Prime Cost**: 12,751
  - **Burden Cost**: 3,680
  - **Total Cost**: 16,432

**Line Item 0100 - field prep**

- **BOE**: Estimator's Experience based on 15 years of experience planning, estimating, and conducting projects of similar scope and size.
- **Breakdown of Cost Data**:
  - **Units**: hours
  - **Unit Cost**: 1380
  - **Unit Cost Adjustment Factor**: 0.25
  - **Revised Unit**: 345 hours
Item: Subcontractor costs to perform above individual tasks for either Ryan's Pit or T-3/T-4.

Units: 1 lot
Unit Cost: $10K
Unit Cost Adjustment Factor: 0.25
Revised Unit: $2.5K

Basis for adjustment. Hours and costs for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be characterized at once.

Procurement includes preparation of statement of work, proposal review (technical evaluation), and negotiations. Based on a T-3/T-4 burdened cost of $29,186.52. Assuming it is primarily labor hours (RMRS Environmental Engineer charging at $57.45 per hour) yields 508 hours which rounds to 510 total hours.

Davis Bacon Documentation: It was assumed that it would take an environmental engineer twenty-four hours to prepare a Davis Bacon cost estimate and to support the Davis-Bacon determination.

Subcontractor Health and Safety Plan: Costs for the health and safety plan are based on Ryan's Pit, which cost approximately $10,000. It was assumed that these are A5H dollars. In addition, it was assumed that a safety engineer, an industrial hygienist, and a radiological engineer would each provide one week (40 hours) of support for review and document preparation.

Radiological Work Permit: It was assumed that it would take a radiological control technician two working days (18 hours) to complete counting preparation and review.

Implementation Plan: It was estimated that this activity would take 13 weeks of time for engineers, scientists or equivalent to complete. This would include preparation of an implementation plan as required (Rocky Flats Cleanup Agreement, Appendix 3, Interim Guidance Document, Dated August 1977). In addition this includes all tasks related to documentation for the Integrated Work Control Program and Integrated Safety Management.

Ecology Survey/National Environmental Protection Act (NEPA) Support: It was estimated that this would take 40 hours for an ecologist. The activities include NEPA review and support in document preparation, site surveys to verify compliance with ecological regulations, categorical exclusions, and NEPA evaluations.

Utility Clearance/Soil Disturbance Permits: It was estimated based on experience that it would take the equivalent 2 weeks (80 hours) for technical staff to do utility surveys, prepare and review soil disturbance permits, and prepare authorizing documents for excavation.

The combined resources for procurement and field preparations are:

Total Procurement and Field Preparation Hours
Environmental Engineer 1134 hours
Safety Engineer 40 hours
Industrial Hygiene 40 hours
Radiological Engineering 58 hours
Radiological Control Technician 18 hours
Ecologist/Life Scientist 40 hours
Manager 50 hours
Quality Assurance* 29 hours
A5H Total $10,000

* On some projects these hours were assumed to be included in other tasks or part of this task under environmental engineer or one of the other job functions.

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

Factor 1134 – Environmental Engineer 283 Hours
Factor 40 – Safety Engineer 10 Hours
Factor 40 – Industrial Hygiene 10 Hours
Factor 58 – Radiological Engineering 14 Hours
Factor 18 – RCT 5 Hours
Factor 40 – Life Scientist 10 Hours
Factor 50 – Project Manager 11 Hours
Factor 10000 – A5H Subcontracted Services 2,500 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### Rocky Flats Closure Project
#### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0708  
**Activity ID:** 1G70080020  
**Baseline Devl:** WBS Filter: 1GAC

<table>
<thead>
<tr>
<th>Activity ID:</th>
<th>Description:</th>
<th>BOE</th>
<th>Contingency And Escalation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1G70080020</td>
<td>Readiness Review - Group 700-8</td>
<td>1260.07 Dollars</td>
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**Line Item 0100 - readiness assessment**

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<th>Line Item</th>
<th>Description</th>
<th>Quantity</th>
<th>Units</th>
<th>BOE Type</th>
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<th>Labor Cost Total</th>
<th>Materials/ Sub Cost</th>
<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
<th>Burden Cost</th>
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**Total for Activity 1G70080020:** 68 | 1.887 | 1.015 | 986 | 3,888 | 653 | 4,541 |

### Estimator's Experience

- **Item Desc:** 
  - Evaluate readiness of the field characterization team and plans.

- **Breakdown of Cost Data:**
  - **Item:** Site Labor to perform Readiness Assessment for T-3/T-4.
    - Units: hours
    - Unit Cost: 187
    - Unit Cost Adjustment Factor: 0.25
    - Revised Unit: 48
  - **Item:** Subcontractor costs to perform Readiness Assessment for T-3/T-4.
    - Units: 1 lot
    - Unit Cost: $4800
    - Unit Cost Adjustment Factor: 0.25
    - Revised Unit: $1200

- It was estimated that subcontractor involvement would require 80 hours at $60/hour = $4,800. It was assumed that about 3 weeks of time was required for an environmental engineer or similar person in addition to 12 hours of project management, which yielded 132 hours. An additional 11 hours was added for management oversight. It was estimated that a radiological engineer (QA) and an industrial hygienist would be needed for 2.5 days each (22 hours).

- The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 projects will be conducted at once and only one of each fixed cost is needed for the group.
Factor 22 - Quality Assurance 6 Hours
Factor 4,800 - A5H Subcontracted Srvs 1,200 Dollars

20 hours of administrative time will also be required.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

<table>
<thead>
<tr>
<th>Resources</th>
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<th>Description: Field Characterization - Group 700-8</th>
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<tr>
<td>0200</td>
<td>analyze samples (radioisotopes)</td>
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<td>0300</td>
<td>project mgmt oversight</td>
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Total for Activity 1G70080050:

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<th>Material/ Sub Cost</th>
<th>Contingency &amp; Escalation</th>
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Total for Activity 1G70080050: 54,448 32,934 31,191 10,098 197,502

Line Item 0100 - collect surficial soil samples

Item Desc:

Collection of surficial soil samples. A site Environmental Engineer will direct the sample collection, containerize, package, and ship the samples; prepare field QC documentation, and prepare field notes on a full time basis. A site RCT will monitor the site for radiological contamination on a full time basis. A site Industrial Hygienist will implement the field portion of the HASP on a full time basis.

Breakdown of Cost Data:

Item: Site Personnel for support of sample collection
Units: hours
Unit Cost: 24
Unit Cost Adjustment Factor: none
Revised Unit Hours: 24

<table>
<thead>
<tr>
<th>Resources</th>
<th>Activity ID: 1G70080050</th>
<th>Description: Field Characterization - Group 700-8</th>
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<td>Cost Element</td>
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Total for Activity 1G70080050: 54,448 32,934 31,191 10,098 197,502

Line Item 0100 - collect surficial soil samples

Item Desc:

Collection of surficial soil samples. A site Environmental Engineer will direct the sample collection, containerize, package, and ship the samples; prepare field QC documentation, and prepare field notes on a full time basis. A site RCT will monitor the site for radiological contamination on a full time basis. A site Industrial Hygienist will implement the field portion of the HASP on a full time basis.

Breakdown of Cost Data:

Item: Site Personnel for support of sample collection
Units: hours
Unit Cost: 24
Unit Cost Adjustment Factor: none
Revised Unit Hours: 24
### Rocky Flats Closure Project
#### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0708  
**Activity ID:** 1G70080050  
**Project:**  
**Baseline Devl**  
**WBS Filter:** 1GAC  
**Activity Filter:** *  
**Starts In FY:** *

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<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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</table>
| **Line Item 0200 - analyze samples (radioisotopes)**  
BOE  
**Vendor Quote:** Email quote: average cost from Kaiser-Hill ASD (V. Ideker).  
**Item Desc:** Analyze samples produced by geoprobe borings. It is anticipated that 3 samples from each boring will be collected. They will be analyzed for Metals, VOCs, SVOCs, PCBs, and radioisotopes (est. 3 isotopes) with a 30 day TAT. This item is priced on a per sample basis. Per sample costs include DOT rad screen, bottle charge, shipping, and validation.  
**Breakdown of Cost Data:**  
- **Item:** Analyze samples at an offsite laboratory.  
- **Units:** analysis  
- **Unit Cost:** Metals $345, VOCs $280, SVOCs $440, PCBs and other analytes $150, and Radioisotopes 3 isotopes) $590 per each sample.  
- **Unit Cost Adjustment Factor:** Must add: DOT rad screen $32/sample, bottle charge $7/sample, shipping $4.2/bottle, and validation per each: $17.30 VOA, $19.25 SVOC, $16.75 Metals, $5.95 PCB, and $15.60 Rad.  
- **Revised Unit Hours:** Metals $405, VOCs $341, SVOCs $502, PCBs and other analytes $199, and Rad $649.  
  
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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<tr>
<th>Resources</th>
<th>Cost Element</th>
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<th>Skill</th>
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<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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</table>
| **Line Item 0300 - project mgmt oversight**  
BOE  
**Item Desc:** Project Management/Oversight. Based on half time for a Project Manager, Administrative staff, and Cost Estimator/Scheduler.  
**Breakdown of Cost Data:**  
- **Item:** Mgmt oversight  
- **Units:** hours  
- **Unit Cost:** 12  
- **Unit Cost Adjustment Factor:** none  
- **Revised Unit Hours:** 12  
  
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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<th>Quantity</th>
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</table>
| **Line Item 0400 - analyze samples (nitrates)**  
BOE  
**Vendor Quote:** Email quote: average cost from Kaiser-Hill ASD (V. Ideker).  
**Item Desc:** Analyze samples produced by geoprobe borings. It is anticipated that 3 samples from each boring will be collected. They will be analyzed for Metals, VOCs, SVOCs, PCBs, and radioisotopes (est. 3 isotopes) with a 30 day TAT. This item is priced on a per sample basis. Per sample costs include DOT rad screen, bottle charge, shipping, and validation.  
**Breakdown of Cost Data:**
Item: Analyze samples at an offsite laboratory.

Unit Cost: Metals $345, VOCs $280, SVOCs $440, PCBs and other analytes $85, and Radionuclides (3 isotopes) $590 per each sample.

Unit Cost Adjustment Factor: Must add: DOT rad screen $22/sample, bottle charge $7/sample, shipping $4.2/bottle, and validation per each: $17.30 VOA, $19.25 SVOC, $16.75 Metals, $5.95 PCB, and $15.60 Rad.

Revised Unit Hours: Metals $405, VOCs $341, SVOCs $502, PCBs and other analytes $214, and Rad $649.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

**Line Item SYS - Contingency And Escalation**

**BOE Resources**

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<th>Cost Element</th>
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**Activity ID: 1G70080070**

**Description:** Prepare NFA - Group 700-8

**Cost Risk:** 1  **Schedule Risk:** 1

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<tr>
<th>Line Item</th>
<th>Description</th>
<th>Quantity</th>
<th>Units</th>
<th>BOE Type</th>
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**Total for Activity 1G70080070:** 138 4,164 0 3,003 7,167 1,449 8,616

**Line Item 0100 - develop documentation**

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

This estimate was constructed based on actual hours required to complete previous NFA Reports (obtained from actual author) and professional judgement of level of effort required for remaining reports.

**Item Desc:**
Perform Data Analysis including GIS representation of data, NFA Summary, and associated project management.

**Breakdown of Cost Data:**

- **Environmental Engineer:** 45 hrs Evaluate & assemble existing data. Draft Report.
- **SMW Technician:** 10 hrs Identify & pull existing data from database.
- **GIS Technician:** 15 hrs Develop maps for Report. Print multiple copies.
- **Technical Editor:** 15 hrs Complete initial and revised tech edits of Report.
- **Technical Reviews:** 4 hrs Review and comment per area of expertise.
- **Peer (2):** 8 hrs Review and comment per area of expertise.
- **Compliance:** 4 hrs Review and comment per area of expertise.
- **Management (2):** 8 hrs Review and comment per area of expertise.
- **Legal:** 4 hrs Review and comment per area of expertise.
- **Environmental Engineer:** 15 hrs Disposition comments and finalize document.
- **Administrative Support:** 6 hrs Copy & assemble final documents, submit to records.

**Unit Cost Adjustment Factor:** none

**Revised Unit Hours:** 138

**Basis for adjustment: N/A**
### Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

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<th>WBS No: 1GAC0708</th>
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#### Cost Element: Straight Time Base

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**Total for Activity 1G7000A0100:**

- 280 hours
- 10,021 Labor Hours Total
- 1,421 Labor Cost Total
- 13,479 Materials/Sub Cost
- 2,037 Contingency & Escalation
- 16,504 Total Prime Cost
- 2,826 Burden Cost
- 19,330 Total Cost

**Item Description:**

Estimate based on estimator's experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

Breakdown of Cost Data:

- **Item:** Preparation of SAP Addenda
- **Units:** hours
- **Unit Cost:** $120
- **Unit Cost Adjustment Factor:** none
- **Revised Unit Hours:** 120

**Basis for adjustment:**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Resources**

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**Item:** Preparation of SAP Addenda to Industrial Area Characterization Plan.
### Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

<table>
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<th>WBS No:</th>
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#### Line Item 0200 - HASP Addenda

**BOE**

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Item Desc:**

Preparation of HASP addenda to Industrial Area Characterization Plan.

**Breakdown of Cost Data:**

- **Item:** Preparation of addenda for HASP.
- **Units:** hours
- **Unit Cost:** 140
- **Unit Cost Adjustment Factor:** none
- **Revised Unit Hours:** 140

**Basis for adjustment:**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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#### Line Item 0300 - QAP Addenda

**BOE**

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Item Desc:**

Preparation of QAP Addenda to Industrial Area Characterization Plan.

**Breakdown of Cost Data:**

- **Item:** Preparation of QAP addenda
- **Units:** hours
- **Unit Cost:** 60
- **Unit Cost Adjustment Factor:** none
- **Revised Unit Hours:** 60

**Basis for adjustment:**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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#### Line Item SYS - Contingency And Escalation

**BOE**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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## Rocky Flats Closure Project
### Baseline Cost and Basis of Estimate

**Activity ID:** 1G700A0120  
**Description:** Procurement & Field Preparation-IHSS Grp 700-10

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<th>Materials/ Sub Cost Total</th>
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**BOE Experience:**

Estimator's Experience based on 15 years of experience planning, estimating, and conducting projects of similar scope and size.

**Item Desc:**


**Breakdown of Cost Data:**

- **Item:** Site Labor to perform above individual tasks for either Ryan's Pit or T-3/T-4.
  - **Units:** hours
  - **Unit Cost:** 1380
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** 345 hours

- **Item:** Subcontractor costs to perform above individual tasks for either Ryan's Pit or T-3/T-4.
  - **Units:** 1 lot
  - **Unit Cost:** $10K
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** $2.5K

**Basis for adjustment.** Hours and costs for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be characterized at once.

**Procurement** includes preparation of statement of work, proposal review (technical evaluation), and negotiations. Based on a T-3/T-4 burdened cost of $29,186.52. Assuming it is primarily labor hours (RMRS Environmental Engineer charging at $57.45 per hour) yields 508 hours which rounds to 510 total hours.

**Davis Bacon Documentation:** It was assumed that it would take an environmental engineer twenty-four hours to prepare a Davis Bacon cost estimate and to support the Davis-Bacon determination.

**Subcontractor Health and Safety Plan:** Costs for the health and safety plan are based on Ryan's Pit, which cost approximately $10,000. It was assumed that these are A5B dollars. In addition, it was assumed that a safety engineer, an industrial hygienist, and a radiological engineer would each provide one week (40 hours) of support for review and document preparation.

**Radiological Work Permit:** It was assumed that it would take a radiological control technician two working days (18 hours) to complete counting preparation and review.

**Implementation Plan:** It was estimated that this activity would take 13 weeks of time for engineers, scientists or equivalent to complete. This would include preparation of an implementation plan as required (Rocky Flats Cleanup Agreement, Appendix J, Interim Guidance Document, Dated August 1977). In addition this includes all tasks related to documentation for the Integrated Work Control Program and Integrated Safety Management.

**Ecology Survey/National Environmental Protection Act (NEPA) Support:** It was estimated that this would take 40 hours for an ecologist. The activities include NEPA review and support in document preparation, site surveys to verify compliance with ecological regulations, categorical exclusions, and NEPA evaluations.

**Utility Clearance/Soil Disturbance Permits:** It was estimated based on experience that it would take the equivalent 2 weeks (80 hours) for technical staff to do utility surveys, prepare and review soil disturbance permits, and prepare authorizing documents for excavation.

**The combined resources for procurement and field preparations are**

- **Total Procurement and Field Preparation Hours**
  - Environmental Engineer 1134 hours
  - Safety Engineer 40 hours
  - Industrial Hygiene 40 hours
**Rocky Flats Closure Project**

Baseline Cost and Basis of Estimate

---

**WBS No:** 1GAC070A  
**Activity ID:** 1G700A0120  
**Project:** Baseline Dev

1GAC  
**WBS Filter:** Activity Filter: *  
**Starts In FY:** *

---

Radiological Engineering 58 hours  
Radiological Control Technician 18 hours  
Ecologist/Life Scientist 40 hours  
Manager 50 hours  
Quality Assurance* 29 hours  
A5K Total $10,000

* On some projects these hours were assumed to be included in other tasks or part of this task under environmental engineer or one of the other job functions.

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

---

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This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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**Activity ID:** 1G700A0140  
**Description:** Readiness Review - Group 700-10

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**BOE**

Estimator's Experience based on 15 years of experience planning, estimating and conducting projects of similar scope and size.
**Item Desc:**
Evaluate readiness of the field characterization team and plans.

**Breakdown of Cost Data:**

**Item:** Site Labor to perform Readiness Assessment for T-3/T-4.
- **Units:** hours
- **Unit Cost:** 187
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** 48

**Item:** Subcontractor costs to perform Readiness Assessment for T-3/T-4.
- **Units:** 1 lot
- **Unit Cost:** $4800
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** $1200

It was estimated that subcontractor involvement would require 80 hours at $60/hour = $4,800. It was assumed that about 3 weeks of time was required for an environmental engineer or similar person in addition to 12 hours of project management, which yielded 132 hours. An additional 11 hours was added for management oversight. It was estimated that a radiological engineer (QA) and an industrial hygienist would be needed for 2.5 days each (22 hours).

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 projects will be conducted at once and only one of each fixed cost is needed for the group.

**Factor 132 - Environmental Engineer 33 Hours**
**Factor 22 - Health Physicists 6 Hours**
**Factor 11 - Manager 3 Hours**
**Factor 4,800 - A5H Subcontracted Srvs 1,200 Dollars**

20 hours of administrative time will also be required.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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**Line Item SYS - Contingency And Escalation**

**BOE**

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**Activity ID:** 1G700A0150  **Description:** Field Characterization - Group 700-10
**Cost Risk:** 1  **Schedule Risk:** 1

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<th>Labor Cost Total</th>
<th>Material/ Sub Cost</th>
<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
<th>Burden Cost</th>
<th>Total Cost</th>
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**Page 766 of 1121**  **6/23/00 9:22:38 AM**  **OFFICIAL USE ONLY**
**Project: Rocky Flats Closure Project**

**WBS Filter: 1GAC**

**Baseline Deviation: Baseline Cost and Basis of Estimate**

**Activity Filter: Activity Filter**

**WBS No:** 1GAC070A

**Activity ID:** 1G700A0150

---

### Line Item 0100 - Collect Surfacial Soil Samples

**BOE**

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Item Desc:**

Collection of surficial soil samples. A site Environmental Engineer will direct the sample collection, containerize, package, and ship the samples; prepare field QC documentation, and prepare field notes on a full time basis. A site RCT will monitor the site for radiological contamination on a full time basis. A site Industrial Hygienist will implement the field portion of the HASP on a full time basis.

**Breakdown of Cost Data:**

- **Item:** Site Personnel for support of sample collection
- **Units:** hours
- **Unit Cost:** 24
- **Unit Cost Adjustment Factor:** none
- **Revised Unit Hours:** 24

**Resources**

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</table>

**Factors:** 8 hours

---

### Line Item 0200 - Analyze Samples (Radionuclides)

**BOE**

Vendor Quote

Email quote: average cost from Kaiser-Hill ASD (V. Ideker).

**Item Desc:**

Analyze samples produced from geoprobe borings. It is anticipated that 20 samples will be collected. They will be analyzed for radionuclides (est. 3 isotopes) with a 30 day TAT. This item is priced on a per sample basis. Per sample costs include DOT rad screen, bottle charge, shipping, and validation.

**Breakdown of Cost Data:**

- **Item:** Analyze samples at an offsite laboratory
- **Units:** analysis
- **Unit Cost:** $500 per each sample
- **Unit Cost Adjustment Factor:** Must add: DOT rad screen $32/sample, bottle charge $7/sample, shipping $4.2/bottle, and validation per each: $15.60 Rad
- **Revised Unit Cost:** $649

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Resources**

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
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<th>Units</th>
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**Factors:** 8 hours

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### Line Item 0300 - Project Mgmt Oversight

**BOE**

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Item Desc:**

Project Management/Oversight. Based on half time for a Project Manager, Administrative staff, and Cost Estimator/Scheduler

**Breakdown of Cost Data:**

- **Item:** Mgmt oversight
- **Units:** hours
- **Unit Cost:** 12
- **Unit Cost Adjustment Factor:** none
- **Revised Unit Hours:** 12

Basis for adjustment.
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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<thead>
<tr>
<th>Cost Element</th>
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<th>Units</th>
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<td>R100S RMRS Salaried</td>
<td>Linear</td>
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<td>Hours</td>
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</table>

Factors: 4 hrs

| ASH SUBCONTRACTED SRVS | P070 COST ESTIMATORS PLANNERS AN | K26S ER Programs | Linear | 142.09 | Dollars |

Factors: 4 hrs $42 estimated $/hr

### Line Item SYS - Contingency And Escalation

**BOE**

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
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Factors: 3674.15 Dollars

### Line Item 0100 - develop documentation

**BOE**

#### Description: Prepare NFA - Group 700-10

**Item Desc:**
- Perform Data Analysis including GIS representation of data, NFA Summary, and associated project management.

**Breakdown of Cost Data:**
- **Item: Develop Documentation**
  - **Units:** Hours
  - **Unit Cost:** 138
  - **Environmental Engineer:** 45 hrs Evaluate & assemble existing data. Draft Report.
  - **SMD Technician:** 10 hrs Identify & pull existing data from database.
  - **GIS Technician:** 15 hrs Develop maps for Report. Print multiple copies.
  - **Technical Editor:** 15 hrs Complete initial and revised tech edits of Report.
  - **Technical Reviews**
    - **QA:** 4 hrs Review and comment per area of expertise.
    - **Peer (2):** 8 hrs Review and comment per area of expertise.
    - **Compliance:** 4 hrs Review and comment per area of expertise.
    - **Environmental:** 4 hrs Review and comment per area of expertise.
    - **Management (2):** 8 hrs Review and comment per area of expertise.
    - **Legal:** 4 hrs Review and comment per area of expertise.
    - **Environmental Engineer:** 15 hrs Disposition comments and finalize document.
  - **Administrative Support:** 6 hrs Copy & assemble final documents, submit to records.
  - **Unit Cost Adjustment Factor:** none
  - **Revised Unit Hours:** 138
  - **Basis for adjustment:** N/A

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<tr>
<th>Line Item</th>
<th>Quantity</th>
<th>Units</th>
<th>BOE Type</th>
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**Total for Activity 1G700A0170:**

- **138**
- **4,164**
- **762**
- **4,927**
- **1,174**
- **6,101**

**Line Item 0100 - develop documentation**

This estimate was constructed based on actual hours required to complete previous NFA Reports (obtained from actual author) and professional judgement of level of effort required for remaining reports.

**Item Desc:**
- Develop Documentation

**Breakdown of Cost Data:**
- **Item: Develop Documentation**
  - **Units:** Hours
  - **Unit Cost:** 138
  - **Environmental Engineer:** 45 hrs Evaluate & assemble existing data. Draft Report.
  - **SMD Technician:** 10 hrs Identify & pull existing data from database.
  - **GIS Technician:** 15 hrs Develop maps for Report. Print multiple copies.
  - **Technical Editor:** 15 hrs Complete initial and revised tech edits of Report.
  - **Technical Reviews**
    - **QA:** 4 hrs Review and comment per area of expertise.
    - **Peer (2):** 8 hrs Review and comment per area of expertise.
    - **Compliance:** 4 hrs Review and comment per area of expertise.
    - **Environmental:** 4 hrs Review and comment per area of expertise.
    - **Management (2):** 8 hrs Review and comment per area of expertise.
    - **Legal:** 4 hrs Review and comment per area of expertise.
    - **Environmental Engineer:** 15 hrs Disposition comments and finalize document.
  - **Administrative Support:** 6 hrs Copy & assemble final documents, submit to records.
  - **Unit Cost Adjustment Factor:** none
  - **Revised Unit Hours:** 138
  - **Basis for adjustment:** N/A

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**Total for Activity 1G700A0170:**

- **138**
- **4,164**
- **762**
- **4,927**
- **1,174**
- **6,101**
### Rocky Flats Closure Project

#### Baseline Cost and Basis of Estimate

**Project**

**WBS Filter**

**Baseline Devl**

**Activity Filter**

**Starts by FY**

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<th>Description</th>
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| Total for Activity 1GHE711180: | 770 | 22,103 | 0 | 4,046 | 26,148 | 6,233 | 32,381 |

### Remarks:

This estimate is based on estimator judgement and historical data. Estimated level of effort is based on actual costs for Estimator's Experience based generally on historical data from Trenches T-3/T-4. Total hours includes PAM and WMP preparation.

**Item Desc:**
Preparation of a PAM in support of source removal of previously characterized IHSSs.

**Proposed Action Memorandum:** A bottoms-up estimate based on historical costs was used as the basis for the estimate. Based on Ryan's Pit (IHSS 108), the cost for the PAM was $50,000 (contractor costs). Assuming that labor rates at this time were approximately $75 (based on a cost center 217). The total labor for a PAM would be approximately 666 hours, which rounds to 700 hours. It was assumed that 10% would be required for managerial hours.

For a PAM the total labor hours are:
- Environmental Engineer 700 Hours
- Manager 70 Hours

**Breakdown of Cost Data:**
- Item: Preparation of PAM for Ryan's Pit source removal action.
- Units: hours
- Unit Cost: 770
- Revised Unit Hours: 770
Rocky Flats Closure Project
Baseline Cost and Basis of Estimate

WBS No: 1GAC070B
Activity ID: 1GHE71180

Baseline Cost

Activity Filter 1GAC
WBS Filter WBS 1GAC

Starts In FY *

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Line Item SYS - Contingency And Escalation

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<th>Curve</th>
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Activity ID: 1GHE711210 Description: Procurement and Field Prep - IHSS Group 700-11

<table>
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<th>Total Prime Cost</th>
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Total for Activity 1GHE711210: 1,409 43,594 8.458 22,548 74,600 13,805 88,405

Line Item 0100 - procurement & field prep

Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation

Item Desc:

Breakdown of Cost Data:
Item: Site Labor to perform above individual tasks for either Ryan's Pit or T-3/T-4.
Units: hours
Unit Cost: 1409
Unit Cost Adjustment Factor: 0
Revised Unit: 1409 hours

Item: Subcontractor costs to perform above individual tasks for either Ryan's Pit or T-3/T-4.
Units: 1 lot
Unit Cost: $10K
Unit Cost Adjustment Factor: 0
Revised Unit: $10K

Procurement includes preparation of statement of work, proposal review (technical evaluation), and negotiations. Based on a T-3/T-4 burdened cost of $29,186.52. Assuming it is primarily labor hours (RMRS Environmental Engineer charging at $57.45 per hour) yields 508 hours which rounds to 510 total hours.

Davis Bacon Documentation: It was assumed that it would take an environmental engineer twenty-four hours to prepare a Davis Bacon cost estimate and to support the Davis-Bacon determination.

Subcontractor Health and Safety Plan: Costs for the health and safety plan are based on Ryan's Pit, which cost approximately $10,000. It was assumed that these are A5H dollars. In addition, it was assumed that a safety engineer, an industrial hygienist, and a radiological engineer would each provide one week (40 hours) of support for review and document preparation.

Radiological Work Permit: It was assumed that it would take a radiological control technician two working days (18 hours) to complete counting preparation and review.

Implementation Plan: It was estimated that this activity would take 13 weeks of time for engineers, scientists or equivalent to complete. This would include preparation of an implementation plan as required (Rocky Flats Cleanup Agreement, Appendix 3, Interim Guidance Document, Dated August 1977). In addition this includes all tasks related to documentation for the Integrated Work Control Program and Integrated Safety Management.

Ecology Survey/National Environmental Protection Act (NEPA) Support: It was estimated that this would take 40 hours for an ecologist. The activities include NEPA review and support in document preparation, site surveys to verify compliance with ecological regulations, categorical exclusions, and NEPA evaluations.
Utility Clearance/Soil Disturbance Permits: It was estimated based on experience that it would take the equivalent 2 weeks (80 hours) for technical staff to do utility surveys, prepare and review soil disturbance permits, and prepare authorizing documents for excavation.

The combined resources for procurement and field preparations are:

<table>
<thead>
<tr>
<th>Total Procurement and Field Preparation Hours</th>
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</thead>
<tbody>
<tr>
<td>Environmental Engineer 1134 hours</td>
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<tr>
<td>Safety Engineer 40 hours</td>
</tr>
<tr>
<td>Industrial Hygiene 40 hours</td>
</tr>
<tr>
<td>Radiological Engineering 58 hours</td>
</tr>
<tr>
<td>Radiological Control Technician 18 hours</td>
</tr>
<tr>
<td>Ecologist/Life Scientist 40 hours</td>
</tr>
<tr>
<td>Manager 50 hours</td>
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<tr>
<td>Quality Assurance 29 hours</td>
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<td>A5# Total $10,000</td>
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This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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<th>Skill</th>
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### Activity 1GHE711240

**Description:** Readiness Assessment - IHSS Group 700-11

**BOE**

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Total for Activity 1GHE711240:

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<td>7,465</td>
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Estimator's Experience based generally on historical data for T-3/T4 Remediation.
Conduct Readiness Assessment in support of source removal action.

Breakdown of Cost Data:
- **Item**: Site Labor to perform Readiness Assessment for T-3/T-4.
  - **Units**: hours
  - **Unit Cost**: 207
  - **Unit Cost Adjustment Factor**: 0
  - **Revised Unit**: 207

- **Item**: Subcontractor costs to perform Readiness Assessment for T-3/T-4.
  - **Units**: lot
  - **Unit Cost**: $4800
  - **Unit Cost Adjustment Factor**: 0
  - **Revised Unit**: $4800

It was estimated that subcontractor involvement would require 80 hours at $60/hour = $4,800. It was assumed that about 3 weeks of time was required for an environmental engineer or similar person in addition to 12 hours of project management, which yielded 132 hours. An additional 11 hours was added for management oversight. It was estimated that a radiological engineer (QA) and an industrial hygienist would be needed for 2.5 days each (22 hours). Administrative support will also be required.

Environmental Engineer 132 Hours
Health Physicists 22 Hours
Manager 11 Hours
Quality Assurance 22 Hours
A5H Subcontracted Srvs 4,800 Dollars
Administrative 20 Hours

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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<th>Cost Element</th>
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<th>Department</th>
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Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Breakdown of Cost Data:
- **Item**: Site Labor to perform above individual tasks for T-3/T-4.
  - **Units**: hours
  - **Unit Cost**: 132 Hours
  - **Unit Cost Adjustment Factor**: 0.25
  - **Revised Unit**: 33 hours

- **Item**: Subcontractor costs to perform above individual tasks for T-3/T-4.
  - **Units**: lot
  - **Unit Cost**: $12K
  - **Unit Cost Adjustment Factor**: 0.25
  - **Revised Unit**: $3K
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**Line Item 0300 - pre-evolution meeting**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc: Conduct Pre-Evolution Meeting in support of source removal action

Breakdown of Cost Data:

Item: Site Labor to perform above individual tasks for T-3/T-4.

- Units: hours
- Unit Cost: $6K
- Unit Cost Adjustment Factor: 0.25
- Revised Unit: 15 hours

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Resources**

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**Line Item SYS - Contingency And Escalation**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc: Conduct Pre-Evolution Meeting in support of source removal action

Breakdown of Cost Data:

Item: Site Labor to perform above individual tasks for T-3/T-4.

- Units: hours
- Unit Cost: $6K
- Unit Cost Adjustment Factor: 0.25
- Revised Unit: 15 hours

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Resources**

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**Activity ID: 1GHE711250**

Description: Remedial Action - IHSS Group 700-11

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**Line Item 0100 - Remediation of Water**

**Item Desc:**
This scope includes mobilization and water removal and treatment. The water in the pond will be pumped out and sent for treatment at Building 891, at a cost of $1.50/gallon. There are 8,976 gallons for treatment. It was assumed the remedial action would be on contaminated soils. It was assumed that remedial actions are based on the amount of soil removed. 15 cubic yards of contaminated soil will be removed, and stored in cargo containers for shipment to off-site disposal.

**Mobilization in support of remediation.**
Estimator's Experience based generally on historical data for T-3/T-4 Remediation.

**Breakdown of Cost Data:**
- **Item:** Site Labor to perform above individual tasks for T-3/T-4.
  - **Units:** hours
  - **Unit Cost:** 1,100
  - **Unit Cost Adjustment Factor:** 0.50
  - **Revised Unit:** 550

- **Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
  - **Units:** 1 lot
  - **Unit Cost:** 184k
  - **Unit Cost Adjustment Factor:** 0.50
  - **Revised Unit:** 92,000 dollars

**Basis for adjustment.** The costs were divided into fixed costs and variable costs. The fixed costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.50 factor because IHSS Group 700-11 will not be remediated with other IHSSs or UBCs. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

**D&D construction trade hours were calculated using the following methodology:**
A5H subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.

**Waste water removal is calculated using $1.50/gallon, since the pond is 6' deep x 10' x 20' = 1,200 cu.ft.,
Using 7.48 gal/cu.ft, 1,200 cu.ft. x 7.48 gal/cu.ft = 8,976 gallons x $1.50/gal = $13,464**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
**Project:** Rocky Flats Closure Project  
**Activity:** Baseline Devl  
**Baseline Cost and Basis of Estimate**  
**Project WBS Filter:** 1GAC  
**Activity Filter:** 1GAC  
**WBS No:** 1GAC070B  
**Activity ID:** 1GHE711250

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**Line Item IAHDER7525 - Excavation**

This scope includes Site Preparation and Excavation Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:**
- Site Preparation
- T3/T4 hours 120 Environmental Engineer 30 hours
- T3/T4 dollars 30,000 Subcontracted Srvs 7,500 Dollars

**Excavation.**

**Breakdown of Historical Data:**

**Item:** Site Labor to perform above individual tasks for T-3/T-4.
- Units: hours
- Unit Cost: see below
- Unit Cost Adjustment Factor: see below
- Revised Unit: see below

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
- Units: 1 lot
- Unit Cost: see below
- Unit Cost Adjustment Factor: see below
- Revised Unit: see below

**Basis for adjustment.** The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.50 factor because IHSS Group 700-11 will not be remediated with other IHSSs or UBCs. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

**Total Contaminated Soil to be removed 15 CY**
- Total Soil for Thermal Desorption 0 CY
- Offsite Waste Volume 15 CY

The excavation cost was based on the excavation cost for the T-3/T-4 Project. Burdened cost based on the T-3/T-4 actuals is $171,487. For the 3,800 cubic yards of contaminated soil removed this yielded a unit cost of $45 per cubic yard of contaminated soil removed. This estimate includes the removal of overburden that might be on top of the contaminated soil. The hours for an environmental engineer from T-3/T-4 were 1.09 hours per cubic yard of contaminated soil. Likewise the hours for the following were assumed to be linearly proportional:

**Environmental Engineer 2.18 per cubic yard**
- Health Physicists .94 hours per cubic yard
- Environmental Operations .62 hours per cubic yard
- Industrial Hygienists 0.62 hours per cubic yard
- Radiological Control Technician 2.00 hour per cubic yard

* Based on $50/cubic yard from T-3/T-4, assumes a labor rate of $50/hour

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

**Factors**
- Factor 2.18 - E050 Environmental Engineer 33 Hours
- Factor 0.94 - P080 Health Physicists 14 Hours
Factor 0.62 - Environmental Operations  9 Hours
Factor 0.62 - P090 Industrial Hygienists  9 Hours
Factor 2.00 - T050 Radiological Control Technician 30 Hours
Factor 45.23 - A5H Subcontracted Srvs 679 Dollars

D&D construction trade hours were calculated using the following methodology:

A5H subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.

RCT hours were calculated using the following methodology, unless they were already estimated.

For Site Preparation tasks – RCT hours were the same as D&D construction hours.

For all other tasks A5H subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under KG10H department code.

The dollars amounts calculated for D&D construction workers and RCTs were subtracted from the subcontractor dollars and the revised A5H dollar amount was entered into Best.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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<th>Resources</th>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
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Line Item IAHDER7526 - Remove and Clean Debris

Estimator’s Experience based generally on a base case of 700 cy.

Breakdown of Historical Data:

Item: Site Labor to perform above individual tasks for T-3/T-4.
  Units: hours
  Unit Cost: see below
  Unit Cost Adjustment Factor: see below
  Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
  Units: 1 lot
  Unit Cost: see below
  Unit Cost Adjustment Factor: see below
  Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.50 factor because IHSS Group 700-11 will not be remediated with other IHSS or UBCs. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Total Contaminated Soil to be removed 15 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 15 CY

For the base case, it was assumed that about five cubic yards out of 700 cubic yards would be debris and would be segregated and cleaned. It was estimated that each cubic yard of debris would cost $1,000 or $5,000 total for 700 cubic yards. This yields a rate of $7.14 per cubic yard.

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 7.14 - A5H Subcontracted Srvs 107 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

Item Desc:
Confirmation Sampling.

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
   Units: hours
   Unit Cost: see below
   Unit Cost Adjustment Factor: see below
   Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
   Units: 1 lot
   Unit Cost: see below
   Unit Cost Adjustment Factor: see below
   Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.50 factor because IHSS Group 700-11 will not be remediated with other IHSSs. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Total Contaminated Soil to be removed 15 CY

Total Soil for Thermal Desorption 0 CY

Offsite Waste Volume 15 CY

The analytical costs were based on T-3/T-4, which cost $435,574 for 3800 cubic yards of contaminated soil removed. This yielded a unit rate of about $115/cubic yard. Based on estimator experience the cost of sampling including labor and materials was estimated to be 20% of that rate or about $23/ cubic yard.

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 114.62 - A5H Subcontracted Srvs (Analytical) 1,719 Dollars
Factor 22.924 - A5H Subcontracted Srvs 344 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
**Line Item IAHDER7528 - Waste Acceptance Sampling**

**BOE**

**Estimator's Experience based generally on historical data for T-3/T4 Remediation.**

**Item Desc:**
- Waste Acceptance Sampling

**Breakdown of Historical Data:**
- **Item:** Site Labor to perform above individual tasks for T-3/T-4.
  - **Units:** hours
  - **Unit Cost:** see below
  - **Unit Cost Adjustment Factor:** see below
  - **Revised Unit:** see below
- **Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
  - **Units:** 1 lot
  - **Unit Cost:** see below
  - **Unit Cost Adjustment Factor:** see below
  - **Revised Unit:** see below

**Factors for adjustment.** The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Because the waste acceptance sampling is difficult to predict and could vary significantly from project to project, it was assumed that about $800 worth of additional analysis would be required for 20 cubic yards which is the volume that can be placed in one roll-off. This yielded a unit rate of about $40/cubic yard. This sampling and analysis is in addition to the confirmational samples so the costs are not as great. It was assumed that this sampling would be more labor intensive so the sampling costs were estimated to be about 50% of the analytical costs or about $20/cubic yard.

**Total Contaminated Soil to be removed 15 CY**
**Total Soil for Thermal Desorption 0 CY**
**Offsite Waste Volume 15 CY**

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

**Factor 40 - ASH Analytical 600 Dollars**
**Factor 20 - ASH Subcontracted Svrs 300 Dollars**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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**Resources**

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**Line Item IAHDER7530 - Field Oversight & Support**

**BOE**

**Estimator’s Experience based generally on a base case of 700 cy.**

**Item Desc:**
- Field Oversight and Project Management

**Breakdown of Historical Data:**
- **Item:** Site Labor to perform above individual tasks for T-3/T-4.
  - **Units:** hours
  - **Unit Cost:** see below
Item: Subcontractor costs to perform above individual tasks for T-3/T-4.

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.50 factor because IHSS Group 700-11 will not be remediated with other IHSSs. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

It was assumed that a field manager would be needed for 150 nine-hour working days or about 33 weeks. This work breaks down as follows:

Preparation Activities 50 working days
Field Activities –  80 working days
Demobilization –  20 working days
Total 150 nine-hour working days or 1350 hours

In addition it was estimated that technical staff, quality assurance, and project management would be required for the equivalent of ten additional weeks, which is 400 hours each.

Based on the base case of a 700 cubic yard removal project, these values yielded unit rates as follows

<table>
<thead>
<tr>
<th>Hours Per Cubic Yard</th>
<th>Of Contaminated Soil</th>
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<tbody>
<tr>
<td>Field Manager</td>
<td>1.93</td>
</tr>
<tr>
<td>Technical Staff</td>
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</tr>
<tr>
<td>Quality Assurance</td>
<td>0.57</td>
</tr>
<tr>
<td>Project Management</td>
<td>0.57</td>
</tr>
</tbody>
</table>

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Total Contaminated Soil to be removed 15 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 15 CY

| Factor 1.93 – Environmental Engineer         | 29 Hours |
| Factor 0.57 – Technical Support             | 9 Hours  |
| Factor 0.57 – Project Manager               | 9 Hours  |
| Factor 0.57 – Quality Assurance             | 9 Hours  |

The basis for this estimate is estimator judgement, and historical costs (OU-9, OU 14, T3/T4, 903 Pad).

For more detail refer to estimate "PAC 700-1108, Building 771 & 774 Footing Drain (Bowman’s Pond),PAC # 700-1108, dated December 24, 1996, contact John Hopkins, RMRS X4974.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
Rocky Flats Closure Project
Baseline Cost and Basis of Estimate

WBS No: 1GAC070B
Activity ID: 1GHE711250

Baseline Devi WBS Filter Activity Filter 1GAC * *

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<tbody>
<tr>
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**Baseline Cost and Basis of Estimate**

- **WBS No:** 1GAC070B
- **Activity ID:** 1GHE711250
- **Estimated Cost:** $24,505.90
- **Factors:** 0.84576

**Cost Element**

- **BOE**
- **Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites. (T-3/T-4 and others).**
- **Item Desc:** Prepare Closeout Report - IHSS Group 700-11
- **Activity ID:** 1GHE711270

**Total for Activity 1GHE711270:**

<table>
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<th>Line Item</th>
<th>Description</th>
<th>Quantity</th>
<th>Units</th>
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<th>Materials/Sub Cost</th>
<th>Contingency &amp; Escalation</th>
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**Total**

- **BOE**
- **Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites. (T-3/T-4 and others).**
- **Item Desc:** Perform Data Analysis including GIS representation of data, Closeout Report, and associated project management.

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6/23/00 9:22:41 AM  OFFICIAL USE ONLY
**Baseline Cost and Basis of Estimate**

**WBS No:** 1GAC070B  
**Activity ID:** 1GHE711270

---

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**Line Item SYS - Contingency And Escalation**

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<tr>
<td>0200 HASP Addenda</td>
</tr>
<tr>
<td>0300 OAP Addendum</td>
</tr>
<tr>
<td>SYS Contingency And Escalation</td>
</tr>
</tbody>
</table>

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**Breakdown of Cost Data:**

- **Item:** Development of SAP Addenda
  - **Description:** Preparation of SAP Addenda to Industrial Area Characterization Plan
  - **BoE:** 0100

---

**Contingency And Escalation**

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<tbody>
<tr>
<td>0100 SAP Addenda</td>
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<tr>
<td>0300 OAP Addendum</td>
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<tr>
<td>SYS Contingency And Escalation</td>
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</tbody>
</table>

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**Line Item 0100 - SAP Addenda**

- **Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.**
- **Item Desc:** Preparation of SAP Addenda
- **Estimator's Experience**

---

**Breakdown of Cost Data:**

- **Item:** Preparation of SAP Addenda
  - **Units:** hours
  - **Unit Cost:** 120
  - **Unit Cost Adjustment Factor:** none
### Rocky Flats Closure Project

#### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC070C  
**Activity ID:** 1G700C0100  
**Department:** RMRS Salaried

### Cost Element: Revised Unit Hours: 120

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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#### Line Item 0200 - HASP Addenda

**BOE**

- **Item Desc:** Preparation of HASP addenda to Industrial Area Characterization Plan
- **Breakdown of Cost Data:**
  - **Item:** Preparation of addenda for HASP.
  - **Units:** hours
  - **Unit Cost:** 140
  - **Unit Cost Adjustment Factor:** none
  - **Revised Unit Hours:** 140
- **Basis for adjustment:**

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#### Line Item 0300 - QAP Addendum

**BOE**

- **Item Desc:** Preparation of SAP Addenda to Industrial Area Characterization Plan.
- **Breakdown of Cost Data:**
  - **Item:** Preparation of QAP addenda
  - **Units:** hours
  - **Unit Cost:** 60
  - **Unit Cost Adjustment Factor:** none
  - **Revised Unit Hours:** 60
- **Basis for adjustment:**
- This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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Project: Rocky Flats Closure Project
Baseline Cost and Basis of Estimate

WBS No: 1GAC070C
Activity ID: 1G700C0100
Baseline Devl

WBS Filter: 1GAC
Activity Filter: Starts In FY

Line Item - Contingency And Escalation

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Activity ID: 1G700C0120
Description: Procurement & Field Preparation - Group 700-12

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<th>Type</th>
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<th>Labor Hours/Unit</th>
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<th>Contingency &amp; Escalation</th>
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<td>2,249</td>
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Total for Activity 1G700C0120:

- **Total Procurement and Field Preparation Hours**: 345
- **Total Labor Cost**: 10,637
- **Total Labor Cost with Contingency & Escalation**: 12,751
- **Total Cost**: 15,000
- **Burden Cost**: 0
- **Total Cost with Burden**: 18,000

**Estimator's Experience**: Based on 15 years of experience planning, estimating, and conducting projects of similar scale and size.


**Breakdown of Cost Data**:

- **Item**: Site Labor to perform above individual tasks for either Ryan's Pit or T-3/T-4.
  - **Units**: hours
  - **Unit Cost**: $1380
  - **Unit Cost Adjustment Factor**: 0.25
  - **Revised Unit**: 345 hours

- **Item**: Subcontractor costs to perform above individual tasks for either Ryan's Pit or T-3/T-4.
  - **Units**: 1 lot
  - **Unit Cost**: $10K
  - **Unit Cost Adjustment Factor**: 0.25
  - **Revised Unit**: $2.5K

**Basis for adjustment**: Hours and costs for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be characterized at once.

**Procurement includes preparation of statement of work, proposal review (technical evaluation), and negotiations. Based on a T-3/T-4 burdened cost of $29,186.52. Assuming it is primarily labor hours (RMRS Environmental Engineer charging at $57.45 per hour) yields 508 hours which rounds to 510 total hours.**

**Davis Bacon Documentation**: It was assumed that it would take an environmental engineer twenty-four hours to prepare a Davis Bacon cost estimate and to support the Davis-Bacon determination.

**Subcontractor Health and Safety Plan**: Costs for the health and safety plan are based on Ryan's Pit, which cost approximately $10,000. It was assumed that these are A5H dollars. In addition, it was assumed that a safety engineer, an industrial hygienist, and a radiological engineer would each provide one week (40 hours) of support for review and document preparation.

**Radiological Work Permit**: It was assumed that it would take a radiological control technician two working days (18 hours) to complete counting preparation and review.

**Implementation Plan**: It was estimated that this activity would take 13 weeks of time for engineers, scientists or equivalent to complete. This would include preparation of an implementation plan as required (Rocky Flats Cleanup Agreement, Appendix 4, Interim Guidance Document, Dated August 1977). In addition this includes all tasks related to documentation for the Integrated Work Control Program and Integrated Safety Management.

**Ecology Survey/National Environmental Protection Act (NEPA) Support**: It was estimated that this would take 40 hours for an ecologist. The activities include NEPA review and support in document preparation, site surveys to verify compliance with ecological regulations, categorical exclusions, and NEPA evaluations.

**Utility Clearance/Soil Disturbance Permits**: It was estimated based on experience that it would take the equivalent 2 weeks (80 hours) for technical staff to do utility surveys, prepare and review soil disturbance permits, and prepare authorizing documents for excavation.

The combined resources for procurement and field preparation are
### Resources

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<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
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**Line Item SYS - Contingency And Escalation**

**BOE Resources**

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### Activity ID: 1G700C0120 Description: Readiness Review - Group 700-12

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<td>490</td>
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* On some projects these hours were assumed to be included in other tasks or part of this task under environmental engineer or one of the other job functions. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

Factor 1134 - Environmental Engineer 283 Hours
Factor 40 - Safety Engineer 10 Hours
Factor 40 - Industrial Hygiene 10 Hours
Factor 58 - Radiological Engineering 14 Hours
Factor 18 - RCT 5 Hours
Factor 40 - Life Scientist 10 Hours
Factor 50 - Project Manager 13 Hours
Factor 10000 - ASH Subcontracted Services 2,500 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

Environmental Engineer 1134 hours
Safety Engineer 40 hours
Industrial Hygiene 40 hours
Radiological Engineering 58 hours
Radiological Control Technician 18 hours
Ecologist/Life Scientist 40 hours
Manager 50 hours
Quality Assurance* 29 hours
ASH Total $10,000

* On some projects these hours were assumed to be included in other tasks or part of this task under environmental engineer or one of the other job functions.
**Line Item 0100 - readiness assessment**

**BOE**

Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation.

**Item Desc:**
Evaluate readiness of the field characterization team and plans.

**Breakdown of Cost Data:**
- **Item:** Site Labor to perform Readiness Assessment for T-3/T-4.
  - **Units:** hours
  - **Unit Cost:** 187
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** 48 plus 20 hours administrative support = 68 hours

- **Item:** Subcontractor costs to perform Readiness Assessment for T-3/T-4.
  - **Units:** 1 lot
  - **Unit Cost:** $4800
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** $1200

It was estimated that subcontractor involvement would require 80 hours at $60/hour = $4,800. It was assumed that about 3 weeks of time was required for an environmental engineer or similar person in addition to 12 hours of project management, which yielded 132 hours. An additional 11 hours was added for management oversight. It was estimated that a radiological engineer (QA) and an industrial hygienist would be needed for 2.5 days each (22 hours).

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 projects will be conducted at once and only one of each fixed cost is needed for the group.

- **Factor 132 - Environmental Engineer 33 Hours**
- **Factor 22 - Health Physicists 6 Hours**
- **Factor 11 - Manager 3 Hours**
- **Factor 22 - Quality Assurance 6 Hours**
- **Factor 4,800 - A5H Subcontracted Srvs 1,200 Dollars**

20 hours of administrative time will also be required.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Resources**

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**Line Item SYS - Contingency And Escalation**

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**Rocky Flats Closure Project**

**Baseline Cost and Basis of Estimate**

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Total for Activity 1G700C0150:

640 | 19,069 | 13,820 | 38,352 | 43,730 |

**Line Item 0100 - collect surficial soil samples**

**BOE**

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Item Desc:**

Collection of surficial soil samples. A site Environmental Engineer will direct the sample collection, containerize, package, and ship the samples; prepare field QC documentation, and prepare field notes on a full time basis. A site RCT will monitor the site for radiological contamination on a full time basis. A site Industrial Hygienist will implement the field portion of the HASP on a full time basis.

**Breakdown of Cost Data:**

Item: Site Personnel for support of sample collection

Units: hours

Unit Cost: 24

Unit Cost Adjustment Factor: none

Revised Unit Hours: 24

**Resources**

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**Line Item 0200 - analyze samples (radionuclides)**

**BOE**

Vendor Quote

Email quote: average cost from Kaiser-Hill ASD (V. Ideker).

**Item Desc:**

Analyze samples produced from geoprobe borings. It is anticipated that 20 samples from each boring will be collected. They will be analyzed for Metals, VOCs, SVOCs, PCBs, and radionuclides (est. 3 isotopes) with a 30 day TAT. This item is priced on a per sample basis. Per sample costs include DOT rad screen, bottle charge, shipping, and validation.

**Breakdown of Cost Data:**

Item: Analyze samples at an offsite laboratory

Units: analysis

Unit Cost: Radionuclides 3 isotopes) $590 per each sample.

Unit Cost Adjustment Factor: Must add: DOT rad screen $32/sample, bottle charge $7/sample, shipping $4.2/bottle, and validation per each: $15.60 Rad.

Revised Unit Hours: Rad $649.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Resources**

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**Line Item 0300 - project mgmt oversight**

**BOE**

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Item Desc:**

Project Management/Oversight. Based on half time for a Project Manager, Administrative staff, and Cost Estimator/Scheduler

**Breakdown of Cost Data:**

Item: Mgmt oversight

Units: hours

Unit Cost: 12

Unit Cost Adjustment Factor: none
Revised Unit Hours: 12

Basis for adjustment.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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**Line Item SYS - Contingency And Escalation**

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**Activity ID: 1G700C0170**

**Description:** Prepare NFA - Group 700-12

**Line Item 0100 - develop documentation**

**BOE**

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**Item Desc:**

Perform Data Analysis including GIS representation of data, NFA Summary, and associated project management.

Breakdown of Cost Data:

Item: Develop Documentation

Units: Hours

Environmental Engineer 45 hrs Evaluate & assemble existing data. Draft Report.

SMD Technician 10 hrs Identify & pull existing data from database.


Technical Editor 15 hrs Complete initial and revised tech edits of Report.

Technical Reviews

QA 4 hrs Review and comment per area of expertise.

Peer (2) 8 hrs Review and comment per area of expertise.

Compliance 4 hrs Review and comment per area of expertise.

Environmental 4 hrs Review and comment per area of expertise.

Management (2) 8 hrs Review and comment per area of expertise.

Legal 4 hrs Review and comment per area of expertise.

Environmental Engineer 15 hrs Disposition comments and finalize document.

Administrative Support 6 hrs Copy & assemble final documents, submit to records.

Unit Cost Adjustment Factor: none

Revised Unit Hours: 138

Basis for adjustment. N/A
### Rocky Flats Closure Project
#### Baseline Cost and Basis of Estimate

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**Line Item 0100 - SAP Addenda**

- **Description:** Preparation based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.
- **Item Desc:** Preparation of SAP Addenda to Industrial Area Characterization Plan.
- **Breakdown of Cost Data:**
  - **Item:** Preparation of SAP addenda  
  - **Units:** hours  
  - **Unit Cost:** 120  
  - **Unit Cost Adjustment Factor:** none  
  - **Revised Unit Hours:** 120  
- **Line Item:** 0100 - SAP Addenda  
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Line Item 0200 - HASP Addenda

**Item Desc:**
Preparation of HASP addenda to Industrial Area Characterization Plan.

**Breakdown of Cost Data:**
- Item: Preparation of addenda for HASP.
- Units: hours
- Unit Cost: 140
- Unit Cost Adjustment Factor: none
- Revised Unit Hours: 140

**Basis for adjustment:**

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Line Item 0300 - QAP Addenda

**Item Desc:**
Preparation of SAP Addenda to Industrial Area Characterization Plan.

**Breakdown of Cost Data:**
- Item: Preparation of QAP addenda
- Units: hours
- Unit Cost: 60
- Unit Cost Adjustment Factor: none
- Revised Unit Hours: 60

**Basis for adjustment:**
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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Line Item SYS - Contingency And Escalation

**Item Desc:**
Contingency and escalation.

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Rocky Flats Closure Project
Baseline Cost and Basis of Estimate

Activity ID: 1GER162120
Description: Procurement and Field Prep - IHSS Group 800-1

Line Item 0100 - procurement & field prep

BOE

Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation

Item Desc:

Breakdown of Cost Data:
Item: Site Labor to perform above individual tasks for either Ryan's Pit or T-3/T-4.
- Units: hours
- Unit Cost: 1380
- Unit Cost Adjustment Factor: 0.25
- Revised Unit: 345 hours

Item: Subcontractor costs to perform above individual tasks for either Ryan's Pit or T-3/T-4.
- Units: 1 lot
- Unit Cost: $10K
- Unit Cost Adjustment Factor: 0.25
- Revised Unit: $2.5K

Basis for adjustment. Hours and costs for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be characterized at once.

Procurement includes preparation of statement of work, proposal review (technical evaluation), and negotiations. Based on a T-3/T-4 burdened cost of $29,186.52. Assuming it is primarily labor hours (RMRS Environmental Engineer charging at $57.45 per hour) yields 508 hours which rounds to 510 total hours.

Davis Bacon Documentation: It was assumed that it would take an environmental engineer twenty-four hours to prepare a Davis Bacon cost estimate and to support the Davis-Bacon determination.

Subcontractor Health and Safety Plan: Costs for the health and safety plan are based on Ryan's Pit, which cost approximately $10,000. It was assumed that these are A5H dollars. In addition, it was assumed that a safety engineer, an industrial hygienist, and a radiological engineer would each provide one week (40 hours) of support for review and document preparation.

Radiological Work Permit: It was assumed that it would take a radiological control technician two working days (18 hours) to complete counting preparation and review.

Implementation Plan: It was estimated that this activity would take 13 weeks of time for engineers, scientists or equivalent to complete. This would include preparation of an implementation plan as required (Rocky Flats Cleanup Agreement, Appendix 3, Interim Guidance Document, Dated August 1977). In addition this includes all tasks related to documentation for the Integrated Work Control Program and Integrated Safety Management.

Ecology Survey/National Environmental Protection Act (NEPA) Support: It was estimated that this would take 40 hours for an ecologist. The activities include NEPA review and support in document preparation, site surveys to verify compliance with ecological regulations, categorical exclusions, and NEPA evaluations.

Utility Clearance/Soil Disturbance Permits: It was estimated based on experience that it would take the equivalent 2 weeks (80 hours) for technical staff to do utility surveys, prepare and review soil disturbance permits, and prepare authorizing documents for excavation.

The combined resources for procurement and field preparations are

Total Procurement and Field Preparation Hours

Environmental Engineer 1134 hours
Safety Engineer 40 hours  
Industrial Hygiene 40 hours  
Radiological Engineering 58 hours  
Radiological Control Technician 18 hours  
Ecologist/Life Scientist 40 hours  
Manager 50 hours  
Quality Assurance* 29 hours  
ASH Total $10,000  

* On some projects these hours were assumed to be included in other tasks or part of this task under environmental engineer or one of the other job functions.

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

Factor 1134 - Environmental Engineer 283 Hours  
Factor 40 - Safety Engineer 10 Hours  
Factor 40 - Industrial Hygiene 10 Hours  
Factor 58 - Radiological Engineering 14 Hours  
Factor 18 - RCT 5 Hours  
Factor 40 - Life Scientist 10 Hours  
Factor 10000 - ASH Subcontracted Services 2,500 Dollars  

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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**Line Item SYS - Contingency And Escalation**  
**BOE**  

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**Activity ID:** 1GER162140  
**Description:** Readiness Assessment - I HSS Group 800-1  
**Cost Risk:** 1  
**Schedule Risk:** 1  

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Line Item 0100 - readiness assessment

BOE

Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation.

Item Desc:
Evaluate readiness of the field characterization team and plans.

Breakdown of Cost Data:
Item: Site Labor to perform Readiness Assessment for T-3/T-4.
Units: hours
Unit Cost: 187
Unit Cost Adjustment Factor: 0.25
Revised Unit: 48 plus 20 hours administrative support for a total of 68 hours.

Units: 1 lot
Unit Cost: $4800
Unit Cost Adjustment Factor: 0.25
Revised Unit: $1200

It was estimated that subcontractor involvement would require 80 hours at $60/hour = $4,800. It was assumed that about 3 weeks of time was required for an environmental engineer or similar person in addition to 12 hours of project management, which yielded 132 hours. An additional 11 hours was added for management oversight. It was estimated that a radiological engineer (QA) and an industrial hygienist would be needed for 2.5 days each (22 hours).

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 projects will be conducted at once and only one of each fixed cost is needed for the group.

Factor 132 - Environmental Engineer 33 Hours
Factor 22 - Health Physicists 6 Hours
Factor 11 - Manager 3 Hours
Factor 22 - Quality Assurance 6 Hours
Factor 4,800 - ASH Subcontracted Svrs 1,200 Dollars

20 hours of administrative time will also be required.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

**WBS No:** 1GAC0801  
**Activity ID:** 1GER162150  
**Activity Filter:**  
**WBS Filter:** 1GAC  
**Baseline Devi:**  
**Starts In FY:**  

### Line Item 0100 - Collect Geoprobe Samples

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<th>Quantity</th>
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<th>Labor Hours</th>
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**Cost Element**

- **Item:** Site Personnel for support of geoprobe samples  
- **Units:** hours  
- **Unit Cost:** 32  
- **Unit Cost Adjustment Factor:** none  
- **Revised Unit Hours:** 32

**Item:** Kaiser-Hill/RMRS Geoprobe unit with 2 Technician crew. Item costs $100 per hour or $800 per 8-hour day.  
**Units:** dollars  
**Unit Cost:** 800  
**Unit Cost Adjustment Factor:** none  
**Revised Unit Hours:** 800

**Breakdown of Cost Data:**

- Basis for adjustment. A 50% reduction in characterization from that which was done at Building 123 was taken because process history and building knowledge indicate that characterization to the extent required for Building 123 will not be required at this location. This leaves 41 boreholes and 203 samples.

### Line Item 0200 - Analyze Samples

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**Cost Element**

- **Item:** Analyze samples at an offsite laboratory.  
- **Units:** analysis

**Vendor Quote**

Email quote: average cost from Kaiser-Hill ASD (V. Ideker).

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**Page 793 of 1121**  
6/23/00 9:22:44 AM  
OFFICIAL USE ONLY
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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**Cost Element**

- **Unit Cost:** Metals $345, VOCs $280, SVOCs $440, PCBs and other analytes $150, and Radionuclides 3 isotopes) $590 per each sample.
- **Unit Cost Adjustment Factor:** Must add: DOT rad screen $32/sample, bottle charge $7/sample, shipping $4.2/bottle, and validation per each: $17.30 VOA, $19.25 SVOC, $16.75 Metals, $5.95 PCB, and $15.60 Rad.
- **Revised Unit Hours:** Metals $405, VOCs $341, SVOCs $502, PCBs and other analytes $199, and Rad $649.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

#### Line Item 0300 - project mgmt oversight

**BOE**

- **Estimate Based on Estimator's Experience:**
  - Project Management/Oversight. Based on half time for a Project Manager, Administrative staff, and Cost Estimator/Scheduler
  - **Unit Cost Adjustment Factor:** none
  - **Revised Unit Hours:** 12

**Resources**

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This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

#### Line Item SYS - Contingency And Escalation

**BOE**

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<th>Description: develop documentation</th>
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<td>Line Item 0100</td>
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<tr>
<td><strong>BOE</strong></td>
<td>Estimate based on estimator's Experience of more than 10 years of experience with projects of similar size and scope.</td>
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<tr>
<td>Item Desc:</td>
<td>Perform Data Analysis including GIS representation of data, NFA Summary, Characterization Report and associated project management. Disposition comments and finalize document</td>
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</tbody>
</table>
Computer Specialist  80 hrs  Identify & pull existing data from database.
GIS Specialist  80 hrs  Develop maps for Report. Print multiple copies.
Technical Editor  40 hrs  Complete initial and revised tech edits of Report.
Quality Assurance  60 hrs Review
Environmental Engineer  40 hrs  Peer review
Regulatory Compliance  20 hrs  Review
Management  48 hrs  Review
Legal  8 hrs  Review
Administrative Support  40 hrs  Copy & assemble final documents, submit to records.

Breakdown of Cost Data:
- Item: Develop Documentation
- Units: Hours
- Unit Cost: 656
- Unit Cost Adjustment Factor: none
- Revised Unit Hours: 656
- Basis for adjustment: N/A

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<td>750 STRAIGHT TIME BASE</td>
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Total for Activity 1GER162180: 289 9,164 0 1,677 10,841 2,584 13,426

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<th>Description</th>
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Total for Activity 1GER162180: 289 9,164 0 1,677 10,841 2,584 13,426

Estimator's Experience based generally on historical data for Ryan's Pit

Item Desc:
Preparation of of PAM or IM/IRA in support of source removal of previously characterized UBC.
Proposed Action Memorandum: A bottoms-up estimate based on historical costs was used as the basis for the estimate. Based on Ryan's Pit (IHSS 108), the cost for the PAM was $50,000 (contractor costs). Assuming that labor rates at this time were approximately $75 (based on a cost center 217). The total labor for a PAM would be approximately 666 hours, which rounds to 700 hours. It was assumed that 10% would be required for managerial hours.

For a PAM the total labor hours are:
- Environmental Engineer 700 Hours
- Manager 70 Hours
- Factor 70 Environmental Engineer 175 hours
- Factor 70 Manager 18 hours

Breakdown of Cost Data:
- Item: Preparation of PAM for Ryan's Pit source removal action.
  - Units: hours
  - Unit Cost: 770
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit Hours: 193

Basis for adjustment. Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

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<td>Breakdown of Historical Data:</td>
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<td>Breakdown of Historical Data:</td>
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<th>Curve</th>
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<td>Item Desc: Preparation of WMP in support of source removal of previously characterized UBC.</td>
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### Resources

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Factors: 20 hrs

### Line Item SYS - Contingency And Escalation

**BOE**

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Factors: 1128.02 Dollars

### Activity ID: 1GER162210

**Description:** Procurement and Field Prep - HSS Grouping 800-1

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Total for Activity 1GER162210:

|          | 345 | 10,637 | 2,114 | 8,801 | 21,553 | 3,702 | 25,254 |

**Line Item 0100 - procurement & field prep**

**BOE**

Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation

**Item Desc:**

**Breakdown of Cost Data:**
**Item:** Site Labor to perform above individual tasks for either Ryan's Pit or T-3/T-4.
  - Units: 1380 hours
  - Unit Cost: 1380
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit: 345 hours

**Item:** Subcontractor costs to perform above individual tasks for either Ryan's Pit or T-3/T-4.
  - Units: 1 lot
  - Unit Cost: $10K
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit: $2.5K

**Basis for adjustment:** Hours and costs for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be characterized at once.

Procurement includes preparation of statement of work, proposal review (technical evaluation), and negotiations. Based on a T-3/T-4 burdened cost of $29,186.52. Assuming it is primarily labor hours (RMRS Environmental Engineer charging at $57.45 per hour) yields 508 hours which rounds to 510 total hours.

Davis Bacon Documentation: It was assumed that it would take an environmental engineer twenty-four hours to prepare a Davis Bacon cost estimate and to support the Davis-Bacon determination.

Subcontractor Health and Safety Plan: Costs for the health and safety plan are based on Ryan's Pit, which cost approximately $10,000. It was assumed that these are A56 dollars. In addition, it was assumed that a safety engineer, an industrial hygienist, and a radiological engineer would each provide one week (40 hours) of support for review and document preparation.

Radiological Work Permit: It was assumed that it would take a radiological control technician two working days (18 hours) to complete counting preparation and review.

Implementation Plan: It was estimated that this activity would take 13 weeks of time for engineers, scientists or equivalent to complete. This would include preparation of an implementation plan as required (Rocky Flats Cleanup Agreement, Appendix J, Interim Guidance Document, Dated August 1977). In addition, this includes all tasks related to documentation for the Integrated Work Control Program and Integrated Safety Management.

Ecology Survey/National Environmental Protection Act (NEPA) Support: It was estimated that this would take 40 hours for an ecologist. The activities include...
NEPA review and support in document preparation, site surveys to verify compliance with ecological regulations, categorical exclusions, and NEPA evaluations.

Utility Clearance/Soil Disturbance Permits: It was estimated based on experience that it would take the equivalent 2 weeks (80 hours) for technical staff to do utility surveys, prepare and review soil disturbance permits, and prepare authorizing documents for excavation.

The combined resources for procurement and field preparations are

Total Procurement and Field Preparation Hours

- Environmental Engineer 1134 hours
- Safety Engineer 40 hours
- Industrial Hygiene 40 hours
- Radiological Engineering 58 hours
- Radiological Control Technician 18 hours
- Ecologist/Life Scientist 40 hours
- Manager 50 hours
- Quality Assurance 29 hours

ASK Total $10,000

* On some projects these hours were assumed to be included in other tasks or part of this task under environmental engineer or one of the other job functions.

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

- Factor 1134 - Environmental Engineer 283 Hours
- Factor 40 - Safety Engineer 10 Hours
- Factor 40 - Industrial Hygiene 10 Hours
- Factor 58 - Radiological Engineering 14 Hours
- Factor 18 – RCT 5 Hours
- Factor 40 – Life Scientist 10 Hours
- Factor 50 – Project Manager 13 Hours
- Factor 10000 - ASH Subcontracted Services 2,500 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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<td>NEPA review and support in document preparation, site surveys to verify compliance with ecological regulations, categorical exclusions, and NEPA evaluations.</td>
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<td>Utility Clearance/Soil Disturbance Permits</td>
<td>364</td>
<td>Utility Clearance/Soil Disturbance Permits: It was estimated based on experience that it would take the equivalent 2 weeks (80 hours) for technical staff to do utility surveys, prepare and review soil disturbance permits, and prepare authorizing documents for excavation.</td>
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### Activity Information

**Activity ID:** 1GER162240  
**Description:** Readiness Assessment - IHSS Group 800-1

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**Total for Activity 1GER162240:** 117 4,116 4,221 5,547 14,494 1,432 15,916

### Details

**Item Identiﬁers**
- **Line Item 0100 - readiness assessment**

**BOE**

**Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation.**

**Item Desc:** Evaluate readiness of the field characterization team and plans.

**Breakdown of Cost Data:**
- **Item:** Site Labor to perform Readiness Assessment for T-3/T-4.
  - **Units:** hours
  - **Unit Cost:** $187
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** 48 plus 20 hours administrative support = 68 hours

- **Item:** Subcontractor costs to perform Readiness Assessment for T-3/T-4.
  - **Units:** 1 lot
  - **Unit Cost:** $4800
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** $1200

**It was estimated that subcontractor involvement would require 80 hours at $60/hour = $4,800. It was assumed that about 3 weeks of time was required for an environmental engineer or similar person in addition to 12 hours of project management, which yielded 132 hours. An additional 11 hours was added for management oversight. It was estimated that a radiological engineer (QA) and an industrial hygienist would be needed for 2.5 days each (22 hours). The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 projects will be conducted at once and only one of each fixed cost is needed for the group.**

**Factor 132 - Environmental Engineer 33 Hours**
**Factor 22 - Health Physicists 6 Hours**
**Factor 11 - Manager 3 Hours**
**Factor 22 - Quality Assurance 6 Hours**
**Factor 4,800 - ASH Subcontracted Svvs 1,200 Dollars**

20 hours of administrative time will also be required.

This estimate includes a project productivity/efficiency factor for committed but as yet undeﬁned cost reductions.

### Resources

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**Conduct perform Training in support of source removal action.**

**Breakdown of Cost Data:**
- **Item:** Site Labor to perform above individual tasks for T-3/T-4.
  - Units: hours
  - Unit Cost: 132 Hours
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit: 33 hours

- **Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
  - Units: 1 lot
  - Unit Cost: $12K
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit: $3K

**Basis for adjustment.** Costs for each UBC are divided by 4 to account for the fact that 4 UBCs will be remediated at once and only one Training is needed for the group.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Estimator's Experience based generally on historical data for T-3/T4 Remediation.**

**Breakdown of Cost Data:**
- **Item:** Site Labor to perform above individual tasks for T-3/T-4.
  - Units: hours
  - Unit Cost: 60 hours
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit: 15 hours

- **Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
  - Units: 1 lot
  - Unit Cost: $6K
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit: $1.5K

**Basis for adjustment.** Costs for each UBC are divided by 4 to account for the fact that 4 UBCs will be remediated at once and only one Pre-Evolution Meeting is needed for the group.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Line Item SYS - Contingency And Escalation**

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**Line Item 0300 - pre-evolution meeting**

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**Factors**

- 33 hrs
- 3000 sub/c support

**Factors**

- 15 hrs
- 1500 sub/c support

**BOE**

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Project Baseline Devi
Baseline Cost and Basis of Estimate
WBS Filter 1GAC
Activity Filter *

### Activity ID: 1GER1622250
**Description:** Remedial Action - IHSS Group 800-1

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**Total for Activity 1GER162250:**
5,813 | 189,638 | 226,721 | 261,064 | 677,423 | 744,261

**Line Item 0100 - mobilization**

**BOE**
Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:**
Mobilization in support of remediation.

**Breakdown of Cost Data:**

- **Item:** Site Labor to perform above individual tasks for T-3/T-4.
  - **Units:** hours
  - **Unit Cost:** 1,100
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** 275

- **Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
  - **Units:** 1 lot
  - **Unit Cost:** 184k
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** see below

**Breakdown of Costs:**
The costs were divided into fixed costs and variable costs. The fixed costs include Mobilization, Site Preparation, Waste Acceptance Forms, and Demobilization. The variable costs include Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The variable costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

- **T3/T4 hours 110 Health Physicists 27 Hours**
- **T3/T4 hours 330 Manager 83 Hours**
- **T3/T4 hours 550 Environmental Engineer 138 Hours**
- **T3/T4 hours 110 Industrial Hygienist 27 Hours**

**This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.**

**Resources**

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Factors: 138 hrs
Project: Rocky Flats Closure Project
Baseline Cost and Basis of Estimate

WBS No: 1GAC0801
Activity ID: 1GER162250

**Line Item 0200 - site prep**

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**Item Desc:**
Site Preparation including setting up fencing, trailer, etc.

**Breakdown of Historical Data:**

**Item:** Site Labor to perform above individual tasks for T-3/T-4.
- **Units:** hours
- **Unit Cost:** see below
- **Unit Cost Adjustment Factor:** see below
- **Revised Unit:** see below

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
- **Units:** 1 lot
- **Unit Cost:** see below
- **Unit Cost Adjustment Factor:** see below
- **Revised Unit:** see below

**Basis for adjustment.** The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

T3/T4 hours 120 Environmental Engineer 30 hours
T3/T4 dollars 30,000 Subcontracted Srvs 7,500 Dollars

D&D construction trade hours were calculated using the following methodology:

A5H subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.

For Site Preparation tasks - RCT hours were the same as D&D construction hours.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Resources**

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**Item Desc:**
Excavation.

**Breakdown of Historical Data:**

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**Line Item 0300 - excavation**

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**Item Desc:**
Excavation.

**Breakdown of Historical Data:**

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Page 802 of 1121 6/23/00 9:22:46 AM OFFICIAL USE ONLY
Item: Site Labor to perform above individual tasks for T-3/T-4.
  Units: hours
  Unit Cost: see below
  Unit Cost Adjustment Factor: see below
  Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
  Units: 1 lot
  Unit Cost: see below
  Unit Cost Adjustment Factor: see below
  Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Total Contaminated Soil to be removed 754 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 754 CY

The excavation cost was based on the excavation cost for the T-3/T-4 Project. Burdened cost based on the T-3/T-4 actuals is $171,487. For the 3,800 cubic yards of contaminated soil removed this yielded a unit cost of $45 per cubic yard of contaminated soil removed. This estimate includes the removal of overburden that might be on top of the contaminated soil. The hours for an environmental engineer from T-3/T-4 were 1.09 hours per cubic yard of contaminated soil. Likewise the hours for the following were assumed to be linearly proportional:

Health Physicists .47 hours per cubic yard
Environmental Operations .31 hours per cubic yard
Industrial Hygienists 0.31 hours per cubic yard
Radiological Control Technician 1.00 hour per cubic yard *

* Based on $50/cubic yard from T-3/T-4, assumes a labor rate of $50/hour

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 1.09 - E050 Environmental Engineer 821 Hours
Factor 0.47 - P080 Health Physicists 354 Hours
Factor 0.31 - Environmental Operations 234 Hours
Factor 0.31 - P090 Industrial Hygienists 234 Hours
Factor 1.00 - T050 Radiological Control Technician 754 Hours
Factor 45.23 - A5H Subcontracted Svrs 34,103 Dollars

D&D construction trade hours were calculated using the following methodology:

A5H subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.

For Site Preparation tasks - RCT hours were the same as D&D construction hours.
For all other tasks A5H subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under KG10H department code.

The dollars amounts calculated for D&D construction workers were subtracted from the subcontractor dollars and the revised A5H dollar amount was entered into Best.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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Project: Rocky Flats Closure Project  
Baseline Cost and Basis of Estimate  

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**RMRS Salaried**  
**Health Physicists**  
Linear 354.00 Hours  
Factors: 354 hrs  

**RMRS Salaried**  
**Industrial Hygienists**  
Linear 234.00 Hours  
Factors: 234 hrs  

**Remediation Steelworkers**  
**Radiation Control Technologist**  
Linear 754.00 Hours  
Factors: 754 hrs  

**ASH Subcontracted Srvs**  
**D&D Construction Trades** (incl. Field Oversight)  
Linear 108.00 Hours  
Factors: 108 hrs  

**ASH Subcontracted Srvs**  
**ER Programs**  
Linear 23,362.43 Dollars  
Factors: 27623 sub/c support  

---

**Line Item 0400 - remove and clean debris**  
**BOE**  
Estimator's Experience based generally on a base case of 700 cy.

Item Desc: Remove and clean debris.

Breakdown of Historical Data:

Item: Site Labor to perform above individual tasks for T-3/T-4.

- Units: hours
- Unit Cost: see below
- Unit Cost Adjustment Factor: see below
- Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.

- Units: 1 lot
- Unit Cost: see below
- Unit Cost Adjustment Factor: see below
- Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Total Contaminated Soil to be removed 754 CY  
Total Soil for Thermal Desorption 0 CY  
Offsite Waste Volume 754 CY  

For the base case, it was assumed that about five cubic yards out of 700 cubic yards would be debris and would be segregated and cleaned. It was estimated that each cubic yard of debris would cost $1,000 or $5,000 total for 700 cubic yards. This yields a rate of $7.14 per cubic yard.

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 7.14 - ASH Subcontracted Srvs 5,384 Dollars  
D&D construction trade hours were calculated using the following methodology:

ASH subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.

RCT hours were calculated using the following methodology, unless they were already estimated.

The dollars amounts calculated for D&D construction workers were subtracted from the subcontractor dollars and the revised ASH dollar amount was entered into Best.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

**Resources**

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6/23/00 9:22:47 AM  
OFFICIAL USE ONLY
### Rocky Flats Closure Project

#### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0801  
**Activity ID:** 1GER162250

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#### Project: Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

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#### Line Item 0600 - confirmation sampling

**BOE:**

*Estimator's Experience based generally on historical data for T-3/T4 Remediation.*

**Item Desc:** Confirmation Sampling.

**Breakdown of Historical Data:**

- **Item:** Site Labor to perform above individual tasks for T-3/T-4.  
  - **Units:** hours  
  - **Unit Cost:** see below  
  - **Unit Cost Adjustment Factor:** see below  
  - **Revised Unit:** see below

- **Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.  
  - **Units:** 1 lot  
  - **Unit Cost:** see below  
  - **Unit Cost Adjustment Factor:** see below  
  - **Revised Unit:** see below

**Basis for adjustment.** The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

- **Total Contaminated Soil to be removed:** 754 CY  
- **Total Soil for Thermal Desorption:** 0 CY  
- **Offsite Waste Volume:** 754 CY

The analytical costs were based on T-3/T-4, which cost $435,574 for 3800 cubic yards of contaminated soil removed. This yielded a unit rate of about $115/cubic yard. Based on estimator experience the cost of sampling including labor and materials was estimated to be 20% of that rate or about $23/ cubic yard.

**The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.**

- **Factor 114.62 - ASH Subcontracted Srvs (Analytical):** 86,423 Dollars  
- **Factor 22.924 - ASH Subcontracted Srvs:** 17,285 Dollars

**This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.**

#### Resources

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| ASH SUBCONTRACTED SRVS | 0000 | K267 | Analytical Laboratory Services | Linear | 96.94 | Dollars |
| Factors | 114.62 | units per yard |

#### Line Item 0700 - prepare waste acceptance forms

**BOE:**

*Estimator's Experience based generally on historical data for T-3/T4 Remediation.*

**Item Desc:** Prepare Waste Acceptance Forms

**Breakdown of Historical Data:**

- **Item:** Site Labor to perform above individual tasks for T-3/T-4.  
  - **Units:** hours

---

*OFFICIAL USE ONLY*
**Rocky Flats Closure Project**  
Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0801  
**Activity ID:** 1GER16250  
**Project:** Rocky Flats Closure Project  
**Baseline Devi:** GAC  
**WBS Filter:** GAC  
**Activity Filter:** *  
**Starts In FY:** *

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**Cost Element**

**Skill**

**Department**

**Curve**

**Quantity**

**Units**

*Factors 20 hrs*

---

**Line Item 0800 - waste acceptance sampling**

**BOE**

Estimator’s Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:**

Waste Acceptance Sampling

**Breakdown of Historical Data:**

**Item:** Site Labor to perform above individual tasks for T-3/T-4.

- Units: hours
- Unit Cost: see below
- Unit Cost Adjustment Factor: see below
- Revised Unit: see below

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.

- Units: 1 lot
- Unit Cost: see below
- Unit Cost Adjustment Factor: see below
- Revised Unit: see below

**Basis for adjustment.** T3/T4 hours 80 environmental engineer with an adjustment factor of 25% = 20 hours. Adjustment was based on remediation of 4 sites at once.

**Resources**

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**Cost Element**

**Skill**

**Department**

**Curve**

**Quantity**

**Units**

*Factors 20 units per yard in crates*
Estimator's Experience based generally on a base case of 700 cy.

Item Desc:
Field Oversight and Project Management

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
Units: hours
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
Units: 1 lot
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forma, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

It was assumed that a field manager would be needed for 150 nine-hour working days or about 33 weeks. This work breaks down as follows:

Preparation Activities 50 working days
Field Activities - 80 working days
Demobilization - 20 working days
Total 150 nine-hour working days or 1350 hours

In addition it was estimated that technical staff, quality assurance, and project management would be required for the equivalent of ten additional weeks, which is 400 hours each.

Based on the base case of a 700 cubic yard removal project, these values yielded unit rates as follows

Hours Per Cubic Yard
Of Contaminated Soil
Field Manager 1.93
Technical Staff .57
Quality Assurance .57
Project Management 0.57

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Total Contaminated Soil to be removed 754 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 754 CY

Factor 1.93 – Environmental Engineer 1,455 Hours
Factor 0.57 – Technical Support 430 Hours
Factor 0.57 – Project Manager 430 Hours
Factor 0.57 – Quality Assurance 430 Hours
Rocky Flats Closure Project  
Baseline Cost and Basis of Estimate  

WBS No: 1GAC0801  
Activity ID: 1GER162250  

Baseline Cost Filter: 1GAC  
Activity Filter: *  
Starts In FY: *  

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**Line Item 1000 - Backfill**  
**BOE**  
Trade Publication  
*Means 1995, Site Work & Landscape Cost Data (page 34, 42, and 34)*  
Item Desc: Backfill.  

Breakdown of Historical Data:  
- **Item:** Site Labor to perform above individual tasks for T-3/T-4.  
  - **Units:** hours  
  - **Unit Cost:** see below  
  - **Unit Cost Adjustment Factor:** see below  
  - **Revised Unit:** see below  

- **Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.  
  - **Units:** 1 lot  
  - **Unit Cost:** see below  
  - **Unit Cost Adjustment Factor:** see below  
  - **Revised Unit:** see below  

*Means (1995) Site Work & Landscape Cost Data as follows:*  
- **Common Fill $ 4.77/cubic yard (page 34 Borrow Bank Measure)**  
- **Hauling $ 3.98/cubic yard (page 42 2-mile round-trip, 6 cubic yard dump truck)**  
- **Backfilling $ 1.69/cubic yard (page 34)**  
- **Burden (43%) $ 4.49/cubic yard**  
- **Total $14.23/cubic yard or about $15/cubic yard**  

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.  
Factor: 15 - ASH Subcontracted Srvs 11,310 Dollars  
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Resources**  

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**Line Item 1100 - Demobilization**  
**BOE**  
Estimator's Experience based generally on historical data for T-3/T4 Remediation.  
Item Desc: Demobilization.  

Breakdown of Historical Data:  
- **Item:** Site Labor to perform above individual tasks for T-3/T-4.  
  - **Units:** hours  
  - **Unit Cost:** see below  
  - **Unit Cost Adjustment Factor:** see below  
  - **Revised Unit:** see below  

- **Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.  
  - **Units:** 1 lot  
  - **Unit Cost:** see below  
  - **Unit Cost Adjustment Factor:** see below  
  - **Revised Unit:** see below  

0.84576  
[SYS 061400] .84576000 - System
Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Demobilization: Based on the T-3/T-4 project, it was assumed that demobilization costs would cover demobilization for excavation activities also. The subcontractor cost for demobilization was about $95,000 for 3,800 cubic yards at the T-3/T-4 project. In addition it was estimated that the following hours were necessary:

Environmental Engineer 300 hours
Health Physicist 100 hours
Manager 200 hours
Industrial Hygiene 100 hours

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

Factor 300 - Environmental Engineer 75 Hours
Factor 100 - Health Physicists 25 Hours
Factor 200 - Manager 50 Hours
Factor 100 - P090 Industrial Hygienists 25 Hours
Factor 95000 - A5H Subcontracted Svgs 23,750 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
Required level of effort:
- Environmental Engineer - 80 hours
- Environmental Scientist - 20 hours
- Computer Specialist - 160 hours (GIS, SWD)
- Manager - 20 hours
- Administrative - 20 hours
- Cost Estimators - 20 hours

Breakdown of Cost Data:
- Item: Develop Documentation
  - Units: hours
  - Unit Cost: $320
  - Unit Cost Adjustment Factor: none
  - Revised Unit Hours: 320

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Line Item SYS - Contingency And Escalation

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WBS No: 1GAC0802
Activity ID: 1GER682100

Description: SAP Preparation - IHSS Group 800-2 (B881)

Line Item 0100 - SAP Addenda

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Total for Activity 1GER682100:
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
Line Item SYS - Contingency And Escalation

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Activity ID: 1GER682120 Description: Procurement and Field Prep - IHSS Group 800-2

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Total for Activity 1GER682120: 345 10,637 2,114 4,556 17,307 3,680 20,987

Line Item 0100 - procurement & field prep

Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation

Item Desc:

Breakdown of Cost Data:
Item: Site Labor to perform above individual tasks for either Ryan's Pit or T-3/T-4.
  - Units: hours
  - Unit Cost: 1380
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit: 345 hours

Item: Subcontractor costs to perform above individual tasks for either Ryan's Pit or T-3/T-4.
  - Units: 1 lot
  - Unit Cost: $10K
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit: $2.5K

Basis for adjustment. Hours and costs for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be characterized at once.

Procurement includes preparation of statement of work, proposal review (technical evaluation), and negotiations. Based on a T-3/T-4 burdened cost of $29,186.52. Assuming it is primarily labor hours (RMRS Environmental Engineer charging at $57.45 per hour) yields 508 hours which rounds to 510 total hours.

Davis Bacon Documentation: It was assumed that it would take an environmental engineer twenty-four hours to prepare a Davis Bacon cost estimate and to support the Davis-Bacon determination.

Subcontractor Health and Safety Plan: Costs for the health and safety plan are based on Ryan's Pit, which cost approximately $10,000. It was assumed that these are A5H dollars. In addition, it was assumed that a safety engineer, an industrial hygienist, and a radiological engineer would each provide one week (40 hours) of support for review and document preparation.

Radiological Work Permit: It was assumed that it would take a radiological control technician two working days (18 hours) to complete counting preparation and review.

Implementation Plan: It was estimated that this activity would take 13 weeks of time for engineers, scientists or equivalent to complete. This would include preparation of an implementation plan as required (Rocky Flats Cleanup Agreement, Appendix 3, Interim Guidance Document, Dated August 1977). In addition this includes all tasks related to documentation for the Integrated Work Control Program and Integrated Safety Management.

Ecology Survey/National Environmental Protection Act (NEPA) Support: It was estimated that this would take 40 hours for an ecologist. The activities include NEPA review and support in document preparation, site surveys to verify compliance with ecological regulations, categorical exclusions, and NEPA evaluations.

Utility Clearance/Soil Disturbance Permits: It was estimated based on experience that it would take the equivalent 2 weeks (80 hours) for technical staff to do utility surveys, prepare and review soil disturbance permits, and prepare authorizing documents for excavation.
The combined resources for procurement and field preparations are
Total Procurement and Field Preparation Hours
Environmental Engineer 1134 hours
Safety Engineer 40 hours
Industrial Hygiene 40 hours
Radiological Engineering 58 hours
Radiological Control Technician 18 hours
Ecologist/Life Scientist 40 hours
Manager 50 hours
Quality Assurance* 29 hours
ASH Total $10,000

* On some projects these hours were assumed to be included in other tasks or part of this task under environmental engineer or one of the other job functions.

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

Factor 1134 - Environmental Engineer 283 Hours
Factor 40 - Safety Engineer 10 Hours
Factor 40 - Industrial Hygiene 10 Hours
Factor 58 - Radiological Engineering 14 Hours
Factor 18 - RCT 5 Hours
Factor 40 - Life Scientist 10 Hours
Factor 50 - Project Manager 13 Hours
Factor 10000 - ASH Subcontracted Services 2,500 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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**Line Item** SYS - Contingency And Escalation

**BOE**

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Activity ID: 1GER682140

**Description**: Readiness Assessment - IHSS Group 800-2

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### Line Item 0100 - readiness assessment

**BOE**

Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation.

#### Item Desc:
Evaluate readiness of the field characterization team and plans.

#### Breakdown of Cost Data:

**Item:** Site Labor to perform Readiness Assessment for T-3/T-4.
- **Units:** hours
- **Unit Cost:** $187
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** 48 plus 20 hours administrative support = 68 hours

**Item:** Subcontractor costs to perform Readiness Assessment for T-3/T-4.
- **Units:** 1 lot
- **Unit Cost:** $4800
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** $1200

It was estimated that subcontractor involvement would require 80 hours at $60/hour = $4,800. It was assumed that about 3 weeks of time was required for an environmental engineer or similar person in addition to 12 hours of project management, which yielded 132 hours. An additional 11 hours was added for management oversight. It was estimated that a radiological engineer (QA) and an industrial hygienist would be needed for 2.5 days each (22 hours).

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 projects will be conducted at once and only one of each fixed cost is needed for the group.

**Factors**
- **Factor 132 - Environmental Engineer 33 Hours**
- **Factor 22 - Health Physicists 6 Hours**
- **Factor 22 - Quality Assurance 6 Hours**
- **Factor 4,800 - ASH Subcontracted Svrs 1,200 Dollars**

20 hours of administrative time will also be required.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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### Line Item SYS - Contingency And Escalation

**BOE**

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## Activity ID: 1GER682150
**Description:** Field Sampling, Lab Analysis - IHSS Group 800-2

### Line Item 0100 - collect geoprobe samples

**BOE**
- Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Item Desc:**
Collection of geoprobe samples with the site geoprobe with two technicians. A site Environmental Engineer will direct the boring placement, log the borings; collect, containerize, package, and ship the samples; prepare field QC documentation, and prepare field notes on a full time basis. A site RCT will monitor the site for radiological contamination on a full time basis. A site Industrial Hygienist will implement the field portion of the HASP on a full time basis. Decon Operations staff will decon the vehicle and equipment when it leaves the work area on a half time basis. It is estimated that one 10' boring will be place per 500 SF of building footprint (same as Bldg. 123 characterization) with 5 samples per 10' boring. It is estimated that one boring per eight hours can be completed. A 50% reduction in characterization from that which was done at Building 123 was taken because process history and building knowledge indicate that characterization to the extent required for Building 123 will not be required at this location.

**Breakdown of Cost Data:**
- **Item:** Site Personnel for support of geoprobe samples
  - **Units:** hours
  - **Unit Cost:** 32
  - **Unit Cost Adjustment Factor:** none
  - **Revised Unit Hours:** 32
- **Item:** Kaiser-Hill/RMRS Geoprobe unit with 2 Technician crew. Item costs $100 per hour or $800 per 8-hour day.
  - **Units:** dollars
  - **Unit Cost:** 800
  - **Unit Cost Adjustment Factor:** none
  - **Revised Unit Hours:** 800

**Basis for adjustment:**
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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### Line Item 0200 - analyze samples

**BOE**
- Vendor Quote
  - **Email quote:**average cost from Kaiser-Hill ASD (V. Ideker).
  - **Item Desc:** Analyze samples produced from geoprobe borings. It is anticipated that 5 samples from each boring will be collected. They will be analyzed for Metals, VOCs, SVOCs, PCBs, and radionuclides(est. 3 isotopes) with a 30 day TAT. This item is priced on a per sample basis. Per sample costs include DOT rad screen, bottle charge, shipping, and validation.

**Item:** Analyze samples at an offsite laboratory.
Units: analysis
Unit Cost: Metals $345, VOCs $280, SVOCs $440, PCBs and other analytes $150, and Radionuclides 3 isotopes) $590 per each sample.
Unit Cost Adjustment Factor: Must add: DOT rad screen $32/sample, bottle charge $7/sample, shipping $4.2/bottle, and validation per each: $17.30 VOA, $19.25 SVOC, $16.75 Metals, $5.95 PCB, and $15.60 Rad.
Revised Unit Hours: Metals $405, VOCs $341, SVOCs $502, PCBs and other analytes $199, and Rad $649.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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### Line Item 0300 - project mgmt oversight

**BOE**

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Item Desc:**
Project Management/Oversight. Based on half time for a Project Manager, Administrative staff, and Cost Estimator/Scheduler

**Breakdown of Cost Data:**
- **Item:** Mgmt oversight
- **Units:** hours
- **Unit Cost:** $12
- **Unit Cost Adjustment Factor:** none
- **Revised Unit Hours:** 12

**Basis for adjustment:** A 50% reduction in characterization from that which was done at Building 123 was taken because process history and building knowledge indicate that characterization to the extent required for Building 123 will not be required at this location.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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### Line Item SYS - Contingency And Escalation

**BOE**

**Resources**

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### Activity ID: 1GER682170

**Description:** Prepare Summary/NFA - IHSS Group 800-2

**Line Item 0100 - develop documentation**

Estimator's Experience:

Estimate for summary report based on estimator's 16 years of experience performing and costing projects of similar size and scope.

**Item Desc:**
Perform Data Analysis including GIS representation of data, NFA Summary, Characterization Report and associated project management. Disposition comments and finalize document

**BOE**

**Line Item 0100 - develop documentation**

**Quantity**

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Total for Activity 1GER682170: 656 19,024 0 4,604 23,628 5,649 29,277
Computer Specialist 80 hrs Identify & pull existing data from database.
GIS Specialist 80 hrs Develop maps for Report. Print multiple copies.
Technical Editor 40 hrs Complete initial and revised tech edits of Report.
Quality Assurance 60 hrs Review
Environmental Engineer 40 hrs Peer review
Regulatory Compliance 20 hrs Review
Management 48 hrs
Legal 8 hrs Review
Administrative Support 40 hrs Copy & assemble final documents, submit to records.

Breakdown of Cost Data:
Item: Develop Documentation
Units: Hours
Unit Cost: 656
Unit Cost Adjustment Factor: none

Cost Element          Skill          Quantity          Units          Curve          Resources
Line Item SYS - Contingency And Escalation
BOE

Activity ID: 1GER682180  Description: Prepare Decision Document - IHSS Group 800-2  Cost Risk 1  Schedule Risk 1

Line Item 0100 - PAM
BOE
Estimator's Experience based generally on historical data for Ryan's Pit
Item Desc:
Preparation of of PAM or IM/IRA in support of source removal of previously characterized UBC.

Proposed Action Memorandum: A bottoms-up estimate based on historical costs was used as the basis for the estimate. Based on Ryan's Pit (INHS 108), the cost for the PAM was $50,000 (contractor costs). Assuming that labor rates at this time were approximately $75 (based on a cost center 217). The total labor for a PAM would be approximately 666 hours, which rounds to 700 hours. It was assumed that 10% would be required for managerial hours.

For a PAM the total labor hours are:

- Environmental Engineer 700 Hours
- Manager 70 Hours

Factor 700 Environmental Engineer 175 hours
Factor 70 Manager 18 hours

Breakdown of Cost Data:
- Item: Preparation of PAM for Ryan's Pit source removal action.
  - Units: hours
  - Unit Cost: $770
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit Hours: 193

Basis for adjustment. Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

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**Line Item 0200 - SAP**
BOE

Estimator's Experience based generally on historical data for Ryan's Pit

Item Desc:
Preparation of SAP in support of source removal of previously characterized UBC.

Breakdown of Historical Data:
- Item: Preparation of SAP for Ryan's Pit source removal action.
  - Units: hours
  - Unit Cost: $300
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit Hours: 76

Basis for adjustment. Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

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**Line Item 0300 - WMP**
BOE

Estimator's Experience based generally on historical data for Ryan's Pit

Item Desc:
Preparation of WMP in support of source removal of previously characterized UBC.

Breakdown of Historical Data:
- Item: Preparation of WMP for Ryan's Pit source removal action.
  - Units: hours
  - Unit Cost: $80
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit Hours: 20
Basis for adjustment. Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

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Line Item SYS - Contingency And Escalation

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Activity ID: 1GER682210

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Total for Activity 1GER682210: 345, 10,637, 2,114, 6,573, 19,325, 3,502, 22,827

Line Item 0100 - procurement & field prep

Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation

**Item Desc:**

Breakdown of Cost Data:

**Item:** Site Labor to perform above individual tasks for either Ryan's Pit or T-3/T-4.
- Units: hours
- Unit Cost: 1380
- Unit Cost Adjustment Factor: 0.25
- Revised Unit: 345 hours

**Item:** Subcontractor costs to perform above individual tasks for either Ryan's Pit or T-3/T-4.
- Units: 1 lot
- Unit Cost: $10K
- Unit Cost Adjustment Factor: 0.25
- Revised Unit: $2.5K

Basis for adjustment. Hours and costs for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be characterized at once.

Procurement includes preparation of statement of work, proposal review (technical evaluation), and negotiations. Based on a T-3/T-4 burdened cost of $29,186.52. Assuming it is primarily labor hours (RMRS Environmental Engineer charging at $57.45 per hour) yields 508 hours which rounds to 510 total hours.

Davis Bacon Documentation: It was assumed that it would take an environmental engineer twenty-four hours to prepare a Davis Bacon cost estimate and to support the Davis-Bacon determination.

Subcontractor Health and Safety Plan: Costs for the health and safety plan are based on Ryan's Pit, which cost approximately $10,000. It was assumed that these are A5H dollars. In addition, it was assumed that a safety engineer, an industrial hygienist, and a radiological engineer would each provide one week (40 hours) of support for review and document preparation.

Radiological Work Permit: It was assumed that it would take a radiological control technician two working days (18 hours) to complete counting preparation and review.

Implementation Plan: It was estimated that this activity would take 13 weeks of time for engineers, scientists or equivalent to complete. This would include preparation of an implementation plan as required (Rocky Flats Cleanup Agreement, Appendix J, Interim Guidance Document, Dated August 1977). In addition this includes all tasks related to documentation for the Integrated Work Control Program and Integrated Safety Management.
Ecology Survey/National Environmental Protection Act (NEPA) Support: It was estimated that this would take 40 hours for an ecologist. The activities include NEPA review and support in document preparation, site surveys to verify compliance with ecological regulations, categorical exclusions, and NEPA evaluations.

Utility Clearance/Soil Disturbance Permits: It was estimated based on experience that it would take the equivalent 2 weeks (80 hours) for technical staff to do utility surveys, prepare and review soil disturbance permits, and prepare authorizing documents for excavation.

The combined resources for procurement and field preparations are
Total Procurement and Field Preparation Hours

- Environmental Engineer 1134 hours
- Safety Engineer 40 hours
- Industrial Hygiene 40 hours
- Radiological Engineering 58 hours
- Radiological Control Technician 18 hours
- Ecologist/Life Scientist 40 hours
- Manager 50 hours
- Quality Assurance* 29 hours

* On some projects these hours were assumed to be included in other tasks or part of this task under environmental engineer or one of the other job functions.

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

Factor 1134 - Environmental Engineer 283 Hours
Factor 40 - Safety Engineer 10 Hours
Factor 40 - Industrial Hygiene 10 Hours
Factor 58 - Radiological Engineering 14 Hours
Factor 18 - RCT 5 Hours
Factor 40 - Life Scientist 10 Hours
Factor 50 - Project Manager 13 Hours
Factor 10000 - A5H Subcontracted Services 2,500 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### Activity ID: 1GER682240
Description: Readiness Assessment - IHSS Group 800-2

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**Total for Activity 1GER682240:**

- Labor Hours: 117
- Total Labor Cost: 4,116
- Total Materials/Sub Cost: 4,821
- Total Prime Cost: 14,484
- Total Cost: 15,916

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**Cost Element**

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Rocky Flats Closure Project
Baseline Cost and Basis of Estimate

WBS No: 1GAC0802
Activity ID: 1GER682240

**Line Item 0200 - training**

*BOE*

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc:
Conduct training in support of source removal action.

Breakdown of Cost Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
- Units: hours
- Unit Cost: 132 Hours
- Unit Cost Adjustment Factor: 0.25
- Revised Unit: 33 hours

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
- Units: 1 lot
- Unit Cost: $12K
- Unit Cost Adjustment Factor: 0.25
- Revised Unit: $3K

Basis for adjustment. Costs for each UBC are divided by 4 to account for the fact that 4 UBCs will be remediated at once and only one training is needed for the group.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Resources**

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**Line Item 0300 - pre-evolution meeting**

*BOE*

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc:
Conduct Pre-Evolution Meeting in support of source removal action.

Breakdown of Cost Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
- Units: hours
- Unit Cost: 60 hours
- Unit Cost Adjustment Factor: 0.25
- Revised Unit: 15 hours

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
- Units: 1 lot
- Unit Cost: $6K
- Unit Cost Adjustment Factor: 0.25
- Revised Unit: $1.5K

Basis for adjustment. Costs for each UBC are divided by 4 to account for the fact that 4 UBCs will be remediated at once and only one Pre-Evolution Meeting is needed for the group.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Resources**

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### Rocky Flats Closure Project

#### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0802  
**Activity ID:** 1GER682240  
**Project:** Rocky Flats Closure Project  
**Baseline Devi:** 1GAC  
**WBS Filter:** 1GAC  
**Activity Filter:** *  
**Starts In FY:** *  

**Line Item 1GER682250**  
**Description:** Remedial Action - IHSS Group 800-2  
**Cost Risk:** 2  
**Schedule Risk:** 3  

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**Line Item 0100 - mobilization**

**BOE**

*Estimator's Experience based generally on historical data for T-3/T4 Remediation.*

**Item Desc:** Mobilization in support of remediation.

**Breakdown of Cost Data:**

**Item:** Site Labor to perform above individual tasks for T-3/T-4.

- **Units:** hours
- **Unit Cost:** 1,100
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** 275

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.

- **Units:** 1 lot
- **Unit Cost:** 184k
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** see below

**Basis for adjustment:** The costs were divided into fixed costs and variable costs. The fixed costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

- **T3/T4 hours 110 Health Physicists 27 Hours**
- **T3/T4 hours 330 Manager 83 Hours**
- **T3/T4 hours 550 Environmental Engineer 138 Hours**
- **T3/T4 hours 110 Industrial Hygienist 27 Hours**
- **T3/T4 subcontractor dollars 184,000 Subcontractor 46,000**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
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**Line Item 0200 - site prep**

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:**

Site Preparation including setting up fencing, trailer, etc.

**Breakdown of Historical Data:**

- **Item:** Site Labor to perform above individual tasks for T-3/T4.
  - **Units:** hours
  - **Unit Cost Adjustment Factor:** see below
  - **Revised Unit:** see below

- **Item:** Subcontractor costs to perform above individual tasks for T-3/T4.
  - **Units:** 1 lot
  - **Unit Cost Adjustment Factor:** see below
  - **Revised Unit:** see below

**Basis for adjustment.** The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

T3/T4 hours 120 Environmental Engineer 30 hours
T3/T4 dollars 30,000 Subcontracted Srvs 7,500 Dollars

D&D construction trade hours were calculated using the following methodology:

A5H subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.

RCT hours were calculated using the following methodology, unless they were already estimated.

For Site Preparation tasks - RCT hours were the same as D&D construction hours.

For all other tasks A5H subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under KG10H department code.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:**
Excavation.

**Breakdown of Historical Data:**
**Item:** Site Labor to perform above individual tasks for T-3/T-4.
   **Units:** hours
   **Unit Cost:** see below
   **Unit Cost Adjustment Factor:** see below
   **Revised Unit:** see below

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
   **Units:** 1 lot
   **Unit Cost:** see below
   **Unit Cost Adjustment Factor:** see below
   **Revised Unit:** see below

**Basis for adjustment.** The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Total Contaminated Soil to be removed 1,660 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 1,660 CY

The excavation cost was based on the excavation cost for the T-3/T4 Project. Burdened cost based on the T-3/T-4 actuals is $171,487. For the 3,800 cubic yards of contaminated soil removed this yielded a unit cost of $45 per cubic yard of contaminated soil removed. This estimate includes the removal of overburden that might be on top of the contaminated soil. The hours for an environmental engineer from T-3/T-4 were 1.09 hours per cubic yard of contaminated soil. Likewise the hours for the following were assumed to be linearly proportional:

- Health Physicists .47 hours per cubic yard
- Manager .31 hours per cubic yard
- Industrial Hygienists 0.31 hours per cubic yard
- Radiological Control Technician 1.00 hour per cubic yard *

* Based on $50/cubic yard from T-3/T-4, assumes a labor rate of $50/hour

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

- Factor 1.09 - E050 Environmental Engineer 1,809 Hours
- Factor 0.47 - P080 Health Physicists 780 Hours
- Factor 0.31 - Manager 515 Hours
- Factor 0.31 - P090 Industrial Hygienists 515 Hours
- Factor 1.00 - T050 Radiological Control Technician 1,660 Hours
- Factor 45.23 - A5H Subcontracted Srvs 75,082 Dollars

D&D construction trade hours were calculated using the following methodology:

A5H subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.

The dollars amounts calculated for D&D construction workers were subtracted from the subcontractor dollars and the revised A5H dollar amount was entered into Best.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
WBS No: 1GAC0802  
Activity ID: 1GER682250  

**Rocky Flats Closure Project**  
Baseline Cost and Basis of Estimate  

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**Factors**

- 1809 hrs
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- 780 hrs
- 515 hrs
- 1660 hrs
- 238 hrs
- 60816 sub/c support

**Line Item 0400 - remove and clean debris**

**BOE**

Estimator's Experience based generally on a base case of 700 cy.

**Item Desc:**
Remove and clean debris.

**Breakdown of Historical Data:**

- **Item:** Site Labor to perform above individual tasks for T-3/T-4.
  - Units: hours
    - Unit Cost: see below
    - Unit Cost Adjustment Factor: see below
    - Revised Unit: see below

- **Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
  - Units: 1 lot
    - Unit Cost: see below
    - Unit Cost Adjustment Factor: see below
    - Revised Unit: see below

**Basis for adjustment:** The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

**Total Contaminated Soil to be removed 1,660 CY**

**Total Soil for Thermal Desorption 0 CY**

**Offsite Waste Volume 1,660 CY**

For the base case, it was assumed that about five cubic yards out of 700 cubic yards would be debris and would be segregated and cleaned. It was estimated that each cubic yard of debris would cost $1,000 or $5,000 total for 700 cubic yards. This yields a rate of $7.14 per cubic yard.

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

**Factor 7.14 – ASH Subcontracted Srvs 11,852 Dollars**

D&D construction trade hours were calculated using the following methodology:

ASH subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.

RCT hours were calculated using the following methodology, unless they were already estimated.

For Site Preparation tasks – RCT hours were the same as D&D construction hours.
For all other tasks A5H subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under KG10H department code.

The dollars amounts calculated for D&D construction workers and RCTs were subtracted from the subcontractor dollars and the revised A5H dollar amount was entered into Best.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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**Line Item 0600 - confirmation sampling**

BOE

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc: Confirmation Sampling.

Breakdown of Historical Data:

Item: Site Labor to perform above individual tasks for T-3/T-4.
- Units: hours
- Unit Cost: see below
- Unit Cost Adjustment Factor: see below
- Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
- Units: 1 lot
- Unit Cost: see below
- Unit Cost Adjustment Factor: see below
- Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Total Contaminated Soil to be removed 1,660 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 1,660 CY

The analytical costs were based on T-3/T-4, which cost $435,574 for 3800 cubic yards of contaminated soil removed. This yielded a unit rate of about $115/cubic yard. Based on estimator experience the cost of sampling including labor and materials was estimated to be 20% of that rate or about $23/ cubic yard.

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 114.62 - A5H Subcontracted Srvs (Analytical) 190,269 Dollars
Factor 22.924 - A5H Subcontracted Srvs 38,054 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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OFFICIAL USE ONLY
### Line Item 0700 - prepare waste acceptance forms

**BOE**  
Estimator's Experience based generally on historical data for T-3/T4 Remediation.

| Item Desc: | Prepare Waste Acceptance Forms |
| Breakdown of Historical Data: | Site Labor to perform above individual tasks for T-3/T-4. |
| Units: | hours |
| Unit Cost: | see below |
| Unit Cost Adjustment Factor: | see below |
| Revised Unit: | see below |

| Item: | Subcontractor costs to perform above individual tasks for T-3/T-4. |
| Units: | 1 lot |
| Unit Cost: | see below |
| Unit Cost Adjustment Factor: | see below |
| Revised Unit: | see below |

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs are mobilization, site preparation, prepare waste acceptance forms, and demobilization. The variable costs are excavation, remove and clean debris, thermal desorption, confirmation sampling, waste acceptance sampling, field oversight, and backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

**T3/T4 hours 80 environmental engineer 20 hours**

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### Line Item 0800 - waste acceptance sampling

**BOE**  
Estimator's Experience based generally on historical data for T-3/T4 Remediation.

| Item Desc: | Waste Acceptance Sampling |
| Breakdown of Historical Data: | Site Labor to perform above individual tasks for T-3/T-4. |
| Units: | hours |
| Unit Cost: | see below |
| Unit Cost Adjustment Factor: | see below |
| Revised Unit: | see below |

| Item: | Subcontractor costs to perform above individual tasks for T-3/T-4. |
| Units: | 1 lot |
| Unit Cost: | see below |
| Unit Cost Adjustment Factor: | see below |
| Revised Unit: | see below |

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs are mobilization, site preparation, prepare waste acceptance forms, and demobilization. The variable costs are excavation, remove and clean debris, thermal desorption, confirmation sampling, waste acceptance sampling, field oversight, and backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Because the waste acceptance sampling is difficult to predict and could vary significantly from project to project, it was assumed that about $800 worth of additional analysis would be required for 20 cubic yards which is the volume that can be placed in one roll-off. This yielded a unit rate of about $40/cubic yard. This sampling and analysis is in addition to the confirmational samples so the costs are not as great. It was assumed that this sampling would be more labor intensive so the sampling costs were estimated to be about 50% of the analytical costs or about $20/cubic yard.

Total Contaminated Soil to be removed 1,660 CY  
Total Soil for Thermal Desorption 0 CY  
Offsite Waste Volume 1,660 CY
The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 40 - ASH Analytical 66,400 Dollars
Factor 20 - ASH Subcontracted Srvs 33,200 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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Line Item 0900 - field oversight & project mgmt

BOE

Estimator's Experience based generally on a base case of 700 cy.

Item Desc:
Field Oversight and Project Management

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
Units: hours
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
Units: 1 lot
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

It was assumed that a field manager would be needed for 150 nine-hour working days or about 33 weeks. This work breaks down as follows:

Preparation Activities 50 working days
Field Activities - 80 working days
Demobilization - 20 working days
Total 150 nine-hour working days or 1350 hours

In addition it was estimated that technical staff, quality assurance, and project management would be required for the equivalent of ten additional weeks, which is 400 hours each.

Based on the base case of a 700 cubic yard removal project, these values yielded unit rates as follows

Hours Per Cubic Yard
Of Contaminated Soil
Field Manager 1.93
Technical Staff .57
Quality Assurance .57
Project Management 0.57

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Total Contaminated Soil to be removed 1,660 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 1,660 CY
### Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

**WBS No:** 1GAC0802  
**Activity ID:** 1GER682250

**Resources**

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**Factors**

- 3204 hrs

- Quantity: 3,204.00
- Units: Hours

**Line Item 1000 - backfill**

**Trade Publication**

- Means 1995, Site Work & Landscape Cost Data (page 34, 42, and 34)

**Item Desc:**

Backfill.

**Breakdown of Historical Data:**

**Item:** Site Labor to perform above individual tasks for T-3/T-4.

- **Units:** hours
- **Unit Cost:** see below
- **Unit Cost Adjustment Factor:** see below
- **Revised Unit:** see below

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.

- **Units:** 1 lot
- **Unit Cost:** see below
- **Unit Cost Adjustment Factor:** see below
- **Revised Unit:** see below

**Means (1995) Site Work & Landscape Cost Data as follows:**

- **Common Fill:** $4.77/cubic yard (page 34 Borrow Bank Measure)
- **Hauling:** $3.98/cubic yard (page 42 2-mile round-trip, 6 cubic yard dump truck)
- **Backfilling:** $1.69/cubic yard (page 34)
- **Burden:** 43% $4.49/cubic yard

**Total $14.23/cubic yard or about $15/cubic yard**

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

**Factor 15 - ASH Subcontracted Svcs 24,900 Dollars**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Line Item 1100 - demobilization**

**BOE**

**Estimator's Experience based generally on historical data for T-3/T4 Remediation.**

**Item Desc:** Demobilization.

**Breakdown of Historical Data:**

**Item:** Site Labor to perform above individual tasks for T-3/T-4.
Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Demobilization: Based on the T-3/T-4 project, it was assumed that demobilization costs would cover demobilization for excavation activities also. The subcontractor cost for demobilization was about $95,000 for 3,800 cubic yards at the T-3/T-4 project. In addition it was estimated that the following hours were necessary:

Environmental Engineer 300 hours
Health Physicist 100 hours
Manager 200 hours
Industrial Hygiene 100 hours

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

Factor 300 - Environmental Engineer 75 Hours
Factor 100 - Health Physicists 25 Hours
Factor 200 - Manager 50 Hours
Factor 100 - P090 Industrial Hygienists 25 Hours
Factor 95000 - A5H Subcontracted Srvs 23,750 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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Line Item SYS - Contingency And Escalation
BOE

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Activity ID: 1GER682270 Description: Prepare Closeout Report - IHSS Group 802-2

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OFFICIAL USE ONLY
### Rocky Flats Closure Project

#### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0802  
**Activity ID:** 1GER682270  
**Project:**  
**Baseline Devl:**  
**WBS Filter:** 1GAC  
**Activity Filter:** *

**Starts In FY:** *

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**WBS No:** 1GAC0802  
**Activity ID:** 1GER682270

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### Line Item 0100 - develop report

**BOE**

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Item Desc:**
Perform Data Analysis including GIS representation of data, Closeout Report, and associated project management.

**Required level of effort:**
- Environmental Engineer - 80 hours
- Environmental Scientist - 160 hours
- Manager - 20 hours
- Administrative - 20 hours
- Cost Estimators - 20 hours

**Breakdown of Cost Data:**
- Item: Develop Documentation
- Units: hours
- Labor Cost: 320

---

**WBS No:** 1GAC0803  
**Activity ID:** 1GER163100

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Total for Activity 1GER163100:

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**Rocky Flats Closure Project**

**Baseline Cost and Basis of Estimate**

**WBS No:** 1GAC0803  
**Activity ID:** 1GER163100

---

**Item Desc:**
Preparation of SAP Addenda to Industrial Area Characterization Plan.

**Breakdown of Cost Data:**
- **Item:** Preparation of SAP addenda
- **Units:** hours
- **Unit Cost:** 120
- **Unit Cost Adjustment Factor:** none
- **Revised Unit Hours:** 120

**Basis for adjustment:**
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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### Resources

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**Line Item 0200 - HASP Addenda**

**BOE**
Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Item Desc:**
Preparation of HASP addenda to Industrial Area Characterization Plan

**Breakdown of Cost Data:**
- **Item:** Preparation of addenda for HASP.
- **Units:** hours
- **Unit Cost:** 140
- **Unit Cost Adjustment Factor:** none
- **Revised Unit Hours:** 140

**Basis for adjustment:**

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### Resources

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**Line Item 0300 - QAP Addenda**

**BOE**
Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Item Desc:**
Preparation of SAP Addenda to Industrial Area Characterization Plan.

**Breakdown of Cost Data:**
- **Item:** Preparation of QAP addenda
- **Units:** hours
- **Unit Cost:** 60
- **Unit Cost Adjustment Factor:** none
- **Revised Unit Hours:** 60

---
### Rocky Flats Closure Project
#### Baseline Cost and Basis of Estimate

**WBS Filter**
- 1GAC

**Activity Filter**
- *

**Starts In FY**
- *

---

**WBS No:**
- 1GAC0803

**Activity ID:**
- 1GER163100

---

**Basis for adjustment.**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

#### Resources

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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<tbody>
<tr>
<td>750</td>
<td>STRAIGHT TIME BASE</td>
<td>E050 ENVIRONMENTAL ENGINEERS</td>
<td>R100S RMRS Salaried</td>
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</tr>
</tbody>
</table>

**Factors**

- 40 hrs

| ASH SUBCONTRACTED SRVS | P070 | COST ESTIMATORS PLANNERS AN K26SS ER Programs | Linear | 710.44 Dollars |

**Factors**

- 20 hrs
- 42 estimated $/hr

---

**Line Item SYS - Contingency And Escalation**

<table>
<thead>
<tr>
<th>BOE Resources</th>
<th>Cost Element</th>
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<th>Department</th>
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<tr>
<td>CON CONTINGENCY</td>
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**Factors**

- 2990.09 Dollars

| ESC ESCALATION | 0000 | NONE | ZDEPT No Department | Linear | 1,143.27 Dollars |

**Factors**

- 1143.27 Dollars

---

**Activity ID:**
- 1GER163120

**Description:** Procurement and Field Prep - IHSS Group 800-3

**Cost Risk:**
- 1

**Schedule Risk:**
- 1

### Line Item 0100 - procurement & field prep

**BOE**

<table>
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<tr>
<th>Description</th>
<th>Quantity</th>
<th>Units</th>
<th>Labor Hours/Unit</th>
<th>Labor Hours Total</th>
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<th>Materials/ Sub Cost</th>
<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
<th>Burden Cost</th>
<th>Total Cost</th>
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<tr>
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<td>1.00</td>
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<td>345</td>
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**SYS**

| Contingency And Escalation | 1.00 | each | EE | 0 | 0 | 0 | 2,249 | 2,249 | 0 | 2,249 |

**Total for Activity 1GER163120:**

- 345
- 10,637
- 2,114
- 2,249
- 15,000
- 3,000
- 18,000

---

**Line Item 0100 - procurement & field prep**

**BOE**

Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation

**Item Desc:**


**Breakdown of Cost Data:**

- **Item:** Site labor to perform above individual tasks for either Ryan's Pit or T-3/T-4.
  - **Units:** hours
  - **Unit Cost:** 1380
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** 345 hours

- **Item:** Subcontractor costs to perform above individual tasks for either Ryan's Pit or T-3/T-4.
  - **Units:** 1 lot
  - **Unit Cost:** $10K
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** $2.5K

**Basis for adjustment.** Hours and costs for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be characterized at once.

**Procurement includes preparation of statement of work, proposal review (technical evaluation), and negotiations. Based on a T-3/T-4 burdened cost of $29,186.52. Assuming it is primarily labor hours (RMRS Environmental Engineer charging at $57.45 per hour) yields 508 hours which rounds to 510 total hours.**

**Davis Bacon Documentation:** It was assumed that it would take an environmental engineer twenty-four hours to prepare a Davis Bacon cost estimate and to support the Davis-Bacon determination.

**Subcontractor Health and Safety Plan:** Costs for the health and safety plan are based on Ryan's Pit, which cost approximately $10,000. It was assumed that these are ASH dollars. In addition, it was assumed that a safety engineer, an industrial hygienist, and a radiological engineer would each provide one week (40 hours) of support for review and document preparation.

**Radiological Work Permit:** It was assumed that it would take a radiological control technician two working days (18 hours) to complete counting preparation and review.
Implementation Plan: It was estimated that this activity would take 13 weeks of time for engineers, scientists or equivalent to complete. This would include preparation of an implementation plan as required (Rocky Flats Cleanup Agreement, Appendix 1, Interim Guidance Document, Dated August 1977). In addition this includes all tasks related to documentation for the Integrated Work Control Program and Integrated Safety Management.

Ecology Survey/National Environmental Protection Act (NEPA) Support: It was estimated that this would take 40 hours for an ecologist. The activities include NEPA review and support in document preparation, site surveys to verify compliance with ecological regulations, categorical exclusions, and NEPA evaluations.

Utility Clearance/Soil Disturbance Permits: It was estimated based on experience that it would take the equivalent 2 weeks (80 hours) for technical staff to do utility surveys, prepare and review soil disturbance permits, and prepare authorizing documents for excavation.

The combined resources for procurement and field preparations are

Total Procurement and Field Preparation Hours

Environmental Engineer 1134 hours
Safety Engineer 40 hours
Industrial Hygiene 40 hours
Radiological Engineering 58 hours
Radiological Control Technician 18 hours
Ecologist/Life Scientist 40 hours
Manager 50 hours
Quality Assurance* 29 hours
ASK Total $10,000

* On some projects these hours were assumed to be included in other tasks or part of this task under environmental engineer or one of the other job functions.

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

Factor 1134 - Environmental Engineer 283 Hours
Factor 40 - Safety Engineer 10 Hours
Factor 40 - Industrial Hygiene 10 Hours
Factor 58 - Radiological Engineering 14 Hours
Factor 18 - RCT 5 Hours
Factor 40 - Life Scientist 10 Hours
Factor 50 - Project Manager 13 Hours
Factor 10000 - ASH Subcontracted Services 2,500 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### Rocky Flats Closure Project

#### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0803  
**Activity ID:** 1GER163120  
**Baseline Devl:**  
**WBS Filter:** 1GAC  
**Activity Filter:** *

#### Activity Sheet

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#### Activity ID: 1GER163140

**Description:** Readiness Assessment - IHSS Group 800-3

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<th>Activity ID</th>
<th>Description</th>
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<th>Schedule Risk</th>
<th>Line Item</th>
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**Total for Activity 1GER163140:**

- Labor Total: 68 hours
- Labor Cost: 1.887
- Labor Cost Total: 1.015
- Materials/Sub Cost: 0
- Contingency & Escalation: 0
- Total Prime Cost: 2,902
- Burden Cost: 532
- Total Cost: 3,435

### Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation

**Item Desc:**
Evaluate readiness of the field characterization team and plans.

**Breakdown of Cost Data:**
- **Item:** Site Labor to perform Readiness Assessment for T-3/T-4.  
  - Units: hours  
  - Unit Cost: 187  
  - Unit Cost Adjustment Factor: 0.25  
  - Revised Unit: 48 plus 20 hours administrative support

- **Item:** Subcontractor costs to perform Readiness Assessment for T-3/T-4.  
  - Units: 1 lot  
  - Unit Cost: $4800  
  - Unit Cost Adjustment Factor: 0.25  
  - Revised Unit: $1200

It was estimated that subcontractor involvement would require 80 hours at $60/hour = $4,800. It was assumed that about 3 weeks of time was required for an environmental engineer or similar person in addition to 12 hours of project management, which yielded 132 hours. An additional 11 hours was added for management oversight. It was estimated that a radiological engineer (QA) and an industrial hygienist would be needed for 2.5 days each (22 hours).

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 projects will be conducted at once and only one of each fixed cost is needed for the group.

- **Factor 132:** Environmental Engineer 33 Hours  
- **Factor 22:** Health Physicists 6 Hours  
- **Factor 11:** Manager - 3 Hours  
- **Factor 22:** Quality Assurance 6 Hours  
- **Factor 4,800:** A5H Subcontracted Svrs 1,200 Dollars

20 hours of administrative time will also be required.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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<th>Resources</th>
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<td>RMRS Salaried</td>
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Rocky Flats Closure Project
Baseline Cost and Basis of Estimate

WBS Filter: 1GAC
Activity Filter: *

**ASH SUBCONTRACTED SRVS**

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**Baseline Deviation**

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<tr>
<td>Description:</td>
<td>Field Sampling, Lab Analysis - IHSS Group 800-3</td>
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</table>

**Cost Risk**

| Schedule Risk | 1 |

**Line Item 0100 - collect geoprobe samples**

**BOE**

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Item Desc:**
Collection of geoprobe samples with the site geoprobe with two technicians. A site Environmental Engineer will direct the boring placement, log the borings; collect, containerize, package, and ship the samples; prepare field QC documentation, and prepare field notes on a full time basis. A site RCT will monitor the site for radiological contamination on a full time basis. A site Industrial Hygienist will implement the field portion of the HASP on a full time basis. Decon Operations staff will decon the vehicle and equipment when it leaves the work area on a half time basis. It is estimated that one 10' boring will be place per 500 SF of building footprint (same as Bldg. 123 characterization) with 5 samples per 10' boring. It is estimated that one boring per eight hours can be completed. A 50% reduction in characterization from that which was done at Building 123 was taken because process history and building knowledge indicate that characterization to the extent required for Building 123 will not be required at this location.

**Breakdown of Cost Data:**

- **Item:** Site Personnel for support of geoprobe samples
  - Units: hours
  - Unit Cost: 32
  - Unit Cost Adjustment Factor: none

- **Kaiser-Hill/RMRS Geoprobe unit with 2 Technician crew.**
  - Item costs $100 per hour or $800 per 8-hour day.
  - Units: dollars
  - Unit Cost: 800
  - Unit Cost Adjustment Factor: none

**Basis for adjustment:**
A 50% reduction in characterization from that which was done at Building 123 was taken because process history and building knowledge indicate that characterization to the extent required for Building 123 will not be required at this location.

**This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.**

**Resources**

<table>
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<th>Cost Element</th>
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<th>Department</th>
<th>Curve</th>
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### Line Item 0200 - Analyze Samples

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<tr>
<td>Description:</td>
<td>Analyze samples produced from geoprobe borings. It is anticipated that 5 samples from each boring will be collected. They will be analyzed for Metals, VOCs, SVOCs, PCBs, and radionuclides (est. 3 isotopes) with a 30 day TAT. This item is priced on a per sample basis. Per sample costs include DOT rad screen, bottle charge, shipping, and validation.</td>
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<tr>
<td>Breakdown of Cost Data:</td>
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<tr>
<td>Item: Analyze samples at an offsite laboratory.</td>
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<tr>
<td>Units:</td>
<td>analysis</td>
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<tr>
<td>Unit Cost: Metals $345, VOCs $280, SVOCs $440, PCBs and other analytes $150, and Radionuclides 3 isotopes) $590 per each sample.</td>
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<tr>
<td>Unit Cost Adjustment Factor:</td>
<td>Must add: DOT rad screen $32/sample, bottle charge $7/sample, shipping $4.2/bottle, and validation per each: $17.30 VOA, $19.25 SVOC, $16.75 Metals, $5.95 PCB, and $15.60 Rad.</td>
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<tr>
<td>Revised Unit Hours: Metals $405, VOCs $341, SVOCs $502, PCBs and other analytes $199, and Rad $649.</td>
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<tr>
<td>This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.</td>
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### Resources

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### Line Item 0300 - Project Mgmt Oversight

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<tr>
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<tr>
<td>Description:</td>
<td>Project Management/Oversight. Based on half time for a Project Manager, Administrative staff, and Cost Estimator/Scheduler</td>
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<td>Breakdown of Cost Data:</td>
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<td>Item: Mgmt oversight</td>
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This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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### Line Item SYS - Contingency And Escalation

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<tr>
<td>Description:</td>
<td>Prepare Summary/NFA - IHSS Group 800-3</td>
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**Line Item 0100 - develop documentation**

**BOE**

**Estimator's Experience:**
Estimate for summary report based on estimator's 16 years of experience performing and costing projects of similar size and scope.

**Item Desc:**
Perform Data Analysis including GIS representation of data, NFA Summary, Characterization Report, and associated project management. Disposition comments and finalize document.

**Environmental Engineer** 240 hrs Evaluate & assemble existing data. Draft Report.

**Computer Specialist** 80 hrs Identify & pull existing data from database.

**GIS Specialist** 80 hrs Develop maps for Report. Print multiple copies.

**Technical Editor** 40 hrs Complete initial and revised tech edits of Report.

**Quality Assurance** 60 hrs Review

**Environmental Engineer** 40 hrs Peer review

**Regulatory Compliance** 20 hrs Review

**Management** 48 hrs

**Legal** 8 hrs Review

**Administrative Support** 40 hrs Copy & assemble final documents, submit to records.

**Breakdown of Cost Data:**
- **Item:** Develop Documentation
- **Units:** Hours
- **Unit Cost:** 656
- **Unit Cost Adjustment Factor:** none
- **Revised Unit Hours:** 656

**Resources**

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**Line Item SYS - Contingency And Escalation**

**BOE**

**Resources**

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### Line Item 0100 - PAM

**Estimator's Experience based generally on historical data for Ryan's Pit**

**Item Desc:**
Preparation of of PAM or IM/IRA in support of source removal of previously characterized UBC.

**Proposed Action Memorandum:** A bottoms-up estimate based on historical costs was used as the basis for the estimate. Based on Ryan's Pit (INSS 108), the cost for the PAM was $50,000 (contractor costs). Assuming that labor rates at this time were approximately $75 (based on a cost center 217). The total labor for a PAM would be approximately 666 hours, which rounds to 700 hours. It was assumed that 10% would be required for managerial hours.

For a PAM the total labor hours are:
- Environmental Engineer: 700 Hours
- Manager: 70 Hours

**Breakdown of Cost Data:**
- Item: Preparation of PAM for Ryan's Pit source removal action.
  - Units: hours
  - Unit Cost: 770
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit Hours: 193

**Basis for adjustment.** Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

**Resources**

<table>
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<tr>
<th>Cost Element</th>
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### Line Item 0200 - SAP

**Estimator's Experience based generally on historical data for Ryan's Pit**

**Item Desc:**
Preparation of SAP in support of source removal of previously characterized UBC.

**Breakdown of Historical Data:**
- Item: Preparation of SAP for Ryan's Pit source removal action.
  - Units: hours
  - Unit Cost: 300
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit Hours: 76

**Basis for adjustment.** Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

**Resources**

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<th>Cost Element</th>
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### Line Item 0300 - WMP

**BOE**

Estimator's Experience based generally on historical data for Ryan's Pit

*Item Desc:*
Preparation of WMP in support of source removal of previously characterized UBC.

**Breakdown of Historical Data:**
- **Item:** Preparation of WMP for Ryan's Pit source removal action.
- **Units:** hours
- **Unit Cost:** 80
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit Hours:** 20

*Basis for adjustment.* Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

### Resources

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<th>Cost Element</th>
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### Line Item SYS - Contingency And Escalation

**BOE**

Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation

*Item Desc:*

**Breakdown of Cost Data:**
- **Item:** Site Labor to perform above individual tasks for either Ryan's Pit or T-3/T-4.
  - **Units:** hours
  - **Unit Cost:** 1380
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** 345 hours

- **Item:** Subcontractor costs to perform above individual tasks for either Ryan's Pit or T-3/T-4.
  - **Units:** 1 lot
  - **Unit Cost:** $10K
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** $2.5K

*Basis for adjustment.* Hours and costs for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be characterized at once.

Procurement includes preparation of statement of work, proposal review (technical evaluation), and negotiations. Based on a T-3/T-4 burdened cost of $29,186.52. Assuming it is primarily labor hours (RMRS Environmental Engineer charging at $57.45 per hour) yields 508 hours which rounds to 510 total hours.
Davis Bacon Documentation: It was assumed that it would take an environmental engineer twenty-four hours to prepare a Davis Bacon cost estimate and to support the Davis-Bacon determination.

Subcontractor Health and Safety Plan: Costs for the health and safety plan are based on Ryan’s Pit, which cost approximately $10,000. It was assumed that these are A5H dollars. In addition, it was assumed that a safety engineer, an industrial hygienist, and a radiological engineer would each provide one week (40 hours) of support for review and document preparation.

Radiological Work Permit: It was assumed that it would take a radiological control technician two working days (18 hours) to complete counting preparation and review.

Implementation Plan: It was estimated that this activity would take 13 weeks of time for engineers, scientists or equivalent to complete. This would include preparation of an implementation plan as required (Rocky Flats Cleanup Agreement, Appendix 3, Interim Guidance Document, Dated August 1977). In addition this includes all tasks related to documentation for the Integrated Work Control Program and Integrated Safety Management.

Ecology Survey/National Environmental Protection Act (NEPA) Support: It was estimated that this would take 40 hours for an ecologist. The activities include NEPA review and support in document preparation, site surveys to verify compliance with ecological regulations, categorical exclusions, and NEPA evaluations.

Utility Clearance/Soil Disturbance Permits: It was estimated based on experience that it would take the equivalent 2 weeks (80 hours) for technical staff to do utility surveys, prepare and review soil disturbance permits, and prepare authorizing documents for excavation.

The combined resources for procurement and field preparations are:

- Total Procurement and Field Preparation Hours
- Environmental Engineer 1134 hours
- Safety Engineer 40 hours
- Industrial Hygiene 40 hours
- Radiological Engineering 58 hours
- Radiological Control Technician 18 hours
- Ecologist/Life Scientist 40 hours
- Manager 50 hours
- Quality Assurance* 29 hours
- A5H Total $10,000

* On some projects these hours were assumed to be included in other tasks or part of this task under environmental engineer or one of the other job functions.

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

Factor 1134 - Environmental Engineer 283 Hours
Factor 40 - Safety Engineer 10 Hours
Factor 40 - Industrial Hygiene 10 Hours
Factor 58 - Radiological Engineering 14 Hours
Factor 18 - RCT 5 Hours
Factor 40 - Life Scientist 10 Hours
Factor 50 - Project Manager 13 Hours
Factor 10000 - A5H Subcontracted Services 2,500 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### Rocky Flats Closure Project

#### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0803  
**Activity ID:** 1GER163210  
**Project:** Baseline Devl  
**Baseline Devl:** 1GAC  
**WBS Filter:** 1GAC  
**Activity Filter:** *  
**Starts By FT:** *

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**Cost Element: Readiness Assessment**

**BOE Resources**

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**Total for Activity 1GER163240:** 117 4,116 4,821 5,547 14,484 1,432 15,916

**Item 0100 - readiness assessment**

- **Estimator's Experience:** Based generally on historical data for Ryan's Pit and T-3/T4 Remediation.
- **Item Desc:** Evaluate readiness of the field characterization team and plans.
- **Breakdown of Cost Data:**
    - Units: hours
      - Unit Cost: 187
      - Unit Cost Adjustment Factor: 0.25
      - Revised Unit: 48 plus 20 hours management support = 68 hours
    - Units: 1 lot
      - Unit Cost: $4800
      - Unit Cost Adjustment Factor: 0.25
      - Revised Unit: $1200

- It was estimated that subcontractor involvement would require 80 hours at $60/hour = $4,800. It was assumed that about 3 weeks of time was required for an environmental engineer or similar person in addition to 12 hours of project management, which yielded 132 hours. An additional 11 hours was added for management oversight. It was estimated that a radiological engineer (QA) and an industrial hygienist would be needed for 2.5 days each (22 hours).
- The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 projects will be conducted at once and only one of each fixed cost is needed for the group.
- **Factors:**
  - Factor 132 - Environmental Engineer 33 Hours
  - Factor 22 - Health Physicists 6 Hours
  - Factor 11 - Manager 3 Hours
  - Factor 22 - Quality Assurance 6 Hours
  - Factor 4,800 - ASH Subcontracted Srvs 1,200 Dollars

- 20 hours of manager's administrative time will also be required.

- This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Resources**

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**Rocky Flats Closure Project**

**Baseline Cost and Basis of Estimate**

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<tr>
<td><strong>Item Desc:</strong></td>
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<tr>
<td>Conduct perform Training in support of source removal action.</td>
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<tr>
<td><strong>Breakdown of Cost Data:</strong></td>
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<tr>
<td><strong>Item:</strong> Site Labor to perform above individual tasks for T-3/T-4.</td>
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<tr>
<td><strong>Item Desc:</strong></td>
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<tr>
<td>Conduct Pre-Evolution Meeting in support of source removal action</td>
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| **Factors** |
| 33 hrs |

**Resources**

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**Factors**

6/23/00 9:22:54 AM
Rocky Flats Closure Project

Baseline Cost and Basis of Estimate

WBS No: 1GAC0803
Activity ID: 1GER163240

Baseline Devi
WBS Filter: 1GAC
Activity Filter: * Sourc for FY: *

Basis for adjustment. Costs for each UBC are divided by 4 to account for the fact that 4 UBCs will be remediated at once and only one Pre-Evolution Meeting is needed for the group.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

BOE

### Resources

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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### Line Item SYS - Contingency And Escalation

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### Activity ID: 1GER163250

Description: Remedial Action - IHSS Group 800-3

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Total for Activity 1GER163250:

7,706 | 250,835 | 285,159 | 119,237 | 285,159 | 961,730

### Line Item 0100 - mobilization

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:**
Mobilization in support of remediation.

**Breakdown of Cost Data:**
**Item:** Site Labor to perform above individual tasks for T-3/T-4.
- **Units:** hours
- **Unit Cost:** 1,100
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** 275

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
- **Units:** 1 lot
- **Unit Cost:** 184k
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

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OFFICIAL USE ONLY
T3/T4 hours 110 Health Physicists 27 Hours
T3/T4 hours 330 Manager 83 Hours
T3/T4 hours 550 Environmental Engineer 138 Hours
T3/T4 hours 110 Industrial Hygienist 27 Hours
T3/T4 subcontractor dollars 184,000 Subcontractor 46,000

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
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Line Item 0200 - site prep

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc:
Site Preparation including setting up fencing, trailer, etc.

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
  Units: hours
  Unit Cost: see below
  Unit Cost Adjustment Factor: see below
  Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
  Units: 1 lot
  Unit Cost: see below
  Unit Cost Adjustment Factor: see below
  Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

T3/T4 hours 120 Environmental Engineer 30 hours
T3/T4 dollars 30,000 Subcontracted Srvs 7,500 Dollars

D&D construction trade hours were calculated using the following methodology:

A5H subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.

RCT hours were calculated using the following methodology, unless they were already estimated.

For Site Preparation tasks - RCT hours were the same as D&D construction hours.
For all other tasks A5H subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under KG10H department code.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
**Line Item 0300 - excavation**

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:**

Excavation.

**Breakdown of Historical Data:**

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<tbody>
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<tr>
<td>Unit Cost:</td>
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<td>Unit Cost Adjustment Factor:</td>
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<th>Item</th>
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<td>Units: 1 lot</td>
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<td>Unit Cost:</td>
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<td>see below</td>
</tr>
<tr>
<td>Revised Unit:</td>
<td>see below</td>
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</table>

**Basis for adjustment.** The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Total Contaminated Soil to be removed 1,025 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 1,025 CY

The excavation cost was based on the excavation cost for the T-3/T-4 Project. Burdened cost based on the T-3/T-4 actuals is $171,487. For the 3,800 cubic yards of contaminated soil removed this yielded a unit cost of $45 per cubic yard of contaminated soil removed. This estimate includes the removal of overburden that might be on top of the contaminated soil. The hours for an environmental engineer from T-3/T-4 were 1.09 hours per cubic yard of contaminated soil. Likewise the hours for the following were assumed to be linearly proportional:

- Health Physicists 0.47 hours per cubic yard
- Project manager 0.31 hours per cubic yard
- Industrial Hygienists 0.31 hours per cubic yard
- Radiological Control Technician 1.00 hour per cubic yard

* Based on $50/cubic yard from T-3/T-4, assumes a labor rate of $50/hour

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 1.09 - E050 Environmental Engineer 1,117 Hours
Factor 0.47 - P080 Health Physicists 482 Hours
Factor 0.31 - Project Manager 318 Hours
Factor 0.31 - P090 Industrial Hygienists 318 Hours
Factor 1.00 - T050 Radiological Control Technician 1025 Hours
Factor 45.23 - ASH Subcontracted Svrs 46,361 Dollars

D&D construction trade hours were calculated using the following methodology:
The dollars amounts calculated for D&D construction workers were subtracted from the subcontractor dollars and the revised A5H dollar amount was entered into Best.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

<table>
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<th>Cost Element</th>
<th>Skill</th>
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### Item 0400 - remove and clean debris

Estimator's Experience based generally on a base case of 700 cy.

Item Desc:
Remove and clean debris.

Breakdown of Historical Data:

**Item:** Site Labor to perform above individual tasks for T-3/T-4.
**Units:** hours
**Unit Cost:** see below
**Unit Cost Adjustment Factor:** see below
**Revised Unit:** see below

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
**Units:** 1 lot
**Unit Cost:** see below
**Unit Cost Adjustment Factor:** see below
**Revised Unit:** see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediates at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Total Contaminated Soil to be removed 1025 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 1025 CY

For the base case, it was assumed that about five cubic yards out of 700 cubic yards would be debris and would be segregated and cleaned. It was estimated that each cubic yard of debris would cost $1,000 or $5,000 total for 700 cubic yards. This yields a rate of $7.14 per cubic yard.

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 7.14 - A5H Subcontracted Srvs 7,319 Dollars

D&D construction trade hours were calculated using the following methodology: A5H subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.
The dollars amounts calculated for D&D construction workers were subtracted from the subcontractor dollars and the revised A5H dollar amount was entered into Best.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
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<th>Curve</th>
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**Line Item 0600 - confirmation sampling**

BOE

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc:
Confirmation Sampling.

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T4.
  Units: hours
  Unit Cost: see below
  Unit Cost Adjustment Factor: see below
  Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T4.
  Units: 1 lot
  Unit Cost: see below
  Unit Cost Adjustment Factor: see below
  Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Total Contaminated Soil to be removed 1,025 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 1,025 CY

The analytical costs were based on T-3/T4, which cost $435,574 for 3800 cubic yards of contaminated soil removed. This yielded a unit rate of about $115/cubic yard. Based on estimator experience the cost of sampling including labor and materials was estimated to be 20% of that rate or about $23/ cubic yard.

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 114.62 - ASH Subcontracted Srvs (Analytical) 117,486 Dollars
Factor 22.924 - ASH Subcontracted Srvs 23,497 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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<tbody>
<tr>
<td>ASH</td>
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</table>

**Line Item 0700 - prepare waste acceptance forms**

BOE

Estimator's Experience based generally on historical data for T-3/T4 Remediation.
**Rocky Flats Closure Project**  
**Baseline Cost and Basis of Estimate**

### Breakdown of Historical Data:
- **Item:** Site Labor to perform above individual tasks for T-3/T-4.
  - Units: hours
  - Unit Cost: see below
  - Unit Cost Adjustment Factor: see below
  - Revised Unit: see below

### Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
- Units: 1 lot
- Unit Cost: see below
- Unit Cost Adjustment Factor: see below
- Revised Unit: see below

**Basis for adjustment.** The costs were divided into fixed costs and variable costs. The fixed costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

**T3/T4 hours 80 environmental engineer 20 hours**

<table>
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<tr>
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**Line Item 0800 - waste acceptance sampling**

**BOE**  
**Estimator's Experience based generally on historical data for T-3/T4 Remediation.**

### Breakdown of Historical Data:
- **Item:** Site Labor to perform above individual tasks for T-3/T-4.
  - Units: hours
  - Unit Cost: see below
  - Unit Cost Adjustment Factor: see below
  - Revised Unit: see below

### Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
- Units: 1 lot
- Unit Cost: see below
- Unit Cost Adjustment Factor: see below
- Revised Unit: see below

**Basis for adjustment.** The costs were divided into fixed costs and variable costs. The fixed costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Because the waste acceptance sampling is difficult to predict and could vary significantly from project to project, it was assumed that about $800 worth of additional analysis would be required for 20 cubic yards which is the volume that can be placed in one roll-off. This yielded a unit rate of about $40/cubic yard. This sampling and analysis is in addition to the confirmational samples so the costs are not as great. It was assumed that this sampling would be more labor intensive so the sampling costs were estimated to be about 50% of the analytical costs or about $20/cubic yard.

**Total Contaminated Soil to be removed 1025 CY**
**Total Soil for Thermal Desorption 0 CY**
**Offsite Waste Volume 1025 CY**

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.
Factor 40 - A5H Analytical 41,000 Dollars
Factor 20 - A5H Subcontracted Svrs 20,500 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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**Line Item 0900 - field oversight & project mgmt**

**BOE**

Estimator's Experience based generally on a base case of 700 cy.

Item Desc: Field Oversight and Project Management

Breakdown of Historical Data:

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<tr>
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<th>Site Labor to perform above individual tasks for T-3/T-4.</th>
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<tbody>
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<td>Unit Cost</td>
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<tr>
<td>Revised Unit</td>
<td>see below</td>
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<table>
<thead>
<tr>
<th>Item</th>
<th>Subcontractor costs to perform above individual tasks for T-3/T-4.</th>
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</thead>
<tbody>
<tr>
<td>Units</td>
<td>1 lot</td>
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<tr>
<td>Unit Cost</td>
<td>see below</td>
</tr>
<tr>
<td>Revised Unit</td>
<td>see below</td>
</tr>
</tbody>
</table>

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

It was assumed that a field manager would be needed for 150 nine-hour working days or about 33 weeks. This work breaks down as follows:

Preparation Activities 50 working days
Field Activities - 80 working days
Demobilization - 20 working days
Total 150 nine-hour working days or 1350 hours

In addition it was estimated that technical staff, quality assurance, and project management would be required for the equivalent of ten additional weeks, which is 400 hours each.

Based on the base case of a 700 cubic yard removal project, these values yielded unit rates as follows:

- Hours Per Cubic Yard
- Of Contaminated Soil
- Field Manager 1.93
- Technical Staff .57
- Quality Assurance .57
- Project Management 0.57

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Total Contaminated Soil to be removed 1025 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 1025 CY

Factor 1.93 - Environmental Engineer 1,978 Hours
Factor 0.57 - Technical Support 584 Hours
### Resources

<table>
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**Line Item 1000 - backfill**

**BOE Trade Publication**

Means 1995, Site Work & Landscape Cost Data (page 34, 42, and 34)

**Item Desc:**

Backfill.

**Breakdown of Historical Data:**

**Item:** Site Labor to perform above individual tasks for T-3/T-4.

- **Units:** hours
- **Unit Cost:** see below
- **Unit Cost Adjustment Factor:** see below
- **Revised Unit:** see below

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.

- **Units:** 1 lot
- **Unit Cost:** see below
- **Unit Cost Adjustment Factor:** see below
- **Revised Unit:** see below

**Means (1995) Site Work & Landscape Cost Data as follows:**

- **Common Fill $ 4.77/cubic yard (page 34 Borrow Bank Measure)**
- **Hauling $ 3.98/cubic yard (page 42 2-mile round-trip, 6 cubic yard dump truck)**
- **Backfilling $ 1.69/cubic yard (page 34)**
- **Burden (43%) $ 4.49/cubic yard**
- **Total $14.23/cubic yard or about $15/cubic yard**

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

**Factor 15 - A5H Subcontracted Srvs 15,375 Dollars**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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**Line Item 1100 - demobilization**

**BOE Estimator's Experience based generally on historical data for T-3/T4 Remediation.**

**Item Desc:**

Demobilization.

**Breakdown of Historical Data:**

**Item:** Site Labor to perform above individual tasks for T-3/T-4.

- **Units:** hours
- **Unit Cost:** see below
- **Unit Cost Adjustment Factor:** see below
Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
Units: 1 lot
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Demobilization: Based on the T-3/T-4 project, it was assumed that demobilization costs would cover demobilization for excavation activities also. The subcontractor cost for demobilization was about $95,000 for 3,800 cubic yards at the T-3/T-4 project. In addition it was estimated that the following hours were necessary:

- Environmental Engineer 300 hours
- Health Physicist 100 hours
- Industrial Hygiene 100 hours

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

Factor 300 - Environmental Engineer 75 Hours
Factor 100 - Health Physicists 25 Hours
Factor 200 - Manager 50 Hours
Factor 100 - P090 Industrial Hygienists 25 Hours
Factor 95000 - A5H Subcontracted Svrs 23,750 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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<td>750 STRAIGHT TIME BASE</td>
<td>P080 HEALTH PHYSICISTS</td>
<td>R100S RMRS Salaried</td>
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Desired Contingency And Escalation

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Activity ID: 1GER163270
Description: Prepare Closeout Report - HSS Group 800-3

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### Rocky Flats Closure Project
#### Baseline Cost and Basis of Estimate

**Project:** Baseline Devl  
**WBS Filter:** 1GAC  
**Activity Filter:** *  
**Starts In FY:** *

Total for Activity 1GER163270:

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</table>

**Line Item 0100 - develop report**

**BOE**

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites. (T-3/T-4 and others)

**Item Desc:**

Perform Data Analysis including GIS representation of data, Closeout Report, and associated project management.

Required level of effort:
- Environmental Engineer - 80 hours
- Environmental Scientist - 20 hours
- Computer Specialist - 160 hours (GIS, SWD)
- Manager - 20 hours
- Administrative - 20 hours
- Cost Estimators - 20 hours

Breakdown of Cost Data:
- Item: develop documentation
  - Units: hours
  - Unit Cost: 320
  - Unit Cost Adjustment Factor: none
- Revised Unit Hours: 320

**Resources**

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### Line Item SYS - Contingency And Escalation

**BOE**

**Resources**

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**WBS No:** 1GAC0804  
**Title:** Group 800-4 (B886)  
**Activity ID:** 1GER161100  
**Description:** SAP Preparation - IHSS Group 800-4 (B886)

**Line Item 0100 - SAP Addenda**

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<tr>
<th>Line Item</th>
<th>Description</th>
<th>Quantity</th>
<th>Units</th>
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Total for Activity 1GER161100:

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</table>

**Line Item 0100 - SAP Addenda**

**BOE**

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Item Desc:**

Preparation of SAP Addenda to Industrial Area Characterization Plan.

Breakdown of Cost Data:
Item: Preparation of SAP addenda
Units: hours
Unit Cost: 120
Unit Cost Adjustment Factor: none
Revised Unit Hours: 120

Basis for adjustment.
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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**Line Item 0200 - HASP Addenda**

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

Item Desc:
Preparation of HASP addenda to Industrial Area Characterization Plan

Breakdown of Cost Data:
Item: Preparation Labor for addenda for HASP.
Units: 1 Lot
Unit Cost: 140 Hours
Unit Cost Adjustment Factor: none
Revised Unit Hours: 140 Hours

Basis for adjustment: N/A

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**Line Item 0300 - QAP Addenda**

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

Item Desc:
Preparation of SAP Addenda to Industrial Area Characterization Plan.

Breakdown of Cost Data:
Item: Preparation of QAP Addenda
Units: hours
Unit Cost: 60
Unit Cost Adjustment Factor: none
Revised Unit Hours: 60

Basis for adjustment.
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### Line Item SYS - Contingency and Escalation

#### Resources

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### Line Item 0100 - Procurement and Field Prep

#### BOE

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**Total for Activity 1GER161120:**

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**Item Desc:**

**Breakdown of Cost Data:**

- **Item:** Procure Item: Site labor to perform above individual tasks for either Ryan’s Pit or T-3/T-4.
  - **Units:** hours
  - **Unit Cost:** $1380
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** 345 hours

- **Item:** Subcontractor costs to perform above individual tasks for either Ryan’s Pit or T-3/T-4.
  - **Units:** 1 lot
  - **Unit Cost:** $10K
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** $2.5K

**Basis for adjustment:** Hours and costs for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be characterized at once.

Procurement includes the preparation of a statement of work, proposal review (technical evaluation), and negotiations. Based on a T-3/T-4 burdened cost of $29,186.52. Assuming it is primarily labor hours (RMRS Environmental Engineer charging at $57.45 per hour) yields 508 hours which rounds to 510 total hours.

Davis Bacon Documentation: It was assumed that it would take an environmental engineer twenty-four hours to prepare a Davis Bacon cost estimate and to support the Davis-Bacon determination.

Subcontractor Health and Safety Plan: Costs for the health and safety plan are based on Ryan’s Pit, which cost approximately $10,000. It was assumed that these are ASH dollars. In addition, it was assumed that a safety engineer, an industrial hygienist, and a radiological engineer would each provide one week (40 hours) of support for review and document preparation.

Radiological Work Permit: It was assumed that it would take a radiological control technician two working days (18 hours) to complete counting preparation and review.

Implementation Plan: It was estimated that this activity would take 13 weeks of time for engineers, scientists, or equivalent to complete. This would include preparation of an implementation plan as required (Rocky Flats Cleanup Agreement, Appendix J, Interim Guidance Document, Dated August 1977). In addition, this includes all tasks related to documentation for the Integrated Work Control Program and Integrated Safety Management.
Ecology Survey/National Environmental Protection Act (NEPA) Support: It was estimated that this would take 40 hours for an ecologist. The activities include NEPA review and support in document preparation, site surveys to verify compliance with ecological regulations, categorical exclusions, and NEPA evaluations.

Utility Clearance/Soil Disturbance Permits: It was estimated based on experience that it would take the equivalent 2 weeks (80 hours) for technical staff to do utility surveys, prepare and review soil disturbance permits, and prepare authorizing documents for excavation.

The combined resources for procurement and field preparations are

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<td>Industrial Hygiene 40 hours</td>
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<td>Ecologist/Life Scientist 40 hours</td>
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<td>Quality Assurance* 29 hours</td>
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* On some projects these hours were assumed to be included in other tasks or part of this task under environmental engineer or one of the other job functions.

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

| Factor 1134 - Environmental Engineer 283 Hours |
| Factor 40 - Safety Engineer 10 Hours |
| Factor 40 - Industrial Hygiene 10 Hours |
| Factor 58 - Radiological Engineering 14 Hours |
| Factor 18 - RCT 5 Hours |
| Factor 40 - Life Scientist 10 Hours |
| Factor 50 - Project Manager 13 Hours |
| Factor 10000 - ASH Subcontracted Services 2,500 Dollars |

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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**Line Item SYS - Contingency And Escalation**

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**Resources**

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Project: Rocky Flats Closure Project
Baseline Cost and Basis of Estimate

WBS No: 1GAC0804
Activity ID: 1GER161120

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Activity Filter *

Starts In FY *

No Department

Linear

1,512.35 Dollars

Factors

Activity ID: 1GER161140 Description: Readiness Assessment - IHSS Group 800-4

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Total for Activity 1GER161140: 68 1,887 1,015 490 3,393 3,925 532 3,925

Line Item 0100 - readiness assessment

BOE

Estimator’s Experience based generally on historical data for Ryan’s Pit and T-3/T4 Remediation

Item Desc:
Evaluate readiness of the field characterization team and plans.

Breakdown of Cost Data:
Item: Site Labor to perform Readiness Assessment for T-3/T-4.
   Units: hours
   Unit Cost: 317
   Unit Cost Adjustment Factor: 0.25
   Revised Unit: 48 plus 20 hours administrative support = 68 hours

   Units: 1 lot
   Unit Cost: $4800
   Unit Cost Adjustment Factor: 0.25
   Revised Unit: $1200

It was estimated that subcontractor involvement would require 80 hours at $60/hour = $4,800. It was assumed that about 3 weeks of time was required for an environmental engineer or similar person in addition to 12 hours of project management, which yielded 132 hours. An additional 11 hours was added for management oversight. It was estimated that a radiological engineer (QA) and an industrial hygienist would be needed for 2.5 days each (22 hours).

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 projects will be conducted at once and only one of each fixed cost is needed for the group.

Factor 132 - Environmental Engineer 33 Hours
Factor 22 - Health Physicists 6 Hours
Factor 11 - Manager 3 Hours
Factor 22 - Quality Assurance 6 Hours
Factor 4,800 - ASH Subcontracted Srvs 1,200 Dollars

20 hours of administrative time will also be required.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

Resources

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Rocky Flats Closure Project
Baseline Cost and Basis of Estimate

WBS Filter: 1GAC
Activity Filter: *

Line Item SYS - Contingency And Escalation

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<td>ZDEPT</td>
<td>No Department</td>
<td>Linear</td>
<td>329.77</td>
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<table>
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<tr>
<th>Activity ID: 1GER161150</th>
<th>Description: Field Sampling, Lab Analysis - IHSS Group 800-4</th>
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<table>
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<tr>
<th>Line Item</th>
<th>Description</th>
<th>Quantity</th>
<th>Units</th>
<th>Boe Type</th>
<th>Labor Hours/Unit</th>
<th>Labor Hours Total</th>
<th>Labor Cost Total</th>
<th>Materials/Sub Cost</th>
<th>Contingency And Escalation</th>
<th>Total Prime Cost</th>
<th>Burden Cost</th>
<th>Total Cost</th>
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<tbody>
<tr>
<td>0100</td>
<td>collect geoprobe samples</td>
<td>45.00</td>
<td>kach</td>
<td>EE</td>
<td>24</td>
<td>1,080</td>
<td>30,294</td>
<td>54,268</td>
<td>84,562</td>
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<td>project mgmt oversight</td>
<td>45.00</td>
<td>kach</td>
<td>EE</td>
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<td>22,561</td>
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<td>SYS</td>
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<td>EE</td>
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<td>0</td>
<td>74,029</td>
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Total for Activity 1GER161150: 1,440 | 42,905 | 459,523 | 576,457 | 12,099 | 74,029

Cost Element | Skill | Quantity | Units | Curve | Quantity | Units |
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<thead>
<tr>
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<tbody>
<tr>
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<td>ESC ESCALATION</td>
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<td>NONE</td>
<td>ZDEPT</td>
<td>No Department</td>
<td>Linear</td>
<td>329.77</td>
</tr>
</tbody>
</table>
Line Item 0200 - Analyze samples

**BOE**

**Vendor Quote**

**Email Quote:** Average cost from Kaiser-Hill ASD (V. Ideker).

**Item Description:**

Analyze samples produced from geoprobe borings. It is anticipated that 5 samples from each boring will be collected. They will be analyzed for Metals, VOCs, SVOCs, PCBs, and radionuclides (est. 3 isotopes) with a 30 day TAT. This item is priced on a per sample basis. Per sample costs include DOT rad screen, bottle charge, shipping, and validation.

**Breakdown of Cost Data:**

- **Item:** Analyze samples at an offsite laboratory.
  - **Units:** analysis
  - **Unit Cost:** Metals $345, VOCs $280, SVOCs $440, PCBs and other analytes $150, and Radionuclides 3 isotopes $590 each per sample.
  - **Unit Cost Adjustment Factor:** Must add: DOT rad screen $32/sample, bottle charge $7/sample, shipping $4.2/bottle, and validation per each: Metals: $17.30 VOA, VOCs: $19.25 SVOC, SVOCs: $16.75 Metals, Metals: $5.95 PCB, and Rad: $649.
  - **Revised Unit Hours:** Metals: $405, VOCs: $341, SVOCs: $502, PCBs and other analytes: $199, and Rad: $649.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Resources**

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
</tr>
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<tr>
<td>ASH SUBCONTRACTED SRVS 0000 NONE</td>
<td>K267S Analytical Laboratory Services</td>
<td>Linear</td>
<td>1,772.71</td>
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Line Item 0300 - Project Mgmt Oversight

**BOE**

**Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.**

**Item Description:**

Project Management/Oversight. Based on half time for a Project Manager, Administrative staff, and Cost Estimator/Scheduler.

**Breakdown of Cost Data:**

- **Item:** Mgmt oversight
  - **Units:** hours
  - **Unit Cost:** 12
  - **Unit Cost Adjustment Factor:** none
  - **Revised Unit Hours:** 12

**Basis for adjustment:** A 50% reduction in characterization from that which was done at Building 123 was taken because process history and building knowledge indicate that characterization to the extent required for Building 123 will not be required at this location.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Resources**

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>750 STRAIGHT TIME BASE G010 ADMINISTRATIVE ASSISTANTS</td>
<td>R100S RMRS Salaried</td>
<td>Linear</td>
<td>4.00</td>
<td>Hours</td>
<td></td>
</tr>
<tr>
<td>750 STRAIGHT TIME BASE M020 MANAGERS (GRADE 69 - 72)</td>
<td>R100S RMRS Salaried</td>
<td>Linear</td>
<td>4.00</td>
<td>Hours</td>
<td></td>
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<tr>
<td>ASH SUBCONTRACTED SRVS P070 COST ESTIMATORS PLANNERS AN K265S ER Programs</td>
<td>Linear</td>
<td>142.09</td>
<td>Dollars</td>
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</table>

Line Item SYS - Contingency and Escalation

**BOE**

**Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.**

**Item Description:**

Contingency and escalation.

**Cost Risk:**

- **Activity ID:** 1GER161170
  - **Description:** Prepare Summary/NFA - IHSS Group 800-4
  - **Cost Risk:** 1
  - **Schedule Risk:** 1
## Rocky Flats Closure Project

### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0804  
**Activity ID:** 1GER161170

#### Activity ID: 1GER161180  
**Description:** Prepare Decision Document - IHSS Group 800-4

<table>
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<th>Description</th>
<th>Quantity</th>
<th>Units</th>
<th>BOE Type</th>
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<th>Labor Hours Total</th>
<th>Labor Cost Total</th>
<th>Materials/ Sub Cost</th>
<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
<th>Burden Cost</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>B100</td>
<td>develop documentation</td>
<td>1.00</td>
<td>each</td>
<td>EE</td>
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<td>656</td>
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<td>19,024</td>
<td>5,366</td>
<td>24,388</td>
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<tr>
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<td>Contingency And Escalation</td>
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<td>ea</td>
<td>EE</td>
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<td>0</td>
<td>3,482</td>
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<td>0</td>
<td>3,482</td>
<td>0</td>
<td>3,482</td>
</tr>
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</table>

**Total for Activity 1GER161170:**

| Total | 656 | 19,024 | 0 | 3,482 | 22,506 | 5,366 | 27,871 |

#### Resources

**Cost Element**

| 750 | STRAIGHT TIME BASE | E050 | ENVIRONMENTAL ENGINEERS | R100S | RMRS Salaried | Linear | 280.00 |
| 750 | STRAIGHT TIME BASE | E110 | QUALITY CONTROL ENGINEERS | R100S | RMRS Salaried | Linear | 60.00 |
| 750 | STRAIGHT TIME BASE | G010 | ADMINISTRATIVE ASSISTANTS | R100S | RMRS Salaried | Linear | 40.00 |
| 750 | STRAIGHT TIME BASE | M040 | MANAGERS (GRADE 64 - 68) | K109S | Env Sys, Stewardship & Compliance | Linear | 48.00 |
| 750 | STRAIGHT TIME BASE | P060 | COMPUTER SYSTEMS ANALYSTS | K215S | Information Resource MGT | Linear | 160.00 |
| 750 | STRAIGHT TIME BASE | P160 | TECHNICAL WRITERS AND EDITOR | R100S | RMRS Salaried | Linear | 40.00 |
| 750 | STRAIGHT TIME BASE | P170 | OTHER ADMINISTRATIVE & PROFE | K101S | General Counsel | Linear | 8.00 |
| 750 | STRAIGHT TIME BASE | S020 | ENVIRONMENTAL SCIENTISTS | K253S | Remediation, Industrial & Site Serv | Linear | 20.00 |

**Contingency And Escalation**

| CON CONTINGENCY | 0000 | NONE | ZDEPT | No Department | Linear | 1,140.67 |
| ESC ESCALATION   | 0000 | NONE | ZDEPT | No Department | Linear | 2,341.67 |

**Factors**

| RMRS Salaried | 280.00 | Hours |
| RMRS Salaried | 60.00  | Hours |
| RMRS Salaried | 40.00  | Hours |
| RMRS Salaried | 48.00  | Hours |
| RMRS Salaried | 160.00 | Hours |
| RMRS Salaried | 40.00  | Hours |
| RMRS Salaried | 8.00   | Hours |
| RMRS Salaried | 20.00  | Hours |

**Breakdown of Cost Data:**

- **Item:** Develop Documentation
- **Units:** Hours
- **Unit Cost:** 656
- **Unit Cost Adjustment Factor:** none
- **Revised Unit Hours:** 656

#### Estimator's Experience:

Estimate for summary report based on estimator's 16 years of experience performing and costing projects of similar size and scope.

**Item Desc:**

- **Environmental Engineer 240 hrs** Evaluate & assemble existing data. Draft Report.
- **Computer Specialist 80 hrs** Identify & pull existing data from database.
- **GIS Specialist 80 hrs** Develop maps for Report. Print multiple copies.
- **Technical Editor 40 hrs** Complete initial and revised tech edits of Report.
- **Quality Assurance 60 hrs** Review
- **Environmental Engineer 40 hrs** Peer review
- **Regulatory Compliance 20 hrs** Review
- **Management 48 hrs** Review
- **Legal 8 hrs** Review
- **Administrative Support 40 hrs** Copy & assemble final documents, submit to records.

#### Contingency And Escalation

**Item:** Contingency And Escalation
- **Resources**
  - **CON CONTINGENCY:** 1140.67 Dollars
  - **ESC ESCALATION:** 2341.67 Dollars

**Factors**

- **RMRS Salaried:** 280.00 Hours
- **RMRS Salaried:** 60.00 Hours
- **RMRS Salaried:** 40.00 Hours
- **RMRS Salaried:** 48.00 Hours
- **RMRS Salaried:** 160.00 Hours
- **RMRS Salaried:** 40.00 Hours
- **RMRS Salaried:** 8.00 Hours
- **RMRS Salaried:** 20.00 Hours

---

**Activity ID:** 1GER161180  
**Description:** Prepare Decision Document - IHSS Group 800-4

---

**Schedule Risk:** 1  
**Cost Risk:** 1
### Rocky Flats Closure Project

#### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0804  
**Activity ID:** 1GER161180

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<tr>
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<th>Activity Filter</th>
<th>Start</th>
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<table>
<thead>
<tr>
<th>Line Item 0100 - PAM</th>
<th>BOE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimator's Experience based generally on historical data for Ryan's Pit</td>
<td></td>
</tr>
<tr>
<td>Item Desc: Preparation of PAM or IM/IRA in support of source removal of previously characterized UBC.</td>
<td></td>
</tr>
<tr>
<td>Proposed Action Memorandum: A bottoms-up estimate based on historical costs was used as the basis for the estimate. Based on Ryan's Pit (INHS 108), the cost for the PAM was $50,000 (contractor costs). Assuming that labor rates at this time were approximately $75 (based on a cost center 217). The total labor for a PAM would be approximately 666 hours, which rounds to 700 hours. It was assumed that 10% would be required for managerial hours.</td>
<td></td>
</tr>
<tr>
<td>For a PAM the total labor hours are:</td>
<td></td>
</tr>
<tr>
<td>Environmental Engineer 700 Hours</td>
<td></td>
</tr>
<tr>
<td>Manager 70 Hours</td>
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<td>Factor 700 Environmental Engineer 175 hours</td>
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<tr>
<td>Factor 70 Manager 18 hours</td>
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<tr>
<td>Breakdown of Cost Data:</td>
<td></td>
</tr>
<tr>
<td>Item: Preparation of PAM for Ryan's Pit source removal action.</td>
<td></td>
</tr>
<tr>
<td>Units: hours</td>
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</tr>
<tr>
<td>Unit Cost: 770</td>
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<tr>
<td>Unit Cost Adjustment Factor: 0.25</td>
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</tr>
<tr>
<td>Revised Unit Hours: 193</td>
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<tr>
<td>Basis for adjustment. Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.</td>
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#### Resources

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<th>Cost Element</th>
<th>Skill</th>
<th>Departmen</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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<tr>
<td>750 STRAIGHT TIME BASE</td>
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<td>R100S RMRS Salaried</td>
<td>Linear</td>
<td>175.00</td>
<td>Hours</td>
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<tr>
<td>Factors 175 hrs</td>
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<tr>
<td>750 STRAIGHT TIME BASE</td>
<td>M020 MANAGERS (GRADE 69 - 72)</td>
<td>R100S RMRS Salaried</td>
<td>Linear</td>
<td>18.00</td>
<td>Hours</td>
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<td>Factors 18 hrs</td>
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</table>

### Line Item 0200 - SAP

| BOE |
| Estimator's Experience based generally on historical data for Ryan's Pit |
| Item Desc: Preparation of SAP in support of source removal of previously characterized UBC. |
| Breakdown of Historical Data: |
| Item: Preparation of SAP for Ryan's Pit source removal action. |
| Units: hours |
| Unit Cost: 300 |
| Unit Cost Adjustment Factor: 0.25 |
| Revised Unit Hours: 76 |
| Basis for adjustment. Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group. |

#### Resources

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Departmen</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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<tr>
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<td>E050 ENVIRONMENTAL ENGINEERS</td>
<td>R100S RMRS Salaried</td>
<td>Linear</td>
<td>68.00</td>
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<td>Factors 68 hrs</td>
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<tr>
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<td>M020 MANAGERS (GRADE 69 - 72)</td>
<td>R100S RMRS Salaried</td>
<td>Linear</td>
<td>8.00</td>
<td>Hours</td>
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<tr>
<td>Factors 8 hrs</td>
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</table>

### Line Item 0300 - WMP

| BOE |
| Breakdown of Cost Data: |
| Item: Preparation of WMP for Ryan's Pit source removal action. |
| Units: hours |
| Unit Cost: 591 |
| Unit Cost Adjustment Factor: 0.25 |
| Revised Unit Hours: 591 |
| Basis for adjustment. Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group. |

#### Resources

<table>
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<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Departmen</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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<tbody>
<tr>
<td>750 STRAIGHT TIME BASE</td>
<td>E050 ENVIRONMENTAL ENGINEERS</td>
<td>R100S RMRS Salaried</td>
<td>Linear</td>
<td>0</td>
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</table>
Estimator's Experience based generally on historical data for Ryan's Pit

Item Desc:
Preparation of WMP in support of source removal of previously characterized UBC.

Breakdown of Historical Data:
Item: Preparation of WMP for Ryan's Pit source removal action.
Units: hours
Unit Cost: 80
Unit Cost Adjustment Factor: 0.25
Revised Unit Hours: 20

Basis for adjustment. Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

### Resources

<table>
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<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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<tr>
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<td></td>
<td>R100S</td>
<td>Linear</td>
<td>20.00</td>
<td>Hours</td>
</tr>
</tbody>
</table>

Factors: 20 hrs

### Line Item SYS - Contingency And Escalation

- **BOE Resources**
  - **CON CONTINGENCY**
    - **0000**
    - **NONE**
    - **ZDEPT**
    - **No Department**
    - **Linear**
    - **549.48**
    - **Dollars**

- **ESC ESCALATION**
  - **0000**
  - **NONE**
  - **ZDEPT**
  - **No Department**
  - **Linear**
  - **1,128.02**
  - **Dollars**

### Activity ID: 1GER161210

**Description:** Procurement and Field Prep - HSS Grouping 800-4

<table>
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<tr>
<th>Line Item</th>
<th>Description</th>
<th>Quantity</th>
<th>Units</th>
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<th>Material/Sub Cost</th>
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<th>Total Prime Cost</th>
<th>Burden Cost</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>0100</td>
<td>procurement &amp; field prep</td>
<td>1.00 each</td>
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<td>345</td>
<td>10,637</td>
<td>2,114</td>
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<td>8,801</td>
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<td>8,801</td>
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Total for Activity 1GER161210: 345, 10,637, 2,114, 8,801, 8,801, 0, 8,801

### Line Item 0100 - procurement & field prep

**BOE**

Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation

**Item Desc:**

**Breakdown of Cost Data:**
Item: Site labor to perform above individual tasks for either Ryan's Pit or T-3/T-4.
Units: hours
Unit Cost: 1380
Unit Cost Adjustment Factor: 0.25
Revised Unit: 345 hours

Item: Subcontractor costs to perform above individual tasks for either Ryan's Pit or T-3/T-4.
Units: 1 lot
Unit Cost: $10K
Unit Cost Adjustment Factor: 0.25
Revised Unit: $2.5K

**Basis for adjustment.** Hours and costs for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be characterized at once.

Procurement includes preparation of statement of work, proposal review (technical evaluation), and negotiations. Based on a T-3/T-4 burdened cost of $29,186.52. Assuming it is primarily labor hours (RMRS Environmental Engineer charging at $57.45 per hour) yields 508 hours which rounds to 510 total hours.

**Davis Bacon Documentation:** It was assumed that it would take an environmental engineer twenty-four hours to prepare a Davis Bacon cost estimate and to support the Davis-Bacon determination.
Subcontractor Health and Safety Plan: Costs for the health and safety plan are based on Ryan's Pit, which cost approximately $10,000. It was assumed that these are A5H dollars. In addition, it was assumed that a safety engineer, an industrial hygienist, and a radiological engineer would each provide one week (40 hours) of support for review and document preparation.

Radiological Work Permit: It was assumed that it would take a radiological control technician two working days (18 hours) to complete counting preparation and review.

Implementation Plan: It was estimated that this activity would take 13 weeks of time for engineers, scientists or equivalent to complete. This would include preparation of an implementation plan as required (Rocky Flats Cleanup Agreement, Appendix 3, Interim Guidance Document, Dated August 1977). In addition this includes all tasks related to documentation for the Integrated Work Control Program and Integrated Safety Management.

Ecology Survey/National Environmental Protection Act (NEPA) Support: It was estimated that this would take 40 hours for an ecologist. The activities include NEPA review and support in document preparation, site surveys to verify compliance with ecological regulations, categorical exclusions, and NEPA evaluations.

Utility Clearance/Soil Disturbance Permits: It was estimated based on experience that it would take the equivalent 2 weeks (80 hours) for technical staff to do utility surveys, prepare and review soil disturbance permits, and prepare authorizing documents for excavation.

The combined resources for procurement and field preparations are

<table>
<thead>
<tr>
<th>Total Procurement and Field Preparation Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Engineer 1134 hours</td>
</tr>
<tr>
<td>Safety Engineer 40 hours</td>
</tr>
<tr>
<td>Industrial Hygiene 40 hours</td>
</tr>
<tr>
<td>Radiological Engineering 58 hours</td>
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<tr>
<td>Radiological Control Technician 18 hours</td>
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<tr>
<td>Manager 50 hours</td>
</tr>
<tr>
<td>Quality Assurance* 29 hours</td>
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<tr>
<td>A5H Total $10,000</td>
</tr>
</tbody>
</table>

* On some projects these hours were assumed to be included in other tasks or part of this task under environmental engineer or one of the other job functions.

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

| Factor 1134 - Environmental Engineer 283 Hours |
| Factor 40 - Safety Engineer 10 Hours           |
| Factor 40 - Industrial Hygiene 10 Hours        |
| Factor 58 - Radiological Engineering 14 Hours  |
| Factor 18 - RCT 5 Hours                        |
| Factor 40 - Life Scientist 10 Hours           |
| Factor 50 - Project Manager 13 Hours          |
| Factor 10000 - A5H Subcontracted Services 2,500 Dollars |

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
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<td>RMRS Salaried</td>
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<td>MANAGERS (GRADE 69 - 72)</td>
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<td>RMRS Salaried</td>
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<td>Factors 13 hrs</td>
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<td>ER Programs</td>
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<td>RMRS Salaried</td>
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<td>RMRS Salaried</td>
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## Project: Rocky Flats Closure Project
### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0804
**Activity ID:** 1GER161210

### Activity Filter
- **WBS Filter:** 1GAC
- **Activity Filter:** *

#### ASH SUBCONTRACTED SRVS

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**K26SS ER Programs**

**Factors:** 2500 sub/c support

**WBS No:** 1GAC0604
**Activity ID:** 1GER161240

#### Line Item SYS - Contingency And Escalation

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<th>Skill</th>
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<th>Units</th>
<th>Curve</th>
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**Factors:** 8252.35 Dollars
**Factors:** 2548.82 Dollars

#### Activity ID: 1GER161240

**Description:** Readiness Assessment - IHS Group 800-4

<table>
<thead>
<tr>
<th>Line Item</th>
<th>Description</th>
<th>Quantity</th>
<th>Units</th>
<th>BOE Type</th>
<th>Labor Hours/Unit</th>
<th>Labor Hours Total</th>
<th>Labor Cost Total</th>
<th>Materials/ Sub Cost</th>
<th>Contingency</th>
<th>Escalation</th>
<th>Total Prime Cost</th>
<th>Burden Cost</th>
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**Total for Activity 1GER161240:**

- **Hours:** 117
- **Labor Cost:** 4,116
- **Materials/ Sub Cost:** 4,821
- **Total Prime Cost:** 14,484
- **Burden Cost:** 1,432
- **Total Cost:** 15,916

#### Line Item 0100 - readiness assessment

**BOE Resources**

<table>
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<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Quantity</th>
<th>Units</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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<tr>
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<tr>
<td>750 STRAIGHT TIME BASE</td>
<td>M020 MANAGERS (GRADE 69 - 72)</td>
<td>6</td>
<td>hrs</td>
<td>6.00</td>
<td>Hours</td>
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</tr>
</tbody>
</table>

**Factors:** 33 hours
**Factors:** 6 hours

---

**Estimator's Experience based generally on historical data for Ryan’s Pit and T-3/T4 Remediation**

**Item Desc:**
Evaluate readiness of the field characterization team and plans.

**Breakdown of Cost Data:**
- **Item:** Site Labor to perform Readiness Assessment for T-3/T-4.
  - **Units:** hours
  - **Unit Cost:** $4800
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** $1200
- **Item:** Subcontractor costs to perform Readiness Assessment for T-3/T-4.
  - **Units:** 1 lot
  - **Unit Cost:** $4800
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** $1200

**The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 projects will be conducted at once and only one of each fixed cost is needed for the group.**

**Factor 132- Environmental Engineer 33 Hours**
**Factor 22 - Industrial Hygienists 6 Hours**
**Factor 11 - Manager  3 Hours**
**Factor 22 - Quality Assurance 6 Hours**
**Factor 4,800 - ASH Subcontracted Srvs 1,200 Dollars**

**20 hours of administrative time will also be required.**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
**Boe**

**Line Item 0200 - training**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:**
Conduct perform Training in support of source removal action.

**Breakdown of Cost Data:**

**Item:** Site Labor to perform above individual tasks for T-3/T-4.
- **Units:** hours
- **Unit Cost:** 132 Hours
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** 33 hours

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
- **Units:** 1 lot
- **Unit Cost:** $12K
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** $3K

**Basis for adjustment.** Costs for each UBC are divided by 4 to account for the fact that 4 UBCs will be remediated at once and only one Training is needed for the group.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Resources**

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<tr>
<th>Cost Element</th>
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<th>Quantity</th>
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**Line Item 0300 - pre-evolution meeting**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:**
Conduct Pre-Evolution Meeting in support of source removal action

**Breakdown of Cost Data:**

**Item:** Site Labor to perform above individual tasks for T-3/T-4.
- **Units:** hours
- **Unit Cost:** 60 hours
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** 15 hours

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
- **Units:** 1 lot
- **Unit Cost:** $6K
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** $1.5K

**Basis for adjustment.** Costs for each UBC are divided by 4 to account for the fact that 4 UBCs will be remediated at once and only one Pre-Evolution Meeting is needed for the group.
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

<table>
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### Line Item SYS - Contingency And Escalation

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### Line Item 0100 - mobilization

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<th>Materials/Sub Cost</th>
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**Activity ID:** 1GER161250

**Description:** Remedial Action - IHSS Group 800-4

**Cost Risk:** 2

**Schedule Risk:** 3

### Activity ID: 1GER161250 - Remedial Action - IHSS Group 800-4

**Description:** Remedial Action - IHSS Group 800-4

**Cost Risk:** 2

**Schedule Risk:** 3

### Line Item 0100 - mobilization

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<td>Item</td>
<td>Site Labor to perform above individual tasks for T-3/T-4.</td>
</tr>
<tr>
<td>Units:</td>
<td>hours</td>
</tr>
<tr>
<td>Unit Cost:</td>
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<tr>
<td>Unit Cost Adjustment Factor:</td>
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<tr>
<td>Revised Unit:</td>
<td>275</td>
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</table>

**Item:** Site Labor to perform above individual tasks for T-3/T-4.

**Item Code:** 1,100

**Unit Cost:** 1,100

**Unit Cost Adjustment Factor:** 0.25

**Revised Unit:** 275

**Item Desc:** Mobilization in support of remediation.

**Estimated Costs:**

- **Total for Activity 1GER161250:** 169,993
- **Total Cost:** 169,993
- **Total Cost:** 207,960
- **Total Cost:** 207,960
- **Total Cost:** 207,960
- **Total Cost:** 614,529
- **Total Cost:** 59,921
- **Total Cost:** 674,449

---

**For Official Use Only**
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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<tbody>
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<td>E050 ENVIRONMENTAL ENGINEERS</td>
<td>RMRS Salaried</td>
<td>Linear</td>
<td>138.00</td>
<td>Hours</td>
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<td>750 STRAIGHT TIME BASE</td>
<td>M020 MANAGERS (GRADE 69 - 72)</td>
<td>RMRS Salaried</td>
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<td>750 STRAIGHT TIME BASE</td>
<td>P080 HEALTH PHYSICISTS</td>
<td>RMRS Salaried</td>
<td>Linear</td>
<td>27.00</td>
<td>Hours</td>
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<td>750 STRAIGHT TIME BASE</td>
<td>P090 INDUSTRIAL HYGIENISTS</td>
<td>RMRS Salaried</td>
<td>Linear</td>
<td>27.00</td>
<td>Hours</td>
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<td>46000 SUBCONTRACTED SRVS</td>
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<td>Linear</td>
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</tr>
</tbody>
</table>

Breakdown of Historical Data:

Item: Site Labor to perform above individual tasks for T-3/T-4.
  Units: hours
  Unit Cost: see below
  Unit Cost Adjustment Factor: see below
  Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
  Units: 1 lot
  Unit Cost: see below
  Unit Cost Adjustment Factor: see below
  Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

T3/T4 hours 550 Environmental Engineer 138 Hours
T3/T4 hours 110 Industrial Hygienist 27 Hours
T3/T4 subcontractor dollars 184,000 Subcontractor 46,000

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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</thead>
<tbody>
<tr>
<td>750 STRAIGHT TIME BASE</td>
<td>E050 ENVIRONMENTAL ENGINEERS</td>
<td>RMRS Salaried</td>
<td>Linear</td>
<td>30.00</td>
<td>Hours</td>
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<td>750 STRAIGHT TIME BASE</td>
<td>T050 RADIATION CONTROL TECHNOLOGIST</td>
<td>KG10H Remediation Steelworkers</td>
<td>Linear</td>
<td>23.00</td>
<td>Hours</td>
</tr>
</tbody>
</table>

Item Desc:
Site Preparation including setting up fencing, trailer, etc.

Step 1: Estimator's Experience based generally on historical data for T-3/T4 Remediation.
Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc:
Excavation.

Breakdown of Historical Data:

Item: Site Labor to perform above individual tasks for T-3/T-4.
  Units: hours
  Unit Cost: see below
  Unit Cost Adjustment Factor: see below
  Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
  Units: 1 lot
  Unit Cost: see below
  Unit Cost Adjustment Factor: see below
  Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Total Contaminated Soil to be removed 667 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 667 CY

The excavation cost was based on the excavation cost for the T-3/T-4 Project. Burdened cost based on the T-3/T-4 actuals is $171,487. For the 3,800 cubic yards of contaminated soil removed this yielded a unit cost of $45 per cubic yard of contaminated soil removed. This estimate includes the removal of overburden that might be on top of the contaminated soil. The hours for an environmental engineer from T-3/T-4 were 1.09 hours per cubic yard of contaminated soil. Likewise the hours for the following were assumed to be linearly proportional:

Health Physicists .47 hours per cubic yard
Environmental Operations .31 hours per cubic yard
Industrial Hygienists 0.31 hours per cubic yard
Radiological Control Technician 1.00 hour per cubic yard

Based on $50/cubic yard from T-3/T-4, assumes a labor rate of $50/hour

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 1.09 - E050 Environmental Engineer 727 Hours
Factor 0.47 - P080 Health Physicists 314 Hours
Factor 0.31 - Project Manager 207 Hours
Factor 0.31 - P090 Industrial Hygienists 207 Hours
Factor 1.00 - T050 Radiological Control Technician 667 Hours
Factor 45.23 - A5H Subcontracted Srvs 30,168 Dollars

D&D construction trade hours were calculated using the following methodology:

ASH subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.

The dollars amounts calculated for D&D construction workers were subtracted from the subcontractor dollars and the revised ASH dollar amount was entered into Best.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

6/23/00 9:22:59 AM
### Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

**WBS No:** 1GAC0804  
**Activity ID:** 1GER161250  
**Project:** Rocky Flats Closure Project  
**WBS Filter:** 1GAC  
**Baseline Devi:**  
**Starts In FY:** *

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#### Line Item 0400 - remove and clean debris

**BOE**

**Estimator's Experience based generally on a base case of 700 cy.**

**Item Desc:**
Remove and clean debris.

**Breakdown of Historical Data:**

**Item:** Site Labor to perform above individual tasks for T-3/T-4.
- **Units:** hours
- **Unit Cost:** see below
- **Unit Cost Adjustment Factor:** see below
- **Revised Unit:** see below

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
- **Units:** 1 lot
- **Unit Cost:** see below
- **Unit Cost Adjustment Factor:** see below
- **Revised Unit:** see below

**Basis for adjustment.** The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

**Total Contaminated Soil to be removed 667 CY**
**Total Soil for Thermal Desorption 0 CY**
**Offsite Waste Volume 667 CY**

For the base case, it was assumed that about five cubic yards out of 700 cubic yards would be debris and would be segregated and cleaned. It was estimated that each cubic yard of debris would cost $1,000 or $5,000 total for 700 cubic yards. This yields a rate of $7.14 per cubic yard.

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

**Factor 7.14 - ASH Subcontracted Srvs 4,762 Dollars**

D&D construction trade hours were calculated using the following methodology:

ASH subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.

The dollars amounts calculated for D&D construction workers were subtracted from the subcontractor dollars and the revised ASH dollar amount was entered into Best.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc: Confirmation Sampling.

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
Units: hours
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
Units: 1 lot
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Total Contaminated Soil to be removed 667 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 667 CY

The analytical costs were based on T-3/T-4, which cost $435,574 for 3800 cubic yards of contaminated soil removed. This yielded a unit rate of about $115/cubic yard. Based on estimator experience the cost of sampling including labor and materials was estimated to be 20% of that rate or about $23/ cubic yard.

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 114.62 - ASH Subcontracted Srvs (Analytical) 76,452 Dollars
Factor 22.924 - ASH Subcontracted Srvs 15,290 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
The costs were divided into fixed costs and variable costs. The fixed costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Total Contaminated Soil to be removed 667 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 667 CY

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 40 - A5H Analytical 26,680 Dollars
Factor 20 - A5H Subcontracted Srvs 13,340 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
Rocky Flats Closure Project
Baseline Cost and Basis of Estimate

WBS No: 1GAC0804
Activity ID: 1GER161250

Baseline Devi
WBS Filter 1GAC
Activity Filter *

Starts In FY *

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Factors

BOE

Estimator's Experience based generally on a base case of 700 cy.

Item Desc:
Field Oversight and Project Management

Breakdown of Historical Data:

Item: Site Labor to perform above individual tasks for T-3/T-4.
Units: hours
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
Units: 1 lot
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

It was assumed that a field manager would be needed for 150 nine-hour working days or about 33 weeks. This work breaks down as follows:

Preparation Activities 50 working days
Field Activities – 80 working days
Demobilization – 20 working days
Total 150 nine-hour working days or 1350 hours

In addition it was estimated that technical staff, quality assurance, and project management would be required for the equivalent of ten additional weeks, which is 400 hours each.

Based on the base case of a 700 cubic yard removal project, these values yielded unit rates as follows

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The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Total Contaminated Soil to be removed 667 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 667 CY

Factored 1.93 - Environmental Engineer 1,287 Hours
Factored 0.57 – Technical Support 380 Hours
Factored 0.57 – Project Manager 380 Hours
Factored 0.57 – Quality Assurance 380 Hours

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6/23/00 9:22:59 AM

OFFICIAL USE ONLY
Line Item 1000 - backfill

Trade Publication

Means 1995, Site Work & Landscape Cost Data (page 34, 42, and 34)

Item Desc:
Backfill.

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
  Units: hours
  Unit Cost: see below
  Unit Cost Adjustment Factor: see below
  Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
  Units: 1 lot
  Unit Cost: see below
  Unit Cost Adjustment Factor: see below
  Revised Unit: see below

Means (1995) Site Work & Landscape Cost Data as follows:
Common Fill $4.77/cubic yard (page 34 Borrow Bank Measure)
Hauling $3.98/cubic yard (page 42 2-mile round-trip, 6 cubic yard dump truck)
Backfilling $1.69/cubic yard (page 34)
Burden (43%) $4.49/cubic yard
Total $14.23/cubic yard or about $15/cubic yard

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 15 - A5H Subcontracted Srvs 10,005 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

Line Item 1100 - demobilization

BOE

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc:
Demobilization.

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
  Units: hours
  Unit Cost: see below
  Unit Cost Adjustment Factor: see below
  Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
  Units: 1 lot
Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Demobilization: Based on the T-3/T-4 project, it was assumed that demobilization costs would cover demobilization for excavation activities also. The subcontractor cost for demobilization was about $95,000 for 3,800 cubic yards at the T-3/T-4 project. In addition it was estimated that the following hours were necessary:

- Environmental Engineer 300 hours
- Health Physicist 100 hours
- Manager 200 hours
- Industrial Hygiene 100 hours

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

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This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites. (T-3/T-4 and others)
Item Desc: Perform Data Analysis including GIS representation of data, Closeout Report, and associated project management.

Required level of effort: Environmental Engineer - 80 hours
Environmental Scientist - 20 hours
Computer Specialist - 160 hours (GIS, SWD)
Manager - 20 hours
Administrative - 20 hours
Cost Estimators - 20 hours

Breakdown of Cost Data:
Item: Develop Documentation
Units: hours
Unit Cost: 320

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

Line Item SYS - Contingency And Escalation
BOE

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WBS No: 1GAC0805 Title: Group 800-5 (B887)
Activity ID: 1GER164100 Description: SAP Preparation - IHSS Group 800-5 (B887)

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Total for Activity 1GER164100:

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

Item Desc: Preparation of SAP Addenda to Industrial Area Characterization Plan.
### Breakdown of Cost Data:
- **Item**: Preparation of SAP addenda
- **Units**: hours
- **Unit Cost**: 120
- **Unit Cost Adjustment Factor**: none
- **Revised Unit Hours**: 120

**Basis for adjustment.**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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**Line Item 0200 - HASP Addenda**

**BOE**

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Item Desc:**
Preparation of HASP addenda to Industrial Area Characterization Plan

**Breakdown of Cost Data:**
- **Item**: Preparation of addenda for HASP.
- **Units**: hours
- **Unit Cost**: 140
- **Unit Cost Adjustment Factor**: none
- **Revised Unit Hours**: 140

**Basis for adjustment.**

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**Line Item 0300 - QAP Addenda**

**BOE**

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Item Desc:**
Preparation of SAP Addenda to Industrial Area Characterization Plan.

**Breakdown of Cost Data:**
- **Item**: Preparation of QAP addenda
- **Units**: hours
- **Unit Cost**: 60
- **Unit Cost Adjustment Factor**: none
- **Revised Unit Hours**: 60

**Basis for adjustment.**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
**Rocky Flats Closure Project**  
Baseline Cost and Basis of Estimate

### WBS Filter
- 1GAC

### Activity Filter
- 1GER164100

#### WBS No:
- 1GAC0805

#### Activity ID:
- 1GER164100

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<th>Description</th>
<th>Quantity</th>
<th>Units</th>
<th>BOE Type</th>
<th>Labor Hours</th>
<th>Labor Cost</th>
<th>Materials/Sub Cost</th>
<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
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<th>Total Cost</th>
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**Line Item 0100 - procurement & field prep**

**BOE**

**Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation**

**Item Desc:**

**Breakdown of Cost Data:**

**Item:** Site Labor to perform above individual tasks for either Ryan's Pit or T-3/T-4.
- **Units:** hours
- **Unit Cost:** $130
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** 345 hours

**Item:** Subcontractor costs to perform above individual tasks for either Ryan's Pit or T-3/T-4.
- **Units:** 1 lot
- **Unit Cost:** $10K
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** $2.5K

**Basis for adjustment:** Hours and costs for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be characterized at once.

**Procurement includes preparation of statement of work, proposal review (technical evaluation), and negotiations.** Based on a T-3/T-4 burdened cost of $29,186.52. Assuming it is primarily labor hours (RMRS Environmental Engineer charging at $57.45 per hour) yields 508 hours which rounds to 510 total hours.

**Davis Bacon Documentation:** It was assumed that it would take an environmental engineer twenty-four hours to prepare a Davis Bacon cost estimate and to support the Davis-Bacon determination.

**Subcontractor Health and Safety Plan:** Costs for the health and safety plan are based on Ryan's Pit, which cost approximately $10,000. It was assumed that these are A5H dollars. In addition, it was assumed that a safety engineer, an industrial hygienist, and a radiological engineer would each provide one week (40 hours) of support for review and document preparation.

**Radiological Work Permit:** It was assumed that it would take a radiological control technician two working days (18 hours) to complete counting preparation and review.

**Implementation Plan:** It was estimated that this activity would take 13 weeks of time for engineers, scientists or equivalent to complete. This would include preparation of an implementation plan as required (Rocky Flats Cleanup Agreement, Appendix 3, Interim Guidance Document, Dated August 1977). In addition this includes all tasks related to documentation for the Integrated Work Control Program and Integrated Safety Management.
Ecology Survey/National Environmental Protection Act (NEPA) Support: It was estimated that this would take 40 hours for an ecologist. The activities include NEPA review and support in document preparation, site surveys to verify compliance with ecological regulations, categorical exclusions, and NEPA evaluations.

Utility Clearance/Soil Disturbance Permits: It was estimated based on experience that it would take the equivalent 2 weeks (80 hours) for technical staff to do utility surveys, prepare and review soil disturbance permits, and prepare authorizing documents for excavation.

The combined resources for procurement and field preparations are:

<table>
<thead>
<tr>
<th>Total Procurement and Field Preparation Hours</th>
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<tbody>
<tr>
<td>Environmental Engineer 1134 hours</td>
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<tr>
<td>Safety Engineer 40 hours</td>
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<tr>
<td>Industrial Hygiene 40 hours</td>
</tr>
<tr>
<td>Radiological Engineering 58 hours</td>
</tr>
<tr>
<td>Radiological Control Technician 18 hours</td>
</tr>
<tr>
<td>Ecologist/Life Scientist 40 hours</td>
</tr>
<tr>
<td>Manager 50 hours</td>
</tr>
<tr>
<td>Quality Assurance* 29 hours</td>
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<tr>
<td>ASK Total $10,000</td>
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</table>

* On some projects these hours were assumed to be included in other tasks or part of this task under environmental engineer or one of the other job functions.

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

- Factor 1134 - Environmental Engineer 283 Hours
- Factor 40 - Safety Engineer 10 Hours
- Factor 40 - Industrial Hygiene 10 Hours
- Factor 58 - Radiological Engineering 14 Hours
- Factor 18 - RCT 5 Hours
- Factor 40 - Life Scientist 10 Hours
- Factor 50 - Project Manager 13 Hours
- Factor 10000 - ASK Subcontracted Services 2,500 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
Rocky Flats Closure Project  
Baseline Cost and Basis of Estimate

WBS No: 1GAC0805  
Activity ID: 1GER164120

**Baseline Devl**  
**WBS Filter** 1GAC  
**Activity Filter** *  
**Starts In FY** *

**ESC**  
**ESCALATION** 0000  
**ZDEPT**  
**No Department**  
**Linear**  
1,260.07 Dollars

**Activity Filter**  
**Activity ID:** 1GER164140  
**Description:** Readiness Assessment - IHSS Group 800-5

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<th>Description</th>
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<th>Units</th>
<th>BOE Type</th>
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**Total for Activity 1GER164140:**  
68 66 1,887 1,015 490 490 3,393 3,925 532 3,925

**Line Item 0100 - readiness assessment**

**BOE**

Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation

**Item Desc:**

Evaluate readiness of the field characterization team and plans.

**Breakdown of Cost Data:**

**Item:** Site Labor to perform Readiness Assessment for T-3/T-4.

- **Units:** hours
- **Unit Cost:** 187
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** 48 plus 20 hours administrative support

**Item:** Subcontractor costs to perform Readiness Assessment for T-3/T-4.

- **Units:** 1 lot
- **Unit Cost:** $4,800
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** $1,200

It was estimated that subcontractor involvement would require 80 hours at $60/hour = $4,800. It was assumed that about 3 weeks of time was required for an environmental engineer or similar person in addition to 12 hours of project management, which yielded 132 hours. An additional 11 hours was added for management oversight. It was estimated that a radiological engineer (QA) and an industrial hygienist would be needed for 2.5 days each (22 hours).

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 projects will be conducted at once and only one of each fixed cost is needed for the group.

**Factor 132 - Environmental Engineer 33 Hours**
**Factor 22 - Health Physicists 6 Hours**
**Factor 11 - Manager 3 Hours**
**Factor 22 - Quality Assurance 6 Hours**
**Factor 4,800 - A5H Subcontracted Svrs 1,200 Dollars**

20 hours of administrative time will also be required.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Resources**

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## Rocky Flats Closure Project
### Baseline Cost and Basis of Estimate

#### WBS Filter
- 1GAC

#### Activity Filter
- 1GER164140

#### WBS No:
- 1GAC0805

#### Activity ID:
- 1GER164140

---

### Line Item SYS - Contingency And Escalation

#### BOE Resources

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#### Activity ID: 1GER164150

**Description:** Field Sampling, Lab Analysis - IHSS Group 800-5

**Cost Risk:** 1

**Schedule Risk:** 1

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**Total for Activity 1GER164150:**
- Labor Cost: 32
- Total Cost: 953
- Labor Cost: 10,212
- Total Cost: 12,798
- Burden Cost: 13,067

---

### Line Item 0100 - collect geoprobe samples

#### BOE

- Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Item Desc:**
- Collection of geoprobe samples with the site geoprobe with two technicians. A site Environmental Engineer will direct the boring placement, log the borings; collect, containerize, package, and ship the samples; prepare field QC documentation, and prepare field notes on a full time basis. A site RCT will monitor the site for radiological contamination on a full time basis. A site Industrial Hygienist will implement the field portion of the HASP on a full time basis. Decon Operations staff will decon the vehicle and equipment when it leaves the work area on a half time basis. It is estimated that one 10' boring will be place per 500 SF of building footprint (same as Bldg. 123 characterization) with 5 samples per 10' boring. It is estimated that one boring per eight hours can be completed.

**Breakdown of Cost Data:**
- Item: Site Personnel for support of geoprobe samples
  - Units: hours
  - Unit Cost: 32
  - Unit Cost Adjustment Factor: none
  - Revised Unit Hours: 32
- Item: Kaiser-Hill/RMRS Geoprobe unit with 2 Technician crew. Item costs $100 per hour or $800 per 8-hour day.
  - Units: dollars
  - Unit Cost: 800
  - Unit Cost Adjustment Factor: none
  - Revised Unit Hours: 800

**Basis for adjustment:**
- This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

### Resources

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<th>Skill</th>
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### Line Item 0200 - analyze samples

#### BOE

- Vendor Quote

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6/23/00 9:23:01 AM

OFFICIAL USE ONLY
**Item Desc:** Analyze samples produced from geoprobe borings. It is anticipated that 5 samples from each boring will be collected. They will be analyzed for Metals, VOCs, SVOCs, PCBs, and radiionuclides (est. 3 isotopes) with a 30 day TAT. This item is priced on a per sample basis. Per sample costs include DOT rad screen, bottle charge, shipping, and validation.

Breakdown of Cost Data:
- **Item:** Analyze samples at an offsite laboratory.
  - **Units:** analysis
  - **Unit Cost:** Metals $345, VOCs $280, SVOCs $440, PCBs and other analytes $150, and Radioclines 3 isotopes $590 per each sample.

  - **Unit Cost Adjustment Factor:** Must add: DOT rad screen $32/sample, bottle charge $7/sample, shipping $4.2/bottle, and validation per each: $17.30 VOA, $19.25 SVOC, $16.75 Metals, $5.95 PCB, and $15.60 Rad.

  - **Revised Unit Hours:** Metals $405, VOCs $341, SVOCs $502, PCBs and other analytes $199, and Rad $649. This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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**Line Item SYS - Contingency And Escalation**

**BOE Resources**

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<td>R100S PMRS Salaried</td>
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**Activity ID:** 1GER164170 **Description:** Prepare Summary/NFA - IHSS Group 800-5

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<th>Quantity</th>
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Total for Activity 1GER164170: | 656 | 19,024 | 0 | 3,482 | 22,506 | 5,365 | 27,871 |

**Schedule Risk:** 1 **Cost Risk:** 1
Line Item 0100 - develop documentation

Estimator's Experience:
Estimate for summary report based on estimator's 16 years of experience performing and costing projects of similar size and scope.

Item Desc:
Perform Data Analysis including GIS representation of data, NFA Summary, Characterization Report, and associated project management. Disposition comments and finalize document

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<th>Cost Element</th>
<th>Skill</th>
<th>Quantity</th>
<th>Units</th>
<th>Curve</th>
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Computer Specialist 80 hrs Identify & pull existing data from database.
GIS Specialist 80 hrs Develop maps for Report. Print multiple copies.
Technical Editor 40 hrs Complete initial and revised tech edits of Report.
Quality Assurance 60 hrs Review
Environmental Engineer 40 hrs Peer review
Regulatory Compliance 20 hrs Review
Management 48 hrs
Legal 8 hrs Review
Administrative Support 40 hrs Copy & assemble final documents, submit to records.

Breakdown of Cost Data:
Item: Develop Documentation
Units: Hours
Unit Cost: 656
Revised Unit Hours: 656

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Line Item SYS - Contingency And Escalation

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Activity ID: 1GER164180
Description: Prepare Decision Document - IHSS Group 800-5

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<th>Labor Cost Total</th>
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<th>Contingency &amp; Escalation</th>
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### Line Item 0100 - PAM

**BOE**

**Estimator's Experience** based generally on historical data for Ryan's Pit

**Item Desc:**
Preparation of PAM or IM/IRA in support of source removal of previously characterized UBC.

**Proposed Action Memorandum:** A bottoms-up estimate based on historical costs was used as the basis for the estimate. Based on Ryan's Pit (IHSS 108), the cost for the PAM was $50,000 (contractor costs). Assuming that labor rates at this time were approximately $75 (based on a cost center 217). The total labor for a PAM would be approximately 666 hours, which rounds to 700 hours. It was assumed that 10% would be required for managerial hours.

For a PAM the total labor hours are:
- Environmental Engineer: 700 Hours
- Manager: 70 Hours

**Factor**
- 700 Environmental Engineer: 175 hours
- 70 Manager: 18 hours

**Breakdown of Cost Data:**
- **Item:** Preparation of PAM for Ryan's Pit source removal action.
  - **Units:** hours
  - **Unit Cost:** $770
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit Hours:** 193

**Basis for adjustment.** Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

**Resources**

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<td><strong>Basis for adjustment.</strong> Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.</td>
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### Line Item 0200 - SAP

**BOE**

**Estimator's Experience** based generally on historical data for Ryan's Pit

**Item Desc:**
Preparation of SAP in support of source removal of previously characterized UBC.

**Breakdown of Cost Data:**
- **Item:** Preparation of SAP for Ryan's Pit source removal action.
  - **Units:** hours
  - **Unit Cost:** $300
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit Hours:** 76

**Basis for adjustment.** Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

**Resources**

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### Line Item 0300 - WMP

**BOE**

**Estimator's Experience** based generally on historical data for Ryan's Pit

**Item Desc:**

Preparation of WMP in support of source removal of previously characterized UBC.

Breakdown of Historical Data:
- Item: Preparation of WMP for Ryan's Pit source removal action.
  - Units: hours
  - Unit Cost: 80
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit Hours: 20

Basis for adjustment. Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

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Factors 20 hrs

**Line Item 0400 - IM/IRA Decision Document**

**BOE**

Estimator's Experience based generally on historical data for Ryan's Pit

**Item Desc:** Preparation of Decision Document in support of source removal of previously characterized UBC.

Breakdown of Historical Data:
  - Units: hours
  - Unit Cost: 1700
  - Unit Cost Adjustment Factor: none
  - Revised Unit Hours: none

Basis for adjustment.

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<th>Curve</th>
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Factors 1530 hrs

**Line Item SYS - Contingency And Escalation**

**BOE**

**Resources**

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Factors 3806.13 Dollars

Factors 7813.60 Dollars

**Activity ID: 1GER164210**

**Description:** Procurement and Field Prep - HSS Grouping 800-5

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Total for Activity 1GER164210: 345 10,637 2,114 8,801 21,553 3,702 25,254

**Line Item 0100 - procurement & field prep**

**BOE**

Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation


Breakdown of Cost Data:
- Item: Site Labor to perform above individual tasks for either Ryan's Pit or T-3/T-4.
  - Units: hours
Item: Subcontractor costs to perform above individual tasks for either Ryan's Pit or T-3/T-4.

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<th>Units:</th>
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Basis for adjustment. Hours and costs for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be characterized at once.

Procurement includes preparation of statement of work, proposal review (technical evaluation), and negotiations. Based on a T-3/T-4 burdened cost of $29,186.52. Assuming it is primarily labor hours (RMRS Environmental Engineer charging at $57.45 per hour) yields 508 hours which rounds to 510 total hours.

Davis Bacon Documentation: It was assumed that it would take an environmental engineer twenty-four hours to prepare a Davis Bacon cost estimate and to support the Davis-Bacon determination.

Subcontractor Health and Safety Plan: Costs for the health and safety plan are based on Ryan's Pit, which cost approximately $10,000. It was assumed that these are A5H dollars. In addition, it was assumed that a safety engineer, an industrial hygienist, and a radiological engineer would each provide one week (40 hours) of support for review and document preparation.

Radiological Work Permit: It was assumed that it would take a radiological control technician two working days (18 hours) to complete counting preparation and review.

Implementation Plan: It was estimated that this activity would take 13 weeks of time for engineers, scientists or equivalent to complete. This would include preparation of an implementation plan as required (Rocky Flats Cleanup Agreement, Appendix I, Interim Guidance Document, Dated August 1977). In addition this includes all tasks related to documentation for the Integrated Work Control Program and Integrated Safety Management.

Ecology Survey/National Environmental Protection Act (NEPA) Support: It was estimated that this would take 40 hours for an ecologist. The activities include NEPA review and support in document preparation, site surveys to verify compliance with ecological regulations, categorical exclusions, and NEPA evaluations.

Utility Clearance/Soil Disturbance Permits: It was estimated based on experience that it would take the equivalent 2 weeks (80 hours) for technical staff to do utility surveys, prepare and review soil disturbance permits, and prepare authorizing documents for excavation.

The combined resources for procurement and field preparations are

**Total Procurement and Field Preparation Hours**

- Environmental Engineer 1134 hours
- Safety Engineer 40 hours
- Industrial Hygiene 40 hours
- Radiological Engineering 58 hours
- Radiological Control Technician 18 hours
- Ecologist/Life Scientist 40 hours
- Manager 50 hours
- Quality Assurance* 29 hours
- A5H Total $10,000

* On some projects these hours were assumed to be included in other tasks or part of this task under environmental engineer or one of the other job functions.

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

- Factor 1134 - Environmental Engineer 283 Hours
- Factor 40 - Safety Engineer 10 Hours
- Factor 40 - Industrial Hygiene 10 Hours
- Factor 58 - Radiological Engineering 14 Hours
- Factor 18 - RCT 5 Hours
- Factor 40 - Life Scientist 10 Hours
- Factor 50 - Project Manager 13 Hours
- Factor 10000 - A5H Subcontracted Services 2,500 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
## Activity: Readiness Assessment

### Item 0010 - Readiness Assessment

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**Total for Activity 1GER164240:**

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**Item Desc:**

Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation

breakdown of Cost Data:

  - Units: hours
  - Unit Cost: $187
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit: 48 plus 20 hours management support = 68 hours

  - Units: 1 lot
  - Unit Cost: $4800
  - Unit Cost Adjustment Factor: 0.25
  - Revised Unit: $1200

It was estimated that subcontractor involvement would require 80 hours at $60/hour = $4,800. It was assumed that about 3 weeks of time was required for an environmental engineer or similar person in addition to 12 hours of project management, which yielded 132 hours. An additional 11 hours was added for management oversight. It was estimated that a radiological engineer (QA) and an industrial hygienist would be needed for 2.5 days each (22 hours).
The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 projects will be conducted at once and only one of each fixed cost is needed for the group.

Factor 132 - Environmental Engineer 33 Hours
Factor 22 - Health Physicists 6 Hours
Factor 11 - Manager 3 Hours
Factor 22 - Quality Assurance 6 Hours
Factor 4,800 - A5H Subcontracted Srvs 1,200 Dollars

20 hours of management administrative time will also be required.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

<table>
<thead>
<tr>
<th>Resources</th>
<th>Cost Element</th>
<th>Skill</th>
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**Line Item 0200 - training**

**BOE**

Estimator’s Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:**
Conduct perform Training in support of source removal action.

**Breakdown of Cost Data:**
**Item:** Site Labor to perform above individual tasks for T-3/T-4.
- Units: hours
- Unit Cost: $12K
- Unit Cost Adjustment Factor: 0.25
- Revised Unit: $3K

**Line Item 0300 - pre-evolution meeting**

**BOE**

Estimator’s Experience based generally on historical data for T-3/T4 Remediation.
**Rocky Flats Closure Project**  
**Baseline Cost and Basis of Estimate**  

**Item Desc:** Conduct Pre-Evolution Meeting in support of source removal action

**Breakdown of Cost Data:**

- **Item:** Site Labor to perform above individual tasks for T-3/T-4.
  - **Units:** hours
  - **Unit Cost:** 60 hours
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** 15 hours

- **Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
  - **Units:** 1 lot
  - **Unit Cost:** $6K
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** $1.5K

**Basis for adjustment:** Costs for each UBC are divided by 4 to account for the fact that 4 UBCs will be remediated at once and only one Pre-Evolution Meeting is needed for the group.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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<th>Curve</th>
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**Line Item SYS - Contingency And Escalation**

**BOE**

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**Activity ID:** 1GER164250  
**Description:** Remedial Action - IHSS Group 800-5  
**Cost Risk:** 2  | **Schedule Risk:** 3

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Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediating at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

T3/T4 hours 110 Health Physicists 27 Hours
T3/T4 hours 330 Manager 83 Hours
T3/T4 hours 550 Environmental Engineer 138 Hours
T3/T4 hours 110 Industrial Hygienist 27 Hours
T3/T4 subcontractor dollars 184,000 Subcontractor 46,000

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
T3/T4 hours 120 Environmental Engineer 30 hours
T3/T4 dollars 30,000 Subcontracted Svrs 7,500 Dollars

D&D construction trade hours were calculated using the following methodology:

ASK subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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Line Item 0300 - excavation

BOE

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc:
Excavation.

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
  Units: hours
  Unit Cost: see below
  Unit Cost Adjustment Factor: see below
  Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
  Units: 1 lot
  Unit Cost: see below
  Unit Cost Adjustment Factor: see below
  Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Total Contaminated Soil to be removed 38 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 38 CY

The excavation cost was based on the excavation cost for the T-3/T-4 Project. Burdened cost based on the T-3/T-4 actuals is $171,487. For the 3,800 cubic yards of contaminated soil removed this yielded a unit cost of $45 per cubic yard of contaminated soil removed. This estimate includes the removal of overburden that might be on top of the contaminated soil. The hours for an environmental engineer from T-3/T-4 were 1.09 hours per cubic yard. Likewise the hours for the following were assumed to be linearly proportional:

Health Physicists .47 hours per cubic yard
Environmental Operations .31 hours per cubic yard
Industrial Hygienists 0.31 hours per cubic yard
Radiological Control Technician 1.00 hour per cubic yard

* Based on $50/cubic yard from T-3/T-4, assumes a labor rate of $50/hour

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.
**Resources**

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**Line Item 0400 - remove and clean debris**

**BOE**

Estimator's Experience based generally on a base case of 700 cy.

**Item Desc:**
Remove and clean debris.

**Breakdown of Historical Data:**

**Item:** Site Labor to perform above individual tasks for T-3/T-4.

- **Units:** hours
- **Unit Cost:** see below
- **Unit Cost Adjustment Factor:** see below
- **Revised Unit:** see below

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.

- **Units:** 1 lot
- **Unit Cost:** see below
- **Unit Cost Adjustment Factor:** see below
- **Revised Unit:** see below

**Basis for adjustment.** The costs were divided into fixed costs and variable costs. The fixed costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

**Total Contaminated Soil to be removed 38 CY**

**Total Soil for Thermal Desorption 0 CY**

**Offsite Waste Volume 38 CY**

---

*OFFICIAL USE ONLY*
For the base case, it was assumed that about five cubic yards out of 700 cubic yards would be debris and would be segregated and cleaned. It was estimated that each cubic yard of debris would cost $1,000 or $5,000 total for 700 cubic yards. This yields a rate of $7.14 per cubic yard.

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 7.14 - A5H Subcontracted Srvs 271 Dollars

D&D construction trade hours were calculated using the following methodology:

A5H subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.

RCT hours were calculated using the following methodology, unless they were already estimated.

For Site Preparation tasks - RCT hours were the same as D&D construction hours.

For all other tasks A5H subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under KG10H department code.

The dollars amounts calculated for D&D construction workers and RCTs were subtracted from the subcontractor dollars and the revised A5H dollar amount was entered into Best.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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<th>Resources</th>
<th>Cost Element</th>
<th>Skill</th>
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| ASH SUBCONTRACTED SRVS | 0000 | NONE | K265S | ER Program | Linear | 185.22 | Dollars |
| Factors 219 | sub/c support |       |       |            |       |        |

**Line Item 0600 - confirmation sampling**

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc:
Confirmation Sampling.

Breakdown of Historical Data:

Item: Site Labor to perform above individual tasks for T-3/T-4.
  Units: hours
  Unit Cost: see below
  Unit Cost Adjustment Factor: see below
  Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
  Units: 1 lot
  Unit Cost: see below
  Unit Cost Adjustment Factor: see below
  Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Total Contaminated Soil to be removed 38 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 38 CY

The analytical costs were based on T-3/T-4, which cost $435,574 for 3800 cubic yards of contaminated soil removed. This yielded a unit rate of about $115/cubic yard. Based on estimator experience the cost of sampling including labor and materials was estimated to be 20% of that rate or about $23/ cubic yard.

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.
For Site Preparation tasks - RCT hours were the same as D&D construction hours.
For all other tasks A5H subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under KG10H department code.

The dollar amounts calculated for D&D construction workers and RCTs were subtracted from the subcontractor dollars and the revised A5H dollar amount was entered into Best.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Line Item 0700 - prepare waste acceptance forms**

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc:
Prepare Waste Acceptance Forms

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
  Units: hours
  Unit Cost: see below
  Unit Cost Adjustment Factor: see below
  Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
  Units: 1 lot
  Unit Cost: see below
  Unit Cost Adjustment Factor: see below
  Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

T3/T4 hours 80 environmental engineer 20 hours

**Line Item 0800 - waste acceptance sampling**

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc:
Waste Acceptance Sampling

Breakdown of Historical Data:
Project: Rocky Flats Closure Project
Baseline Cost and Basis of Estimate

Item: Site Labor to perform above individual tasks for T-3/T-4.
Units: hours
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
Units: 1 lot
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Because the waste acceptance sampling is difficult to predict and could vary significantly from project to project, it was assumed that about $800 worth of additional analysis would be required for 20 cubic yards which is the volume that can be placed in one roll-off. This yielded a unit rate of about $40/cubic yard. This sampling and analysis is in addition to the confirmational samples so the costs are not as great. It was assumed that this sampling would be more labor intensive so the sampling costs were estimated to be about 50% of the analytical costs or about $20/cubic yard.

Total Contaminated Soil to be removed 38 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 38 CY

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 40 - A5H Analytical 1,520 Dollars
Factor 20 - A5H Subcontracted Srvs 760 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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Line Item 0900 - field oversight & project mgmt

Estimator's Experience based generally on a base case of 700 cy.

Item Desc:
Field Oversight and Project Management

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
Units: hours
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
Units: 1 lot
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at...
once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

It was assumed that a field manager would be needed for 150 nine-hour working days or about 33 weeks. This work breaks down as follows:

Preparation Activities 50 working days
Field Activities – 80 working days
Demobilization - 20 working days
Total 150 nine-hour working days or 1350 hours

In addition it was estimated that technical staff, quality assurance, and project management would be required for the equivalent of ten additional weeks, which is 400 hours each.

Based on the base case of a 700 cubic yard removal project, these values yielded unit rates as follows

<table>
<thead>
<tr>
<th>Hours Per Cubic Yard</th>
<th>Of Contaminated Soil</th>
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<tr>
<td>Field Manager 1.93</td>
<td>Technical Staff .57</td>
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<td>Quality Assurance .57</td>
<td>Project Management .57</td>
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</table>

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Total Contaminated Soil to be removed 38 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 38 CY

| Factor 1.93 – Environmental Engineer 73 Hours |
| Factor 0.57 – Technical Support 22 Hours |
| Factor 0.57 – Project Manager 22 Hours |
| Factor 0.57 – Quality Assurance 22 Hours |

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Means 1995, Site Work & Landscape Cost Data (page 34, 42, and 34)

Item Desc:
Backfill.

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
  Units: hours
  Unit Cost: see below
  Unit Cost Adjustment Factor: see below
  Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
  Units: 1 lot
  Unit Cost: see below
  Unit Cost Adjustment Factor: see below
  Revised Unit: see below

Means (1995) Site Work & Landscape Cost Data as follows:
## Common Fill
- $4.77/cubic yard (page 34 Borrow Bank Measure)

## Hauling
- $3.98/cubic yard (page 42 2-mile round-trip, 6 cubic yard dump truck)

## Backfilling
- $1.69/cubic yard (page 34)

## Burden (43%) $4.49/cubic yard

Total $14.23/cubic yard or about $15/cubic yard

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 15 - A5H Subcontracted Srvs 570 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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<tr>
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### Line Item 1100 - Demobilization

**Estimator's Experience** based generally on historical data for T-3/T4 Remediation.

**Item Desc:**
Demobilization.

**Breakdown of Historical Data:**

**Item:** Site Labor to perform above individual tasks for T-3/T-4.
- **Units:** hours
- **Unit Cost:** see below
- **Unit Cost Adjustment Factor:** see below
- **Revised Unit:** see below

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
- **Units:** 1 lot
- **Unit Cost:** see below
- **Unit Cost Adjustment Factor:** see below
- **Revised Unit:** see below

**Basis for adjustment.** The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

**Demobilization:** Based on the T-3/T-4 project, it was assumed that demobilization costs would cover demobilization for excavation activities also. The subcontractor cost for demobilization was about $95,000 for 3,800 cubic yards at the T-3/T-4 project. In addition it was estimated that the following hours were necessary:

- **Environmental Engineer 300 hours**
- **Health Physicist 100 hours**
- **Manager 200 hours**
- **Industrial Hygenie 100 hours**

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

**Factors**

- **Factor 300 - Environmental Engineer 75 Hours**
- **Factor 100 - Health Physicists 25 Hours**
- **Factor 200 - Manager 50 Hours**
- **Factor 100 - P090 Industrial Hygienists 25 Hours**
- **Factor 95000 - A5H Subcontracted Srvs 23,750 Dollars**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
Rocky Flats Closure Project

Baseline Cost and Basis of Estimate

WBS No: 1GAC0805
Activity ID: 1GER164250

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Total for Activity 1GER164270:

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Item Desc:
Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites. (T-3/T-4 and others)

Required level of effort:
- Environmental Engineer - 80 hours
- Environmental Scientist - 20 hours
- Computer Specialist - 160 hours (GIS, SWD)
- Manager - 20 hours
- Administrative - 20 hours
- Cost Estimators - 20 hours

Breakdown of Cost Data:
- Item: Develop Documentation
- Units: hours
- Unit Cost: 320
- Unit Cost Adjustment Factor: none
- Revised Unit Hours: 320
### Rocky Flats Closure Project

#### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0805  
**Activity ID:** 1GER164270

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Total for Activity 1G80060100:

- **Total Hours:** 200
- **Total Labor Cost:** 7,656
- **Total Materials/Sub Cost:** 3,488
- **Total Contingency & Escalation:** 3,824
- **Total Prime Cost:** 14,968
- **Total Cost:** 17,617

**Line Item 0100 - SAP Addenda**

- **Description:** Preparation of SAP Addenda to Industrial Area Characterization Plan.  
  - **Breakdown of Cost Data:**  
    - **Item:** Preparation of SAP addenda  
      - **Units:** hours  
      - **Unit Cost:** 120  
      - **Unit Cost Adjustment Factor:** none  
      - **Revised Unit Hours:** 120  
  - **Basis for adjustment:**  
    - This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Resources**

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**Line Item 0200 - HASP Addenda**

- **Description:** Preparation of HASP addenda to Industrial Area Characterization Plan.  
  - **Breakdown of Cost Data:**  
    - **Item:** Preparation of addenda for HASP.  
      - **Units:** hours  
      - **Unit Cost:** 140  
      - **Unit Cost Adjustment Factor:** none

**Resources**

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**Line Item 0200 - HASP Addenda**

- **Description:** Preparation of HASP addenda to Industrial Area Characterization Plan.  
  - **Breakdown of Cost Data:**  
    - **Item:** Preparation of addenda for HASP.  
      - **Units:** hours  
      - **Unit Cost:** 140  
      - **Unit Cost Adjustment Factor:** none

**Resources**

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Revised Unit Hours: 140

Basis for adjustment.

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Line Item 0300 - QAP Addenda

BOE

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

Item Desc:
Preparation of SAP Addenda to Industrial Area Characterization Plan.

Breakdown of Cost Data:
Item: Preparation of QAP addenda
Units: hours
Unit Cost: 60
Unit Cost Adjustment Factor: none
Revised Unit Hours: 60

Basis for adjustment.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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Line Item SYS - Contingency And Escalation

BOE

Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation

Item Desc:
Breakdown of Cost Data:

Item: Site Labor to perform above individual tasks for either Ryan's Pit or T-3/T-4.
   Units: hours
   Unit Cost: 1380
   Unit Cost Adjustment Factor: 0.25
   Revised Unit: 345 hours

Item: Subcontractor costs to perform above individual tasks for either Ryan's Pit or T-3/T-4.
   Units: 1 lot
   Unit Cost: $10K
   Unit Cost Adjustment Factor: 0.25
   Revised Unit: $2.5K

Basis for adjustment. Hours and costs for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be characterized at once.

Procurement includes preparation of statement of work, proposal review (technical evaluation), and negotiations. Based on a T-3/T-4 burdened cost of $29,186.52. Assuming it is primarily labor hours (RMRS Environmental Engineer charging at $57.45 per hour) yields 508 hours which rounds to 510 total hours.

Davis Bacon Documentation: It was assumed that it would take an environmental engineer twenty-four hours to prepare a Davis Bacon cost estimate and to support the Davis-Bacon determination.

Subcontractor Health and Safety Plan: Costs for the health and safety plan are based on Ryan's Pit, which cost approximately $10,000. It was assumed that these are A5H dollars. In addition, it was assumed that a safety engineer, an industrial hygienist, and a radiological engineer would each provide one week (40 hours) of support for review and document preparation.

Radiological Work Permit: It was assumed that it would take a radiological control technician two working days (18 hours) to complete counting preparation and review.

Implementation Plan: It was estimated that this activity would take 13 weeks of time for engineers, scientists or equivalent to complete. This would include preparation of an implementation plan as required (Rocky Flats Cleanup Agreement, Appendix J, Interim Guidance Document, Dated August 1977). In addition this includes all tasks related to documentation for the Integrated Work Control Program and Integrated Safety Management.

Ecology Survey/National Environmental Protection Act (NEPA) Support: It was estimated that this would take 40 hours for an ecologist. The activities include NEPA review and support in document preparation, site surveys to verify compliance with ecological regulations, categorical exclusions, and NEPA evaluations.

Utility Clearance/Soil Disturbance Permits: It was estimated based on experience that it would take the equivalent 2 weeks (80 hours) for technical staff to do utility surveys, prepare and review soil disturbance permits, and prepare authorizing documents for excavation.

The combined resources for procurement and field preparations are:

Total Procurement and Field Preparation Hours
- Environmental Engineer 1134 hours
- Safety Engineer 40 hours
- Industrial Hygiene 40 hours
- Radiological Engineering 58 hours
- Radiological Control Technician 18 hours
- Ecologist/Life Scientist 40 hours
- Manager 50 hours
- Quality Assurance* 29 hours
- A5H Total $10,000

* On some projects these hours were assumed to be included in other tasks or part of this task under environmental engineer or one of the other job functions.

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

Factor 1134 - Environmental Engineer 283 Hours
Factor 40 - Safety Engineer 10 Hours
Factor 40 - Industrial Hygiene 10 Hours
Factor 58 - Radiological Engineering 14 Hours
Factor 18 - RCT 5 Hours
Factor 40 - Life Scientist 10 Hours
Factor 50 - Project Manager 13 Hours
## Baseline Cost and Basis of Estimate

### Resources

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### Activity ID: 1G80060140 - Readiness Assessment - IHSS Group 800-6

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Total for Activity 1G80060140: 66 1,887 1,015 986 986 653 3,555

### Line Item 0100 - readiness assessment

**BOE**

Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation

**Item Desc:**

Evaluate readiness of the field characterization team and plans.

**Breakdown of Cost Data:**

**Item: Site Labor to perform Readiness Assessment for T-3/T-4.**

- **Units:** hours
- **Unit Cost:** $187
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** 48 plus 20 hours administrative support

**Item: Subcontractor costs to perform Readiness Assessment for T-3/T-4.**

- **Units:** 1 lot
- **Unit Cost:** $4800
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** $1200

It was estimated that subcontractor involvement would require 80 hours at $60/hour = $4,800. It was assumed that about 3 weeks of time was required for an environmental engineer or similar person in addition to 12 hours of project management, which yielded 132 hours. An additional 11 hours was added for management oversight. It was estimated that a radiological engineer (QA) and an industrial hygienist would be needed for 2.5 days each (22 hours).
The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 projects will be conducted at once and only one of each fixed cost is needed for the group.

Factor 132 - Environmental Engineer 33 Hours
Factor 22 - Health Physicists 6 Hours
Factor 11 - Manager 3 Hours
Factor 22 - Quality Assurance 6 Hours
Factor 4,800 - A5H Subcontracted Srvs 1,200 Dollars

20 hours of administrative time will also be required.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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### Line Item SYs - Contingency And Escalation

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### Line Item 0100 - collect geoprobe samples

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### Line Item 0100 - collect geoprobe samples

**BOE**

**Item Desc:**
Collection of geoprobe samples with the site geoprobe with two technicians. A site Environmental Engineer will direct the boring placement, log the borings; collect, containerize, package, and ship the samples; prepare field QC documentation, and prepare field notes on a full time basis. A site RCT will monitor the site for radiological contamination on a full time basis. A site Industrial Hygienist will implement the field portion of the HASP on a full time basis. Decon Operations staff will decon the vehicle and equipment when it leaves the work area on a half time basis. It is estimated that one 10' boring will be place per 500 SF of building footprint (same as Bldg. 123 characterization) with 5 samples per 10' boring. It is estimated that one boring per eight hours can be completed. A 50% reduction in characterization from that which was done at Building 123 was taken because process history and building knowledge indicate that characterization to the extent required for Building 123 will not be required at this location.

**Breakdown of Cost Data:**
**Item:** Site Personnel for support of geoprobe samples
### Resources

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<th>Curve Quantity Units</th>
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**Line Item 0200 - analyze samples**

**BOE**

Vendor Quote

Email quote: average cost from Kaiser-Hill ASD (V. Ideker).

Item Desc:

Analyze samples produced from geoprobe borings. It is anticipated that 5 samples from each boring will be collected. They will be analyzed for Metals, VOCs, SVOCs, PCBs, and radionuclides (est. 3 isotopes) with a 30 day TAT. This item is priced on a per sample basis. Per sample costs include DOT rad screen, bottle charge, shipping, and validation.

Breakdown of Cost Data:

- **Item:** Analyze samples at an offsite laboratory.
  - Units: analysis
  - Unit Cost: Metals $345, VOCs $280, SVOCs $440, PCBs and other analytes $150, and Radionuclides $590 per each sample.
  - Unit Cost Adjustment Factor: Must add: DOT rad screen $32/sample, bottle charge $7/sample, shipping $4.2/bottle, and validation per each: $17.30 VOA, $39.25 SVOC, $16.75 Metals, $5.95 PCB, and $15.60 Rad.
  - Revised Unit Hours: Metals $405, VOCs $341, SVOCs $502, PCBs and other analytes $199, and Rad $649.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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**Line Item 0300 - project mgmt oversight**

**BOE**

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

A 50% reduction in characterization from that which was done at Building 123 was taken because process history and building knowledge indicate that characterization to the extent required for Building 123 will not be required at this location.

Item Desc:

Project Management/Oversight. Based on half time for a Project Manager, Administrative staff, and Cost Estimator/Scheduler

Breakdown of Cost Data:

- **Item:** Mgmt oversight
### Resources

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**Line Item SYS - Contingency And Escalation**

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### Line Item 0100 - develop documentation

**BOE**

Estimator's Experience:

Estimate for summary report based on estimator's 16 years of experience performing and costing projects of similar size and scope.

Item Desc:

Perform Data Analysis including GIS representation of data, NFA Summary, Characterization Report, and associated project management. Disposition comments and finalize document.

- Computer Specialist 80 hrs Identify & pull existing data from database.
- GIS Specialist 80 hrs Develop maps for Report. Print multiple copies.
- Technical Editor 40 hrs Complete initial and revised tech edits of Report.
- Quality Assurance 60 hrs Review
- Environmental Engineer 40 hrs Peer review
- Regulatory Compliance 20 hrs Review
- Management 48 hrs
- Legal 8 hrs Review
- Administrative Support 40 hrs Copy & assemble final documents, submit to records.

Breakdown of Cost Data:

- Item: Develop Documentation
- Units: Hours
- Unit Cost: 656
- Unit Cost Adjustment Factor: none
- Revised Unit Hours: 656
- Basis for adjustment. N/A

---

**Activity ID:** 1G80060170  
**Description:** Prepare Summary/NFA - IHSS Group 800-6

**Cost Risk 1 Schedule Risk 1**

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**6/23/00 9:23:05 AM**

**OFFICIAL USE ONLY**
### Rocky Flats Closure Project
#### Baseline Cost and Basis of Estimate

**Activity ID:** 1G80060170

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<td>Prepare Decision Document - IHSS Group 800-6</td>
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### Line Item 0100 - PAM

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#### Breakdown of Cost Data:
- **Item:** Preparation of PAM for Ryan's Pit source removal action.
  - **Units:** hours
  - **Unit Cost:** 770
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit Hours:** 193

**BOE Resources**

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<th>Skill</th>
<th>Unit Cost</th>
<th>Unit Cost Adjustment Factor</th>
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**Total for Activity 1G80060180:**

- **Total BOE:** 289
- **Total Labor Cost:** 9,164
- **Total Materials/Sub Cost:** 0
- **Total Contingency & Escalation:** 0
- **Total Prime Cost:** 11,748
- **Total Burden Cost:** 2,903
- **Total Cost:** 14,650

---

**Note:**
- Estimator's Experience based generally on historical data for Ryan's Pit
- Preparation of of PAM or IM/IRA in support of source removal of previously characterized UBC.
- Proposed Action Memorandum: A bottoms-up estimate based on historical costs was used as the basis for the estimate. Based on Ryan's Pit (IHSS 108), the cost for the PAM was $50,000 (contractor costs). Assuming that labor rates at this time were approximately $75 (based on a cost center 217). The total labor for a PAM would be approximately 666 hours, which rounds to 700 hours. It was assumed that 10% would be required for managerial hours.
- For a PAM the total labor hours are:
  - Environmental Engineer 700 Hours
  - Manager 70 Hours
  - Factor 700 Environmental Engineer 175 hours
  - Factor 70 Manager 18 hours

---

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Interim Measure/Interim Remedial Action Decision Document: It was assumed that an IM/IRA Decision Document would take 75% more effort than a PAM or 1,166 hours, which rounds to 1200 hours. It was assumed that 10% of this labor would be required for managerial hours.

For an IM/IRA the total labor hours are:

- Environmental Engineer: 1200 Hours
- Manager: 120 Hours
- Factor (1200): Environmental Engineer 300 hours
- Factor (120): Manager 30 hours

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Estimator's Experience based generally on historical data for Ryan's Pit

Item Desc:
Preparation of SAP in support of source removal of previously characterized UBC.

Breakdown of Historical Data:
- Item: Preparation of SAP for Ryan's Pit source removal action.
- Units: hours
- Unit Cost: 300
- Unit Cost Adjustment Factor: 0.25
- Revised Unit Hours: 76

Basis for adjustment. Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

<table>
<thead>
<tr>
<th>Resources</th>
<th>Cost Element</th>
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Estimator's Experience based generally on historical data for Ryan's Pit

Item Desc:
Preparation of WMP in support of source removal of previously characterized UBC.

Breakdown of Historical Data:
- Item: Preparation of WMP for Ryan's Pit source removal action.
- Units: hours
- Unit Cost: 80
- Unit Cost Adjustment Factor: 0.25
- Revised Unit Hours: 20

Basis for adjustment. Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

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## Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

**Project**

Baseline Deviation

**WBS Filter**

1GAC

### Resources

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### Factors

- 1554.49 Dollars
- 1029.04 Dollars

### Activity ID: 1G80060210

**Description:** Procurement and Field Prep - IHSS Grouping 800-6

**Cost Risk:** 1

**Schedule Risk:** 1

### Line Item 0100 - procurement & field prep

**BOE Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation**

**Item Desc:**


**Breakdown of Cost Data:**

- **Item:** Site labor to perform above individual tasks for either Ryan's Pit or T-3/T-4.
  - **Units:** hours
  - **Unit Cost:** $1380
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** 345 hours

- **Item:** Subcontractor costs to perform above individual tasks for either Ryan's Pit or T-3/T-4.
  - **Units:** 1 lot
  - **Unit Cost:** $10K
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** $2.5K

**Basis for adjustment. Hours and costs for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be characterized at once.**

**Procurement includes preparation of statement of work, proposal review (technical evaluation), and negotiations. Based on a T-3/T-4 burdened cost of $29,186.52. Assuming it is primarily labor hours (RMRS Environmental Engineer charging at $57.45 per hour) yields 508 hours which rounds to 510 total hours.**

**Davis Bacon Documentation:** It was assumed that it would take an environmental engineer twenty-four hours to prepare a Davis Bacon cost estimate and to support the Davis-Bacon determination.

**Subcontractor Health and Safety Plan:** Costs for the health and safety plan are based on Ryan's Pit, which cost approximately $10,000. It was assumed that these are A5H dollars. In addition, it was assumed that a safety engineer, an industrial hygienist, and a radiological engineer would each provide one week (40 hours) of support for review and document preparation.

**Radiological Work Permit:** It was assumed that it would take a radiological control technician two working days (18 hours) to complete counting preparation and review.

**Implementation Plan:** It was estimated that this activity would take 13 weeks of time for engineers, scientists or equivalent to complete. This would include preparation of an implementation plan as required (Rocky Flats Cleanup Agreement, Appendix 3, Interim Guidance Document, Dated August 1977). In addition this includes all tasks related to documentation for the Integrated Work Control Program and Integrated Safety Management.

**Ecology Survey/National Environmental Protection Act (NEPA) Support:** It was estimated that this would take 40 hours for an ecologist. The activities include NEPA review and support in document preparation, site surveys to verify compliance with ecological regulations, categorical exclusions, and NEPA evaluations.

**Utility Clearance/Soil Disturbance Permits:** It was estimated based on experience that it would take the equivalent 2 weeks (80 hours) for technical staff to do utility surveys, prepare and review soil disturbance permits, and prepare authorizing documents for excavation.

The combined resources for procurement and field preparations are total procurement and field preparation hours.

<table>
<thead>
<tr>
<th>Line Item</th>
<th>Description</th>
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<th>Units</th>
<th>BOE Type</th>
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<th>Materials/Sub Cost</th>
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**Total for Activity 1G80060210:**

- 345 hours
- 10,637 labor cost
- 2,114 total labor cost
- 2,848 materials/sub cost
- 2,848 total prime cost
- 3,030 burden cost
- 15,782 total cost

**Page 908 of 1121**
Environmental Engineer 1134 hours
Safety Engineer 40 hours
Industrial Hygiene 40 hours
Radiological Engineering 58 hours
Radiological Control Technician 18 hours
Ecologist/Life Scientist 40 hours
Manager 50 hours
Quality Assurance* 29 hours
ASH Total $10,000

* On some projects these hours were assumed to be included in other tasks or part of this task under environmental engineer or one of the other job functions.

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

Factor 1134 - Environmental Engineer 283 Hours
Factor 40 - Safety Engineer 10 Hours
Factor 40 - Industrial Hygiene 10 Hours
Factor 58 - Radiological Engineering 14 Hours
Factor 18 - RCT 5 Hours
Factor 40 - Life Scientist 10 Hours
Factor 50 - Project Manager 13 Hours
Factor 10000 - A5H Subcontracted Services 2,500 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

Resources

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Line Item SYS - Contingency And Escalation

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Activity ID: 1G80060240
Description: Readiness Assessment - IHSS Group 800-6

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<th>Materials/Sub Cost</th>
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### Rocky Flats Closure Project

#### Baseline Cost and Basis of Estimate

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### Contingency And Escalation

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<tr>
<td>Item Desc: Evaluate readiness of the field characterization team and plans.</td>
</tr>
<tr>
<td>Breakdown of Cost Data:</td>
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<tr>
<td>Item: Site Labor to perform Readiness Assessment for T-3/T-4.</td>
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<tr>
<td>Units: hours</td>
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<td>Revised Unit: 48</td>
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<tr>
<td>Units: 1 lot</td>
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<td>Unit Cost: $4800</td>
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<td>Unit Cost Adjustment Factor: 0.25</td>
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<tr>
<td>Revised Unit: $1200</td>
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</table>

It was estimated that subcontractor involvement would require 80 hours at $60/hour = $4,800. It was assumed that about 3 weeks of time was required for an environmental engineer or similar person in addition to 12 hours of project management, which yielded 132 hours. An additional 11 hours was added for management oversight. It was estimated that a radiological engineer (QA) and an industrial hygienist would be needed for 2.5 days each(22 hours).

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 projects will be conducted at once and only one of each fixed cost is needed for the group.

Factor 132- Environmental Engineer 33 Hours
Factor 22 - Health Physicists 6 Hours
Factor 11 - Manager 3 Hours
Factor 4,800 - ASH Subcontracted Svrs 1,200 Dollars

20 hours of administrative time will also be required.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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<th>Line Item 0200 - training</th>
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<tr>
<td>Estimator's Experience based generally on historical data for T-3/T4 Remediation.</td>
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<tr>
<td>Item Desc: Conduct perform Training in support of source removal action.</td>
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<tr>
<td>Breakdown of Cost Data:</td>
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<tr>
<td>Item: Site Labor to perform above individual tasks for T-3/T-4.</td>
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### Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

**Project:** Baseline Dev

**WBS Filter:** 1GAC

**Activity Filter:** *

**Starts In FY:** *

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**Activity ID:** 1G80060240

**Description:** Remedial Action - IHSS Group 800-6

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**WBS No:** 1GAC0806

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### Resources

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**Units:** hours
**Unit Cost:** 132 Hours
**Unit Cost Adjustment Factor:** 0.25
**Revised Unit:** 33 hours

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
**Units:** 1 lot
**Unit Cost:** $12K
**Unit Cost Adjustment Factor:** 0.25
**Revised Unit:** $3K

Basis for adjustment. Costs for each UBC are divided by 4 to account for the fact that 4 UBCs will be remediated at once and only one Training is needed for the group.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

**Line Item 0300 - Pre-evolution meeting**

**BOE**

**Estimator's Experience based generally on historical data for T-3/T4 Remediation.**

**Item Desc:** Conduct Pre-Evolution Meeting in support of source removal action

**Breakdown of Cost Data:**

- **Item:** Site Labor to perform above individual tasks for T-3/T-4.
  - **Units:** hours
  - **Unit Cost:** 60 hours
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** 15 hours

- **Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
  - **Units:** 1 lot
  - **Unit Cost:** $6K
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** $1.5K

Basis for adjustment. Costs for each UBC are divided by 4 to account for the fact that 4 UBCs will be remediated at once and only one Pre-Evolution Meeting is needed for the group.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
## Rocky Flats Closure Project

### Baseline Cost and Basis of Estimate

**Project:** Baseline Devi 1GAC  
**Activity Filter:** 1GAC  
**WBS Filter:** 1GAC

### WBS No: 1GAC0806  
**Activity ID:** 1G80060250

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**Line Item 0100 - mobilization**

**BOE:** Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:** Mobilization in support of remediation.

**Breakdown of Cost Data:**

- **Item:** Site Labor to perform above individual tasks for T-3/T-4.
- **Units:** hours
- **Unit Cost:** $1,100
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** 275

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.

- **Units:** 1 lot
- **Unit Cost:** $184k
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** see below

**Basis for adjustment.** The costs were divided into fixed costs and variable costs. The fixed costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

**Resources**

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<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
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This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
Project: Rocky Flats Closure Project
Baseline Cost and Basis of Estimate

WBS No: 1GAC0806
Activity ID: 1G80060250

Line Item 0200 - site prep

BOE

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc:
Site Preparation including setting up fencing, trailer, etc.

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
Units: hours
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
Units: 1 lot
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

T3/T4 hours 120 Environmental Engineer 30 hours
T3/T4 dollars 30,000 Subcontracted Svrs 7,500 Dollars

D&D construction trade hours were calculated using the following methodology:

A5H subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.

RCT hours were calculated using the following methodology, unless they were already estimated.

For Site Preparation tasks - RCT hours were the same as D&D construction hours.
For all other tasks A5H subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under KG10H department code.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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<th>Resources</th>
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Line Item 0300 - excavation

BOE

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc:
Excavation.

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
Units: hours
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below
Item: Subcontractor costs to perform above individual tasks for T-3/T-4.

Units: 1 lot
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Offsite Waste Volume 621 CY

The excavation cost was based on the excavation cost for the T-3/T-4 Project. Burdened cost based on the T-3/T-4 actuals is $171,487. For the 3,800 cubic yards of contaminated soil removed this yielded a unit cost of $45 per cubic yard of contaminated soil removed. This estimate includes the removal of overburden that might be on top of the contaminated soil. Likewise the hours for the following were assumed to be linearly proportional:

- Health Physicists .47 hours per cubic yard
- Environmental Operations .31 hours per cubic yard
- Industrial Hygienists 0.31 hours per cubic yard
- Radiological Control Technician 1.00 hour per cubic yard

* Based on $50/cubic yard from T-3/T-4, assumes a labor rate of $50/hour

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 1.09 - E050 Environmental Engineer 677 Hours
Factor 0.47 - P080 Health Physicists 292 Hours
Factor 0.31 - Environmental Operations 193 Hours
Factor 0.31 - P090 Industrial Hygienists 193 Hours
Factor 1.00 - T050 Radiological Control Technician 621 Hours
Factor 45.23 - A5H Subcontracted Srvs 28,088 Dollars

D&D construction trade hours were calculated using the following methodology:

A5H subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.

RCT hours were calculated using the following methodology, unless they were already estimated.

For Site Preparation tasks - RCT hours were the same as D&D construction hours.
For all other tasks A5H subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under KG10H department code.

The dollars amounts calculated for D&D construction workers and RCTs were subtracted from the subcontractor dollars and the revised A5H dollar amount was entered into Best.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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Line Item 0400 - remove and clean debris

BOE

Estimator's Experience based generally on a base case of 700 cy.

Item Desc:
Remove and clean debris.

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
  Units: hours
  Unit Cost: see below
  Unit Cost Adjustment Factor: see below
  Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
  Units: 1 lot
  Unit Cost: see below
  Unit Cost Adjustment Factor: see below
  Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Total Contaminated Soil to be removed 621 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 621 CY

For the base case, it was assumed that about five cubic yards out of 700 cubic yards would be debris and would be segregated and cleaned. It was estimated that each cubic yard of debris would cost $1,000 or $5,000 total for 700 cubic yards. This yields a rate of $7.14 per cubic yard.

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 7.14 - ASH Subcontracted Srvs 4,434 Dollars

D&D construction trade hours were calculated using the following methodology:

ASH subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.

RCT hours were calculated using the following methodology, unless they were already estimated.

For Site Preparation tasks - RCT hours were the same as D&D construction hours. For all other tasks ASH subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under KG10H department code.

The dollars amounts calculated for D&D construction workers and RCTs were subtracted from the subcontractor dollars and the revised ASH dollar amount was entered into Best.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
BOE

Line Item 0600 - confirmation sampling

Estimator's Experience based generally on historical data for T-3/4 Remediation.

Breakdown of Historical Data:

Item: Site Labor to perform above individual tasks for T-3/T-4.

Units: hours

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.

Units: 1 lot

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Total Contaminated Soil to be removed 621 CY

Total Soil for Thermal Desorption 0 CY

Offsite Waste Volume 621 CY

The analytical costs were based on T-3/T-4, which cost $435,574 for 3800 cubic yards of contaminated soil removed. This yielded a unit rate of about $115/cubic yard. Based on estimator experience the cost of sampling including labor and materials was estimated to be 20% of that rate or about $23/cubic yard.

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 114.62 - ASH Subcontracted Srvs (Analytical) 71,179 Dollars

Factor 22.924 - ASH Subcontracted Srvs 14,236 Dollars

D&D construction trade hours were calculated using the following methodology:

ASH subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.

RCT hours were calculated using the following methodology, unless they were already estimated.

For Site Preparation tasks - RCT hours were the same as D&D construction hours.

The dollars amounts calculated for D&D construction workers and RCTs were subtracted from the subcontractor dollars and the revised ASH dollar amount was entered into Best.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

**WBS No:** 1GAC0806  
**Activity ID:** 1G80060250

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#### Line Item 0700 - prepare waste acceptance forms

**BOE**

**Estimator's Experience based generally on historical data for T-3/T4 Remediation.**

**Item Desc:** Prepare Waste Acceptance Forms

**Breakdown of Historical Data:**

**Item:** Site Labor to perform above individual tasks for T-3/T-4.  
**Units:** hours  
**Unit Cost:** see below  
**Unit Cost Adjustment Factor:** see below  
**Revised Unit:** see below

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.  
**Units:** 1 lot  
**Unit Cost:** see below  
**Unit Cost Adjustment Factor:** see below  
**Revised Unit:** see below

**Basis for adjustment.** The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.5 factor to account for the fact that 2 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

**T3/T4 hours 80 environmental engineer 20 hours**

#### Resources

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<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
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<th>Units</th>
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#### Line Item 0800 - waste acceptance sampling

**BOE**

**Estimator's Experience based generally on historical data for T-3/T4 Remediation.**

**Item Desc:** Waste Acceptance Sampling

**Breakdown of Historical Data:**

**Item:** Site Labor to perform above individual tasks for T-3/T-4.  
**Units:** hours  
**Unit Cost:** see below  
**Unit Cost Adjustment Factor:** see below  
**Revised Unit:** see below

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.  
**Units:** 1 lot  
**Unit Cost:** see below  
**Unit Cost Adjustment Factor:** see below  
**Revised Unit:** see below

**Basis for adjustment.** The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

**Because the waste acceptance sampling is difficult to predict and could vary significantly from project to project, it was assumed that about $800 worth of additional analysis would be required for 20 cubic yards which is the volume that can be placed in one roll-off. This yielded a unit rate of about $40/cubic yard. This sampling and analysis is in addition to the confirmational samples so the costs are not as great. It was assumed that this sampling would be more labor intensive so the sampling costs were estimated to be about 50% of the analytical costs or about $20/cubic yard.**
Total Contaminated Soil to be removed 621 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 621 CY

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 40 - A5H Analytical 24,840 Dollars
Factor 20 - A5H Subcontracted Srvs 12,420 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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<tr>
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| ASH SUBCONTRACTED SRVS | 0000 | NONE | K267S Analytical Laboratory Services | Linear | 33.83 Dollars |
| Factors | 40 | units per yard in crates (analytical) | 0.84576 | [SYS 061400] 84576000 - System |

Line Item 0900 - field oversight & project mgmt

Estimator's Experience based generally on a base case of 700 cy.

Item Desc:
Field Oversight and Project Management

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
  Units: hours
  Unit Cost: see below
  Unit Cost Adjustment Factor: see below
  Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
  Units: 1 lot
  Unit Cost: see below
  Unit Cost Adjustment Factor: see below
  Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

It was assumed that a field manager would be needed for 150 nine-hour working days or about 33 weeks. This work breaks down as follows:

Preparation Activities 50 working days
Field Activities - 80 working days
Demobilization - 20 working days
Total 150 nine-hour working days or 1350 hours

In addition it was estimated that technical staff, quality assurance, and project management would be required for the equivalent of ten additional weeks, which is 400 hours each.

Based on the base case of a 700 cubic yard removal project, these values yielded unit rates as follows

Hours Per Cubic Yard
Of Contaminated Soil
Field Manager 1.93
Technical Staff .57
Quality Assurance .57
Project Management 0.57

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.
Total Contaminated Soil to be removed 621 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 621 CY

Factor 1.93 - Environmental Engineer 1,199 Hours
Factor 0.57 - Technical Support 354 Hours
Factor 0.57 - Project Manager 354 Hours
Factor 0.57 - Quality Assurance 354 Hours

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Line Item 1000 - backfill

BOE

Trade Publication
Means 1995, Site Work & Landscape Cost Data (page 34, 42, and 34)

Item Desc:
Backfill.

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
  Units: hours
  Unit Cost: see below
  Unit Cost Adjustment Factor: see below
  Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
  Units: 1 lot
  Unit Cost: see below
  Unit Cost Adjustment Factor: see below
  Revised Unit: see below

Means (1995) Site Work & Landscape Cost Data as follows:
Common Fill $ 4.77/cubic yard (page 34 Borrow Bank Measure)
Hauling $ 3.98/cubic yard (page 42 2-mile round-trip, 6 cubic yard dump truck)
Backfilling $ 1.69/cubic yard (page 34)
Burden (43%) $ 4.49/cubic yard
Total $14.23/cubic yard or about $15/cubic yard

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.
Factor  15 - A5H Subcontracted Srvs 9,315 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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Line Item 1100 - demobilization

BOE

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc:
Breakdown of Historical Data:

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### Basis for adjustment

The costs were divided into fixed costs and variable costs. The fixed costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Demobilization: Based on the T-3/T-4 project, it was assumed that demobilization costs would cover demobilization for excavation activities also. The subcontractor cost for demobilization was about $95,000 for 3,800 cubic yards at the T-3/T-4 project. In addition it was estimated that the following hours were necessary:

- Environmental Engineer 300 hours
- Health Physicist 100 hours
- Manager 200 hours
- Industrial Hygiene 100 hours

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

- Factor 300 - Environmental Engineer 75 Hours
- Factor 100 - Health Physicists 25 Hours
- Factor 200 - Manager 50 Hours
- Factor 100 - P090 Industrial Hygienists 25 Hours
- Factor 95000 - A5H Subcontracted Srvs 23,750 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

#### Cost Element

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### Line Item SY - Contingency And Escalation

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### Rocky Flats Closure Project
#### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0806  
**Activity ID:** 1G80060270

**Activity ID:** 1G80060270  
**Description:** Prepare Closeout Report - IHSS Group 800-6

### WBS Filter
- 1GAC

### Activity Filter
- * Starts In FY
- 1 Schedule Risk
- 1 Cost Risk

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**Total for Activity 1G80060270:**

- Labor Hours: 320
- Labor Cost: 9,045
- Materials/Sub Cost: 6,522
- Total Cost: 15,567
- Burden Cost: 3,148
- Total: 18,714

### Resources

#### BOE

**Estimate Based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites. (T-3/T-4 and others)**

**Item Desc:**
Perform Data Analysis including GIS representation of data, Closeout Report, and associated project management.

**Required level of effort:**
- Environmental Engineer - 80 hours
- Environmental Scientist - 20 hours
- Computer Specialist - 160 hours (GIS, SWD)
- Manager - 20 hours
- Administrative - 20 hours
- Cost Estimators - 20 hours

**Breakdown of Cost Data:**

- Item: Develop Documentation
  - Units: hours
  - Unit Cost: 320
  - Unit Cost Adjustment Factor: none
  - Revised Unit Hours: 320

**Resources**

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**Line Item 0100 - develop report**

**BOE**

- Estimate Based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites. (T-3/T-4 and others)

**Item Desc:**
Perform Data Analysis including GIS representation of data, Closeout Report, and associated project management.

**Required level of effort:**
- Environmental Engineer - 80 hours
- Environmental Scientist - 20 hours
- Computer Specialist - 160 hours (GIS, SWD)
- Manager - 20 hours
- Administrative - 20 hours
- Cost Estimators - 20 hours

**Breakdown of Cost Data:**

- Item: Develop Documentation
  - Units: hours
  - Unit Cost: 320
  - Unit Cost Adjustment Factor: none
  - Revised Unit Hours: 320

**Resources**

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**Title:** Group 900-Area (Non D&D)

**Activity ID:** 1G999AREA100  
**Description:** Planning IHSS - Group 900-Area (Non D&D)

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Rocky Flats Closure Project
Baseline Cost and Basis of Estimate

WBS No: 1GAC0900
Activity ID: 1G9AREA100

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| 0100 - SAP Addenda | Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites. | Item Desc: Preparation of SAP Addenda to Industrial Area Characterization Plan. Breakdown of Cost Data: Item: Preparation of SAP addenda Units: hours Unit Cost: 120 Unit Cost Adjustment Factor: none Revised Unit Hours: 120
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions. |

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## Baseline Cost and Basis of Estimate

### Rocky Flats Closure Project

**Baseline Deviation**

**Project:** Rocky Flats Closure Project  
**WBS Filter:** WBS Filter  
**Activity Filter:** Activity Filter  
**WBS No.:** 1GAC0900  
**Activity ID:** 1G9AREA100

### Basis for adjustment.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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### Line Item SYS - Contingency And Escalation

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### Activity ID: 1G9AREA120

**Description:** Procurement & Field Prep - IHSS Group 900-Area

**Cost Risk:** 1  
**Schedule Risk:** 1

### Line Item 0100 - field prep

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Total for Activity 1G9AREA120:  
345 | 10,637 | 2,114 | 2,467 | 15,218 | 3,755 | 18,973 |

### Line Item 0100 - field prep

**Estimator's Experience based on 15 years of experience planning, estimating, and conducting projects of similar scope and size.**

**Item Desc:**

**Breakdown of Cost Data:**

**Item:** Site Labor to perform above individual tasks for either Ryan's Pit or T-3/T-4.  
**Units:** hours  
**Unit Cost:** 1380  
**Unit Cost Adjustment Factor:** 0.25  
**Revised Unit:** 345 hours

**Item:** Subcontractor costs to perform above individual tasks for either Ryan's Pit or T-3/T-4.  
**Units:** 1 lot  
**Unit Cost:** $10K  
**Unit Cost Adjustment Factor:** 0.25  
**Revised Unit:** $2.5K

**Basis for adjustment.** Hours and costs for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be characterized at once. Procurement includes preparation of statement of work, proposal review (technical evaluation), and negotiations. Based on a T-3/T-4 burdened cost of $29,186.52. Assuming it is primarily labor hours (RMRS Environmental Engineer charging at $57.45 per hour) yields 508 hours which rounds to 510 total hours.  
**Davis Bacon Documentation:** It was assumed that it would take an environmental engineer twenty-four hours to prepare a Davis Bacon cost estimate and to support the Davis-Bacon determination.  
**Subcontractor Health and Safety Plan:** Costs for the health and safety plan are based on Ryan's Pit, which cost approximately $10,000. It was assumed that these are ASH dollars. In addition, it was assumed that a safety engineer, an industrial hygienist, and a radiological engineer would each provide one week (40 hours) of support for review and document preparation.  
**Radiological Work Permit:** It was assumed that it would take a radiological control technician two working days (18 hours) to complete counting preparation and review.
Implementation Plan: It was estimated that this activity would take 13 weeks of time for engineers, scientists or equivalent to complete. This would include preparation of an implementation plan as required (Rocky Flats Cleanup Agreement, Appendix 3, Interim Guidance Document, Dated August 1977). In addition, this includes all tasks related to documentation for the Integrated Work Control Program and Integrated Safety Management.

Ecology Survey/National Environmental Protection Act (NEPA) Support: It was estimated that this would take 40 hours for an ecologist. The activities include NEPA review and support in document preparation, site surveys to verify compliance with ecological regulations, categorical exclusions, and NEPA evaluations.

Utility Clearance/Soil Disturbance Permits: It was estimated based on experience that it would take the equivalent 2 weeks (80 hours) for technical staff to do utility surveys, prepare and review soil disturbance permits, and prepare authorizing documents for excavation.

The combined resources for procurement and field preparations are:

**Total Procurement and Field Preparation Hours**
- Environmental Engineer: 1134 hours
- Safety Engineer: 40 hours
- Industrial Hygiene: 40 hours
- Radiological Engineering: 58 hours
- Radiological Control Technician: 18 hours
- Ecologist/Life Scientist: 40 hours
- Manager: 50 hours
- Quality Assurance*: 29 hours
- A5H Total: $10,000

* On some projects these hours were assumed to be included in other tasks or part of this task under environmental engineer or one of the other job functions.

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

Factor 1134 - Environmental Engineer 283 Hours
Factor 40 - Safety Engineer 10 Hours
Factor 40 - Industrial Hygiene 10 Hours
Factor 58 - Radiological Engineering 14 Hours
Factor 18 - RCT 5 Hours
Factor 40 - Life Scientist 10 Hours
Factor 50 - Project Manager 13 Hours
Factor 10000 - A5H Subcontracted Services 2,500 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
Project: Rocky Flats Closure Project
Baseline Cost and Basis of Estimate

WBS No: 1GAC0900
Activity ID: 1G9AREA120

Baseline Deviation
WBS Filter: 1GAC
Activity Filter: *

Starts In FY: *

| Activity ID | Description                                      | Activity Filter | Start Date | |
|-------------|--------------------------------------------------|----------------|------------|--

**Cost Element**
- **E050** ENVIROMENTAL ENGINEERS
- **E110** QUALITY CONTROL ENGINEERS
- **G010** ADMINISTRATIVE ASSISTANTS
- **M020** MANAGERS (GRADE 69-72)
- **P080** HEALTH PHYSICISTS

**Resources**

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**Factors**

| Activity ID | Description                                      | Activity Filter | Start Date | |
|-------------|--------------------------------------------------|----------------|------------|--

**Breakdown of Cost Data:**
- **Item:** Site Labor to perform Readiness Assessment for T-3/T-4.
  - Units:  hours
  - Unit Cost: 187
  - Revised Unit: 48
- **Item:** Subcontractor costs to perform Readiness Assessment for T-3/T-4.
  - Units: 1 lot
  - Unit Cost: $4800
  - Revised Unit: $1200

**Estimator's Experience:**
Based on 15 years of experience planning, estimating and conducting projects of similar scope and size.

**Item Description:**
Evaluate readiness of the field characterization team and plans.

**Resources:**
- **750** STRAIGHT TIME BASE
- **850** STRAIGHT TIME WORK
- **900** STRAIGHT TIME OFFICE

**Cost Risk:**
- Baseline Cost:
  - 1GAC0900
  - Activity Filter: *
  - Start Date: *

**Schedule Risk:**
- Baseline Cost:
  - 1GAC0900
  - Activity Filter: *
  - Start Date: *

**Total Cost:**
- Baseline Cost:
  - 1GAC0900
  - Activity Filter: *
  - Start Date: *

**Cost Elements:**
- **E050** ENVIROMENTAL ENGINEERS
- **E110** QUALITY CONTROL ENGINEERS
- **G010** ADMINISTRATIVE ASSISTANTS
- **M020** MANAGERS (GRADE 69-72)
- **P080** HEALTH PHYSICISTS

**Factors:**
- **750** STRAIGHT TIME BASE
- **850** STRAIGHT TIME WORK
- **900** STRAIGHT TIME OFFICE
### Rocky Flats Closure Project
#### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0900  
**Activity ID:** 1G9AREA140

**Project:** Baseline Devi  
**WBS Filter:** 1GAC

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#### Line Item 1G9AREA150 - collect surficial soil samples

**BOE**

**Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.**

**Item Desc:**
Collection of surficial soil samples. A site Environmental Engineer will direct the sample collection, containerize, package, and ship the samples; prepare field QC documentation, and prepare field notes on a full time basis. A site RCT will monitor the site for radiological contamination on a full time basis. A site Industrial Hygienist will implement the field portion of the HASP on a full time basis.

**Breakdown of Cost Data:**

- **Item:** Site Personnel for support of sample collection

  - **Units:** hours
  - **Unit Cost:** 24
  - **Unit Cost Adjustment Factor:** none
  - **Revised Unit Hours:** 24

**Resources**

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#### Line Item 0200 - analyze samples (hydrocarbons)

**BOE**

**Item Desc:**

Analyze samples produced from geoprobe borings. It is anticipated that 3 samples from each boring will be collected. They will be analyzed for Metals, VOCs, SVOCs, PCBs, and radionuclides (est. 3 isotopes) with a 30 day TAT. This item is priced on a per sample basis. Per sample costs include DOT rad screen, bottle charge, shipping, and validation.

**Breakdown of Cost Data:**

- **Item:** Analyze samples at an offsite laboratory.

  - **Units:** analysis
  - **Unit Cost:** Metals $345, VOCs $280, SVOCs $440, PCBs and other analytes $150, and Radionuclides 3 isotopes $590 per each sample.
  - **Unit Cost Adjustment Factor:** Must add: DOT rad screen $32/sample, bottle charge $7/sample, shipping $4.2/bottle, and validation per each: $17.30 VOA, $19.25 SVOC, $16.75 Metals, $5.95 PCB, and $15.60 Rad.
  - **Revised Unit Hours:** Metals $405, VOCs $341, SVOCs $502, PCBs and other analytes $199, and Rad $649.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
## Rocky Flats Closure Project
### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0900  
**Activity ID:** 1G9AREA150  
**Baseline Devi WBS Filter:** 1GAC  
**Activity Filter:** *  
**Starts In FY:** *  

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### Line Item 0300 - project mgmt oversight

**BOE**  
Estimate based on Estimator’s Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Item Desc:**  
Project Management/Oversight. Based on half time for a Project Manager, Administrative staff, and Cost Estimator/Scheduler

**Breakdown of Cost Data:**
- **Units:** hours
- **Unit Cost:** 12
- **Unit Cost Adjustment Factor:** none
- **Revised Unit Hours:** 12

**Factors**  
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### Line Item SYS - Contingency And Escalation

**BOE**  
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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**Description:** Prepare NFA - Group 900-Area

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**Total for Activity 1G9AREA170:**  
138 4,164 0 1,016 5,180 1,460 6,641

### Line Item 0100 - develop documentation

**BOE**  
Estimate based on Estimator’s Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Item Desc:**  
Perform Data Analysis including GIS representation of data, NFA Summary, and associated project management.

**Breakdown of Cost Data:**
- **Units:** Hours
- **Unit Cost:** 138
  - Environmental Engineer 45 hrs Evaluate & assemble existing data. Draft Report.
  - SWD Technician 10 hrs Identify & pull existing data from database.
Technical Editor 15 hrs Complete initial and revised tech edits of Report.
Technical Reviews 4 hrs Review and comment per area of expertise.
QA 8 hrs Review and comment per area of expertise.
Compliance 4 hrs Review and comment per area of expertise.
Environmental 4 hrs Review and comment per area of expertise.
Management (2) 8 hrs Review and comment per area of expertise.
Legal 4 hrs Review and comment per area of expertise.
Environmental Engineer 15 hrs Disposition comments and finalize document.
Administrative Support 6 hrs Copy & assemble final documents, submit to records.

Unit Cost Adjustment Factor: none
Revised Unit Hours: 138
Basis for adjustment: N/A

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Total for Activity 1GER91100: 280 10,021 1,421 4,133 15,575 3,467 19,042
Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Item Desc:**
Preparation of SAP Addenda to Industrial Area Characterization Plan.

**Breakdown of Cost Data:**
- **Item:** Preparation of SAP addenda
  - **Units:** hours
  - **Unit Cost:** 120
  - **Unit Cost Adjustment Factor:** none
  - **Revised Unit Hours:** 120

Basis for adjustment.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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**Line Item 0200 - HASP Addenda**

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Item Desc:**
Preparation of HASP addenda to Industrial Area Characterization Plan.

**Breakdown of Cost Data:**
- **Item:** Preparation of addenda for HASP.
  - **Units:** hours
  - **Unit Cost:** 140
  - **Unit Cost Adjustment Factor:** none
  - **Revised Unit Hours:** 140

Basis for adjustment.

### Resources

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**Line Item 0300 - QAP Addenda**

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

**Item Desc:**
Preparation of SAP Addenda to Industrial Area Characterization Plan.

**Breakdown of Cost Data:**
- **Item:** Preparation of QAP addenda
  - **Units:** hours
  - **Unit Cost:** 60
  - **Unit Cost Adjustment Factor:** none
**Rocky Flats Closure Project**

**Baseline Cost and Basis of Estimate**

- **WBS No:** 1GAC0901
- **Activity ID:** 1GER691100

**Revised Unit Hours:** 60

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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**Factors**

- **40** hrs
- **20** hrs

### Line Item SYS - Contingency And Escalation

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**Factors**

- **2,990.09 Dollars**
- **1,143.27 Dollars**

### Activity ID: 1GER691120

**Description:** Procurement and Field Prep - IHSS Group 900-1

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**Line Item 0100 - procurement & field prep**

**BOE**

- **Item Desc:**

- **Breakdown of Cost Data:**
  - **Item:** Site Labor to perform above individual tasks for either Ryan's Pit or T-3/T-4.
    - **Units:** hours
    - **Unit Cost:** $1380
    - **Unit Cost Adjustment Factor:** 0.25
    - **Revised Unit:** 345 hours

  - **Item:** Subcontractor costs to perform above individual tasks for either Ryan's Pit or T-3/T-4.
    - **Units:** 1 lot
    - **Unit Cost:** $10K
    - **Unit Cost Adjustment Factor:** 0.25
    - **Revised Unit:** $2.5K

**Basis for adjustment.** Hours and costs for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be characterized at once.

Procurement includes preparation of statement of work, proposal review (technical evaluation), and negotiations. Based on a T-3/T-4 burdened cost of $29,186.52. Assuming it is primarily labor hours (RMRS Environmental Engineer charging at $57.45 per hour) yields 508 hours which rounds to 510 total hours.

Davis Bacon Documentation: It was assumed that it would take an environmental engineer twenty-four hours to prepare a Davis Bacon cost estimate and to support the Davis-Bacon determination.

Subcontractor Health and Safety Plan: Costs for the health and safety plan are based on Ryan's Pit, which cost approximately $10,000. It was assumed that these are ASH dollars. In addition, it was assumed that a safety engineer, an industrial hygienist, and a radiological engineer would each provide one week (40 hours) of support for review and document preparation.
Radiological Work Permit: It was assumed that it would take a radiological control technician two working days (18 hours) to complete counting preparation and review.

Implementation Plan: It was estimated that this activity would take 13 weeks of time for engineers, scientists or equivalent to complete. This would include preparation of an implementation plan as required (Rocky Flats Cleanup Agreement, Appendix 3, Interim Guidance Document, Dated August 1977). In addition, this includes all tasks related to documentation for the Integrated Work Control Program and Integrated Safety Management.

Ecology Survey/National Environmental Protection Act (NEPA) Support: It was estimated that this would take 40 hours for an ecologist. The activities include NEPA review and support in document preparation, site surveys to verify compliance with ecological regulations, categorical exclusions, and NEPA evaluations.

Utility Clearance/Soil Disturbance Permits: It was estimated based on experience that it would take the equivalent 2 weeks (80 hours) for technical staff to do utility surveys, prepare and review soil disturbance permits, and prepare authorizing documents for excavation.

The combined resources for procurement and field preparations are as follows:

<table>
<thead>
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<th>Total Procurement and Field Preparation Hours</th>
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<tr>
<td>Environmental Engineer 1134 hours</td>
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<tr>
<td>Safety Engineer 40 hours</td>
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<td>Industrial Hygiene 40 hours</td>
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<td>Radiological Engineering 58 hours</td>
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<td>Ecologist/Life Scientist 40 hours</td>
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<tr>
<td>Manager 50 hours</td>
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<td>Quality Assurance 29 hours</td>
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<td>A5H Total $10,000</td>
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* On some projects these hours were assumed to be included in other tasks or part of this task under environmental engineer or one of the other job functions.

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

Factor 1134 - Environmental Engineer 283 Hours
Factor 40 - Safety Engineer 10 Hours
Factor 40 - Industrial Hygiene 10 Hours
Factor 58 - Radiological Engineering 14 Hours
Factor 18 - RCT 5 Hours
Factor 40 - Life Scientist 10 Hours
Factor 50 - Project Manager 13 Hours
Factor 10000 - A5H Subcontracted Services 2,500 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
Line Item SYS - Contingency And Escalation

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Activity ID: 1GER691140  
Description: Readiness Assessment - IHSS Group 900-1  
Cost Risk: 1  
Schedule Risk: 1

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Total for Activity 1GER691140:

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<td>653</td>
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Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation

Item Desc:
Evaluate readiness of the field characterization team and plans.

Breakdown of Cost Data:
Item: Site Labor to perform Readiness Assessment for T-3/T-4.
Units: hours
Unit Cost: $187
Unit Cost Adjustment Factor: 0.25
Revised Unit: 48

Units: 1 lot
Unit Cost: $4800
Unit Cost Adjustment Factor: 0.25
Revised Unit: $1200

It was estimated that subcontractor involvement would require 80 hours at $60/hour = $4,800. It was assumed that about 3 weeks of time was required for an environmental engineer or similar person in addition to 12 hours of project management, which yielded 132 hours. An additional 11 hours was added for management oversight. It was estimated that a radiological engineer (QA) and an industrial hygienist would be needed for 2.5 days each (22 hours).

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 projects will be conducted at once and only one of each fixed cost is needed for the group.

- Factor 132 - Environmental Engineer 33 Hours
- Factor 22 - Health Physicists 6 Hours
- Factor 11 - Manager 3 Hours
- Factor 22 - Quality Assurance 6 Hours
- Factor 4,800 - A5H Subcontracted Srvs 1,200 Dollars

20 hours of administrative time will also be required.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

Resources

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Rocky Flats Closure Project
Baseline Cost and Basis of Estimate

WBS No: 1GAC0901
Activity ID: 1GER691140

Baseline Devl
WBS Filter: 1GAC
Activity Filter: *

Starts In FY: *

Project: Rocky Flats Closure Project

Baseline Cost and Basis of Estimate

WBS No: 1GAC0901
Activity ID: 1GER691140

Activity Filter:

* Start:

Factors: 6 hrs
ASH Subcontracted SRVS: 0000, None
K26SS: ER Programs
Linear: 1,014.91 Dollars
Factors: 1200 Dollars

Line Item SYS - Contingency And Escalation

BOE Resources

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Total for Activity 1GER691150:

3,616,107,739 2,063,663 539,852 539,852 2,711,254 36,602 539,852

Line Item 0100 - collect geoprobe samples

BOE

Estimate based on estimator's experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

Item Desc:
Collection of geoprobe samples with the site geoprobe with two technicians. A site Environmental Engineer will direct the boring placement, log the borings; collect, containerize, package, and ship the samples; prepare field QC documentation, and prepare field notes on a full time basis. A site RCT will monitor the site for radiological contamination on a full time basis. A site Industrial Hygienist will implement the field portion of the HASP on a full time basis. Decon Operations staff will decon the vehicle and equipment when it leaves the work area on a half time basis. It is estimated that one 10' boring will be place per 500 SF of building footprint (same as Bldg. 123 characterization) with 5 samples per 10' boring. It is estimated that one boring per eight hours can be completed. Based on the Building 123, however field sampling was reduced by 50% because of the newer building and processes involved, and the lesser likelihood of contamination.

Breakdown of Cost Data:
- Item: Site Personnel for support of geoprobe samples
  - Units: hours
  - Unit Cost: 32
  - Unit Cost Adjustment Factor: none
  - Revised Unit Hours: 32

- Item: Kaiser-Hill/RMRS Geoprobe unit with 2 Technician crew. Item costs $100 per hour or $800 per 8-hour day.
  - Units: dollars
  - Unit Cost: 800
  - Unit Cost Adjustment Factor: none
  - Revised Unit Hours: 800

Basis for adjustment:
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

Resources

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## Rocky Flats Closure Project
### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0901  
**Activity ID:** 1GER691150  
**Project:** Baseline Devl  
**WBS Filter:** 1GAC  
**Activity Filter:** *  

### ASC - SUPPLIES

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**Factors:** 800 geoprobe

### ASH - SUBCONTRACTED SRVS

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**Factors:** 8 hrs 60 dollars/hour

---

**Line Item 0200 - analyze samples**

**BOE**

**Vendor Quote:**

Email quote: average cost from Kaiser-Hill ASD (V. Ideker).

**Item Desc:**
Analyze samples produced from geoprobe borings. It is anticipated that 3 samples from each baring will be collected. They will be analyzed for Metals, VOCs, SVOCs, PCBs, and radionuclides (est. 3 isotopes) with a 30 day TAT. This item is priced on a per sample basis. Per sample costs include DOT rad screen, bottle charge, shipping, and validation.

**Breakdown of Cost Data:**
- Item: Analyze samples at an offsite laboratory.
- Unit Cost: Analysis
- Unit Cost: Metals $345, VOCs $280, SVOCs $440, PCBs and other analytes $150, and Radionuclides 3 isotopes $590 per each sample.
- Unit Cost Adjustment Factor: Must add: DOT rad screen $32/sample, bottle charge $7/sample, shipping $4.2/bottle, and validation per each: $17.30 VOA, $19.25 SVOC, $16.75 Metals, $5.95 PCB, and $15.60 Rad.
- Revised Unit Hours: Metals $405, VOCs $341, SVOCs $502, PCBs and other analytes $199, and Rad $649.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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**Line Item 0300 - project mgmt oversight**

**BOE**

**Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.**

**Item Desc:**
Based on the Building 123 field sampling reduced by 50% because of the newer building and processes involved.

**Breakdown of Cost Data:**
- Item: Mgmt oversight
- Unit Cost: hours
- Unit Cost: 12
- Unit Cost Adjustment Factor: none
- Revised Unit Hours: 12

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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**Line Item SYS - Contingency And Escalation**

**BOE**

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### Rocky Flats Closure Project

**Baseline Deviation:** Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0901
**Activity ID:** 1GER691150

---

**Project:** Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

**WBS No:** 1GAC0901
**Activity ID:** 1GER691150

---

**Activity ID:** 1GER691170
**Description:** Prepare Summary/NFA - IHSS Group 900-1

**Schedule Risk:** 1
**Cost Risk:** 1

---

#### Line Item 0100 - develop documentation

**BOE**

**Department**

**Skill**

**Quantity**

**Units**

**Curve**

**Contingency & Escalation**

**Total Cost**

---

**BOE Description**

*Estimator's Experience:*

*Perform Data Analysis including GIS representation of data, NFA Summary, Characterization Report, and associated project management. Disposition comments and finalize document.*

---

**Resources**

**Cost Element**

**Skill**

**Department**

**Curve**

**Quantity**

**Units**

---

**Activity ID:** 1GER691170
**Description:** Prepare Summary/NFA - IHSS Group 900-1

**Schedule Risk:** 1
**Cost Risk:** 1

---

**Resources**

**Cost Element**

**Skill**

**Department**

**Curve**

**Quantity**

**Units**

---

**Factors:** 173,494.10 Dollars

---

**Activity ID:** 1GER691170
**Description:** Prepare Summary/NFA - IHSS Group 900-1

**Schedule Risk:** 1
**Cost Risk:** 1

---

**Resources**

**Cost Element**

**Skill**

**Department**

**Curve**

**Quantity**

**Units**

---

**Factors:** 1140.87 Dollars

---

**Factors:** 6/23/00 9:23:11 AM

---

**OFFICIAL USE ONLY**
**Rocky Flats Closure Project**  
**Baseline Cost and Basis of Estimate**

**WBS No:** 1GAC0901  
**Activity ID:** 1GER691170

**Activity Filter:** 1GAC  
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**Line Item 0200 - SAP**

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**Line Item 0100 - PAM**

*BOE Description:
Preparation of PAM or IM/IRA in support of source removal of previously characterized UBC.*

*Proposed Action Memorandum: A bottoms-up estimate based on historical costs was used as the basis for the estimate. Based on Ryan's Pit (IHSS 108), the cost for the PAM was $50,000 (contractor costs). Assuming that labor rates at this time were approximately $75 (based on a cost center 217). The total labor for a PAM would be approximately 666 hours, which rounds to 700 hours. It was assumed that 10% would be required for managerial hours.*

For a PAM the total labor hours are:
- Environmental Engineer 700 Hours
- Manager 70 Hours

*Factor 700 Environmental Engineer 175 hours
Factor 70 Manager 18 hours

**Breakdown of Cost Data:**
- Item: Preparation of PAM for Ryan's Pit source removal action.
- Units: hours
- Unit Cost: 770
- Unit Cost Adjustment Factor: 0.25
- Revised Unit Hours: 193

*Basis for adjustment. Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.*

*Interim Measure/Interim Remedial Action Decision Document: It was assumed that an IM/IRA Decision Document would take 75% more effort than a PAM or 1,166 hours, which rounds to 1200 hours. It was assumed that 10% of this labor would be required for managerial hours.*

For an IM/IRA the total labor hours are:
- Environmental Engineer 1200 Hours
- Manager 120 Hours

*Factor 1200 Environmental Engineer 300 hours
Factor 120 Manager 30 hours

**Resources**

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**Line Item 0200 - SAP**

*BOE Description:
Preparation of SAP in support of source removal of previously characterized UBC.*

*Item Desc:
Preparation of SAP in support of source removal of previously characterized UBC.*
### Breakdown of Historical Data:

**Item:** Preparation of SAP for Ryan's Pit source removal action.
- **Units:** hours
- **Unit Cost:** 300
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit Hours:** 76

Basis for adjustment. Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

### Line Item 0300 - WMP

#### BOE

Estimator's Experience based generally on historical data for Ryan's Pit.

**Item Desc:**
Preparation of WMP in support of source removal of previously characterized UBC.

Breakdown of Historical Data:
- **Item:** Preparation of WMP for Ryan's Pit source removal action.
  - **Units:** hours
  - **Unit Cost:** 80
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit Hours:** 20

Basis for adjustment. Hours for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be remediated at once and only one set of decision/planning documents are needed for the group.

### Resources

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### Line Item SYS - Contingency And Escalation

#### BOE

**Cost Element**

| CON CONTINGENCY | 0000 NONE | ZDEPT No Department | Linear | 549.477 Dollars |
| ESC ESCALATION  | 0000 NONE | ZDEPT No Department | Linear | 1,128.02 Dollars |

### Activity ID: 1GER691210

**Description:** Procurement and Field Prep - IHSS Grouping 900-1

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Total for Activity 1GER691210:  
- **Labor Hours Total:** 345
- **Labor Cost Total:** 10,637
- **Materials/Sub Cost:** 2,114
- **Contingency & Escalation:** 0
- **Total Prime Cost:** 12,751
- **Burden Cost:** 3,363
- **Total Cost:** 16,114

### Line Item 0100 - procurement & field prep

**Item Desc:**
Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation

**Breakdown of Cost Data:**
- **Item:** Site Labor to perform above individual tasks for either Ryan's Pit or T-3/T-4.
  - **Units:** hours
  - **Unit Cost:** 1380

---

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Unit Cost Adjustment Factor: 0.25  
Revised Unit: 345 hours

Item: Subcontractor costs to perform above individual tasks for either Ryan's Pit or T-3/T-4.

Units: 1 lot
Unit Cost: $10K
Unit Cost Adjustment Factor: 0.25
Revised Unit: $2.5K

Basis for adjustment. Hours and costs for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be characterized at once.

Procurement includes preparation of statement of work, proposal review (technical evaluation), and negotiations. Based on a T-3/T-4 burdened cost of $29,186.52. Assuming it is primarily labor hours (RMRS Environmental Engineer charging at $57.45 per hour) yields 508 hours which rounds to 510 total hours.

Davis Bacon Documentation: It was assumed that it would take an environmental engineer twenty-four hours to prepare a Davis Bacon cost estimate and to support the Davis-Bacon determination.

Subcontractor Health and Safety Plan: Costs for the health and safety plan are based on Ryan's Pit, which cost approximately $10,000. It was assumed that these are A5H dollars. In addition, it was assumed that a safety engineer, an industrial hygienist, and a radiological engineer would each provide one week (40 hours) of support for review and document preparation.

Radiological Work Permit: It was assumed that it would take a radiological control technician two working days (18 hours) to complete counting preparation and review.

Implementation Plan: It was estimated that this activity would take 13 weeks of time for engineers, scientists or equivalent to complete. This would include preparation of an implementation plan as required (Rocky Flats Cleanup Agreement, Appendix J, Interim Guidance Document, Dated August 1977). In addition this includes all tasks related to documentation for the Integrated Work Control Program and Integrated Safety Management.

Ecology Survey/National Environmental Protection Act (NEPA) Support: It was estimated that this would take 40 hours for an ecologist. The activities include NEPA review and support in document preparation, site surveys to verify compliance with ecological regulations, categorical exclusions, and NEPA evaluations.

Utility Clearance/Soil Disturbance Permits: It was estimated based on experience that it would take the equivalent 2 weeks (80 hours) for technical staff to do utility surveys, prepare and review soil disturbance permits, and prepare authorizing documents for excavation.

The combined resources for procurement and field preparations are:

Total Procurement and Field Preparation Hours

Environmental Engineer 1134 hours
Safety Engineer 40 hours
Industrial Hygiene 40 hours
Radiological Engineering 58 hours
Radiological Control Technician 18 hours
Ecologist/Life Scientist 40 hours
Manager 50 hours
Quality Assurance* 29 hours
A5H Total $10,000

* On some projects these hours were assumed to be included in other tasks or part of this task under environmental engineer or one of the other job functions.

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

Factor 1134 – Environmental Engineer 283 Hours
Factor 40 – Safety Engineer 10 Hours
Factor 40 – Industrial Hygiene 10 Hours
Factor 50 – Radiological Engineering 14 Hours
Factor 18 – RCT 5 Hours
Factor 40 – Life Scientist 10 Hours
Factor 50 – Project Manager 13 Hours
Factor 10000 – A5H Subcontracted Services 2,500 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### Resources

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**Line Item SYS - Contingency And Escalation**

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**Activity ID: 1GER691240**

**Description:** Readiness Assessment - IHSS Group 900-1

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**Line Item 0100 - readiness assessment**

Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation

**Item Desc:**

Evaluate readiness of the field characterization team and plans.

**Breakdown of Cost Data:**

**Item: Site Labor to perform Readiness Assessment for T-3/T-4.**

- **Units:** hours
- **Unit Cost:** 187
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** 48

**Item: Subcontractor costs to perform Readiness Assessment for T-3/T4.**

- **Units:** 1 lot
- **Unit Cost:** $4800
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** $1200

It was estimated that subcontractor involvement would require 80 hours at $60/hour = $4,800. It was assumed that about 3 weeks of time was required for an environmental engineer or similar person in addition to 12 hours of project management, which yielded 132 hours. An additional 11 hours was added for management oversight. It was estimated that a radiological engineer (QA) and an industrial hygienist would be needed for 2.5 days each (22 hours).
The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 projects will be conducted at once and only one of each fixed cost is needed for the group.

Factor 132 - Environmental Engineer 33 Hours
Factor 22 - Health Physicists 6 Hours
Factor 11 - Manager 3 Hours
Factor 22 - Quality Assurance 6 Hours
Factor 4,800 - A5H Subcontracted Srvs 1,200 Dollars

20 hours of administrative time will also be required.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
**Rocky Flats Closure Project**  
**Baseline Cost and Basis of Estimate**

**WBS Filter:** 1GAC  
**Activity Filter:** *  
**Starts In FY:** *

**WBS No:** 1GAC0901  
**Activity ID:** 1GER691240

---

### Breakdown of Cost Data:

- **Item:** Site Labor to perform above individual tasks for T-3/T-4.
  - **Units:** hours
  - **Unit Cost:** 60 hours
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** 15 hours

- **Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
  - **Units:** lot
  - **Unit Cost:** $6K
  - **Unit Cost Adjustment Factor:** 0.25
  - **Revised Unit:** $1.5K

**Basis for adjustment:** Costs for each UBC are divided by 4 to account for the fact that 4 UBCs will be remediated at once and only one Pre-Evolution Meeting is needed for the group.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

### Resources

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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<td>STRAIGHT TIME BASE</td>
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<td>R100S BMRS Salaried</td>
<td>Linear</td>
<td>15.00 Hours</td>
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<td>ZDEPT No Department</td>
<td>Linear</td>
<td>1,437.27 Dollars</td>
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---

### Line Item 0100 - mobilization

- **Description:** Mobilization in support of remediation.
- **BOE:** Estimator's Experience based generally on historical data for T-3/T4 Remediation.
- **Item Desc:** Conduct Pre-Evolution Meeting in support of source removal action.
Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

T3/T4 hours 110 Health Physicists 27 Hours
T3/T4 hours 330 Manager 83 Hours
T3/T4 hours 550 Environmental Engineer 138 Hours
T3/T4 hours 110 Industrial Hygienist 27 Hours
T3/T4 subcontractor dollars 184,000 Subcontractor 46,000

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
T3/T4 hours 120 Environmental Engineer 30 hours
T3/T4 dollars 30,000 Subcontracted Svrs 7,500 Dollars

D&D construction trade hours were calculated using the following methodology:

A5H subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.

RCT hours were calculated using the following methodology, unless they were already estimated.

For Site Preparation tasks - RCT hours were the same as D&D construction hours.
For all other tasks A5H subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under KG10H department code.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

<table>
<thead>
<tr>
<th>Resource</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>T3/T4 hours 120 Environmental Engineer 30 hours</td>
<td></td>
</tr>
<tr>
<td>T3/T4 dollars 30,000 Subcontracted Svrs 7,500 Dollars</td>
<td></td>
</tr>
</tbody>
</table>

Breakdown of Historical Data:

**Item:** Site Labor to perform above individual tasks for T-3/T-4.
- **Units:** hours
- **Unit Cost:** see below
- **Unit Cost Adjustment Factor:** see below
- **Revised Unit:** see below

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
- **Units:** 1 lot
- **Unit Cost:** see below
- **Unit Cost Adjustment Factor:** see below
- **Revised Unit:** see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

**Total Contaminated Soil to be removed:** 3333 CY
**Total Soil for Thermal Desorption:** 0 CY
**Offsite Waste Volume:** 3333 CY

The excavation cost was based on the excavation cost for the T-3/T-4 Project. Burdened cost based on the T-3/T-4 actuals is $171,487. For the 3,800 cubic yards of contaminated soil removed this yielded a unit cost of $45 per cubic yard of contaminated soil removed. This estimate includes the removal of overburden that might be on top of the contaminated soil. The hours for an environmental engineer from T-3/T-4 were 1.09 hours per cubic yard. Likewise the hours for the following were assumed to be linearly proportional:

**Health Physicists:** 0.47 hours per cubic yard
**Environmental Operations:** 0.31 hours per cubic yard
**Industrial Hygienists:** 0.31 hours per cubic yard
Radiological Control Technician 1.00 hour per cubic yard *

* Based on $50/cubic yard from T-3/T-4, assumes a labor rate of $50/hour

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

<table>
<thead>
<tr>
<th>Resources</th>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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</thead>
<tbody>
<tr>
<td>750</td>
<td>STRAIGHT TIME BASE</td>
<td>E050</td>
<td>ENVIRONMENTAL ENGINEERS</td>
<td>K26SS</td>
<td>Linear</td>
<td>3,633.00 Hours</td>
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<td>Factors</td>
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<td>MANAGERS (GRADE 69-72)</td>
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<td>750</td>
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<td>P080</td>
<td>HEALTH PHYSICISTS</td>
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<td>INDUSTRIAL HYGIENISTS</td>
<td>R100S</td>
<td>RMRS Salaried</td>
<td>1,033.00 Hours</td>
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<td></td>
<td></td>
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<tr>
<td>750</td>
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Line Item 0400 - remove and clean debris

BOE

Estimator's Experience based generally on a base case of 700 cy.

Item Desc:
Remove and clean debris.

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.

<table>
<thead>
<tr>
<th>Units</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Unit Cost</td>
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</tr>
<tr>
<td>Unit Cost Adjustment Factor</td>
<td>see below</td>
</tr>
<tr>
<td>Revised Unit</td>
<td>see below</td>
</tr>
</tbody>
</table>

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.

<table>
<thead>
<tr>
<th>Units</th>
<th>1 lot</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit Cost</td>
<td>see below</td>
</tr>
<tr>
<td>Unit Cost Adjustment Factor</td>
<td>see below</td>
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</table>
Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Total Contaminated Soil to be removed 3333 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 3333 CY

For the base case, it was assumed that about five cubic yards out of 700 cubic yards would be debris and would be segregated and cleaned. It was estimated that each cubic yard of debris would cost $1,000 or $5,000 total for 700 cubic yards. This yields a rate of $7.14 per cubic yard.

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 7.14 - A5H Subcontracted Srvs 23,798 Dollars
D&D construction trade hours were calculated using the following methodology:
A5H subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.
RCT hours were calculated using the following methodology, unless they were already estimated.
For Site Preparation tasks - RCT hours were the same as D&D construction hours.
For all other tasks A5H subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under KG10H department code.
The dollars amounts calculated for D&D construction workers and RCTs were subtracted from the subcontractor dollars and the revised A5H dollar amount was entered into Best.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

<table>
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<tr>
<th>Resources</th>
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<th>Skill</th>
<th>Department</th>
<th>Curve</th>
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<td>D&amp;D CONSTRUCTION TRADES (incl.</td>
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Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc: Confirmation Sampling.

Breakdown of Historical Data:

Item: Site Labor to perform above individual tasks for T-3/T-4.
Units: hours
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
Units: 1 lot
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated
Contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

Total Contaminated Soil to be removed 3333 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 3333 CY

The analytical costs were based on T-3/T-4, which cost $435,574 for 3800 cubic yards of contaminated soil removed. This yielded a unit rate of about $115/cubic yard. Based on estimator experience the cost of sampling including labor and materials was estimated to be 20% of that rate or about $23/ cubic yard.

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Factor 114.62 - A5H Subcontracted Srvs (Analytical) 382,028 Dollars
Factor 22.924 - A5H Subcontracted Srvs 76,406 Dollars

D&D construction trade hours were calculated using the following methodology:

A5H subcontracted dollars were multiplied by .19, the result was divided by 60 to determine the number of hours allocated to D&D construction.

RCT hours were calculated using the following methodology, unless they were already estimated.

For Site Preparation tasks - RCT hours were the same as D&D construction hours.

For all other tasks A5H subcontracted dollars were multiplied by .15, the result was divided by 60 to determine the number of hours allocated to RCTs under KG10H department code.

The dollars amounts calculated for D&D construction workers and RCTs were subtracted from the subcontractor dollars and the revised A5H dollar amount was entered into Best.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
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<td>A5H SUBCONTRACTED SRVS</td>
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<td>units per yard</td>
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### Line Item 0700 - prepare waste acceptance forms

**Estimator's Experience based generally on historical data for T-3/T4 Remediation.**

**Item Desc:** Prepare Waste Acceptance Forms

**Breakdown of Historical Data:**

**Item: Site Labor to perform above individual tasks for T-3/T-4.**
- **Units:** hours
  - **Unit Cost:** see below
  - **Unit Cost Adjustment Factor:** see below
  - **Revised Unit:** see below

**Item: Subcontractor costs to perform above individual tasks for T-3/T-4.**
- **Units:** 1 lot
  - **Unit Cost:** see below
  - **Unit Cost Adjustment Factor:** see below
  - **Revised Unit:** see below

**Basis for adjustment.** The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.5 factor to account for the fact that 2 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

T3/4 hours 80 environmental engineer 20 hours
### Rocky Flats Closure Project

#### Baseline Cost and Basis of Estimate

<table>
<thead>
<tr>
<th>WBS No: 1GAC0901</th>
<th>Activity ID: 1GER891250</th>
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<tbody>
<tr>
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<td><strong>Cost Element</strong></td>
<td><strong>Skill</strong></td>
</tr>
<tr>
<td>750 STRAIGHT TIME BASE</td>
<td>E050 ENVIRONMENTAL ENGINEERS</td>
</tr>
</tbody>
</table>

**Line Item 0800 - waste acceptance sampling**

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

- **Item Desc:** Waste Acceptance Sampling
- **Breakdown of Historical Data:**
  - **Item:** Site Labor to perform above individual tasks for T-3/T-4.
    - **Units:** hours
    - **Unit Cost:** see below
    - **Unit Cost Adjustment Factor:** see below
    - **Revised Unit:** see below
  - **Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
    - **Units:** 1 lot
    - **Unit Cost:** see below
    - **Unit Cost Adjustment Factor:** see below
    - **Revised Unit:** see below

- **Basis for adjustment:** The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

- **Because the waste acceptance sampling is difficult to predict and could vary significantly from project to project, it was assumed that about $800 worth of additional analysis would be required for 20 cubic yards which is the volume that can be placed in one roll-off. This yielded a unit rate of about $40/cubic yard. This sampling and analysis is in addition to the confirmational samples so the costs are not so great. It was assumed that this sampling would be more labor intensive so the sampling costs were estimated to be about 50% of the analytical costs or about $20/cubic yard.**

- **Total Contaminated Soil to be removed 3333 CY**
- **Total Soil for Thermal Desorption 0 CY**
- **Offsite Waste Volume 3333 CY**

- **The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.**

- **Factor 40 - ASH Analytical 133,320 Dollars**
- **Factor 20 - ASH Subcontracted Srvs 66,660 Dollars**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Line Item 0900 - field oversight & project mgmt

**BOE**

Estimator's Experience based generally on a base case of 700 cy.

- **Item Desc:** Field Oversight and Project Management
- **Breakdown of Historical Data:**
  - **Item:** Site Labor to perform above individual tasks for T-3/T-4.
    - **Units:** hours
    - **Unit Cost:** see below
Project: Rocky Flats Closure Project
Baseline Cost and Basis of Estimate

WBS No: 1GAC0901
Activity ID: 1GER891250

Unit Cost Adjustment Factor: see below
Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
Units: 1 lot
Unit Cost: see below
Unit Cost Adjustment Factor: see below
Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

It was assumed that a field manager would be needed for 150 nine-hour working days or about 33 weeks. This work breaks down as follows:

Preparation Activities 50 working days
Field Activities – 80 working days
Demobilization – 20 working days
Total 150 nine-hour working days or 1350 hours

In addition it was estimated that technical staff, quality assurance, and project management would be required for the equivalent of ten additional weeks, which is 400 hours each.

Based on the base case of a 700 cubic yard removal project, these values yielded unit rates as follows

<table>
<thead>
<tr>
<th>Hours Per Cubic Yard</th>
<th>Of Contaminated Soil</th>
</tr>
</thead>
<tbody>
<tr>
<td>Field Manager</td>
<td>1.93</td>
</tr>
<tr>
<td>Technical Staff</td>
<td>.57</td>
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<tr>
<td>Quality Assurance</td>
<td>.57</td>
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<tr>
<td>Project Management</td>
<td>.57</td>
</tr>
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</table>

The factor for each skill is multiplied by the number of cubic yards of waste to develop hour estimates.

Total Contaminated Soil to be removed 3333 CY
Total Soil for Thermal Desorption 0 CY
Offsite Waste Volume 3333 CY

Factor 1.93 - Environmental Engineer 6,433 Hours
Factor 0.57 - Technical Support 1,899 Hours
Factor 0.57 - Project Manager 1,899 Hours
Factor 0.57 - Quality Assurance 1,899 Hours

<table>
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<td>RMRS Salaried</td>
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Line Item 1000 - backfill

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
### Resources

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Factors 15 units per yard in crates

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<tr>
<td>Estimator's Experience based generally on historical data for T-3/T4 Remediation.</td>
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<tr>
<td>Item Desc:</td>
<td>Demobilization.</td>
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<tr>
<td>Breakdown of Historical Data:</td>
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<tr>
<td>Item: Site Labor to perform above individual tasks for T-3/T-4.</td>
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<tr>
<td>Units: hours</td>
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<td>Unit Cost: see below</td>
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<tr>
<td>Unit Cost Adjustment Factor: see below</td>
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<tr>
<td>Revised Unit: see below</td>
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<tr>
<td>Item: Subcontractor costs to perform above individual tasks for T-3/T-4.</td>
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<tr>
<td>Units: 1 lot</td>
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<tr>
<td>Unit Cost: see below</td>
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<td>Unit Cost Adjustment Factor: see below</td>
<td></td>
</tr>
<tr>
<td>Revised Unit: see below</td>
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</tr>
<tr>
<td>Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs. Demobilization: Based on the T-3/T-4 project, it was assumed that demobilization costs would cover demobilization for excavation activities also. The subcontractor cost for demobilization was about $95,000 for 3,800 cubic yards at the T-3/T-4 project. In addition it was estimated that the following hours were necessary:</td>
<td></td>
</tr>
<tr>
<td>Environmental Engineer 300 hours</td>
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<tr>
<td>Health Physicist 100 hours</td>
<td></td>
</tr>
<tr>
<td>Manager 200 hours</td>
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<tr>
<td>Industrial Hygiene 100 hours</td>
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</table>
The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group.

Factor 300 - Environmental Engineer 75 Hours
Factor 100 - Health Physicists 25 Hours
Factor 200 - Manager 50 Hours
Factor 100 - P090 Industrial Hygienists 25 Hours
Factor 95000 - A5H Subcontracted Srvs 23,750 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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<tr>
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**Line Item SYS - Contingency And Escalation**

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**Activity ID: 1GER691270**

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Total for Activity 1GER691270: 320 9,045 0 6,522 15,567 3,148 18,714

**Line Item 0100 - develop report**

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.(T-3/T-4 and others)

Item Desc: Perform Data Analysis including GIS representation of data, Closeout Report, and associated project management.

Required level of effort:
- Environmental Engineer - 80 hours
- Environmental Scientist - 80 hours
- Computer Specialist - 160 hours (GIS, SWD)
- Manager - 20 hours
- Administrative - 20 hours
- Cost Estimators - 20 hours

Breakdown of Cost Data:
- Item: Develop Documentation
  - Units: hours
  - Unit Cost: 320
  - Unit Cost Adjustment Factor: none
  - Revised Unit Hours: 320
**Rocky Flats Closure Project**  
**Baseline Cost and Basis of Estimate**

### Resources

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### Line Item SYS - Contingency And Escalation

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### Line Item 0100 - SAP Addenda

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<th>Material/Sub Cost</th>
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Total for Activity 1GHF900300:

- Labor Hours Total: 280
- Labor Cost Total: 10,021
- Material/Sub Cost: 1,421
- Contingency & Escalation: 2,037
- Total Prime Cost: 13,479
- Burden Cost: 2,826
- Total Cost: 16,304

### Notes
- The estimate is based on the estimator's experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.
- Breakdown of Cost Data:
  - Item: Preparation of SAP addenda
  - Units: hours
  - Unit Cost: 120
  - Unit Cost Adjustment Factor: none
  - Revised Unit Hours: 120
- Basis for adjustment.
- This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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**Page 951 of 1121**

6/23/00 9:23:14 AM  
OFFICIAL USE ONLY
Line Item 0200 - HASP Addenda

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

Item Desc:
Preparation of HASP addenda to Industrial Area Characterization Plan

Breakdown of Cost Data:
Item: Preparation of addenda for HASP.
Units: hours
Unit Cost: 140
Unit Cost Adjustment Factor: none
Revised Unit Hours: 140

Basis for adjustment.

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<th>Cost Element</th>
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<th>Department</th>
<th>Curve</th>
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<td>ENVIRONMENTAL ENGINEERS</td>
<td>R100S</td>
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<td>M020</td>
<td>MANAGERS (GRADE 69-72)</td>
<td>R100S</td>
<td>RMRS Salaried</td>
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<td>HEALTH PHYSICISTS</td>
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Line Item 0300 - QAP Addenda

Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

Item Desc:
Preparation of SAP Addenda to Industrial Area Characterization Plan.

Breakdown of Cost Data:
Item: Preparation of QAP addenda
Units: hours
Unit Cost: 60
Unit Cost Adjustment Factor: none
Revised Unit Hours: 60

Basis for adjustment.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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Line Item SYS - Contingency And Escalation

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Activity ID: 1GHF900300
Description: Procurement & Field Prep - IHSS Group 900-3

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<th>Line Item</th>
<th>Description</th>
<th>Quantity</th>
<th>Units</th>
<th>BOE</th>
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<th>Contingency &amp; Escalation</th>
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<th>Burden Cost</th>
<th>Total Cost</th>
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Baseline Cost and Basis of Estimate

Line Item 0100 - field prep

| Breakdown of Cost Data: | |
| Item: Site Labor to perform above individual tasks for either Ryan's Pit or T-3/T-4. |
| Units: hours |
| Unit Cost: 1380 |
| Unit Cost Adjustment Factor: 0.25 |
| Revised Unit: 345 hours |
| Item: Subcontractor costs to perform above individual tasks for either Ryan's Pit or T-3/T-4. |
| Units: 1 lot |
| Unit Cost: $10K |
| Unit Cost Adjustment Factor: 0.25 |
| Revised Unit: $2.5K |

Basis for adjustment. Hours and costs for each UBC are multiplied by 0.25 to account for the fact that 4 UBCs will be characterized at once.

Procurement includes preparation of statement of work, proposal review (technical evaluation), and negotiations. Based on a T-3/T-4 burdened cost of $29,186.52. Assuming it is primarily labor hours (RMRS Environmental Engineer charging at $57.45 per hour) yields 508 hours which rounds to 510 total hours.

Davis Bacon Documentation: It was assumed that it would take an environmental engineer twenty-four hours to prepare a Davis Bacon cost estimate and to support the Davis-Bacon determination.

Subcontractor Health and Safety Plan: Costs for the health and safety plan are based on Ryan's Pit, which cost approximately $10,000. It was assumed that these are A5H dollars. In addition, it was assumed that a safety engineer, an industrial hygienist, and a radiological engineer would each provide one week (40 hours) of support for review and document preparation.

Radiological Work Permit: It was assumed that it would take a radiological control technician two working days (18 hours) to complete counting preparation and review.

Implementation Plan: It was estimated that this activity would take 13 weeks of time for engineers, scientists or equivalent to complete. This would include preparation of an implementation plan as required (Rocky Flats Cleanup Agreement, Appendix 3, Interim Guidance Document, Dated August 1977). In addition this includes all tasks related to documentation for the Integrated Work Control Program and Integrated Safety Management.

Ecology Survey/National Environmental Protection Act (NEPA) Support: It was estimated that this would take 40 hours for an ecologist. The activities include NEPA review and support in document preparation, site surveys to verify compliance with ecological regulations, categorical exclusions, and NEPA evaluations.

Utility Clearance/Soil Disturbance Permits: It was estimated based on experience that it would take the equivalent 2 weeks (80 hours) for technical staff to do utility surveys, prepare and review soil disturbance permits, and prepare authorizing documents for excavation.

The combined resources for procurement and field preparations are:

Total Procurement and Field Preparation Hours

- Environmental Engineer 1134 hours
- Safety Engineer 40 hours
- Industrial Hygiene 40 hours
- Radiological Engineering 58 hours
- Radiological Control Technician 18 hours
- Ecologist/Life Scientist 40 hours
- Manager 50 hours
- Quality Assurance* 29 hours

A5H Total $10,000

* On some projects these hours were assumed to be included in other tasks or part of this task under environmental engineer or one of the other job functions.

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for...
Factor 1134 - Environmental Engineer 283 Hours
Factor 40 - Safety Engineer 10 Hours
Factor 40 - Industrial Hygiene 10 Hours
Factor 58 - Radiological Engineering 14 Hours
Factor 18 - RCT 5 Hours
Factor 40 - Life Scientist 10 Hours
Factor 10000 - ASH Subcontracted Services 2,500 Dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

<table>
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<tr>
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Line Item SYS - Contingency And Escalation

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Activity ID: 1GHF900340

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Total for Activity 1GHF900340:

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<tr>
<th>Line Item 0100 - readiness assessment</th>
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Estimator's Experience based on 15 years of experience planning, estimating and conducting projects of similar scope and size.

Item Desc:
Evaluate readiness of the field characterization team and plans.
Breakdown of Cost Data:
Item: Site Labor to perform Readiness Assessment for T-3/T-4.
Units: hours
Unit Cost: 187
Unit Cost Adjustment Factor: 0.25
Revised Unit: 48
It was estimated that subcontractor involvement would require 80 hours at $60/hour = $4,800. It was assumed that about 3 weeks of time was required for an environmental engineer or similar person in addition to 12 hours of project management, which yielded 132 hours. An additional 11 hours was added for management oversight. It was estimated that a radiological engineer (QA) and an industrial hygienist would be needed for 2.5 days each (22 hours).

The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 projects will be conducted at once and only one of each fixed cost is needed for the group.

Factor 132 - Environmental Engineer 33 Hours
Factor 22 - Health Physicists 6 Hours
Factor 11 - Manager 3 Hours
Factor 22 - Quality Assurance 6 Hours
Factor 4,800 - A5H Subcontracted Srvs 1,200 Dollars

20 hours of administrative time will also be required.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
field QC documentation, and prepare field notes on a full time basis. A site RCT will monitor the site for radiological contamination on a full time basis. A site Industrial Hygienist will implement the field portion of the HASP on a full time basis.

### Breakdown of Cost Data:

- **Item:** Site Personnel for support of sample collection
- **Units:** hours
- **Cost:** 24
- **Cost Adjustment Factor:** none
- **Revised Unit Hours:** 24

### Resources

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### Line Item 0200 - analyze samples (radionuclides)

- **BOE:** Vendor Quote
  - Email quote: average cost from Kaiser-Hill ASD (V. Ideker).

  **Item Desc:** Analyze samples produced from geoprobe borings. It is anticipated that 3 samples from each boring will be collected. They will be analyzed for Metals, VOCs, SVOCs, PCBs, and radionuclides (est. 3 isotopes) with a 30 day TAT. This item is priced on a per sample basis. Per sample costs include DOT rad screen, bottle charge, shipping, and validation.

  **Breakdown of Cost Data:**
  - **Item:** Analyze samples at an offsite laboratory
  - **Units:** analysis
  - **Unit Cost:** Metals $345, VOCs $280, SVOCs $440, PCBs and other analytes $150, and Radionuclides 3 isotopes) $590 per each sample.
  - **Unit Cost Adjustment Factor:** Must add: DOT rad screen $32/sample, bottle charge $7/sample, shipping $4.2/bottle, and validation per each: $17.30 VOA, $19.25 SVOC, $16.75 Metals, $5.95 PCB, and $15.60 Rad.
  - **Revised Unit Hours:** Metals $405, VOCs $341, SVOCs $502, PCBs and other analytes $199, and Rad $649.

  This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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### Line Item 0300 - project mgmt oversight

- **BOE:** Estimate based on Estimator's Experience of more than 10 years of experience with projects of similar size and scope at RFETS and other sites.

  **Item Desc:** Project Management/Oversight. Based on half time for a Project Manager, Administrative staff, and Cost Estimator/Scheduler

  **Breakdown of Cost Data:**
  - **Item:** Mgmt oversight
  - **Units:** hours
  - **Cost:** 12
  - **Cost Adjustment Factor:** none
  - **Revised Unit Hours:** 12

  Basis for adjustment.

  This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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<th>Curve</th>
<th>Quantity</th>
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</table>
Line Item 0400 - analyze samples (nitrates)

**BOE**

**Vendor Quote**

Email quote: average cost from Kaiser-Hill ASD (V. Ideker).

**Item Desc:** Analyze samples produced from geoprobe borings. It is anticipated that 3 samples from each boring will be collected. They will be analyzed for Metals, VOCs, SVOCs, PCBs, and radionuclides (est. 3 isotopes) with a 30 day TAT. This item is priced on a per sample basis. Per sample costs include DOT rad screen, bottle charge, shipping, and validation.

**Breakdown of Cost Data:**
- **Item:** Analyze samples at an offsite laboratory.
- **Unit:** analysis
- **Unit Cost:** Metals $345, VOCs $280, SVOCs $440, PCBs $85, and Radionuclides (est. 3 isotopes) $590 per each sample.
- **Unit Cost Adjustment Factor:** Must add: DOT rad screen $32/sample, bottle charge $7/sample, shipping $4.2/bottle, and validation per each: $17.30 VOA, $19.25 SVOC, $16.75 Metals, $5.95 PCB, and $15.60 Rad.
- **Revised Unit Hours:** Metals $405, VOCs $341, SVOCs $502, PCBs $214, and Rad $649.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Resources**

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**Line Item SYS - Contingency And Escalation**

**BOE**

**Factors** 199 dollars

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**Activity ID:** 1GHF900370 **Description:** Prepare NFA - Group 900-3

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<th>Description</th>
<th>Quantity</th>
<th>Units</th>
<th>BOE</th>
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<th>Materials/Sub Cost</th>
<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
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**Total for Activity 1GHF900370:**

|                      | 138 | 4,164 | 3,003 | 7,167 | 1,449 | 8,616 |

**Line Item 0100 - develop documentation**

**BOE**

**Estimator's Experience:**

This estimate was constructed based on actual hours required to complete previous NFA Reports (obtained from actual author) and professional judgement of level of effort required for remaining reports.

**Item Desc:**

Perform Data Analysis including GIS representation of data, NFA Summary, and associated project management.

**Breakdown of Cost Data:**

**Item:** Develop Documentation
- **Units:** Hours
- **Unit Cost:** 138
- **Environmental Engineer:** 45 hrs - Evaluate & assemble existing data. Draft Report.
- **SMD Technician:** 10 hrs - Identify & pull existing data from database.
- **GIS Technician:** 15 hrs - Develop maps for Report. Print multiple copies.
- **Technical Editor:** 15 hrs - Complete initial and revised tech edits of Report.
- **Technical Reviews:**
  - QA: 4 hrs - Review and comment per area of expertise.
  - Peer (2): 8 hrs - Review and comment per area of expertise.
  - Compliance: 4 hrs - Review and comment per area of expertise.
The document contains a detailed breakdown of labor and resources required for the Rocky Flats Closure Project, specifically for the baseline cost and basis of estimate. It includes a table listing the costs, quantities, units, and labor hours for various activities, such as environmental and legal reviews, and administrative support tasks. The document also outlines the cost element, skill, and department for these activities, along with the associated costs and unit prices. The project information includes the WBS filter and activity filter details, and the schedule risk and cost risk values are provided. The document references specific project tasks and provides a breakdown of cost data for decision-making purposes. The page is marked as official use only, indicating its confidentiality level.
Breakdown of Cost Data: The estimate accounts for 1560 hours on a conceptual design of the ET cover. The remaining 1000 hours are estimated to develop a detailed work scope for the characterization of the process waste lines and a decision document.
### Rocky Flats Closure Project

#### Baseline Cost and Basis of Estimate

<table>
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#### WBS: 1GAC0A01

**Project Management**

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#### Contingency And Escalation

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**Resources**

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**Contingency And Escalation**

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**Cost Element**

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**Summary**

**Total for Activity 1GKA200010:**

- **3,100**
- **88,682**
- **260,548**
- **403,509**
- **428,517**

---

**Note:**

- This estimate is based on estimator judgement, historical data, and commercial databases from similar type work.
- For more complete detail refer to Timberline estimate No. EP1000-6B "Solar Ponds Cap" for more detail and the backup for costs.
- This BOE is developed from oversight of the Subcontractors work on Title II/III development which includes planning/budget, management, and project manager oversight.
- 1480 manhours for project management oversight
- 120 manhours for management
- 100 manhours for central planning budget
### Line Item 0100 - Procurement Support

**Description:**
Estimator's Experience based generally on historical data from other projects Ryan's Pit and T-3/T4 Remediation.

**Item Description:**
Assemble procurement package: SOW, CTR checklist, purchase order obtain signatures, perform walkdown during solicitation, perform technical evaluation, and award contract.

**Item:** Procurement Support

- **Activity ID:** BOE
- **Quantity:** 1
- **Units:** hrs
- **Labor Hours:** 1,060
- **Baseline Cost:** $117,688
- **Schedule Risk:** $5,007
- **Cost Risk:** $159,445
- **Burden Cost:** $17,152
- **Total Cost:** $214,467

**Baseline Cost and Basis of Estimate**
- **Baseline Cost:** $117,688
- **Schedule Risk:** $5,007
- **Cost Risk:** $159,445
- **Burden Cost:** $17,152
- **Total Cost:** $214,467

**Baseline Deviation:**
- **WBS Filter:** 1GAC
- **Activity Filter:** 1GAC
- **Starts In FY:**

### Line Item SYS - Contingency And Escalation

**Description:**
Contingency and escalation for the project.

**Item:** Contingency And Escalation

- **Activity ID:** BOE
- **Quantity:** 1
- **Units:** Rs
- **Labor Hours:** 0
- **Baseline Cost:** $5,007
- **Schedule Risk:** $0
- **Cost Risk:** $5,007
- **Burden Cost:** $0
- **Total Cost:** $5,007

**Baseline Cost and Basis of Estimate**
- **Baseline Cost:** $5,007
- **Schedule Risk:** $0
- **Cost Risk:** $5,007
- **Burden Cost:** $0
- **Total Cost:** $5,007

**Baseline Deviation:**
- **WBS Filter:** 1GAC
- **Activity Filter:** 1GAC
- **Starts In FY:**

### Resources

**Cost Element:**
- **SI:** E050
- **Site:** ENVIRONMENTAL ENGINEERS
- **Rate:** RMRS Salaried
- **Unit Cost:** $350
- **Units:** 300 hours

### Activity ID: 1GKA200020

**Description:** Solar Ponds Cap Construction

**Line Item**

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<tr>
<th>Item Description</th>
<th>Quantity</th>
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<th>Labor Hours/Unit</th>
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<th>Contingency &amp; Escalation</th>
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Total for Activity 1GKA200020:
- **Total Labor Hours:** 7,630
- **Total Labor Cost:** $227,133
- **Total Materials/Sub Cost:** $5,409,958
- **Total Contingency & Escalation:** $2,842,860
- **Total Prime Cost:** $8,529,681
- **Total_bases:** $95,635
- **Total Cost:** $8,625,306

**Note:**
- This estimate is based on estimator judgement, historical data, and commercial databases from similar type work.
- For more complete detail refer to Timberline estimate No. EP1000-68 for the OU-4 Solar Ponds Cover Project Management 1480 manhours.
### Rocky Flats Closure Project
**Baseline Cost and Basis of Estimate**

**WBS Filter:** 1GAC

**Activity Filter:** * 

**Baseline Deviation:** * 

**Starts In FY:** * 

#### Resources

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**Line Item NPKAER4106 - Construction Management**

This estimate is based on estimator judgement, historical data, and commercial databases from similar type work.

For more complete detail refer to Timberline estimate No. EP1000-6B for the OU-4 Solar Ponds Cover under Typical Construction Management and Non Typical Construction Management.

**Line Item NPKAER4110 - Provide Fixed Price Contractor Support**

This estimate is based on estimator judgement, historical data, and commercial databases from similar type work.

For more complete detail refer to Timberline estimate #EP1000-6B for the OU-4 Solar Ponds Cover under Typical Construction Management and Non Typical Construction Management.
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**Total Cost:** $1,021,000
Pre-evolution meeting
1.00 ls 630 mh x $24.99=$15,744

Portable Toilet
24 mo x $135/mo = $3240

Pickup Trucks/Flat Bed Truck
175wks x $319 = $55,825
35 wks x $521 = $18,235

Water/Generator
35 wks x $50= $1750

Parts Van (2ea)
70 wks x $75 = $5250

Phones/Pagers
35 wks x $50 = $1750

Sales Tax
1.00 ls 3.8% of Materials $96,804

This estimate is based on estimator judgement and historical data from similar type work.

For more complete detail refer to Timberline estimate No. EP1000-6B.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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### Resources

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### Line Item NPKAER4120 - Provide QA/QC

**BOE**

Estimators Experience - Experience with similar Environmental Restoration project work scope

Experience Item Desc - Timberline estimate #EP1000-6C for the OU-4 Solar Ponds

Breakdown of Cost Data:

- Item - QA/QC
  - Unit Cost Adjustment factor - none
  - Revised Unit Cost - none
  - Basis for adjustment - none

**SO**

4.33wks/month x 80hrs/wk = 346 hrs/mo x 8 months = 2768 x $69.00 = $190,992

Material 2165 x 8 months = $17,320, Total - $208,312

This estimate is based on estimator judgement and historical data from similar type work.

For more complete detail refer to Timberline estimate #EP1000-6C for the OU-4 Solar Ponds

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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### Resources

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### Line Item NPKAER4130 - Project Setup/Trailer/ Road/Water/Traffic Con

**BOE**

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<td>Baseline Cost and Basis of Estimate</td>
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### Contractor Yard
- **Set Up Yard**
  - 1.00 ls 64 mh x $25=$1600
  - Equipment Price $346
  - Total Cost - $1946

- **Office Trailer**
  - 1.00 ls 32 mh x $25=$800
  - Equipment Price $173
  - Total Cost - $973

- **Parts Van**
  - 1.00 ls 64 mh x $25=$1600
  - Equipment Price $346
  - Total Cost - $1946

- **Gravel Yard & Road to Yard**
  - 1.00 ls 440 mh x $25=$11000
  - Equipment Price $1397
  - Material Price $12,375
  - Total Cost - $24,772

- **Contractor Yard**
  - Total Cost - $29,637

### Erosion Control

### Install Silt Fence
- 4763Lf x 0.017 mh/lf x 80.97 mh x 16.92 = $1370
- Materials 4763 x $0.35 = $1667
- Total $3037

### Remove Silt Fence
- 4763 x .009 x 42.87 mh/Lf x $16.92 = $725
- Total Cost - $3762

### Haul Road
- **Haul Road Maintenance**
  - 16 wks x 40 mh/wks x $25=$15994
  - Equipment Price $2875 x 16=$46000
  - Total Cost - $61994

- **Dust Control on Haul Road**
  - 16 wks x 40 mh/wks x $23.82 = $15,245
  - Equipment Price 16 x $3685 = $58960
  - Total Cost - $74,205

- **Construct Haul Road**
  - 1.00 ls 100 mh x $25= $2500
  - Material Price $1230
  - Equipment Price $2947
  - Total Cost - $6677

- **Remove Haul Road**
  - 1.00 ls 75 mh x $25= $1875
  - Equipment Price $1965
  - Total Cost - $3840

- **Grand Total Cost** - $29,637

### Traffic Control

### Barricades, Cones, Delineators, Signs @ Hwy 93
- For 4 months x 692 mh/month x $16.92=$46,435
- Materials - 4 mon. x $3000 = $12000
- Equipment $105 = $400
- Total Cost $106,070

### Flagman
- 4 months x 692mh/month x $16.92=$46,835
- Materials - 4 mon. x $105 = $400
- Total Cost $106,070

### Water Supply
- (3) 4" Dia. Pumps 48 wks x 40 mh/wks x $16.92=$32,486
- Equipment 537 x 48 wks = $25,776

- Elevated Water Tower (3) 318 x 48 wks = $15,264

- Suction/Discharge Hose, 4" Dia 60 x 48 wks = $2880

- Install/Remove 4" Pump 3 x 8 mh x $25 x 2 = $1200
  - Equipment 3 x 112.78 x 2 = $676

- Install/Remove Water Towers 3 x 16mh x $25 x 2 = $2400
  - Equipment 3 x 225.56 x 2 = $1354

- **Grand Total Costs** - $82,036

### Activity Total Cost - $368,221

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
## Rocky Flats Closure Project
### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0A01  
**Activity ID:** 1GKA200020  
**Project:** Baseline Devl  
**WBS Filter:** 1GAC  
**Starts In FY:** *

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**Factors:** 368221 Dollars  
**Line Item NPKAER4140 - Clear & Grub**

**BOE**

SEE BELOW FOR THE FOLLOWING TEMPLATE INFORMATION


Unit Cost - none - Basis for adjustment - none  

22 acres x 8 mh/acre x $25 = $4398  

Equipment Price 22 acres x $420 = $9240  

Total Cost = $13638  

$13638/22 acres = $619.90/acre  

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

<table>
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**Factors:** 619.9 $/acre  
**Line Item NPKAER4170 - Prepare Existing Grade**

**BOE**

SEE BELOW FOR THE FOLLOWING TEMPLATE INFORMATION


Unit Cost - none - Basis for adjustment - none  

Ripping Existing Soil, 6" deep  

Lab: 17,668 cy x .012 hrs/cy x $24.99/hr = $5298  

Equip: 17,668 cy x $0.44 = $7774  

Compaction sheepfoot 6" lifts, 4 passes  

Lab: 17,668 cy x .005 hrs/cy x $24.99 = $2208  

Equip: 17,668cy x $0.22/cy = $3887  

Water Truck 3,000 gallon  

Lab: 17,668 cy x .008hrs/cy x $24.55 = $3470  

Equipment:17,668 cy x $0.39/cy = $6890  

Total: $29,527/17,668 cy = $1.67/cy  

This estimate is based on estimator judgement, historical data, and commercial databases from similar type work.  

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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**Factors:** 1.67 $/cy  
**Line Item NPKAER4180 - Biota Layer 2"- 8" Diameter Rubble**

**BOE**

SEE BELOW FOR THE FOLLOWING TEMPLATE INFORMATION


Unit Cost - none - Basis for adjustment - none  

Haul Rubble 20 miles RT 16.5 cy trucks  

53,003 cy x 0.074 mb/cy x $23.82 = $93,427  

Equip Price 5.18 x 53,003 = $274,555  

Total - $367,982  

Rubble Fill  

53,003 cy x 0.031 mb/cy x $25 = $41,077  

This estimate is based on estimator judgement, historical data, and commercial databases from similar type work.  

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
Rocky Flats Closure Project
Baseline Cost and Basis of Estimate

WBS No: 1GAC0A01
Activity ID: 1GKA200020

Material Price 17.75 x 53,003 = $940,803
Equipment Price 1.25 x 53,003 = $66,253 Total - $1,008,134
Grand Total - $1,416,116
$1,416,116/53,003 cy = $26.718/cy

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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Line Item NPKAER4185 - Asphalt Liner

Fulverize Asphalt & Plank Liners
Labor Cost: 39,843 sy x .029 mh/sy x $24.99 = $28,874
Equipment Cost: 39,843 sy x 1.55/sy = $61,757
Total Cost $90,630/39,843 sy = $2.27/sy

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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Line Item NPKAER4190 - Geotextile Fabric

Geotextile Fabric
Labor: 954,053 sf x .002 hrs/sf x $16.92 = $32,285
Materials: 954,053 sf x .53 = $505,648
$537,933/954,053sf = $0.5638/sf

This estimate is based on estimator judgement, historical data, and commercial databases from similar type work.

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Line Item NPKAER4200 - Earthwork/Common Borrow

Common Borrow, Buy 41d at pit,
Lab: 24,681 cy x 0.005hrs/cy x $24.99/hr = $3084
Mat: 24,681 cy x $3.75/cy = $92,554
Eqquip: 24,681 cy x 0.42 = $10366
Spread Common Borrow, with dozer, no compaction
Lab: 21,461 cy x 0.012 hrs/cy x $24.99 = $6436
Eqquip: 21,461 cy x 0.84/cy = $18,027

OFFICIAL USE ONLY
Haul Common Borrow, 20 mile rt, 16.5 cy Truck
Lab: 24,681 cy x .074hrs/cy x $24.55/hr = $44,838
Equip: 24,681 cy x 5.18 = $127,848

Compaction sheepfoot, 6" lift 4 passes
Lab: 21,461 cy x .005 hrs/cy x $24.99/hr = $2682
Equip: 21,461 cy x 0.22 = $4721

Water Truck 3,000 gallon
Lab: 21,461cy x 008hrs/cy x $23.82 = $4090
Equipment:21,461 cy x $0.39/cy = $8370

Disk and Tractor
Lab: 21,461 cy x 0.005 hrs/cy x $24.99 = $2682
Equip: 21,461 cy x 0.16/cy = $3434

Spotter @ Fill (4 ea.)
Labor: 16 wks x 160hrs/wks x $16.92 = $43315
Total: $372,447/21,461 cy = $17.35/cy

This estimate is based on estimator judgement, historical data, and commercial databases from similar type work.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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Factors 17.35 $/cy

SEE BELOW FOR THE FOLLOWING TEMPLATE INFORMATION

Unit Cost - none - Basis for adjustment - none

Engineered fill, Buy &ld at pit,
Lab:101,590 cy x .005hrs/cy x $24.99/hr = $12694
Mat:101,590 cy x $5.05/cy = $513,030
Equip:101,590 cy x $0.42 = $42,668

Spread Engineered fill, with dozer, no compaction
Lab:88,339 cy x .012 hrs/cy x $24.99 = $26,491
Equip:88,339 cy x $0.84/cy = $74,205

Haul Engineered Fill, 20 mile rt, 16.5 cy Truck
Lab: 101,590 cy x .074hrs/cy x $24.55/hr = $184559
Equip: 101,590 cy x 5.18 = $526,236

Compaction sheepfoot, 6" lift 4 passes
Lab: 88,339 cy x .005 hrs/cy x $24.99/hr = $11,037
Equip: 88,339 cy x 0.22 = $19,435

Water Truck 3,000 gallon
Lab: 88,339 cy x 008hrs/cy x $23.82 = $16,834
Equipment: 88,339 cy x $0.39/cy = $34,452

Disk and Tractor
Lab: 88,339 cy x 0.005 hrs/cy x $24.99 = $11,038
Equip: 88,339 cy x 0.16/cy = $14,134
Total: $1,486,813/88,339cy = $16.83/cy
This estimate is based on estimator judgement, historical data, and commercial databases from similar type work. This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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**Line Item NPKAER4220 - Provide Landscaping**

**BOE** SEE BELOW FOR THE FOLLOWING TEMPLATE INFORMATION


Unit Cost - none - Basis for adjustment - none

Seeding

Lab: 162,395 sy x 0.048hrs/sy x $24.99 = $194,796

Material: 162,395 sy x $0.16/sy = $25,983

Equip: 162,395 sy x 0.22hrs/sy = $35,727

Total: $256,506/162,395 sy = $1.58 sy

This estimate is based on estimator judgement, historical data, and commercial databases from similar type work. This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Line Item NPKAER4230 - Place Top Soil**

**BOE** SEE BELOW FOR THE FOLLOWING TEMPLATE INFORMATION


Unit Cost - none - Basis for adjustment - none

Topsoil, Buy at pit,

Lab: 40,637 cy x .005hrs/cy x $24.99/hr = $5078

Mat: 40,637 cy x $7.50/cy = $304,778

Equip: 40,637 cy x $0.42/cy = $17,068

Topsoil, Spread w/dozer, no compaction

Lab: 35,336 cy x .012 hrs/cy x $24.99 = $10,597

Equip: 35,336 x 0.84 hrs/cy x $24.99 = $29,682

Topsoil, Haul 20 miles rt, 16.5 cy trucks

Labor: 40,637 cy x 0.074hrs/cy x $24.55 = $73825

Equip: 40,637 cy x 5.18 = $210,500

Water Truck

Lab: 35,336 cy x 008hrs/cy x $23.82 = $6734

Equipment: 35,336 cy x $0.39/cy = $13,781

Disk and Tractor

Lab: 35,336 cy x 0.005 hrs/cy x $24.99 = $4415

Equip: 35,336 cy x 0.16/cy = $5654

Total: $682,112/35,336 cy = $19.30/cy

This estimate is based on estimator judgement, historical data, and commercial databases from similar type work. For more complete detail refer to Timberline estimate No. 111111-3A "OU-7 Landfill Cap" by John Hopkins, RMRS X4974.
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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**Line Item NPKAER4240 - Surface Water Ditch**

**BOE**

Excavating, Bulk Bank Measure

Excavating Trench, Backhoe,

Mat: 2118 cy x .021hrs/cy x $24.99/cy = $1112

Equip: 2118 cy x $2.69/cy = $5697

Remove excavated soil, Loader

Lab: 2118 cy x 0.021 hrs/cy x $24.99 = $1112

Equip: 2118 cy x 1.19/cy = $2520

Total: $10,441/2118 cy = $4.93/cy

This estimate is based on estimator judgement, historical data, and commercial databases from similar type work.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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**Line Item NPKAER4260 - Weather Allowance/Show-Up Time**

**BOE**

Backup for Weather Allowance and Showup Time

Weather Allowance/Clean-up Site

5 men @ 7 days

1.00 ls 280 mh x $24.99 = $6997

Blade (2ea)

112 hrs x $55.37 = $6201

Loader

56 hrs. x $56.39 = $3158

Pickup Truck

56 hrs. x $14.44 = $809

Diaphragm Pump, 3" Dia.

56 hrs. x $2.07 = $116

Backhoe

56 hrs. x $21.60 = $1210

Total Cost for Weather Allowance - $18491

Show-Up Time

1.00 ls 768 mhrs x $24.99 = $19,192

Grand Total Cost - $37,683

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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**Line Item SYS - Contingency And Escalation**

**BOE**

- **Resources**

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### Line Item 0100 - READINESS ASSESSMENT

**BOE**

- **Breakdown of Cost Data:**
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  - Item - Project Scope / Concept Design
  - Item - Project Scope / Concept Design
  - Item - Project Scope / Concept Design
  - Basis for adjustment - none

- **This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.**

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### Line Item SYS - Contingency And Escalation

**BOE**

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### Line Item 0100 - DOCUMENTATION PREP

**BOE**

- **Breakdown of Cost Data:**
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  - Item - Project Scope / Concept Design
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**OFFICIAL USE ONLY**
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### Line Item SYS - Contingency And Escalation

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### Activity ID: 1GKA200060

- **Description:** Prepare Solar Pond Cap Closeout Report
- **Cost Risk:** 2
- **Schedule Risk:** 3

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Total for Activity 1GKA200060:

- Labor Hours: 300
- Labor Cost: 11,257
- Total Cost: 96,679

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### Line Item SYS - Contingency And Escalation

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<th>BOE</th>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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<tbody>
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This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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<th>Cost Element</th>
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<th>Curve</th>
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<tbody>
<tr>
<td>750</td>
<td>STRAIGHT TIME BASE</td>
<td>M020 MANAGERS (GRADE 69 - 72)</td>
<td>R100S RMRS Salaried</td>
<td>Linear</td>
<td>100.00 Hours</td>
</tr>
<tr>
<td>ASH SUBCONTRACTED SRVS</td>
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<td>K265 ER Programs</td>
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<td>85,421.76 Dollars</td>
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</table>

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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<tr>
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This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources
### Rocky Flats Closure Project
#### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0A01  
**Activity ID:** 1GKA200060

**Activity ID:** 1GKA200070  
**Description:** Procure Solar Pond Modeling Services Subcontract  

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<th>Contingency &amp; Escalation</th>
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#### Resources

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**Activity ID:** 1GKA200085  
**Description:** Prepare SAP for Solar Ponds Char and RA

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<th>Material/ Sub Cost</th>
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<tr>
<td>0100</td>
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<td>140</td>
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#### Resources

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### Rocky Flats Closure Project

#### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0A01  
**Activity ID:** 1GKA200085

**Activity Filter**  
**WBS Filter** 1GAC  
**Schedule Risk** 1

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<td><strong>Line Item 0200 - HASP Addenda</strong></td>
<td>Preparation of HASP addenda to Industrial Area Characterization Plan</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Source</strong></td>
<td></td>
<td></td>
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<tr>
<td><strong>BOE</strong></td>
<td>Estimator's Experience</td>
<td></td>
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</tr>
<tr>
<td><strong>Item Desc:</strong></td>
<td>Preparation of HASP addenda to Industrial Area Characterization Plan</td>
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<td></td>
</tr>
<tr>
<td><strong>Breakdown of Cost Data:</strong></td>
<td>Item: Preparation of addenda for HASP.</td>
<td></td>
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</tr>
<tr>
<td><strong>Units:</strong></td>
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<td><strong>Unit Cost:</strong></td>
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<td><strong>Unit Cost Adjustment Factor:</strong></td>
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<td><strong>Revised Unit Hours:</strong></td>
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</table>

| **Line Item 0300 - QAP Addenda** | Preparation of SAP Addenda to Industrial Area Characterization Plan | | |
| **Source** | | | |
| **BOE** | Estimator's Experience | | |
| **Item Desc:** | Preparation of SAP Addenda to Industrial Area Characterization Plan. | | |
| **Breakdown of Cost Data:** | Item: Preparation of QAP addenda | | |
| **Units:** | hours | 60 | |
| **Unit Cost:** | 60 | | |
| **Unit Cost Adjustment Factor:** | none | | |
| **Revised Unit Hours:** | 20 | | |

| **Line Item SYS - Contingency And Escalation** | | | |
| **Source** | | | |
| **BOE** | | | |
| **Item Desc:** | | | |
| **Cost Risk:** | 1 | | |

### Cost Breakdown

#### Resources

**Line Item 0200 - HASP Addenda**

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
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<th>Units</th>
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<tbody>
<tr>
<td>750 - STRAIGHT TIME BASE</td>
<td>M020 MANAGERS (GRADE 69 - 72)</td>
<td>R100S RMRS Salaried</td>
<td>Linear</td>
<td>20.00</td>
<td>Hours</td>
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<tr>
<td>750 - STRAIGHT TIME BASE</td>
<td>P070 COST ESTIMATORS PLANNERS AN</td>
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**Line Item 0300 - QAP Addenda**

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<th>Units</th>
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<tr>
<td>750 - STRAIGHT TIME BASE</td>
<td>E050 ENVIRONMENTAL ENGINEERS</td>
<td>R100S RMRS Salaried</td>
<td>Linear</td>
<td>20.00</td>
<td>Hours</td>
</tr>
<tr>
<td>750 - STRAIGHT TIME BASE</td>
<td>M020 MANAGERS (GRADE 69 - 72)</td>
<td>R100S RMRS Salaried</td>
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<td>Hours</td>
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<td>750 - STRAIGHT TIME BASE</td>
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<td>Hours</td>
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<td>750 - STRAIGHT TIME BASE</td>
<td>P090 INDUSTRIAL HYGIENISTS</td>
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<td>Linear</td>
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<td>Hours</td>
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**Line Item SYS - Contingency And Escalation**

<table>
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<tr>
<th>Cost Element</th>
<th>Skill</th>
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**Activity ID:** 1GKA200090  
**Description:** Procure Slr Pnd Char, Summary & Dec Doc Contract  
**Cost Risk:** 1  
**Schedule Risk:** 1

**Line Item 0200 - HASP Addenda**  
**Activity Filter:**  
**WBS Filter:** 1GAC  
**Starts In FY:**  
**Factors:**  
**Cost Element:**  
**Skill:**  
**Quantity:**  
**Units:**  
**Labor Hours/Unit:**  
**Labor Hours Total:**  
**Labor Cost Total:**  
**Materials/Sub Cost:**  
**Contingency & Escalation:**  
**Total Prime Cost:**  
**Burden Cost:**  
**Total Cost:**
## Rocky Flats Closure Project
### Baseline Cost and Basis of Estimate

#### Line Item 0100 - Procurement & Field Prep

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<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
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#### Line Item 0100 - Contingency And Escalation

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**Total for Activity 1GKA200090:**

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<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
<th>Total Cost</th>
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<tr>
<td>0100</td>
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<td>25,373</td>
<td>0</td>
<td>37,824</td>
<td>42,220</td>
<td></td>
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</tbody>
</table>

**Resources:**

- **BOE:** Estimator's Experience based generally on historical data from other projects Ryan's Pit and T-3/T4 Remediation
- **Item Desc:** Assemble procurement package: SOW, CTR checklist, purchase order obtain signatures, perform walkdown during solicitation, perform technical evaluation, and award contract.
- **Breakdown of Cost Data:**
  - **Item:**
    - **Units:** hours
    - **Unit Cost:** 330 hrs.
    - **Unit Cost Adjustment Factor:** None
    - **Revised Unit:** None

**Cost Element:** 0100 - PROCUREMENT & FIELD PREP

<table>
<thead>
<tr>
<th>Resources</th>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
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<tbody>
<tr>
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<td>ENVIRONMENTAL ENGINEERS</td>
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<td>RMRS Salaried</td>
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**Line Item SYS - Contingency And Escalation**

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**Activity ID:** 1GKA200100  
**Description:** Readiness Assessment - Solar Pond Field Sampling

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<th>Description</th>
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<th>Units</th>
<th>BoE Type</th>
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<th>Material/ Sub Cost</th>
<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
<th>Burden Cost</th>
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**Total for Activity 1GKA200100:**

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<td>37,824</td>
<td>42,220</td>
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**Resources:**

- **BOE:** Estimator's Experience - Experience with similar Environmental Restoration project work scope
- **Item Desc - Industrial Area Generic Characterization based off Ryans Pit and T-3/T-4 project

**Breakdown of Cost Data:**

- **Item - Project Scope / Concept Design**
- **Units - lot**
- **Unit Cost - 300 hrs; $30000 sub/c support**
- **Unit Cost Adjustment factor - none**
- **Revised Unit Cost - none**
- **Basis for adjustment - none**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### Line Item SYS - Contingency And Escalation

**Resources**

<table>
<thead>
<tr>
<th>Cost Element</th>
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<th>Units</th>
<th>Curve</th>
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**Activity ID:** 1GKA2000105

**Description:** Solar Ponds Field Sampling and Lab Analysis

**Baseline Cost Data - 2000**

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<td>17</td>
<td>4,080</td>
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**Line Item 0100 - collect geoprobe samples**

**BOE**

**Estimator's Experience**

**Breakdown of Cost Data:**

- **Item Desc:** Collection of geoprobe samples will be performed with three geoprobe units assuming two holes/day/unit and two technicians/unit. A site Environmental Engineer will direct the boring placement, log the borings; collect, containerize, package, and ship the samples; prepare field QC documentation, and prepare field notes on a full time basis. A site RCT will monitor the site for radiological contamination on a full time basis. A site Industrial Hygienist will implement the field portion of the HASP on a full time basis. Decon Operations staff will decon the vehicle and equipment when it leaves the work area on a half time basis. It is estimated that one 10' boring will be place per 500 SF of building footprint (same as Bldg. 123 characterization) with 5 samples per 10' boring. It is estimated that two borings per eight hours can be completed.

- **Item:** Site Personnel for support of geoprobe samples
  - Units: hours
  - Unit Cost: 32
  - Unit Cost Adjustment Factor: none
  - Revised Unit Hours: 32

- **Item:** Kaiser-Hill/RMRS Geoprobe unit with 2 Technician crew. Item costs $100 per hour or $800 per 8-hour day.
  - Units: dollars
  - Unit Cost: 800
  - Unit Cost Adjustment Factor: none
  - Revised Unit Hours: 800

**Basis for adjustment.**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Resources**

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Quantity</th>
<th>Units</th>
<th>Curve</th>
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<td>RMRS Salaried</td>
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<td>8.00</td>
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<td>STRAIGHT TIME BASE</td>
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<td>INDUSTRIAL HYGIENISTS</td>
<td>R100S</td>
<td>RMRS Salaried</td>
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**Line Item 0200 - analyze samples**

**BOE**

Baseline Cost Data - 2000
### Item Desc:
Analyze samples produced from geoprobe borings. It is anticipated that 2 samples from each boring will be collected. They will be analyzed for Metals, VOCs, SVOCs, and radionuclides (est. 3 isotopes) with a 30 day routine TAT. This item is priced on a per sample basis.

### Breakdown of Cost Data:
- **Item:** Analyze samples at an offsite laboratory.
  - **Units:** analysis
  - **Unit Cost:** Metals $345, VOCs $280, SVOCs $440, Radionuclides (3 isotopes) $590 plus $320 rad screen, $7 Bottle charge, and $42 shipping charge/sample.
  - **Revised Unit Hours:** Metals $345, VOCs $280, SVOCs $440, Radionuclides (3 isotopes) $590, plus $320 rad screen, $7 Bottle charge, and $42 shipping charge/sample.

### Basis for adjustment:
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

### Resources

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<th>Curve</th>
<th>Quantity</th>
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### Line Item 0300 - project mgmt oversight

**BOE**

Estimator's Experience

- **Item Desc:** Project Management/Oversight. Based on half time for a Project Manager, Administrative staff, and Cost Estimator/Scheduler

### Breakdown of Cost Data:
- **Item:** Mgmt oversight
  - **Units:** hours
  - **Unit Cost:** 12
  - **Revised Unit Hours:** 12

### Basis for adjustment:

---

### Resources

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### Line Item SYS - Contingency And Escalation

**BOE**

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### Activity ID: 1GKA200115

#### Description: Prepare Solar Ponds Summary/NFA

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<th>BOE Type</th>
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<th>Labor Cost Total</th>
<th>Material/ Sub Cost</th>
<th>Contingency &amp; Escalation</th>
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Total for Activity 1GKA200115:

- Labor Hours Total: 600
- Labor Cost Total: 16,951
- Material/ Sub Cost: 1,421
- Contingency & Escalation: 6,073
- Total Prime Cost: 24,445
- Burden Cost: 5,871
- Total Cost: 30,315
This estimate was constructed based on actual hours required to complete previous NFA Reports (obtained from actual author) and professional judgement of level of effort required for remaining reports.

Item Desc: Perform Data Analysis including GIS representation of data, Characterization Report, and associated project management.

Breakdown of Cost Data:
Item: Develop Documentation
Units: Hours
Unit Cost: 138

Environmental Engineer 45 hrs Evaluate & assemble existing data. Draft Report.
SWD Technician 10 hrs Identify & pull existing data from database.

Technical Editor 15 hrs Complete initial and revised tech edits of Report.
Technical Reviews
QA 4 hrs Review and comment per area of expertise.
Peer (2) 8 hrs Review and comment per area of expertise.
Compliance 4 hrs Review and comment per area of expertise.
Environmental 4 hrs Review and comment per area of expertise.
Management (2) 8 hrs Review and comment per area of expertise.
Legal 4 hrs Review and comment per area of expertise.

Environmental Engineer 15 hrs Disposition comments and finalize document.
Administrative Support 6 hrs Copy & assemble final documents, submit to records.

Unit Cost Adjustment Factor: none
Revised Unit Hours: 138

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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Line Item SYS - Contingency And Escalation

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Activity ID: 1GKA200130 Description: Develop Solar Ponds Field Implementation Plan-RA

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Total for Activity 1GKA200130: 575 22,372 5,075 7,659 35,106 7,172 42,278
### Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

**WBS No:** 1GAC0A01

**Activity ID:** 1GKA200130

**Baseline Devl**

**WBS Filter** 1GAC

**Activity Filter** *

**Starts In FY** *

---

**Estimators Experience** - Based on previous projects (e.g. Trench T-1 and Mound Project).

**Breakdown of Cost Data:**

- **Item** -
  - Units - 550 hrs to develop the FIP with 100 hrs of GIS support in addition.
  - Unit Cost -
  - Unit Cost Adjustment factor -
  - Revised Unit Cost -
  - Basis for adjustment -

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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### Line Item SYS - Contingency And Escalation

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### Activity ID: 1GKA200135

**Description:** Solar Ponds RA Readiness Assessment

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<th>Units</th>
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**Total for Activity 1GKA200135:**

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**Estimators Experience** - Experience with similar Environmental Restoration project work scope

**Experience Item Desc** - Timberline estimate #111111-3A for the OU-7 Landfill

**Breakdown of Cost Data:**

- **Item** -
  - Units - 810 hrs;
  - Unit Cost Adjustment factor - none
  - Revised Unit Cost - none
  - Basis for adjustment - none

---
## Rocky Flats Closure Project: Baseline Cost and Basis of Estimate

### Line Item 0100 - mobilization

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<td>20,173</td>
<td>108,708</td>
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<tr>
<td>SYS Contingency And Escalation</td>
<td>1.00</td>
<td>each</td>
<td>EE</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>353,289</td>
<td>0</td>
<td>353,289</td>
<td>0</td>
<td>353,289</td>
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</tbody>
</table>

**Total for Activity 1GKA200140: 4,334, 141,340, 2,254,636, 353,289, 2,749,266, 39,858, 2,789,124**

### Breakdown of Cost Data:

**Item: Site Labor to perform above individual tasks for T-3/T-4.**

- **Units:** hours
- **Unit Cost:** 275
- **Unit Cost Adjustment Factor:** none
- **Revised Unit:** 275

**Item: Subcontractor costs to perform above individual tasks for T-3/T-4.**

- **Units:** 1 lot
- **Unit Cost:** 184k
- **Unit Cost Adjustment Factor:** 0.25
- **Revised Unit:** see below

**Basis for adjustment:** The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

**This estimate includes a project productivity/efficiency factor for committed but as yet undetermined cost reductions.**

### Resources

**BOE**

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>750</td>
<td>E050</td>
<td>ENVIRONMENTAL ENGINEERS</td>
<td>R100S</td>
<td>RMRS Salaried</td>
<td>Linear</td>
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</table>

**Factors:** 138 hrs

**BOE**

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<tbody>
<tr>
<td>750</td>
<td>M020</td>
<td>MANAGERS (GRADE 69 - 72)</td>
<td>R100S</td>
<td>RMRS Salaried</td>
<td>Linear</td>
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**Factors:** 83 hrs
### Resources

<table>
<thead>
<tr>
<th>Line Item 0200 - site prep</th>
<th>BOE</th>
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</thead>
<tbody>
<tr>
<td><strong>Estimator's Experience based generally on historical data for T-3/T4 Remediation.</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Item Desc:</strong> Site Preparation including setting up fencing, trailer, etc.</td>
<td></td>
</tr>
<tr>
<td><strong>Breakdown of Historical Data:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Item:</strong> Site Labor to perform above individual tasks for T-3/T-4.</td>
<td></td>
</tr>
<tr>
<td><strong>Units:</strong> hours</td>
<td></td>
</tr>
<tr>
<td><strong>Unit Cost:</strong> see below</td>
<td></td>
</tr>
<tr>
<td><strong>Unit Cost Adjustment Factor:</strong> see below</td>
<td></td>
</tr>
<tr>
<td><strong>Revised Unit:</strong> see below</td>
<td></td>
</tr>
<tr>
<td><strong>Item:</strong> Subcontractor costs to perform above individual tasks for T-3/T-4.</td>
<td></td>
</tr>
<tr>
<td><strong>Units:</strong> 1 lot</td>
<td></td>
</tr>
<tr>
<td><strong>Unit Cost:</strong> see below</td>
<td></td>
</tr>
<tr>
<td><strong>Unit Cost Adjustment Factor:</strong> see below</td>
<td></td>
</tr>
<tr>
<td><strong>Revised Unit:</strong> see below</td>
<td></td>
</tr>
</tbody>
</table>

**Basis for adjustment.** The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

<table>
<thead>
<tr>
<th>Line Item 0300 - excavation</th>
<th>BOE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Estimator's Experience based generally on historical data for T-3/T4 Remediation.</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Item Desc:</strong> Excavation.</td>
<td></td>
</tr>
<tr>
<td><strong>Breakdown of Historical Data:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Item:</strong> Site Labor to perform above individual tasks for T-3/T-4.</td>
<td></td>
</tr>
<tr>
<td><strong>Units:</strong> hours</td>
<td></td>
</tr>
<tr>
<td><strong>Unit Cost:</strong> see below</td>
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<tr>
<td><strong>Unit Cost Adjustment Factor:</strong> see below</td>
<td></td>
</tr>
<tr>
<td><strong>Revised Unit:</strong> see below</td>
<td></td>
</tr>
<tr>
<td><strong>Item:</strong> Subcontractor costs to perform above individual tasks for T-3/T-4.</td>
<td></td>
</tr>
<tr>
<td><strong>Units:</strong> 1 lot</td>
<td></td>
</tr>
<tr>
<td><strong>Unit Cost:</strong> see below</td>
<td></td>
</tr>
<tr>
<td><strong>Unit Cost Adjustment Factor:</strong> see below</td>
<td></td>
</tr>
<tr>
<td><strong>Revised Unit:</strong> see below</td>
<td></td>
</tr>
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</table>

**Basis for adjustment.** The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASH SUBCONTRACTED SRVS</td>
<td>0000</td>
<td>NONE</td>
<td>K26SS ER Programs</td>
<td>Linear</td>
<td>76.54 Dollars</td>
</tr>
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**Line Item 0400 - remove and clean debris**

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc: Remove and clean debris.

Breakdown of Historical Data:

Item: Site Labor to perform above individual tasks for T-3/T-4.

- Units: hours
- Unit Cost: see below
- Unit Cost Adjustment Factor: see below
- Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.

- Units: 1 lot
- Unit Cost: see below
- Unit Cost Adjustment Factor: see below
- Revised Unit: see below

Basis for adjustment: The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASH SUBCONTRACTED SRVS</td>
<td>0000</td>
<td>NONE</td>
<td>K26SS ER Programs</td>
<td>Linear</td>
<td>845.76 Dollars</td>
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</table>

**Line Item 0600 - confirmation sampling**

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc: Confirmation Sampling.

Breakdown of Historical Data:

Item: Site Labor to perform above individual tasks for T-3/T-4.

- Units: hours
- Unit Cost: see below
- Unit Cost Adjustment Factor: see below
- Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.

- Units: 1 lot
- Unit Cost: see below
- Unit Cost Adjustment Factor: see below
- Revised Unit: see below

Basis for adjustment: The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

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Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

<table>
<thead>
<tr>
<th>Cost Element</th>
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<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASH SUBCONTRACTED SRVS 0000 NONE K265S ER Programs</td>
<td></td>
<td></td>
<td>Linear</td>
<td>19.39</td>
<td>Dollars</td>
</tr>
<tr>
<td>Factors 22.924 units per yard for desorption</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ASH SUBCONTRACTED SRVS 0000 NONE K267S Analytical Laboratory Services</td>
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<td></td>
<td>Linear</td>
<td>96.94</td>
<td>Dollars</td>
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<tr>
<td>Factors 114.62 units per yard for desorption</td>
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**Line Item 0700 - prepare waste acceptance forms**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc:
Prepare Waste Acceptance Forms

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
  Units: hours
  Unit Cost: see below
  Unit Cost Adjustment Factor: see below
  Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
  Units: 1 lot
  Unit Cost: see below
  Unit Cost Adjustment Factor: see below
  Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>750 STRAIGHT TIME BASE E050 ENVIRONMENTAL ENGINEERS</td>
<td></td>
<td>R100S EMRS Salaried</td>
<td>Linear</td>
<td>225.00</td>
<td>Hours</td>
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<tr>
<td>Factors 225 hrs</td>
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</table>

**Line Item 0800 - waste acceptance sampling**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc:
Waste Acceptance Sampling

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
  Units: hours
  Unit Cost: see below
  Unit Cost Adjustment Factor: see below
  Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
  Units: 1 lot
  Unit Cost: see below
  Unit Cost Adjustment Factor: see below
  Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.
Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
<th>Factors</th>
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</thead>
<tbody>
<tr>
<td>ASH SUBCONTRACTED SRVS</td>
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<td>K26S ER Programs</td>
<td>Linear</td>
<td>16.92</td>
<td>Dollars</td>
<td>20 units per yard in crates</td>
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<tr>
<td>ASH SUBCONTRACTED SRVS</td>
<td>0000</td>
<td>K267S Analytical Laboratory Services</td>
<td>Linear</td>
<td>33.85</td>
<td>Dollars</td>
<td>40 units per yard in crates (analytical)</td>
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**Line Item 0900 - field oversight & project mgmt**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:**
Field Oversight and Project Management

**Breakdown of Historical Data:**
- **Item:** Site Labor to perform above individual tasks for T-3/T-4.
  - **Units:** hours
  - **Unit Cost Adjustment Factor:** see below
  - **Revised Unit:** see below

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
- **Units:** 1 lot
- **Unit Cost Adjustment Factor:** see below
- **Revised Unit:** see below

**Basis for adjustment.** The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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<tr>
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<td>E050 ENVIRONMENTAL ENGINEERS</td>
<td>R100S RMRS Salaried</td>
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<td>Hours</td>
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<tr>
<td>750 STRAIGHT TIME BASE</td>
<td>M020 MANAGERS (GRADE 69 - 72)</td>
<td>R100S RMRS Salaried</td>
<td>Linear</td>
<td>300.00</td>
<td>Hours</td>
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<td>750 STRAIGHT TIME BASE</td>
<td>S020 ENVIRONMENTAL SCIENTISTS</td>
<td>R100S RMRS Salaried</td>
<td>Linear</td>
<td>100.00</td>
<td>Hours</td>
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</table>

**Line Item 1000 - backfill**

**Trade Publication**
Means 1995, Site Work & Landscape Cost Data (page 34, 42, and 34)

**Item Desc:**
Backfill.

**Breakdown of Historical Data:**
- **Item:** Site Labor to perform above individual tasks for T-3/T-4.
  - **Units:** hours
  - **Unit Cost Adjustment Factor:** see below
  - **Revised Unit:** see below

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
- **Units:** 1 lot
Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### Rocky Flats Closure Project

#### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0A01  
**Activity ID:** 1GKA200140  
**Project:** Baseline Devi  
**WBS Filter:** 1GAC  
**Activity Filter:** *  
**Starts In FY:** *

---

#### Resources

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<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
</tr>
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<tr>
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<td>E050 ENVIRONMENTAL ENGINEERS</td>
<td>R100S RMRS Salaried</td>
<td>Linear</td>
<td>2,420.00</td>
<td>Hours</td>
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</table>

Factors: 2420 hrs  

**Skills:**  
- **Factors:** 17000 supplies  
- **Factors:** 119410 Dollars

---

#### Line Item SYS - Contingency And Escalation

**BOE**

<table>
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<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
</tr>
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<tr>
<td>CON CONTINGENCY</td>
<td>0000 NONE</td>
<td>ZDEPT No Department</td>
<td>Linear</td>
<td>119,409.70</td>
<td>Dollars</td>
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</table>

Factors: 119410 Dollars  

**Skills:**  
- **Factors:** 80.00 Hours  
- **Factors:** 20.00 Hours  
- **Factors:** 20.00 Hours  
- **Factors:** 20.00 Hours

---

#### Line Item 0100 - develop report

**BOE**

**Estimator's Experience on similar projects**

**Item Desc:** Prepare Solar Ponds Rem Action Closeout Report  
**Breakdown of Cost Data:**  
- **Item:** Develop Documentation  
  - **Units:** hours 220  
  - **Unit Cost:** none  
  - **Revised Unit Hours:** 220

**Basis for adjustment:**  
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

#### Resources

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<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
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<td>750 STRAIGHT TIME BASE</td>
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<td>R100S RMRS Salaried</td>
<td>Linear</td>
<td>80.00</td>
<td>Hours</td>
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</table>

Factors: 80 hrs  

**Skills:**  
- **Factors:** 20 hrs  
- **Factors:** 20 hrs  
- **Factors:** 20 hrs  
- **Factors:** 20 hrs

---

**BOE**

**Contingency And Escalation**

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>0100 develop report</td>
<td>1.00 each</td>
<td>EE</td>
<td>140</td>
<td>140</td>
<td>4,335</td>
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**Total for Activity 1GKA200150:**  
- **Labor Hours Total:** 140  
- **Labor Cost Total:** 4,835  
- **Materials/ Sub Cost:** 0  
- **Contingency & Escalation:** 12,878  
- **Total Prime Cost:** 14,906  
- **Burden Cost Total:** 16,129

---

**Line Item 0100 - develop report**

**Item Desc:** Prepare Data Analysis including GIS representation of data, prepare closeout report and associated project management.

---

**Cost Risk:** 2  
**Schedule Risk:** 3

---

**6/23/00 9:23:22 AM**

---

**OFFICIAL USE ONLY**
## Rocky Flats Closure Project

### Baseline Cost and Basis of Estimate

#### WBS No: 1GAC0A01

#### Activity ID: 1GKA200150

#### Baseline Devi

#### WBS Filter: 1GAC

#### Activity Filter: "Starts In FY"

---

### Line Item SYS - Contingency And Escalation

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<th>Cost Element</th>
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<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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<tr>
<td>CON</td>
<td>CONTINGENCY</td>
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<td>NONE</td>
<td>ZDEPT</td>
<td>No Department</td>
<td>Linear</td>
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<td>ESC</td>
<td>ESCALATION</td>
<td>0000</td>
<td>NONE</td>
<td>ZDEPT</td>
<td>No Department</td>
<td>Linear</td>
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**Activity ID: 1GKA200160**

**Description:** Perform Solar Ponds Modeling with UNSAT-H(Soils)

<table>
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<tr>
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**Line Item 0100 - PERFORM MODELING**

**BOE**

Estimators Experience - Experience with similar Environmental Restoration project work scope. Experience Item Desc - Based on previous experience with work scope at the Rocky Mountain Arsenal (RMA) and conversation with Lou Greer of Morrison Knudsen Corp at RMA.

Breakdown of Cost Data:

- Item - modeling
- Units - $42000 Sub/c
- Unit Cost Adjustment factor - none
- Revised Unit Cost - none
- Basis for adjustment - none

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Resources**

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**Factors** 42000 Dollars

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**Line Item 0200 - K-H Oversight of Subcont**

**BOE**

Estimators Experience - Experience with similar Environmental Restoration project work scope. Experience Item Desc - Based on previous experience with oversight of Subcontractor work scope.

Breakdown of Cost Data:

- Item - Model Differences
- Units - Hours
- Unit Cost - 275 hours
- Unit Cost Adjustment factor - none
- Revised Unit Cost - none
- Basis for adjustment - none

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**Factors** 275 Hours

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**Line Item SYS - Contingency And Escalation**

**BOE**

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6/23/00 9:23:22 AM

OFFICIAL USE ONLY
### Rocky Flats Closure Project

#### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0A01  
**Activity ID:** 1GKA200165  
**Baseline Deviation Filter:** 1GAC

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**Total for Activity 1GKA200165:**

|            | 275         | 8,129     | 35,522   | 2,565      | 46,216     | 50,093   |

**Line Item 0100 - WATER BALANCE STUDY**

**BOE**

- Estimators Experience - Experience with similar Environmental Restoration project work scope.
- Item - Water Balance Study
- Units - $42000 Sub/c
- Unit Cost Adjustment factor - none
- Revised Unit Cost - none
- Basis for adjustment - none

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Resources**

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**Line Item 0200 - K-H Oversight of Subcont**

**BOE**

- Estimators Experience - Experience with similar Environmental Restoration project work scope.
- Item - Model Differences
- Units - Hours
- Unit Cost - 275 hours
- Unit Cost Adjustment factor - none
- Revised Unit Cost - none
- Basis for adjustment - none

**Resources**

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<tr>
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**Line Item SYS - Contingency And Escalation**

**BOE**

**Resources**

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### Activity ID: 1GKA200170

**Description:** Demon RFCA Attachment 10 Reqt for Solar Ponds

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**Total for Activity 1GKA200170:**

|            | 275         | 8,129     | 71,890   | 7,334      | 87,352     | 90,856   |

**Line Item 0100 - RFCA ATTACHMENT 10**

**BOE**

- Estimators Experience - Experience with similar Environmental Restoration project work scope.
Experience Item Desc - Based on previous experience with work scope at the Rocky Mountain Arsenal (RMA) and conversation with Lou Greer of Morrison Knudsen Corp at RMA.

Breakdown of Cost Data:

Item - RFCA Att. 10 Demonstration
Units - 
Unit Cost - $85000 Sub/c
Unit Cost Adjustment factor - none
Revised Unit Cost - none
Basis for adjustment - none

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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Line Item 0200 - K-H Oversight of Subcont.

BOE
Estimators Experience - Experience with similar Environmental Restoration project work scope.
Experience Item Desc - Based on previous experience with oversight of Subcontractors work scope.

Breakdown of Cost Data:

Item - Model Differences
Units - Hours
Unit Cost - 275 hours
Unit Cost Adjustment factor - none
Revised Unit Cost - none
Basis for adjustment - none

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Line Item SYS - Contingency And Escalation

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Activity ID: 1GKA200175
Description: Model SP Differences RMA/RFETS-Soil,Prop,Precep

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<tr>
<td>0200</td>
<td>K-H Oversight of Subcont</td>
<td>1.00 each</td>
<td>EE</td>
<td>275</td>
<td>275</td>
<td>8,129</td>
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<tr>
<td>SYS</td>
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<td>1.00 each</td>
<td>EE</td>
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Total for Activity 1GKA200175:
275 8,129 17,761 1,607 27,496 3,878 31,374

Line Item 0100 - MODEL DIFFERENCES

BOE
Estimators Experience - Experience with similar Environmental Restoration project work scope.
Experience Item Desc - Based on previous experience with work scope at the Rocky Mountain Arsenal (RMA) and conversation with Lou Greer of Morrison Knudsen Corp at RMA.

Breakdown of Cost Data:

Item - Model Differences
Units - 
Unit Cost - $21000 Sub/c
Unit Cost Adjustment factor - none
Revised Unit Cost - none

<table>
<thead>
<tr>
<th>Resources</th>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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<tbody>
<tr>
<td>0100</td>
<td>MODEL DIFFERENCES</td>
<td>1.00 each</td>
<td>EE</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>0200</td>
<td>K-H Oversight of Subcont</td>
<td>1.00 each</td>
<td>EE</td>
<td>275</td>
<td>275</td>
<td>8,129</td>
</tr>
<tr>
<td>SYS</td>
<td>Contingency And Escalation</td>
<td>1.00 each</td>
<td>EE</td>
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<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Total for Activity 1GKA200175:
275 8,129 17,761 1,607 27,496 3,878 31,374
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASH SUBCONTRACTED SRVS</td>
<td>S020 ENVIRONMENTAL SCIENTISTS</td>
<td>K26SS ER Programs</td>
<td>Linear</td>
<td>17,760.96</td>
<td>Dollars</td>
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Line Item 0200 - K-H Oversight of Subcont

BOE

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<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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<tbody>
<tr>
<td>750 STRAIGHT TIME BASE</td>
<td>E050 ENVIRONMENTAL ENGINEERS</td>
<td>R100S RMRS Salaried</td>
<td>Linear</td>
<td>275.00</td>
<td>Hours</td>
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Line Item SYS - Contingency And Escalation

BOE

<table>
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<th>Cost Element</th>
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Line Item LFEAER3110 - Post Closure Monitoring

BOE

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<td>R100S RMRS Salaried</td>
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This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

**WBS No:** 1GAC0A02  
**Activity ID:** 1GCPER1200

---

### WBS Filter 1GAC

**BOE Filter**

**Starts In FY**

---

#### Line Item SYS - Contingency And Escalation

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<th>Resource</th>
<th>BOE</th>
<th>Description</th>
<th>Quantity</th>
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<th>BOE Type</th>
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<th>Labor Cost Total</th>
<th>Materials/Sub Cost</th>
<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
<th>Burden Cost</th>
<th>Total Cost</th>
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<tr>
<td>CON</td>
<td>0000</td>
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#### Activity ID: 1GCPER1200

**Description:** Procure Orig Landfill Model Services Subcontract

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<th>Contingency &amp; Escalation</th>
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<td>K-H Oversight of subcontract</td>
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<td>Contingency And Escalation</td>
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Total for Activity 1GCPER1200:

- **435** Labor Hours Total
- **12,859** Labor Cost Total
- **13,865** Total Cost

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#### Activity ID: 1GCPER1200

**Description:** Perform Org Landfill Water Balance Study

<table>
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<th>Description</th>
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<th>Units</th>
<th>BOE Type</th>
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<th>Labor Cost Total</th>
<th>Materials/Sub Cost</th>
<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
<th>Burden Cost</th>
<th>Total Cost</th>
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<tr>
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<td>each</td>
<td>EE</td>
<td>275</td>
<td>275</td>
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<td>3,878</td>
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<tr>
<td>SYS</td>
<td>Contingency And Escalation</td>
<td>1.00</td>
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Total for Activity 1GCPER1200:

- **275** Labor Hours Total
- **35,522** Labor Cost Total
- **46,171** Total Cost

---

#### Activity ID: 1GCPER1200

**Description:** Perform Org Landfill Water Balance Study

<table>
<thead>
<tr>
<th>Line Item</th>
<th>Description</th>
<th>Quantity</th>
<th>Units</th>
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<td>each</td>
<td>EE</td>
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<td>275</td>
<td>8,129</td>
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<td>8,129</td>
<td>3,878</td>
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<td>12,007</td>
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<tr>
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<td>Contingency And Escalation</td>
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<td>kca</td>
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</table>

Total for Activity 1GCPER1200:

- **275** Labor Hours Total
- **35,522** Labor Cost Total
- **46,171** Total Cost

---

### Summary

- Estimators experience - Experience with similar Environmental Restoration project work scope.
- Description of work scope.
- Cost and basis of estimate details.
- Breakdown of cost data.

---

**Page:** 991 of 1121  
**Date:** 6/23/00 9:23:23 AM  
**OFFICIAL USE ONLY**
**Rocky Flats Closure Project**  
**Baseline Cost and Basis of Estimate**  

**WBS Filter:** 1GAC  
**Activity Filter:** *  
**Suars In FY:** *

---

**Resources**

<table>
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<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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<tbody>
<tr>
<td>ASH</td>
<td>SUBCONTRACED SRVS</td>
<td>E050 ENVIRONMENTAL ENGINEERS</td>
<td>K26S ER Programs</td>
<td>Linear</td>
<td>35,521.92 Dollars</td>
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**Factors:** 42000 SUB/C DOLLARS

---

**Line Item 0200 - K-H Oversight of subcontract**

- **BOE:** Estimators Experience - Experience with similar Environmental Restoration project work scope
- **Experience Item Desc:** Based on previous experience with work scope at the Rocky Mountain Arsenal (RMA) and conversation with Lou Greer of Morrison Knudsen Corp at RMA.

**Breakdown of Cost Data:**

<table>
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<th>Revised Unit Cost - none</th>
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**Factors:** 0.84576 [SYS 061400].84576000 - System

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**Resources**

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**Factors:** 275 HOURS

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**Line Item SYS - Contingency And Escalation**

- **BOE:** Contingency And Escalation

**Breakdown of Cost Data:**

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**Factors:** 999.417 Dollars

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**Activity ID:** 1GCLPLF1020  
**Description:** Model Differences RMA/RFETS-Soil,Prop,Precep

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<th>Description</th>
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<th>Units</th>
<th>BOE</th>
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<th>Materials/Sub Cost</th>
<th>Contingency &amp; Escalation</th>
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<th>Burden Cost</th>
<th>Total Cost</th>
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<tbody>
<tr>
<td>0100</td>
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<td>1.00 each</td>
<td>EE</td>
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<tr>
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<td>KH oversight of Subcontract</td>
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<td>EE</td>
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<td>275</td>
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**Total for Activity 1GCLPLF1020:**

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<td>12,007</td>
<td>1,578</td>
<td>31,346</td>
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**Resources**

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<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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<tr>
<td>ASH</td>
<td>SUBCONTRACED SRVS</td>
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**Factors:** 21000 SUB/C support

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**Breakdown of Cost Data:**

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</table>
### Line Item 0200 - KH oversight of Subcontract

**BOE**

- **Estimators Experience** - Experience with similar Environmental Restoration project work scope
- **Experience Item Desc** -

Breakdown of Cost Data:
- **Item** - Oversight
- **Units** - hrs
- **Unit Cost** - 275 hrs
- **Unit Cost Adjustment factor** - none
- **Revised Unit Cost** - none
- **Basis for adjustment** - none

**Resources**

<table>
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<th>Cost Element</th>
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<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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<tr>
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**Factors**
- **Costs**
  - 952.20 Dollars
  - 625.94 Dollars

### Line Item SYS - Contingency And Escalation

**BOE**

- **Estimators Experience** - Experience with similar Environmental Restoration project work scope.
- **Experience Item Desc** - Based on previous experience with work scope at the Rocky Mountain Arsenal (RMA) and conversation with Lou Greer of Morrison Knudsen Corp at RMA.

Breakdown of Cost Data:
- **Item** - modeling
- **Units** - each
- **Unit Cost** - $42000 Sub/c
- **Unit Cost Adjustment factor** - none
- **Revised Unit Cost** - none
- **Basis for adjustment** - none

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Resources**

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<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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### Line Item 0100 - PERFORM MODELING

**BOE**

- **Estimators Experience** - Experience with similar Environmental Restoration project work scope.
- **Experience Item Desc** - Based on previous experience with work scope at the Rocky Mountain Arsenal (RMA) and conversation with Lou Greer of Morrison Knudsen Corp at RMA.

Breakdown of Cost Data:
- **Item** - modeling
- **Units** - each
- **Unit Cost** - $42000 Sub/c
- **Unit Cost Adjustment factor** - none
- **Revised Unit Cost** - none
- **Basis for adjustment** - none

**Resources**

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<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
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<td>K265S ER Programs</td>
<td>Linear</td>
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**Factors**
- **Costs**
  - 35,522 Dollars
  - 2,520 Dollars
  - 46,171 Dollars

### Line Item 0200 - KH oversight of Subcontract

**BOE**

- **Estimators Experience** - Experience with similar Environmental Restoration project work scope.
- **Experience Item Desc** -

Breakdown of Cost Data:
- **Item** - Oversight
- **Units** - hrs
### Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

**WBS No:** 1GAC0A02  
**Activity ID:** 1GCPFL1025

#### Project Baseline Devl

**WBS Filter:** 1GAC  
**Activity Filter:** *  
**Succs In FY:** *

---

#### Resources

<table>
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<tr>
<th>Cost Element</th>
<th>Skill</th>
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<th>Curve</th>
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</thead>
<tbody>
<tr>
<td>750 STRAIGHT TIME BASE</td>
<td>E050 ENVIRONMENTAL ENGINEERS</td>
<td>R100S RMRS Salaried</td>
<td>Linear</td>
<td>275.00</td>
<td>Hours</td>
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</table>

**Factors:** 275 hrs.

---

#### Line Item SYS - Contingency And Escalation

**BOE**

**Resources**

<table>
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<tr>
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<th>Department</th>
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<td>CON CONTINGENCY</td>
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<td>NONE</td>
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<td>ESC ESCALATION</td>
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---

#### Activity ID: 1GCPFL1030

**Description:** Demonstrate RFCA Attachment 10 Requirements

---

#### Line Item 0100 - RFCA ATTACHMENT 10

**BOE**

**Resources**

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**Factors:** 85000 SUB/C DOLLARS

---

#### Line Item 0200 - KH oversight of Subcontract

**BOE**

**Resources**

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<td>E050 ENVIRONMENTAL ENGINEERS</td>
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**Factors:** 275 hrs

---

Breakdown of Cost Data:

- **Item - RFCA Att. 10 Demonstration**
  - **Units:** $85000 Sub/c
  - **Unit Cost:** 275 hrs
  - **Unit Cost Adjustment factor:** none
  - **Revised Unit Cost:** none
  - **Basis for adjustment:** none

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

**Breakdown of Cost Data:**

- **Item - Oversight**
  - **Units:** hrs
  - **Unit Cost:** 275 hrs
  - **Unit Cost Adjustment factor:** none
  - **Revised Unit Cost:** none
  - **Basis for adjustment:** none

---

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### Line Item SYS - Contingency And Escalation

#### BOE Resources

<table>
<thead>
<tr>
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#### Activity ID: 1GCPFL1035

**Description:** Develop Org Landfill PAM and Field Documents

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<th>Description</th>
<th>Quantity</th>
<th>Units</th>
<th>BOE</th>
<th>Labor Hours/Unit</th>
<th>Labor Hours</th>
<th>Labor Cost</th>
<th>Materials/ Sub Cost</th>
<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
<th>Burden Cost</th>
<th>Total Cost</th>
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<td>1.00</td>
<td>each</td>
<td>EE</td>
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<td>0200</td>
<td>prepare SAP</td>
<td>1.00</td>
<td>each</td>
<td>EE</td>
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<td>prepare WMP</td>
<td>1.00</td>
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<td>EE</td>
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<tr>
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**Total for Activity 1GCPFL1035:**

- 2,492
- 77,738
- 0
- 16,055
- 121,235

#### Line Item 0100 - prepare PAM

**BOE:**

Estimator's Experience based generally on historical data for Ryan's Pit

**Item Desc:** Preparation of of PAM in support of source removal of previously characterized site.

**Breakdown of Cost Data:**

- Item: Preparation of PAM for Ryan's Pit source removal action.
  - Units: hours
  - Unit Cost: 700
  - Unit Cost Adjustment Factor: 1.0
  - Revised Unit Hours: 700

**Basis for adjustment:**

#### Resources

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<td>R100S</td>
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**Line Item 0200 - prepare SAP**

**BOE:**

Estimator's Experience based generally on historical data for Ryan's Pit

**Item Desc:** Preparation of SAP in support of source removal of previously characterized site.

**Breakdown of Historical Data:**

- Item: Preparation of SAP for Ryan's Pit source removal action.
  - Units: hours
  - Unit Cost: 300
  - Unit Cost Adjustment Factor: 1.0
  - Revised Unit Hours: 300

**Basis for adjustment:**

#### Resources

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<td>R100S</td>
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| 750      | M020   | R100S      | Linear| 300.00   | Hours |
| Factors  | 30 hrs |           |       |          |       |
### Line Item 0300 - prepare WMP

**BOE**

Estimator's Experience based generally on historical data for Ryan’s Pit

**Item Desc:**
Preparation of WMP in support of source removal of previously characterized site.

**Breakdown of Historical Data:**
- Item: Preparation of WMP for Ryan's Pit source removal action.
  - Units: hours
  - Unit Cost: 240
  - Unit Cost Adjustment Factor: 1.0
  - Revised Unit Hours: 240

**Basis for adjustment:**

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<td>R100S RMRS Salaried</td>
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</table>

**Factors:**
- 240 hrs

### Line Item 0400 - field preparation documents/permits

**BOE**

Estimator's Experience based generally on historical data for Ryan's Pit and T-3/T4 Remediation

**Item Desc:**

**Breakdown of Cost Data:**
- Item: Site Labor to perform above individual tasks for either Ryan's Pit or T-3/T-4.
  - Units: hours
  - Unit Cost: 1252
  - Unit Cost Adjustment Factor: 1.0
  - Revised Unit: 1252

**Factors:**
- 1252 hrs

### Line Item SYS - Contingency And Escalation

**BOE**

**Cost Element**
- **CON CONTINGENCY** 0000 NONE
  - **ESC ESCALATION** 0000 NONE

**Factors:**
- 11,139.4 Dollars
- 4,915.22 Dollars

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<th>Schedule Risk</th>
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<th>Material/Sub Cost</th>
<th>Contingency &amp; Escalation</th>
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<th>Total Cost</th>
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<td>EE</td>
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<td>107,341</td>
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<td>Contingency And Escalation</td>
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<td>EE</td>
<td>0</td>
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<td>0</td>
<td>16,209</td>
<td>16,209</td>
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**Total for Activity 1GCPFL1040:**
- 2.040
- 79,336
- 16,209
- 95,544
- 28,005
- 123,550
### Line Item 0100 - DESIGN

**BOE**

- **Cost Element:** Line Item 0100 - DESIGN
- **Skill:** Resources
- **Department:** BOE
- **Curve:** None
- **Quantity:** 1.00
- **Units:** each
- **Labor Hours/Unit:** 800
- **Labor Hours Total:** 800
- **Labor Cost Total:** 143,779
- **Materials/Sub Total:** 0
- **Contingency & Escalation:** 0
- **Total Prime Cost:** 186,539
- **Burden Cost:** 15,094
- **Total Cost:** 201,633

**Activity ID:** 1GCPLF1045

**Description:** Org Landfill Dec Doc Prep

**Cost Risk:** 3

**Schedule Risk:** 3

**Line Item 0100 - DOCUMENT PREPARATION**

**BOE**

- **Cost Element:** Line Item SYS - Contingency And Escalation
- **Skill:** Resources
- **Department:** BOE
- **Curve:** None
- **Quantity:** 1.00
- **Units:** each
- **Labor Hours/Unit:** 0
- **Labor Hours Total:** 0
- **Labor Cost Total:** 0
- **Materials/Sub Total:** 30,777
- **Contingency & Escalation:** 30,777
- **Total Prime Cost:** 0
- **Burden Cost:** 0
- **Total Cost:** 61,554

**Activity ID:** 1GCPLF1045

**Description:** Drafthp rev for OA

**Cost Risk:** 3

**Schedule Risk:** 3

---

**Breakdown of Cost Data:**

- **Item - Project Scope / Concept Design**
- **Units - hrs** 800
- **Unit Cost - $170000 Sub/c**

**Estimators Experience - Experience with similar Environmental Restoration project work scope**

- **Experience Item Desc - Timberline estimate #EP1000-1B for the OU-5 Old Sanitary Landfill**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

**Line Item SYS - Contingency And Escalation**

**BOE**

- **Cost Element:** Line Item SYS - Contingency And Escalation
- **Skill:** Resources
- **Department:** BOE
- **Curve:** None
- **Quantity:** 1.00
- **Units:** each
- **Labor Hours/Unit:** 0
- **Labor Hours Total:** 0
- **Labor Cost Total:** 0
- **Materials/Sub Total:** 30,777
- **Contingency & Escalation:** 30,777
- **Total Prime Cost:** 0
- **Burden Cost:** 0
- **Total Cost:** 61,554

**Activity ID:** 1GCPLF1045

**Description:** Drafthp rev for OA

**Cost Risk:** 3

**Schedule Risk:** 3

---

**Breakdown of Cost Data:**

- **Item - Decision Document**
- **Units - lot**
- **Unit Cost - $170000 Sub/c**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

**Line Item 0100 - DOCUMENT PREPARATION**

**BOE**

- **Cost Element:** Line Item 0100 - DOCUMENT PREPARATION
- **Skill:** Resources
- **Department:** BOE
- **Curve:** None
- **Quantity:** 1.00
- **Units:** each
- **Labor Hours/Unit:** 800
- **Labor Hours Total:** 800
- **Labor Cost Total:** 143,779
- **Materials/Sub Total:** 0
- **Contingency & Escalation:** 0
- **Total Prime Cost:** 186,539
- **Burden Cost:** 15,094
- **Total Cost:** 201,633

**Activity ID:** 1GCPLF1045

**Description:** Org Landfill Dec Doc Prep

**Cost Risk:** 3

**Schedule Risk:** 3

---

**Breakdown of Cost Data:**

- **Item - Decision Document**
- **Units - lot**
- **Unit Cost - $170000 Sub/c**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

**Line Item SYS - Contingency And Escalation**

**BOE**

- **Cost Element:** Line Item SYS - Contingency And Escalation
- **Skill:** Resources
- **Department:** BOE
- **Curve:** None
- **Quantity:** 1.00
- **Units:** each
- **Labor Hours/Unit:** 0
- **Labor Hours Total:** 0
- **Labor Cost Total:** 0
- **Materials/Sub Total:** 30,777
- **Contingency & Escalation:** 30,777
- **Total Prime Cost:** 0
- **Burden Cost:** 0
- **Total Cost:** 61,554

**Activity ID:** 1GCPLF1045

**Description:** Drafthp rev for OA

**Cost Risk:** 3

**Schedule Risk:** 3

---

**Breakdown of Cost Data:**

- **Item - Decision Document**
- **Units - lot**
- **Unit Cost - $170000 Sub/c**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

**Line Item 0100 - DOCUMENT PREPARATION**

**BOE**

- **Cost Element:** Line Item 0100 - DOCUMENT PREPARATION
- **Skill:** Resources
- **Department:** BOE
- **Curve:** None
- **Quantity:** 1.00
- **Units:** each
- **Labor Hours/Unit:** 800
- **Labor Hours Total:** 800
- **Labor Cost Total:** 143,779
- **Materials/Sub Total:** 0
- **Contingency & Escalation:** 0
- **Total Prime Cost:** 186,539
- **Burden Cost:** 15,094
- **Total Cost:** 201,633

**Activity ID:** 1GCPLF1045

**Description:** Org Landfill Dec Doc Prep

**Cost Risk:** 3

**Schedule Risk:** 3

---

**Breakdown of Cost Data:**

- **Item - Decision Document**
- **Units - lot**
- **Unit Cost - $170000 Sub/c**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

**Line Item SYS - Contingency And Escalation**

**BOE**

- **Cost Element:** Line Item SYS - Contingency And Escalation
- **Skill:** Resources
- **Department:** BOE
- **Curve:** None
- **Quantity:** 1.00
- **Units:** each
- **Labor Hours/Unit:** 0
- **Labor Hours Total:** 0
- **Labor Cost Total:** 0
- **Materials/Sub Total:** 30,777
- **Contingency & Escalation:** 30,777
- **Total Prime Cost:** 0
- **Burden Cost:** 0
- **Total Cost:** 61,554

**Activity ID:** 1GCPLF1045

**Description:** Drafthp rev for OA

**Cost Risk:** 3

**Schedule Risk:** 3

---

**Breakdown of Cost Data:**

- **Item - Decision Document**
- **Units - lot**
- **Unit Cost - $170000 Sub/c**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

**Line Item 0100 - DOCUMENT PREPARATION**

**BOE**

- **Cost Element:** Line Item 0100 - DOCUMENT PREPARATION
- **Skill:** Resources
- **Department:** BOE
- **Curve:** None
- **Quantity:** 1.00
- **Units:** each
- **Labor Hours/Unit:** 800
- **Labor Hours Total:** 800
- **Labor Cost Total:** 143,779
- **Materials/Sub Total:** 0
- **Contingency & Escalation:** 0
- **Total Prime Cost:** 186,539
- **Burden Cost:** 15,094
- **Total Cost:** 201,633

**Activity ID:** 1GCPLF1045

**Description:** Org Landfill Dec Doc Prep

**Cost Risk:** 3

**Schedule Risk:** 3

---

**Breakdown of Cost Data:**

- **Item - Decision Document**
- **Units - lot**
- **Unit Cost - $170000 Sub/c**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
## Rocky Flats Closure Project
### Baseline Cost and Basis of Estimate

- **WBS No:** 1GAC0A02
- **Activity ID:** 1GCPFL1045
- **Description:** Rocky Flats Closure Project

### Activity 1GCPFL1045
- **WBS No:** 1GAC0A02
- **Activity ID:** 1GCPLF1045
- **Description:** Orq Landfill Hot Spot Readiness Assessment

<table>
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### Line Item 0100 - readiness assessment

**BOE:** Estimator's Experience based generally on historical data for T-3/T-4 Remediation.

**Item Desc:**
Conduct Readiness Assessment in support of source removal action.

**Breakdown of Cost Data:**
- **Item:** Site Labor to perform Readiness Assessment for T-3/T-4.
- **Units:** hours
- **Unit Cost:** 250
- **Unit Cost Adjustment Factor:** none
- **Revised Unit:** 250

### Resources

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### Line Item 0200 - training

**BOE:** Estimator's Experience based generally on historical data for T-3/T-4 Remediation.

**Item Desc:**
Conduct perform Training in support of source removal action.

**Breakdown of Cost Data:**
- **Item:** Site Labor to perform above individual tasks for T-3/T-4.
- **Units:** hours
- **Unit Cost:** 200 Hours
- **Unit Cost Adjustment Factor:** none
- **Revised Unit:** 200 hours

### Resources

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### Line Item 0300 - pre-evolution meeting

**BOE:** Estimator's Experience based generally on historical data for T-3/T-4 Remediation.

**Item Desc:**
Conduct Pre-Evolution Meeting in support of source removal action

**Breakdown of Cost Data:**
- **Item:** Site Labor to perform above individual tasks for T-3/T-4.
- **Units:** hours
- **Unit Cost:** 120 hours (15 workers @ 8 hours each)
- **Unit Cost Adjustment Factor:** none
### Rocky Flats Closure Project
**Baseline Cost and Basis of Estimate**

**WBS No:** 1GAC0A02  
**Activity ID:** 1GCPFL1060  
**Project:** Baseline Devi  
**Baseline:** 1GAC  
**Activity Filter:**  
**Starts In FY:** *

### Resources

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**Factors:** 120 hrs

### Line Item SYS - Contingency And Escalation

#### BOE

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**Factors:** 5106.38 Dollars  
**Factors:** 1952.44 Dollars

### Activity ID: 1GCPFL1065  
**Description:** Perform Org Landfill Hot Spot Removal

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<th>Quantity</th>
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<th>Labor Cost Total</th>
<th>Material/ Sub Cost</th>
<th>Contingency &amp; Escalation</th>
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<td>cy</td>
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**Total for Activity 1GCPFL1065:** 1,403 48,724 39,709 29,192 117,625 16,858 134,483

### Line Item 0100 - mobilization

**BOE**

**Estimator's Experience based generally on historical data for T-3/T4 Remediation.**

**Item Desc:**  
Mobilization in support of remediation.

**Breakdown of Cost Data:**

**Item:** Site Labor to perform above individual tasks for T-3/T-4.  
**Units:** hours  
**Unit Cost:** 275  
**Unit Cost Adjustment Factor:** none  
**Revised Unit:** 275

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.  
**Units:** 1 lot  
**Unit Cost:** 184k  
**Unit Cost Adjustment Factor:** 0.25  
**Revised Unit:** see below

**Basis for adjustment:** The costs were divided into fixed costs and variable costs. The fixed costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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<tr>
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<td>R100S RMRS Salaried</td>
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<td>750 STRAIGHT TIME BASE</td>
<td>M020 MANAGERS (GRADE 69 - 72)</td>
<td>R100S RMRS Salaried</td>
<td>Linear</td>
<td>83.00</td>
<td>Hours</td>
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**Factors:** 138 hrs  
**Factors:** 83 hrs
Project: Rocky Flats Closure Project
Baseline Devl Cost and Basis of Estimate
Baseline Cost and Basis of Estimate

WBS No: 1GAC0A02
Activity ID: 1GCPLF1065

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**Line Item 0200 - site prep**

BOE

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Breakdown of Historical Data:**

**Item:** Site Labor to perform above individual tasks for T-3/T-4.
  - Units: hours
  - Unit Cost: see below
  - Unit Cost Adjustment Factor: see below
  - Revised Unit: see below

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
  - Units: 1 lot
  - Unit Cost: see below
  - Unit Cost Adjustment Factor: see below
  - Revised Unit: see below

**Basis for adjustment.** The costs were divided into fixed costs and variable costs. The fixed costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Line Item 0300 - excavation**

BOE

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Breakdown of Historical Data:**

**Item:** Site Labor to perform above individual tasks for T-3/T-4.
  - Units: hours
  - Unit Cost: see below
  - Unit Cost Adjustment Factor: see below
  - Revised Unit: see below

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
  - Units: 1 lot
  - Unit Cost: see below
  - Unit Cost Adjustment Factor: see below
  - Revised Unit: see below

**Basis for adjustment.** The costs were divided into fixed costs and variable costs. The fixed costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.
Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Line Item 0600 - Confirmation Sampling

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:** Confirmation Sampling.

**Breakdown of Historical Data:**

- **Item:** Site Labor to perform above individual tasks for T-3/T-4.
  - **Units:** hours
  - **Unit Cost:** see below
  - **Unit Cost Adjustment Factor:** see below
  - **Revised Unit:** see below

- **Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
  - **Units:** 1 lot
  - **Unit Cost:** see below
  - **Unit Cost Adjustment Factor:** see below
  - **Revised Unit:** see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Line Item 0700 - Prepare Waste Acceptance Forms

**BOE**

Estimator's Experience based generally on historical data for T-3/T4 Remediation.

**Item Desc:** Prepare Waste Acceptance Forms
Breakdown of Historical Data:

Item: Site Labor to perform above individual tasks for T-3/T-4.
  Units: hours
  Unit Cost: see below
  Unit Cost Adjustment Factor: see below
  Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
  Units: 1 lot
  Unit Cost: see below
  Unit Cost Adjustment Factor: see below
  Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

<table>
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<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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**Factors 80 hrs**

**Line Item 0800 - waste acceptance sampling**

BOE Estimator's Experience based generally on historical data for T-3/T4 Remediation.

Item Desc: Waste Acceptance Sampling

Breakdown of Historical Data:

Item: Site Labor to perform above individual tasks for T-3/T-4.
  Units: hours
  Unit Cost: see below
  Unit Cost Adjustment Factor: see below
  Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
  Units: 1 lot
  Unit Cost: see below
  Unit Cost Adjustment Factor: see below
  Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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**Line Item 0900 - field oversight & project mgmt**

BOE Estimator’s Experience based generally on historical data for T-3/T4 Remediation.

Item Desc: Field Oversight and Project Management

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<th>Skill</th>
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<th>Curve</th>
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### Breakdown of Historical Data:

**Item:** Site Labor to perform above individual tasks for T-3/T-4.
- **Units:** hours
- **Unit Cost:** See below
- **Unit Cost Adjustment Factor:** See below
- **Revised Unit:** See below

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
- **Units:** 1 lot
- **Unit Cost:** See below
- **Unit Cost Adjustment Factor:** See below
- **Revised Unit:** See below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

### Resources

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<th>Cost Element</th>
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**Cost Element:** RMS

**Skill:** Environmental Engineers, Managers (Grade 69 - 72), Environmental Scientists

**Department:** Linear

**Curve:** Linear

**Quantity:** 303.00

**Units:** Hours

**Factors:** 303

**Line Item 1000 - backfill**

**BOE**

**Trade Publication**
Means 1995, Site Work & Landscape Cost Data (page 34, 42, and 34)

**Item Desc:** Backfill.

**Breakdown of Historical Data:**

**Item:** Site Labor to perform above individual tasks for T-3/T-4.
- **Units:** hours
- **Unit Cost:** See below
- **Unit Cost Adjustment Factor:** See below
- **Revised Unit:** See below

**Item:** Subcontractor costs to perform above individual tasks for T-3/T-4.
- **Units:** 1 lot
- **Unit Cost:** See below
- **Unit Cost Adjustment Factor:** See below
- **Revised Unit:** See below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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<td>RMRS Salaried</td>
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**Cost Element:** RMS

**Skill:** Environmental Scientists

**Department:** Linear

**Curve:** Linear

**Quantity:** 69.00

**Units:** Hours

**Factors:** 69

**Line Item 1100 - demobilization**

**BOE**

**Estimator's Experience based generally on historical data for T-3/T4 Remediation.**

**Item Desc:**
Demobilization.

Breakdown of Historical Data:
Item: Site Labor to perform above individual tasks for T-3/T-4.
  Units: hours
  Unit Cost: see below
  Unit Cost Adjustment Factor: see below
  Revised Unit: see below

Item: Subcontractor costs to perform above individual tasks for T-3/T-4.
  Units: 1 lot
  Unit Cost: see below
  Unit Cost Adjustment Factor: see below
  Revised Unit: see below

Basis for adjustment. The costs were divided into fixed costs and variable costs. The fixed costs costs are Mobilization, Site Preparation, Prepare Waste Acceptance Forms, and Demobilization. The variable costs are Excavation, Remove and Clean Debris, Thermal Desorption, Confirmation Sampling, Waste Acceptance Sampling, Field Oversight, and Backfill. The fixed costs are adjusted by a 0.25 factor to account for the fact that 4 UBCs will be remediated at once and only one of each fixed cost is needed for the group. The variable costs were calculated on a per cubic yard historical basis. The estimated contaminated soil volumes and waste type distributions were applied to the per yard historical unit rates to arrive at the estimated costs.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

<table>
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<tr>
<th>Cost Element</th>
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<th>Quantity</th>
<th>Units</th>
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Activity ID: 1GCPLF1075 Description: Prepare Hot Spot Closeout Report

Breakdown of Cost Data:
Item - Closure Report
  Units - lot
  Unit Cost - 155 hrs;
  Unit Cost Adjustment factor - none
Rocky Flats Closure Project
Baseline Cost and Basis of Estimate

Activity ID: 1GCPLF1075

Baseline Devl Project
WBS Filter 1GAC
Activity Filter * Suits In FY *

---

### Revised Unit Cost
- none

### Basis for adjustment
- none

### Resources

<table>
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<th>Skill</th>
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<th>Curve</th>
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<td>750 STRAIGHT TIME BASE</td>
<td>E050 ENVIRONMENTAL ENGINEERS</td>
<td>R100S RMRS Salaried</td>
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<td>130.00</td>
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<td>750 STRAIGHT TIME BASE</td>
<td>M020 MANAGERS (GRADE 69 - 72)</td>
<td>R100S RMRS Salaried</td>
<td>Linear</td>
<td>15.00</td>
<td>Hours</td>
</tr>
<tr>
<td>750 STRAIGHT TIME BASE</td>
<td>S020 ENVIRONMENTAL SCIENTISTS</td>
<td>R100S RMRS Salaried</td>
<td>Linear</td>
<td>10.00</td>
<td>Hours</td>
</tr>
</tbody>
</table>

**Factors**
- 130 HRS
- 15 HRS
- 10 hrs

### Line Item SYS - Contingency And Escalation

**BOE**

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CON CONTINGENCY</td>
<td>0000 NONE</td>
<td>ZDEPT No Department</td>
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<td>1,379.20</td>
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<tr>
<td>ESC ESCALATION</td>
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<td>ZDEPT No Department</td>
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<td>512.71</td>
<td>Dollars</td>
</tr>
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</table>

**Factors**
- 1379.20 Dollars
- 512.71 Dollars

### Activity ID: 1GCPLF1090

**Description:** Procure Org Landfill Cap Design & Build Subc

**Schedule Risk:** 2

**Cost Risk:** 2

<table>
<thead>
<tr>
<th>Line Item</th>
<th>Description</th>
<th>Quantity</th>
<th>Units</th>
<th>BOE Type</th>
<th>Labor Hours/Unit</th>
<th>Labor Hours Total</th>
<th>Labor Cost Total</th>
<th>Materials/Sub Cost</th>
<th>Contingency</th>
<th>Total Prime Cost</th>
<th>Burden Cost</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>0100</td>
<td>PROCUREMENT SUPPORT</td>
<td>1.00 each</td>
<td>EE</td>
<td>590</td>
<td>590</td>
<td>17,152</td>
<td>0</td>
<td>0</td>
<td>17,152</td>
<td>5,980</td>
<td>23,133</td>
<td>590</td>
</tr>
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</table>

**Factors**
- 350.00 Hours

**Breakdown of Cost Data:**

- **Item - Procurement**
  - Unit Cost - 350 hrs; 240 hrs. KH Procurement
  - Unit Cost Adjustment factor - none
  - Revised Unit Cost - none

### Activity ID: 1GCPLF1100

**Description:** Org Landfill Cap Title II/Title III Design

**Schedule Risk:** 2

**Cost Risk:** 2

<table>
<thead>
<tr>
<th>Line Item</th>
<th>Description</th>
<th>Quantity</th>
<th>Units</th>
<th>BOE Type</th>
<th>Labor Hours/Unit</th>
<th>Labor Hours Total</th>
<th>Labor Cost Total</th>
<th>Materials/Sub Cost</th>
<th>Contingency</th>
<th>Total Prime Cost</th>
<th>Burden Cost</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>0100</td>
<td>DESIGN OF CAP</td>
<td>1.00 each</td>
<td>EE</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>499,168</td>
<td>499,168</td>
<td>0</td>
<td>499,168</td>
<td>0</td>
<td>499,168</td>
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<tr>
<td>0200</td>
<td>PROJECT MGMT</td>
<td>1.00 each</td>
<td>EE</td>
<td>1,040</td>
<td>1,040</td>
<td>55,588</td>
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<td>74,821</td>
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<td>Contingency And Escalation</td>
<td>1.00 each</td>
<td>EE</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>160,729</td>
<td>160,729</td>
<td>715,485</td>
<td>19,233</td>
<td>734,718</td>
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Total for Activity 1GCPLF1100:

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<th>Labor Cost Total</th>
<th>Materials/Sub Cost</th>
<th>Contingency</th>
<th>Total Prime Cost</th>
<th>Burden Cost</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,040</td>
<td>55,588</td>
<td>499,168</td>
<td>160,729</td>
<td>715,485</td>
<td>19,233</td>
<td>734,718</td>
<td>0</td>
<td>160,729</td>
<td></td>
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Page 1005 of 1121

6/23/00 9:23:26 AM

OFFICIAL USE ONLY
### Project: Rocky Flats Closure Project
#### Baseline Cost and Basis of Estimate

<table>
<thead>
<tr>
<th>Activity ID</th>
<th>Description</th>
<th>WBS Filter</th>
<th>Activity Filter</th>
<th>Starts In FY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1GCPFL110</td>
<td>Org Landfill Cap Field Document Preparation</td>
<td>1GAC</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Line Item 0100 - DESIGN OF CAP

**BOE**

Estimators Experience - Experience with similar Environmental Restoration project work scope
Experience Item Desc - Timberline estimate #EP1000-1B for the OU-5 Landfill

Breakdown of Cost Data:

- **Item** - Design
- **Units** - lot
- **Unit Cost** - $590200 Sub/c
- **Unit Cost Adjustment factor** - none
- **Revised Unit Cost** - none
- **Basis for adjustment** - none

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

#### Resources

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>SUBCONTRACTED SRVS</td>
<td>E050 ENVIRONMENTAL ENGINEERS</td>
<td>K265 ER Programs</td>
<td>Linear</td>
<td>499,167.60</td>
<td>Dollars</td>
</tr>
</tbody>
</table>

| Factors | SUB/C DOLLARS | 0.84576 | [SYS 061400] .84576000 - System |

### Line Item 0200 - PROJECT MGMT

**BOE**

Estimators Experience - Experience with similar Environmental Restoration project work scope
Experience Item Desc - Timberline estimate #EP10001B for the OU-5 Landfill

Breakdown of Cost Data:

- **Item** - Project Mgmt
- **Units** - 1040 hrs
- **Unit Cost** - 1040 hrs
- **Unit Cost Adjustment factor** - none
- **Revised Unit Cost** - none
- **Basis for adjustment** - none

#### Resources

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>STRAIGHT TIME BASE</td>
<td>M020 MANAGERS (GRADE 69 - 72)</td>
<td>R100S ER Programs</td>
<td>Linear</td>
<td>1,040.00</td>
<td>Hours</td>
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</table>

| Factors | HRS | 1040 |

### Line Item SYS - Contingency And Escalation

**BOE**

#### Resources

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CON CONTINGENCY</td>
<td>0000</td>
<td>ZDEPT No Department</td>
<td>Linear</td>
<td>116,712.90</td>
<td>Dollars</td>
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</table>

| Factors | CONTINGENCY DOLLARS | 116,712.90 |

| ESC ESCALATION     | 0000  | ZDEPT No Department | Linear| 44,016.50| Dollars|

| Factors | ESCALATION DOLLARS | 44,016.50 |

### Activity ID: 1GCPFL1110

**Description:** Org Landfill Cap Field Document Preparation

<table>
<thead>
<tr>
<th>Line Item</th>
<th>Description</th>
<th>Quantity</th>
<th>Units</th>
<th>BOE Type</th>
<th>Labor Hours/Unit</th>
<th>Labor Hours Total</th>
<th>Labor Cost Total</th>
<th>Materials/Sub Cost</th>
<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
<th>Burden Cost</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>0100</td>
<td>DOCUMENTATION PREP</td>
<td>1.00</td>
<td>each</td>
<td>EE</td>
<td>300</td>
<td>300</td>
<td>8,868</td>
<td>33,830</td>
<td>42,698</td>
<td>2,516</td>
<td>7,693</td>
<td>45,215</td>
</tr>
<tr>
<td>SYS</td>
<td>Contingency And Escalation</td>
<td>1.00</td>
<td>ka</td>
<td>EE</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>7,693</td>
<td>0</td>
<td>7,693</td>
<td>0</td>
<td>7,693</td>
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**Total for Activity 1GCPFL1110:**

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Units</th>
<th>BOE Type</th>
<th>Labor Hours/Unit</th>
<th>Labor Hours Total</th>
<th>Labor Cost Total</th>
<th>Materials/Sub Cost</th>
<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
<th>Burden Cost</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>300</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>52,907</td>
</tr>
</tbody>
</table>

**Activity ID: 1GCPFL1110**

**Description:** Org Landfill Cap Field Document Preparation

**BOE**

Estimators Experience - Experience with similar Environmental Restoration project work scope.
Experience Item Desc - Based on previous experience with work scope at RFETS to develop field documentation, permits to enter the field. Coordination with Subcontractors on attaining approval of JHAs and HASP.

Breakdown of Cost Data:

- **Item** - modeling
- **Units** - Hours/Dollars
- **Unit Cost** - 300 hrs, for Oversight Support and 40K for Subcontractor Support
**Rocky Flats Closure Project**

**Baseline Cost and Basis of Estimate**

WBS No: 1GAC0A02  
Activity ID: 1GCPLF1110

**Resources**

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>750</td>
<td>STRAIGHT TIME BASE</td>
<td>E050 ENVIRONMENTAL ENGINEERS</td>
<td>R100S RMRS Salaried</td>
<td>Linear</td>
<td>300.00 Hours</td>
</tr>
<tr>
<td>ASH</td>
<td>SUBCONTRACTED SRVS</td>
<td>E050 ENVIRONMENTAL ENGINEERS</td>
<td>K26S ER Programs</td>
<td>Linear</td>
<td>25,372.80 Dollars</td>
</tr>
</tbody>
</table>

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Line Item Sys - Contingency And Escalation**

**BOE**

<table>
<thead>
<tr>
<th>Department</th>
<th>Skill</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>RMRS Salaried</td>
<td>ENVIRONMENTAL ENGINEERS</td>
<td>Linear</td>
<td>3,375.13 Dollars</td>
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</table>

**Line Item 0100 - READINESS ASSESSMENT**

**BOE**

<table>
<thead>
<tr>
<th>Description</th>
<th>Quantity</th>
<th>Units</th>
<th>BOE Type</th>
<th>Labor Hours/Unit</th>
<th>Labor Hours</th>
<th>Total</th>
<th>Labor Cost Total</th>
<th>Materials/ Sub Cost</th>
<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
<th>Burden Cost 1</th>
<th>Total Cost 1</th>
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<tbody>
<tr>
<td>READINESS ASSESSMENT</td>
<td>1.00 ea</td>
<td>EE</td>
<td>400</td>
<td>400</td>
<td>21,380</td>
<td>25,373</td>
<td>0</td>
<td>46,753</td>
<td>60,319</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Contingency And Escalation</td>
<td>1.00 ea</td>
<td>EE</td>
<td>0</td>
<td>0</td>
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<td>0</td>
<td>0</td>
<td>7,537</td>
<td>7,537</td>
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</table>

Total for Activity 1GCPLF1115: 400 21,380 25,373 7,537 54,289 60,319

**Line Item SYS - Contingency And Escalation**

<table>
<thead>
<tr>
<th>Department</th>
<th>Skill</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>RMRS Salaried</td>
<td>ENVIRONMENTAL ENGINEERS</td>
<td>Linear</td>
<td>25,372.80 Dollars</td>
<td></td>
</tr>
</tbody>
</table>

**Breakdown of Cost Data:**

**Estimators Experience - Experience with similar Environmental Restoration project work scope**

**Item - Project Scope / Concept Design**

**Units - lot**

**Unit Cost - 400 hrs; $30000 sub/c support**

**Unit Cost Adjustment factor - none**

**Revised Unit Cost - none**

**Basis for adjustment - none**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### WBS No: 1GAC0A02
### Activity ID: 1GCPFL1115
### Projects
#### Rocky Flats Closure Project
#### Baseline Cost and Basis of Estimate

**WBS Filter:** Baseline Devl

**Activity Filter:** WBS Filter

**Starts In FY:**

#### WBS Filter

**WBS No:** 1GAC0A02

**Activity ID:** 1GCPFL1115

**Description:** Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

**WBS No:** 1GAC0A02

**Activity ID:** 1GCPFL1115

**Description:** Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

<table>
<thead>
<tr>
<th>WBS No</th>
<th>Activity ID</th>
<th>Description</th>
<th>Activity ID</th>
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<tr>
<td>1GAC0A02</td>
<td>1GCPFL1115</td>
<td>Rocky Flats Closure Project</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Factors**

- **Dollars:** 5,067.93

---

#### Activity ID: 1GCPFL1120

**Description:** Construct Org Landfill Retaining Wall/Buttruss

<table>
<thead>
<tr>
<th>Line Item</th>
<th>Description</th>
<th>Quantity</th>
<th>Units</th>
<th>BOE Type</th>
<th>Labor Hours/Unit</th>
<th>Labor Total</th>
<th>Labor Cost Total</th>
<th>Material/Sub Cost</th>
<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
<th>Burden Cost</th>
<th>Total Cost</th>
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</thead>
<tbody>
<tr>
<td>IBCPER1140</td>
<td>Install Stabilizing Berm</td>
<td>00,000.00</td>
<td>cy</td>
<td>EE</td>
<td>0</td>
<td>0</td>
<td>2,621,010</td>
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<td>2,621,010</td>
<td>0</td>
<td>2,621,010</td>
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<td>Contingency And Escalation</td>
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<td>ka</td>
<td>EE</td>
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<td>0</td>
<td>380,147</td>
<td>380,147</td>
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</tbody>
</table>

**Total for Activity 1GCPFL1120:**

- **Labor Total:** 2,621,010
- **Labor Cost Total:** 2,621,010
- **Material/Sub Cost:** 380,147
- **Total Prime Cost:** 3,001,157
- **Burden Cost:** 380,147
- **Total Cost:** 3,381,304

---

**Line Item IBCPER1140 - Install Stabilizing Berm**

**BOE**

- **Department:** Er Programs
- **Skill:** NONE

**Resources**

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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</thead>
<tbody>
<tr>
<td>ASH</td>
<td>SUBCONTRACTED SRVS</td>
<td>0000</td>
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<td>K285S</td>
<td>ER Programs</td>
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<tr>
<td>Factors</td>
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<td>Dollars</td>
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<td>[SYS 061400].8457600 - System</td>
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**Line Item SYS - Contingency And Escalation**

**BOE**

- **Department:** Er Programs
- **Skill:** NONE

---

**Resources**

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
</tr>
</thead>
</table>

---

**Notes:**

- This estimate is based on estimator judgement, historical data, and commercial databases from similar type work.
- For more complete detail refer to Timberline estimate No. 111111-1A "Old Sanitary Landfill Cap" by John Hopkins, RMRS X4974.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
Line Item Description
1GCPF006 - Org Landfill Cap Construction

BOE

For more complete detail refer to Timberline estimate No. EP1000-3C for the OU-7 Landfill Cover

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

Resources

Line Item 0200 - Project Mgmt Support

Total for Activity 1GCPF0125:
5,826  197,137  9,952,080  4,541,602  1,778,556  2,826,967  1,694,035  1,694,035  53,947  53,947  0  4,541,602  14,757,044

Line Item LFEAER2210 - Provide Fixed Price Contractor Support

Estimators Experience - Experience with similar Environmental Restoration project work scope

Experience Item Desc - Timberline estimate #EP1000-3C for the OU-7 Landfill

Breakdown of Cost Data:
Item - Construction Support

Unit Cost Adjustment factor - none
<table>
<thead>
<tr>
<th>Activity ID: 1GCPLF1125</th>
<th>Rocky Flats Closure Project</th>
</tr>
</thead>
<tbody>
<tr>
<td>WBS No: 1GAC0A02</td>
<td>Baseline Cost and Basis of Estimate</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Activity Filter</th>
<th>Project Filter</th>
<th>Baseline Deviation</th>
<th>Starts In FY</th>
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<tbody>
<tr>
<td>*</td>
<td>1GAC</td>
<td>*</td>
<td>*</td>
</tr>
</tbody>
</table>

**Revised Unit Cost - none**  
**Basis for adjustment - none**

**Project Manager**  
SO  
2249 hrs x $83.00 = $186,667

**Superintendent**  
SO  
40 hrs/wk x 4.33 wk/mo = 173 hrs/mo x 13 months = 2249 hrs x $57.00 = $128,193

**Secretary Support**  
1.00 ls 570 mh x $35 = $19,950

**Submittals**  
1.00 ls 40 mh x $83.00 = $3320

**Scheduling**  
1.00 ls 228 mh x $57.00 = $12,996

**Estimating**  
1.00 ls 357 mh x $57 = $20,349

**Procurement**  
1.00 ls 240 mh x $57 = $13,680

**Action Item Log**  
1.00 ls 285 mh x $57 = $16,245

**Surveyor**  
SO  
4.33 wks/month x 40 hrs/wk = 347 hrs/mo x 11 months = 3817 hrs x $25.00 = $95,387  
Material $200/mo x 11 Months = $2200, Equipment $283/mo x 11 months = $3113  
Total $95,387 + 2200 + 3113 = $100,700

**Health and Safety Compliance/Health & Safety Plan**  
SO  
1.00 ls 2280 mh x $69.00 = $157,320

**Badging**  
1.00 ls = 72 mh x $25.00 = $1799 plus equipment $50.00 total $1849

**Training**  
1.00 ls = 720 mh x $25.00 = $17,993

**As Built Drawings**  
SO  
1.00 ls = 40 mh x $57.00 = $2280

**Mobilization/Demob**  
SO  
36 items of equipment 36 items x 16 hrs = 576 hrs x $24.55/hr = $14,141  
Equip Price 1200 Equipment Amt. 43,200 Total = $57,341

**Equipment Allowance**  
40 wks x 80 = 3200 mhrs x $25 = $80,000  
Equipment Price $31,200 x 40 = $124,800 Total = $204,800

**Office/Power & Phones to trailers/**  
13 months x $1000/month = $13,000  
1.00 ls = 48 mh x $33.94 = $1629, Material & Equipment $2400 - Total $4,029  
1.00 ls = 24 mn x $33.94 = $815, Material & Equipment $1200 - Total $2,015

**Pre-evolution meeting**

---

6/23/00 9:23:28 AM  
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### Rocky Flats Closure Project

#### Baseline Cost and Basis of Estimate

<table>
<thead>
<tr>
<th>Resource Description</th>
<th>Price Breakdown</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Portable Toilet</td>
<td>13 mo x 3 ea x $39/mo, Material $135, Total = $5265</td>
<td></td>
</tr>
<tr>
<td>Pickup Trucks/Flat Bed Truck</td>
<td>(5 trucks) 285wks x $319 = $90,915</td>
<td></td>
</tr>
<tr>
<td>Water/Generator</td>
<td>57 wks x $50 = $2850</td>
<td></td>
</tr>
<tr>
<td>Parts Van (2ea)</td>
<td>114 wks x $75 = $8550</td>
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</tr>
<tr>
<td>Phones/Pagers</td>
<td>57 wks x $50 = $2850</td>
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<tr>
<td>Sales Tax</td>
<td>1.00 ls 3.8% of Materials $249,127</td>
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</tr>
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For more complete detail refer to Timberline estimate No. EP1000-3C.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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<td>705,069.50</td>
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</table>

#### Line Item LFEAER2220 - Provide QA/QC

**BOE**

Estimators Experience - Experience with similar Environmental Restoration project work scope

Experience Item Desc - Timberline estimate #EP1000-3C for the OU-7 Landfill

Breakdown of Cost Data:

- Item = QA/QC
- Unit Cost Adjustment factor - none
- Revised Unit Cost - none
- Basis for adjustment - none

**SO**

4.33wks/month x 80hrs/wk = 346 hrs/mo x13 months = 4498 x $69.00 = $310,362

Material 2165 x 13 months = $28,145, Total - $338,507

This estimate is based on estimator judgement and historical data from similar type work.

For more complete detail refer to Timberline estimate #EP1000-3C for the OU-7 Landfill.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
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</table>

#### Line Item LFEAER2275 - Project Setup/Trailer/ Road/Water/Traffic Con

**BOE**

SEE BELOW FOR THE FOLLOWING TEMPLATE INFORMATION


---

Page 1011 of 1121 6/23/00 9:23:28 AM OFFICIAL USE ONLY
## Unit Cost - none - Basis for adjustment - none

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Quantity</th>
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<tr>
<td>Contractor Yard</td>
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<tr>
<td>Set Up Yard</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.00 ls 64 mh x $25=$1600</td>
<td>Equipment Price $346</td>
<td>Total Cost = $1946</td>
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</tr>
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<td>Office Trailer</td>
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<tr>
<td>1.00 ls 32 mh x $25=$800</td>
<td>Equipment Price $173</td>
<td>Total Cost = $973</td>
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<tr>
<td>Parts Van</td>
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<tr>
<td>1.00 ls 64 mh x $25=$1600</td>
<td>Equipment Price $346</td>
<td>Total Cost = $1946</td>
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<tr>
<td>Gravel Yard &amp; Road to Yard</td>
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<td>1.00 ls 440 mh x $25=$11000</td>
<td>Equip Price $1397</td>
<td>Material Price $12,375</td>
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<td>Total Cost - $24,772</td>
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<tr>
<td>Grand Total Cost - $29,637</td>
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<td>Erosion Control</td>
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<tr>
<td>Install Silt Fence</td>
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<tr>
<td>6990 Lf 118.83 mh x 16.92 =$2011</td>
<td>Materials 6990 x $0.35= $2447</td>
<td>Total $4457</td>
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<tr>
<td>Remove Silt Fence</td>
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<tr>
<td>59.42 x $16.92= $1005</td>
<td>Total Cost - $5462</td>
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<tr>
<td>Haul Road</td>
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<td></td>
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<tr>
<td>Haul Road Maintenance</td>
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<td>1600 mh x $25=$40000</td>
<td>Equipment Price $2875 x 40=$115000 Total Cost = $155000</td>
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<tr>
<td>Dust Control on Haul Road</td>
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<tr>
<td>1600 mh x $23.82 = $38,112</td>
<td>Equipment Price 40 x $3685= $147400 Total Cost = $185512</td>
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<tr>
<td>Construct Haul Road</td>
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</tr>
<tr>
<td>1.00 ls 100 mh x $25= $2500</td>
<td>Material Price $1230</td>
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<tr>
<td>Equipment Price</td>
<td>$2947</td>
<td>Total Cost = $6677</td>
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<tr>
<td>Remove Haul Road</td>
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<td>1.00 ls 67 mh x $25= $1675</td>
<td>Equipment Price $1965 Total Cost = $3640</td>
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<td>Material Price</td>
<td>$1230</td>
<td>Total Cost = $350,811</td>
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<tr>
<td>Traffic Control</td>
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<tr>
<td>Barricades, Cones, Delineators, Signs @ Hwy 93</td>
<td>For 13 months 8996 mh x $16.92=$152,212</td>
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<tr>
<td>Materials - 13 mon.x $3000=$39000</td>
<td>Flagman</td>
<td>$8996 mh x $16.92=$152,212</td>
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<td>Materials - 13 mon.x $100= $1300</td>
<td>Total Cost $344,724</td>
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<tr>
<td>Water Supply</td>
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<tr>
<td>(3) 4&quot; Dia. Pumps 4800 mh x $16.92=$81,216</td>
<td>Equipment 537 x 120 wks =64,440</td>
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<tr>
<td>Elevated Water Tower (3) 318 x 120 wks = $38160</td>
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<td>Suction/Discharge Hose, 4&quot; Dia 60 x 120 wks = $27200</td>
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<td>Install/Remove 4&quot; Pump 2 x 24 mh x $25 = $1200</td>
<td>Equipment 2 x 112.78 x 3 = $676</td>
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<tr>
<td>Install/Remove Water Towers 2 x 48 x $25 = $2400</td>
<td>Equipment 2 x 225.56 x 3 = $1354</td>
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<td>Grand Total Costs - $196,646</td>
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Activity Total Cost - $927,280/

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

**WBS Filter:** 1GAC

**Activity Filter:**

<table>
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**WBS No:** 1GAC0A02

**Project:**

**Baseline Deviation:**

**Line Item LFEAER2300 - Clear & Grub**

**Cost Element:** LFEAER2300 - Clear & Grub

**Department:** ER Programs

**Curve:** Linear

**Line Item: LFEAER2300**

**Trade Publication:** SEE BELOW FOR THE FOLLOWING TEMPLATE INFORMATION

**Unit Cost:** none - Basis for adjustment - none

**Total Cost:** $20457

**Cost Element:**

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**Factors:** 927280

**Line Item LFEAER2305 - Prepare Existing Grade**

**Cost Element:** LFEAER2305 - Prepare Existing Grade

**Department:** ER Programs

**Curve:** Linear

**Line Item: LFEAER2305**

**Trade Publication:** SEE BELOW FOR THE FOLLOWING TEMPLATE INFORMATION

**Unit Cost:** none - Basis for adjustment - none

**Total Cost:** $41,764

**Cost Element:**

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**Factors:** 619.3

**Line Item LFEAER2310 - Biota Layer 2" - 8" Diameter Rubble**

**Cost Element:** LFEAER2310 - Biota Layer 2" - 8" Diameter Rubble

**Department:** ER Programs

**Curve:** Linear

**Line Item: LFEAER2310**

**Trade Publication:** SEE BELOW FOR THE FOLLOWING TEMPLATE INFORMATION

**Unit Cost:** none - Basis for adjustment - none

**Total Cost:** $725,163

**Cost Element:**

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<th>Curve</th>
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<td>Dollars</td>
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**Factors:** 0.84576

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### Resources

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**Factors**: 26.717

#### Line Item LFEAER2315 - Geotextile Fabric

**BOE**

SEE BELOW FOR THE FOLLOWING TEMPLATE INFORMATION


Geotextile Fabric

Labor: 1,349,460 sf x .002 hrs/sf x $16.92 = $45,666
Materials: 1,349,460 sf x .53 = $715,213

$760,878/1,349,460 = $0.5638

This estimate is based on estimator judgement, historical data, and commercial databases from similar type work.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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<thead>
<tr>
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<th>Skill</th>
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**Factors**: 0.5638

#### Line Item LFEAER2330 - Earthwork/Common Borrow

**BOE**

SEE BELOW FOR THE FOLLOWING TEMPLATE INFORMATION


Common Borrow, Buy &ld at pit, haul 20 Miles rt

Lab: 242,556 cy x .005hrs/cy x $24.99/hr = $30,307
Mat: 242,556 cy x $3.75/cy = $909,585
Equip: 242,556 cy x $0.42 = $101,874

Spread Common Borrow, with dozer, no compaction

Lab: 210,770 cy x .012 hrs/cy x $24.99/hr = $63,206
Equip: 210,770 cy x $0.84/cy = $177,047

Haul Common Borrow, 20 mile rt, 16.5 cy Truck

Lab: 242,556 cy x .074hrs/cy x $24.55/hr = $440,651
Equip: 242,556 cy x 5.18 = $1,256,440

Compaction sheepfoot, 6" lift 4 passes

Lab: 210,770 cy x .005 hrs/cy x $24.99/hr = $26,336
Equip: 210,770 cy x $0.22 = $46,369

Water Truck 3,000 gallon

Lab: 210,770cy x .008hrs/cy x $23.82 = $40,164
Equipment: 210,770 cy x $0.39/cy = $82,200

Disk and Tractor

Lab: 210,770 cy x 0.005 hrs/cy x $24.99 = $26,336
Equip: 210,770 cy x 0.16/cy = $33,723

Spotter @ Fill (4 ea.)
## Rocky Flats Closure Project

### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0A02  
**Activity ID:** 1GCPFL1125

This estimate is based on estimator judgement, historical data, and commercial databases from similar type work. This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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<th>Curve</th>
<th>Quantity</th>
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<tbody>
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### Line Item LFEAER2335 - Earthwork/Engineered Fill

**BOE**

Lab:143,693 cy x .005hrs/cy x $24.99/hr = $17,954  
Mat:143,693 cy x $5.05/cy = $725,649  
Equip:143,693 cy x $0.42 = $60,351 Spread Engineered fill, with dozer, no compaction  
Lab:124,950 cy x .012 hrs/cy x $24.99 = $37,470  
Equip:124,950 cy x $0.84/cy = $104,958 Haul Engineered Fill, 20 mile rt, 16.5 cy Truck  
Lab: 143,693 cy x .074hrs/cy x $24.55/hr = $261,047  
Equip: 143,693 cy x 5.18 = $744,329 Compaction sheepsfoot, 6" lift 4 passes  
Lab: 124,950 cy x .005 hrs/cy x $24.99/hr = $15,613  
Equip: 124,950 cy x 0.22 = $27,489 Water Truck 3,000 gallon  
Lab: 124,950cy x 0.005hrs/cy x $23.82 = $23,810  
Equipment:124,950 cy x $0.39/cy = $48,731 Disk and Tractor  
Lab: 124,950 cy x 0.005 hrs/cy x $24.99 = $15,613  
Equip: 124,950 cy x 0.16/cy = $19,992 Total: $2,103,007/124,950 cy = $16.83/cy  
This estimate is based on estimator judgement, historical data, and commercial databases from similar type work. This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Line Item LFEAER2340 - Provide Landscaping

**BOE**

Lab: 222,829sy x 0.048hrs/sy x $24.99 = $267,288  
Material: 222,829sy x $0.16/sy = $35,653

---

This estimate is based on estimator judgement, historical data, and commercial databases from similar type work. This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
**Rocky Flats Closure Project**

**Baseline Cost and Basis of Estimate**

### Resources

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<th>Cost Element</th>
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<td>K265S ER Programs</td>
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### Line Item LFEAER2345 - Place Top Soil

**BOE**

**SEE BELOW FOR THE FOLLOWING TEMPLATE INFORMATION**

- Unit Cost - none - Basis for adjustment - none

#### Topsoil, Buy 41d at pit,

- Lab: 57,477 cy x .005hrs/cy x $24.99/hr = $7182
- Mat: 57,477 cy x $7.50/cy = $431,078
- Equip: 57,477 cy x 50.42/cy = $24,140

#### Topsoil, Spread w/dozer, no compaction

- Lab: 49,980 cy x .012 hrs/cy x $24.99 = $14,988
- Equip: 49,980 x 0.84 hrs/cy x $24.99 = $41,983

#### Topsoil, Haul 20 miles rt, 16.5 cy trucks

- Labor: 57,477 cy x 0.074hrs/cy x $24.55 = $104,418
- Equip: 57,477 cy x 5.18 = $297,730

#### Water Truck

- Lab: 49,980cy x 008hrs/cy x $23.82 = $9524
- Equipment: 49,980cy x $0.39/cy = $19492

#### Disk and Tractor

- Lab: 49,980cy x 0.055 hrs/cy x $24.99 = $6245
- Equip: 49,980cy x 0.16/cy = $7997

**Total: $964,778/49,980 cy = $19.30/cy**

This estimate is based on estimator judgement, historical data, and commercial databases from similar type work.

For more complete detail refer to Timberline estimate No. 111111-3A "OU-7 Landfill Cap" by John Hopkins, RMRS X4974.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Line Item LFEAER2350 - Clean Out Old Ditch

**BOE**

- Excavating, Bulk Bank Measure
- Excavating, Backhoe, hyd, crawler mtd., 3 cy cap = 160cy/hr
- Mat: 770cy x .0125hrs/cy x $26.015/cy = $250
- Equip: 770 x .0625hrs/cy x $262.13/hr = $1,262

- Fill
- Fill spread dumped material By Dozer
  - Lab: 770cy x 0.012 hrs/cy x $23.44 = $217
  - Equip: 770cy x .008hrs/cy x $102.45 = $631

This estimate is based on estimator judgement, historical data, and commercial databases from similar type work.

For more complete detail refer to Timberline estimate No. 111111-3A "OU-7 Landfill Cap" by John Hopkins, RMRS X4974.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

**WBS No:** 1GAC0A02  
**Activity ID:** 1GCPLF1125

**WBS Filter: 1GAC**  
**Activity Filter:** *  
**Surs In FY:** *

#### Cost Element

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<tbody>
<tr>
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**Factors:** 4.81  
**Dollars:** 0.84576  
**[SYS 061400] .84576000 - System**

#### Line Item LFEAR2370 - Weather Allowance/Show-Up Time

**BOE**

- **Backup for Weather Allowance and Showup Time**
- **Weather Allowance/Clean-up Site**
  - 5 men @ 12 days  
  - 192 hrs x $55.37 = $10,631  
  - 96 hrs x $14.44 = $1386
- **Diaphragm Pump, 3" Dia.**
  - 96 hrs x $2.07 = $199
- **Total Cost for Weather Allowance - $31,698**

**Show-Up Time**

- 1.00 ls 1284 mh x $24.99 = $32,087
- **Grand Total Cost - $63,785**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

#### Resources

<table>
<thead>
<tr>
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<th>Skill</th>
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<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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**Factors:** 63785  
**Dollars:** 0.84576  
**[SYS 061400] .84576000 - System**

#### Line Item SYS - Contingency And Escalation

**BOE**

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<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
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**Factors:** 3068966  
**Dollars:** 0.84576  
**[SYS 061400] .84576000 - System**

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<th>Description: Prepare Org Landfill Cap Constr Closeout Report</th>
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<tbody>
<tr>
<td>Line Item</td>
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<td>0100 CLOSEOUT REPORT PREP</td>
<td>1.00</td>
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<td>EE</td>
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<tr>
<td>SYS Contingency And Escalation</td>
<td>1.00</td>
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Total for Activity 1GCPLF1140:  
- Quantity: 300  
- Labor Hours: 11,257  
- Labor Cost: 85,422  
- Materials: 76,503  
- Burden: 3,917  
- Total: 177,100
Project: Rocky Flats Closure Project
Baseline Cost and Basis of Estimate

WBS No: 1GAC0A02
Activity ID: 1GCPLF1140

Baseline Devl
WBS Filter 1GAC
Activity Filter

Experience Item Desc - Reference Estimate #EP1000-3C

Breakdown of Cost Data:

Item - Closure Report
Units - lot
Unit Cost - 300 hrs; $101000 Sub/c
Unit Cost Adjustment factor - none
Revised Unit Cost - none
Basis for adjustment - none

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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<tr>
<th>Resources</th>
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<th>Skill</th>
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Line Item SY - Contingency And Escalation

BOE

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WBS No: 1GAC0B01
Title: Industrial Area Characterization

Activity ID: 1GAC0B0110
Description: HRR Update & ER Ranking

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<th>Line Item</th>
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<tr>
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<td>0</td>
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Total for Activity 1GAC0B0110:

6/23/00 9:23:28 AM
### Rocky Flats Closure Project

#### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0B01

**Activity ID:** 1GAC0B0110

**Project:** Baseline Deviation

**WBS Filter:** 1GAC

**Activity Filter:** *

**Starts In FY:** *

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<th>Curve</th>
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<td>750 STRAIGHT TIME BASE</td>
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**Line Item SYS - Contingency And Escalation**

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**Line Item 010 - HRR Update and ER Ranking**

The number of No Further Action sites is increasing along with the effort to resolve concerns with the CDPHE and EPA. Resolution of these issues is critical to Site Closure and the HRR Update is the vehicle used to resolve these issues. The HRR and ER Ranking used to be a 2 month activity. With the increased requirement to close out the no further action sites in a timely manner, this has changed to a full time activity for 6 months. 2 technical staff people are required full time for 4 months. -1 Subcontracted -1 Site Staff

Secretarial support is required on a 1/4 FTE for 4 months to assist with production of reports and documents. $5,000 GIS support is required for the numerous maps. This is based on previous experience.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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<tr>
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<td>R100S RMRS Salaried</td>
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<td>K26SS ER Programs</td>
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Total for Activity 1GAC0B0120:

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<th>Materials/Sub Cost Total</th>
<th>Contingency &amp; Escalation Total Prime Cost</th>
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Total for Activity 1GAC0B0120:

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<th>Description</th>
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<th>Burden Cost</th>
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<tr>
<td>HRR Update and ER Ranking</td>
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<td>7,689</td>
<td>7,689</td>
<td>0</td>
<td>7,689</td>
</tr>
</tbody>
</table>

- 2 technical staff people are required full time for 4 months.
- 1 Subcontracted
- 1 Site Staff

Secretarial support is required on a 1/4 FTE for 4 months to assist with production of reports and documents.

$5,000 GIS support is required for the numerous maps. This is based on previous experience.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

<table>
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<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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<td>Hours</td>
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<td>G040 SECRETARIES</td>
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<td>Hours</td>
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### Line Item 010 - HRR Update and ER Ranking

**Experience Item Desc - Preparation of yearly HRR update and ER Ranking**

Breakdown of Cost Data:

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<td>Units - 2048 hours, $5,000 ASH</td>
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</tr>
<tr>
<td>Revised Unit Cost - Basis for adjustment</td>
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</table>

The number of No Further Action sites is increasing along with the effort to resolve concerns with the CDPHE and EPA. Resolution of these issues is critical to Site Closure and the HRR Update is the vehicle used to resolve these issues. The HRR and ER Ranking used to be a 2 month activity. With the increased requirement to close out the no further action sites in a timely manner, this has changed to a full time activity for 6 months. 2 technical staff people are required full time for 4 months. -1 Subcontracted -1 Site Staff

Secretarial support is required on a 1/4 FTE for 4 months to assist with production of reports and documents. $5,000 GIS support is required for the numerous maps. This is based on previous experience.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
## Rocky Flats Closure Project
### Baseline Cost and Basis of Estimate
#### Project: Baseline Deviation
#### WBS Filter: 1GAC

### Activity: 1GAC0B0120

### WBS No: 1GAC0B01

### Activity ID: 1GAC0B0120

**WBS Filter: 1GAC**

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<tr>
<td>910</td>
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<td>75</td>
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**Line Item SYS - Contingency and Escalation**

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**Activity ID: 1GAC0B0130**

### Description: HRR Update & ER Ranking

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**Total for Activity 1GAC0B0130:**

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**Resources**

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<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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<td>SUBCONTRACTED SRVS</td>
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<td>K265 ER Programs</td>
<td>Max Backload</td>
<td>4,228.80</td>
<td>Dollars</td>
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<td>$ GIS support</td>
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<td>K265 ER Programs</td>
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**Line Item SYS - Contingency and Escalation**

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<th>Quantity</th>
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<tr>
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<td>0000</td>
<td>1.00</td>
<td>EE</td>
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<td>31.010</td>
<td>61,952</td>
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<td>103,827</td>
<td>19,560</td>
<td>123,387</td>
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<td>0</td>
<td>19,560</td>
<td>0</td>
<td>19,560</td>
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**Breakdown of Cost Data:**

- Item - Preparation of annual documents
- Units - 2048 hours, $5,000 ASH

**Estimators Experience - Discussions with current HRR and ER Ranking staff**

**Experience Item Desc - Preparation of yearly HRR update and ER Ranking**

**Basis for adjustment -**

- 2 technical staff people are required full time for 4 months.
- 1 Subcontracted
- 1 Site Staff

**Secretarial support is required on a 1/4 FTE for 4 months to assist with production of reports and documents.**

**$5,000 GIS support is required for the numerous maps. This is based on previous experience.**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
**Project**: Rocky Flats Closure Project  
**Baseline Cost and Basis of Estimate**

**WBS No:** 1GAC0B01  
**Activity ID:** 1GAC0B0130

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**Line Item 010 - HRR Update and ER Ranking**

- Estimators Experience - Discussions with current HRR and ER Ranking staff
- Experience Item Desc - Preparation of yearly HRR update and ER Ranking

Breakdown of Cost Data:
- Item - Preparation of annual documents
- Units - 2048 hours, $5,000 ASR
- Unit Cost -
- Unit Cost Adjustment factor -
- Revised Unit Cost -
- Basis for adjustment -

The number of No Further Action sites is increasing along with the effort to resolve concerns with the CDPHE and EPA. Resolution of these issues is critical to Site Closure and the HRR Update is the vehicle used to resolve these issue. The HRR and ER Ranking used to be a 2 month activity. With the increased requirement to close out the no further action sites in a timely manner, this has changed to a full time activity for 6 months.

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- 1 Subcontracted
- 1 Site Staff

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$5,000 GIS support is required for the numerous maps. This is based on previous experience.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Resources**

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**Line Item SYS - Contingency And Escalation**

**BOE Resources**

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### Rocky Flats Closure Project
#### Baseline Cost and Basis of Estimate

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#### Activity ID: 1GAC0B0150

**Description:** HRR Update and ER Ranking

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**Total for Activity 1GAC0B0150:**

|                      | 1.138 | 31,010 | 61,952 | 0        | 40,633         | 75,852      | 133,595    | 10,127              | 143,722               |                 |

#### Line Item 010 - HRR Update and ER Ranking

**BOE**

- Estimators Experience - Discussions with current HRR and ER Ranking staff
- Experience Item Desc - Preparation of yearly HRR update and ER Ranking

**Breakdown of Cost Data:**
- Item - Preparation of annual documents
- Units - 2048 hours, $5,000 ASR
- Unit Cost -
- Revised Unit Cost -
- Basis for adjustment -

The number of No Further Action sites is increasing along with the effort to resolve concerns with the CDPHE and EPA. Resolution of these issues is critical to Site Closure and the HRR Update is the vehicle used to resolve these issue. The HRR and ER Ranking used to be a 2 month activity. With the increased requirement to close out the no further action sites in a timely manner, this has changed to a full time activity for 6 months.

2 technical staff people are required full time for 4 months.
- 1 Subcontracted
- 1 Site Staff

Secretarial support is required on a 1/4 FTE for 4 months to assist with production of reports and documents.

$5,000 GIS support is required for the numerous maps. This is based on previous experience.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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**Line Item SYS - Contingency And Escalation**

**BOE**

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**Activity ID:** 1GAC0B0160

**Description:** HRR Update & ER Ranking

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**Total for Activity 1GAC0B0160:**

|                      | 1.138 | 31,010 | 61,952 | 0        | 75,852      | 168,815    | 10,127              | 179,942               |                 |

**Line Item 010 - HRR Update and ER Ranking**

**BOE**

- Estimators Experience - Discussions with current HRR and ER Ranking staff
- Experience Item Desc - Preparation of yearly HRR update and ER Ranking
Breakdown of Cost Data:
Item - Preparation of annual documents
Units - 2048 hours, $5,000 A5H
Unit Cost -
Unit Cost Adjustment factor -
Revised Unit Cost -
Basis for adjustment -

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Breakdown of Cost Data:
Item - Preparation of annual documents
Units - 2048 hours, $5,000 A5H
Unit Cost -
Unit Cost Adjustment factor -
Revised Unit Cost -
Basis for adjustment -

The number of No Further Action sites is increasing along with the effort to resolve concerns with the CDPHE and EPA. Resolution of these issues is critical to Site Closure and the HRR Update is the vehicle used to resolve these issue. The HRR and ER Ranking used to be a 2 month activity. With the increased requirement to close out the no further action sites in a timely manner, this has changed to a full time activity for 6 months.

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<th>Department</th>
<th>Curve</th>
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Line Item SYS - Contingency And Escalation

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Activity ID: 1GHE0110AE Description: Final IA Char DQOs

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Total for Activity 1GHE0110AE:

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<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
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<td>14,792</td>
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<td>16,488</td>
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Estimators Experience - 15 years of experience planning, estimating, and conducting projects of similar scope and size.

Item Description - Develop DQOs

Breakdown of Cost Data

Units - hours
Unit Cost - 360
Unit Cost Adjustment Factor - .230
Revised Unit Cost - 83

Basis for Adjustment - adjustment based on duration of the finalization of the DQO activity in comparison to the overall duration for DQO development

Units - sub/c dollars
Unit Cost - $52727
Unit Cost Adjustment Factor - .230
Revised Unit Cost - $12127

Basis for Adjustment - adjustment based on duration of the finalization of the DQO in comparison to the overall duration for DQO development

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<th>Curve</th>
<th>Quantity</th>
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## Rocky Flats Closure Project

### Baseline Cost and Basis of Estimate

**Project:** Rocky Flats Closure Project  
**WBS Filter:** 1GAC  
**Activity Filter:**  
**Starts By:**  

#### WBS No: 1GAC0B01  
**Activity ID:** 1GHE0110AE

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### Activity ID: 1GHE0110AH  
**Description:** IA Char Agency Review of SAP

**Line Item 0200 - agency review of SAP**

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Total for Activity 1GHE0110AH:

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### Activity ID: 1GHE0110AJ  
**Description:** IA Char Final SAP

**Line Item 0200 - agency review of SAP**

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<td>750</td>
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### Activity ID: 1GHE0110AH  
**Description:** IA Char Final SAP

**Line Item 0200 - agency review of SAP**

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**Description:** IA Char Final SAP

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**Project: Rocky Flats Closure Project**

**Baseline Cost and Basis of Estimate**

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**WBS Filter: 1GAC**

### Activity 0200 - finalize sampling & analysis plan

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<tbody>
<tr>
<td>Description</td>
<td>IA Char Risk Assessment Methodology</td>
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#### Breakdown of Cost Data
- Item Description: Sampling and Analysis Plan
- Breakdown of Cost Data:
  - **Item**: Develop sampling and analysis plan, address comments.
  - **Units**: dollars
  - **Unit Cost**: $20259
  - **Unit Cost Adjustment Factor**: .74
  - **Revised Unit Cost**: $2634

#### Basis for Adjustment - adjustment based on duration of the finalization of the SAP activity in comparison to the overall duration for SAP development and approval.

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<tr>
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<th>Skill</th>
<th>Department</th>
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### Activity 0100 - risk assessment methodology

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- Item Description: Risk Assessment

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### Activity 0100 - risk assessment methodology

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- Item Description: Risk Assessment

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**Line Item 0200 - finalize sampling & analysis plan**

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**Resources**

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**Line Item SYS - Contingency And Escalation**

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**Activity 0100 - risk assessment methodology**

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**Project**: Rocky Flats Closure Project  
**Baseline Cost and Basis of Estimate**

**WBS No:** 1GAC0B01  
**Activity ID:** 1GHE0110AK

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**WBS Filter** | 1GAC  
**Activity Filter** | *  
**Starts In FY** | *

---

**Baseline Devl**

**Revised Unit Cost - 651**

Item - Risk Assessment Methodologies  
Units - dollars  
Unit Cost - $119453  
Unit Cost Adjustment Factor - .74  
Revised Unit Cost - $88395

Basis for Adjustment - Labor hours and sub/c dollars were reduced/adjusted in an effort to meet the WADlet target value.

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### Line Item SYS - Contingency And Escalation

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**Activity ID:** 1GHE0110AN  
**Description:** FY00 IA Data Summary Report Preparation

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**Total for Activity 1GHE0110AN:**

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### Line Item 0100 - data summary report

**BOE**

Estimator's experience - 15 years of experience planning, estimating, and conducting projects of similar scope and size.

Experience Item Description - Data Summary Report

Breakdown of Cost Data:

- Item - Prepare Data Summary Report to describe existing data, data gaps, and data usability
- **Units - dollars**
- **Unit Cost - 668500**
- **Unit Cost Adjustment factor - .47**
- **Revised Unit Cost - $32058**

Basis for adjustment - adjustment based on duration of activity in comparison to the overall duration of the data summary report preparation.

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### Resources

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**Page 1027 of 1121**  
**6/23/00 9:23:31 AM**  
**OFFICIAL USE ONLY**
**Project: Rocky Flats Closure Project**

**Baseline Cost and Basis of Estimate**

- **WBS No:** 1GAC0B01
- **Activity ID:** 1GHE0110AN
- **WBS Filter:** 1GAC
- **Activity Filter:** *

### 1GHE0110AP

**Description:** FY00 IA Data Summary Agency Review

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**Cost Element:** ASH

**Skill:** M020 MANAGERS (GRADE 69 - 72)

**Department:** K26SS ER Programs

**Curve:** Linear

**Quantity:** 100 hr

**Units:** $/hr

**Factors:**
- **ASH SUBCONTRACTED SRVS M020 MANAGERS (GRADE 69 - 72) K26SS ER Programs:**
  - **Factors:** 60 $/hr

### 1GHE0110AQ

**Description:** Final FY00 IA Data Summary Report

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**Cost Element:** ASH

**Skill:** S020 ENVIRONMENTAL SCIENTISTS

**Department:** K26SS ER Programs

**Curve:** Linear

**Quantity:** 80 hr

**Units:** $/hr

**Factors:**
- **ASH SUBCONTRACTED SRVS S020 ENVIRONMENTAL SCIENTISTS K26SS ER Programs:**
  - **Factors:** 60 $/hr

---

**Breakdown of Cost Data:**

- **Item - Prepare Data Summary Report to describe existing data, data gaps, and data usability**
- **Units - dollars**
- **Unit Cost - $68,500**
- **Unit Cost Adjustment factor - .31**
- **Revised Unit Cost - $21,166**

### Resources

- **BOE Estimator’s experience – 15 years of experience planning, estimating, and conducting projects of similar scope and size.**
- **Experience Item Description – Data Summary Report**
- **Breakdown of Cost Data:**
  - **Item - Prepare Data Summary Report to describe existing data, data gaps, and data usability**
  - **Units - dollars**
  - **Unit Cost - $68,500**
  - **Unit Cost Adjustment factor - .31**
  - **Revised Unit Cost - $21,166**

---

**Activity ID:** 1GHE0110AP

**Description:** FY00 IA Data Summary Agency Review

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**Line Item 0100 - data summary report**

- **BOE:** EE

---

**Total for Activity 1GHE0110AP:**

- **Total Labor Cost:** $21,166
- **Total Cost:** $21,166

---

**Breakdown of Cost Data:**

- **Item - Prepare Data Summary Report to describe existing data, data gaps, and data usability**
- **Units - dollars**
- **Unit Cost - $68,500**
- **Unit Cost Adjustment factor - .31**
- **Revised Unit Cost - $21,166**

---

**Activity ID:** 1GHE0110AQ

**Description:** Final FY00 IA Data Summary Report

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**Line Item 0100 - data summary report**

- **BOE:** EE

---

**Total for Activity 1GHE0110AQ:**

- **Total Labor Cost:** $15,755
- **Total Cost:** $16,015

---

**Breakdown of Cost Data:**

- **Item - Prepare Data Summary Report to describe existing data, data gaps, and data usability**
- **Units - dollars**
- **Unit Cost - $68,500**
- **Unit Cost Adjustment factor - .23**
- **Revised Unit Cost - $15,755**

---

**Activity ID:** 1GHE0110AP

**Description:** FY00 IA Data Summary Agency Review

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**Line Item 0100 - data summary report**

- **BOE:** EE

---

**Total for Activity 1GHE0110AP:**

- **Total Labor Cost:** $21,166
- **Total Cost:** $21,166

---

**Breakdown of Cost Data:**

- **Item - Prepare Data Summary Report to describe existing data, data gaps, and data usability**
- **Units - dollars**
- **Unit Cost - $68,500**
- **Unit Cost Adjustment factor - .31**
- **Revised Unit Cost - $21,166**

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**Activity ID:** 1GHE0110AQ

**Description:** Final FY00 IA Data Summary Report

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**Line Item 0100 - data summary report**

- **BOE:** EE

---

**Total for Activity 1GHE0110AQ:**

- **Total Labor Cost:** $15,755
- **Total Cost:** $16,015

---

**Breakdown of Cost Data:**

- **Item - Prepare Data Summary Report to describe existing data, data gaps, and data usability**
- **Units - dollars**
- **Unit Cost - $68,500**
- **Unit Cost Adjustment factor - .23**
- **Revised Unit Cost - $15,755**
### Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

*WBS Filter: 1GAC*

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#### Resources

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#### Line Item SYS - Contingency And Escalation

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#### Activity ID: 1GHE0110AR

**Description:** IA Char Data Management and Validation

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<th>Materials/Sub Cost</th>
<th>Contingency &amp; Escalation</th>
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<td>176,871</td>
<td>33,802</td>
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#### Line Item 0300 - data mgmt & data validation

- **BOE: Estimators Experience - 15 years of experience planning, estimating, and conducting projects of similar scope and size.**
- **Item Description - Data Validation and Management**
- **Breakdown of Cost Data**
- **Item - Validate existing data, enhance data management system, maintain data**
- **Units - hours**
- **Unit Cost - 4160**
- **Unit Cost Adjustment Factor - .66**
- **Revised Unit Cost - 2733**
- **Units - dollars**
- **Unit Cost - $161,961**
- **Unit Cost Adjustment Factor - .66**
- **Revised Unit Cost - $106,408**

**Basis for Adjustment - Labor hours and sub/c dollars were reduced/adjusted in an effort to meet the WADlet target value.**

#### Resources

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### Line Item SYS - Contingency And Escalation

#### Resources

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**Activity ID:** 1GHE0110AT  
**Description:** IA Strategy Yearly Report

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**Total for Activity 1GHE0110AT:**

- Labor Cost: 38,100
- Total Cost: 38,311

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### Line Item SYS - Risk Assessment

#### Resources

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**Activity ID:** 1GHE0110BB  
**Description:** Agency Review of IA Risk Assessment Methodology

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**Total for Activity 1GHE0110BB:**

- Labor Cost: 0
- Total Cost: 0

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### Breakdown of Cost Data:

- **Boilerplate Text:**
  - Estimator’s experience – 15 years of experience planning, estimating, and conducting projects of similar scope and size.
  - Experience Item Description – Report on Pre-Remedial Investigation of IA

**Breakdown of Cost Data:**

- **Units:** dollars
- **Unit Cost:** $38,100
- **Unit Cost Adjustment factor:** none
- **Revised Unit Cost:** none
- **Basis for adjustment:** none

---

### Summary:

- **Summary Text:**
  - Development guidelines for preparation of the IA Annual Report. Prepare IA Annual Report that will include information on the progress of characterization and remediation activities; and modifications to the strategy based on changes to RFCA, risk assessment methodology, budgets, or schedules.

---

### Projects:

- **Rocky Flats Closure Project**
  - Baseline Cost and Basis of Estimate
  - **WBS Filter:** 1GAC
  - **Activity Filter:** *"Starts In FY"*

---

### Additional Information:

- **OFFICIAL USE ONLY**
  - Page 1030 of 1121
  - 6/23/00 9:23:32 AM
Item - Develop risk assessment methodology for the IA. Includes evaluation of current and past risk assessment methodologies at RFETS, evaluating dose and risk assessment methods and usability, and participating in meetings with the regulatory agencies.

Units - hours
Unit Cost - 0
Unit Cost Adjustment factor 0
Revised Unit Cost - 0

Units - dollars
Unit Cost - 0
Unit Cost Adjustment factor 0
Revised Unit Cost - $0

Basis for adjustment - adjustment based on duration of activity in comparison to the overall duration for the risk assessment effort

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

**Resources**

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**Activity ID:** 1GHE0110BC  
**Description:** Final IA Risk Assessment Methodology

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Total for Activity 1GHE0110BC: 520 17,422 51,591 4,173 73,186 8,310 81,497

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**Activity ID:** 1GHE0110BC  
**Description:** Final IA Risk Assessment Methodology

**Boe**

- Estimators Experience - 15 years of experience planning, estimating, and conducting projects of similar scope and size.
- Item Description - Risk Assessment

**Breakdown of Cost Data**

- Item - Risk Assessment Methodologies
- Units - hours
- Unit Cost - 880
- Unit Cost Adjustment Factor - .50
- Revised Unit Cost - 440

---
### Rocky Flats Closure Project

#### Baseline Cost and Basis of Estimate

#### WBS No: 1GAC0B01
#### Activity ID: 1GHE0110BC

**Project** Baseline Devl  
**WBS Filter** 1GAC  

**Description:** IA Data Management and Validation

**Item - Risk Assessment Methodologies**
- **Units:** dollars
- **Unit Cost:** $119,453
- **Revised Unit Cost:** $59,727
- **Basis for Adjustment:**
  - This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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**BOE**

**Line Item - Risk Assessment Methodologies**

**Item Description:** Data Validation and Management

**Estimators Experience:** 16 years of experience planning, estimating, and conducting projects of similar scope and size.

**Breakdown of Cost Data**
- **Item - Validate existing data, enhance data management system, maintain data**
  - **Units - hours**
  - **Unit Cost:** $4160
  - **Unit Cost Adjustment Factor:** 0
  - **Revised Unit Cost:** $4160

**Units - dollars**
- **Unit Cost:** $161,961
- **Revised Unit Cost:** $160,932

**BOE**

**Line Item 0300 - data mgmt & data validation**

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<th>Materials/ Sub Cost</th>
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**Total for Activity 1GHE0110BG:**
- **Cost Risk:** 1
- **Schedule Risk:** 1
- **Total Cost:** $170,974

---

**Line Item 0300 - data mgmt & data validation**

**BOE**

**Estimators Experience:** 16 years of experience planning, estimating, and conducting projects of similar scope and size.

**Item Description:** Data Validation and Management

**Breakdown of Cost Data**
- **Item - Validate existing data, enhance data management system, maintain data**
  - **Units - hours**
  - **Unit Cost:** $4160
  - **Unit Cost Adjustment Factor:** 0
  - **Revised Unit Cost:** $4160

**Units - dollars**
- **Unit Cost:** $161,961
- **Revised Unit Cost:** $160,932

---

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### Rocky Flats Closure Project

#### Baseline Cost and Basis of Estimate

**Activity ID:** 1GHE0110BG

- **WBS No:** 1GAC0B01
- **Project:** Baseline Devl
- **WBS Filter:** 1GAC
- **Activity Filter:** * Suca In FY *

**Unit Cost Adjustment Factor - 0**

- Revised Unit Cost - $161,961

- Basis for Adjustment none

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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<th>Curve</th>
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**Line Item SYS - Contingency And Escalation**

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**Breakdown of Cost Data:**

- **Item** - Develop guidelines for preparation of the IA Annual Report. Prepare IA Annual Report that will include information on the progress of characterization and remediation activities; and modifications to the strategy based on changes to RFCA, risk assessment methodology, budgets, or schedules.

- **Units** - dollars
  - Unit Cost = $38,100
  - Unit Cost Adjustment factor = none
  - Revised Unit Cost = none
  - Basis for adjustment = none

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
Rocky Flats Closure Project
Baseline Cost and Basis of Estimate

<table>
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<th>Description</th>
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**Line Item 0600 - Project Management**

Estimators Experience - 16 years of experience planning, estimating, and conducting projects of similar scope and size.

Item Description - Project Management

Breakdown of Cost Data

- Item - Coordination of IA activities, Coordination with other RFETS organizations, Schedule coordination, Regulatory agency interface, Public meeting support
- Units - hours
- Unit Cost - $2640
- Unit Cost Adjustment Factor - 0
- Revised Unit Cost - $2640
- Units - dollars
- Unit Cost - $10080
- Unit Cost Adjustment Factor - 0
- Revised Unit Cost - $10080
- Basis for Adjustment none

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Resources**

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## Rocky Flats Closure Project

### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0B01  
**Activity ID:** 1GHE0110BJ  
**Starts In FY:**  
**Activity Filter:** *  
**WBS Filter:** 1GAC  
**Baseline Devi:**  

### Project Resources

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### Line Item SYS - Contingency And Escalation

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<th>Units</th>
<th>Labor Hours/Unit</th>
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<th>Total Cost</th>
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### Costs for instrumentation were developed from vendor quotes as follows:

- **Field XRF**
  - Quote from EDAX Corporation (T. Howe 1-800-466-5323)
  - Field XRF - for Metals analysis basic unit $25,000.00 includes calibration, software, and standards
  - Additional NLCd batteries $130.00
  - Additional supplies $3,500.00
  - Maintenance Agreement $3,000

- **Field Gas Chromatograph for VOCs, SVOCs, PCBs, Pest/Herbs**
  - Bruker Viking 573 Gas Chromatograph $129,970.00 includes detectors, oven, pumps, computer, software, controls
  - External LCD flat panel monitor and integrated keyboard $3,175.00
  - Spectra library $3,995.00
  - Transport Cases $2,760.00
  - Helium carrier gas cylinder $1,450.00
  - Field Tool and Supply Kit $4,850.00
  - 4-day training at RFETS $19,000.00
  - Maintenance Agreement $5,000

- **Field HPGE - NA**

- **Global Positioning System and Software $2,000**

- **Radiation Detection Instruments (IH)**
  - NE Electrans 4 each @$2,700.00 = $10,800.00
  - Other IH instrumentation $5,370

- **Field Equipment Van $30,000.00**
  - Quote from John Elway Ford

- **Labor**
  - Set up and trouble shoot equipment
  - Chemist $100.00/hour @1020 hrs = $102,000.00
  - Computer Specialists $100.00/hour @1020 hrs = $102,000.00

---

OFFICIAL USE ONLY
Environmental Engineer $80.00 x 360.00 hrs = $28,800.00
Administrative 120 hours
Procurement 120 hours

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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Activity ID: 1GAC0B01
Project Baseline Devl
WBS Filter 1GAC
Activity Filter *
Suits In FY *
The Remediation RSOP will require the same resources as the Concrete RSOP but will also require Environmental Engineers, Risk Assessment Specialists, Technical Editing, Radiological Engineering, and Health and Safety resources.
The resource requirements are:
- Project Manager - 240 hours
- Environmental Engineer - 640 hours
- Radiological Engineer - 120 hours
- Health and Safety Specialist - 160 hours
- Quality Assurance - 160 hours
- Compliance - 160 hours
- Technical Editor - 80 hours
- Computer Specialist (GIS) - 160 hours
- Computer Specialist (SWD database) - 120 hours
- Administration - 80 hours

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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### Line Item SYS - Contingency And Escalation

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**BOE Resources**

**Line Item SYS - Contingency And Escalation**
### Rocky Flats Closure Project
**Baseline Cost and Basis of Estimate**

**Project**  | Baseline Devi  | WBS Filter  | 1GAC  | Starts In FY  | *
--- | --- | --- | --- | --- | ---

**WBS No:** 1GAC0B01  
**Activity ID:** 1GHE0110R2

#### WBS Filter
- 1GAC

#### Activity Filter
- *

---

### Activity ID: 1GHE0110R4

**Description:** Incorporate Agency Comments (RSOP)

**Factors:** 2714.04 Dollars

---

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<th>Units</th>
<th>BOE Type</th>
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<th>Material/ Sub Cost</th>
<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
<th>Burden Cost</th>
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Total for Activity 1GHE0110R4:

- 240
- 10,884
- 39,228
- 2,932
- 53,044
- 5,192
- 58,236

---

**Resources**

- **Cost Element:** Revised Remediation RSOP
- **Skill:** M020 MANAGERS (GRADE 69 - 72)
- **Department:** ER Programs
- **Curve:** Linear

---

**Resources**

- **Cost Element:** Revised Remediation RSOP
- **Skill:** S090 OTHER SCIENTISTS
- **Department:** Env Sys, Stewardship & Compliance
- **Curve:** Linear

---

**Resources**

- **Cost Element:** Revised Remediation RSOP
- **Skill:** E050 ENVIRONMENTAL ENGINEERS
- **Department:** ER Programs
- **Curve:** Linear

---

**Resources**

- **Cost Element:** Revised Remediation RSOP
- **Skill:** E110 QUALITY CONTROL ENGINEERS
- **Department:** Indoq Oversight & Quality Assurance
- **Curve:** Linear

---

**Resources**

- **Cost Element:** Revised Remediation RSOP
- **Skill:** E120 SAFETY ENGINEERS
- **Department:** Occup Safety & Indus Hygiene
- **Curve:** Linear

---

**Resources**

- **Cost Element:** Revised Remediation RSOP
- **Skill:** E130 OTHER ENGINEERS
- **Department:** Remediation, Industrial & Site Serv
- **Curve:** Linear

---

**Resources**

- **Cost Element:** Revised Remediation RSOP
- **Skill:** P060 COMPUTER SYSTEMS ANALYSTS
- **Department:** Env Sys, Stewardship & Compliance
- **Curve:** Linear

---

**Resources**

- **Cost Element:** Revised Remediation RSOP
- **Skill:** ZDEPT No Department
- **Department:** Linear

---

**BOE**

**Basis of Estimate:**
Estimator has more than 16 years of experience scheduling and costing projects of similar size and scope. The Industrial Area Strategy revision costs were used as a basis for the Remediation RSOP revisions because of the similarity in the scope of the documents.

Costs for the IA Strategy revisions: - completed FY99 - $36,400.

Resources for the IA Strategy revisions: Project Manager, Environmental Engineer, Quality Assurance, Risk Assessment Specialist, Compliance Specialists, Computer Specialists (GIS), Administration, Technical Editing

The Remediation RSOP revisions will require the same resources as the IA Strategy revisions but will also require Radiological Engineering, and Health and Safety resources.

The resource requirements are:
- Project Manager - 120 hours
- Environmental Engineer - 240 hours
- Radiological Engineer - 40 hours
- Health and Safety Specialist - 40 hours
- Quality Assurance - 80 hours
- Compliance Specialist - 120 hours
- Computer Specialist (GIS) - 80 hours
- Technical Editor - 40 hours
- Administrative - 40 hours

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
**Activities**

- **Baseline Cost and Basis of Estimate**
  - **Activity ID**: 1GHE0110R5
  - **Description**: Support of Draft RSOP Public Review
  - **Starts In FY */ *:**
  - **Contingency And Escalation**
    - **Resources**
      - **BOE**
        - **Department**: ER Programs
        - **Curve**: Linear
        - **Quantity**: ZDEPT
        - **Units**: No Department
        - **Factors**: 1.00
        - **Cost**: 3,630 Dollars
        - **Factors**: 1,759.06 Dollars
        - **Cost**: 120,000 Dollars
        - **Factors**: 175,906 Dollars
        - **Cost**: 1,162.92 Dollars
        - **Factors**: 11,629.22 Dollars

- **Resources**
  - **BOE**
    - **Cost Element**: STRAIGHT TIME BASE
      - **Skill**: MANAGERS (GRADE 69 - 72)
      - **Department**: K26SS
      - **Curve**: Linear
      - **Quantity**: 40 Hours
      - **Units**: STRAIGHT TIME BASE
      - **Factors**: 120 Hours
      - **Cost**: 120,000 Dollars
      - **Factors**: 120 Hours
      - **Cost**: 80 Dollars/Hour
      - **Factors**: 80 Hours
      - **Cost**: 1,500 Dollars
      - **Factors**: 1500 Dollars
      - **Cost**: 80 Dollars/Hour
      - **Factors**: 160 Hours

**Notes**
- Estimator has more than 16 years of experience scheduling and costing projects of similar size and scope. Public meeting supports include the following:
  - preparation of meeting materials
  - responding to comments

- Resources for the Remediation RSOP public review include:
  - Project Manager, Environmental Engineer, Compliance Specialists, Computer Specialists (GIS), Communication Specialist, Administration, Technical Editing

- The resource requirements are:
  - Project Manager - 120 hours
  - Environmental Engineer - 160 hours
  - Compliance Specialist - 120 hours
  - Computer Specialist (GIS) - 80 hours
  - Technical Editor - 40 hours
  - Administrative - 40 hours
  - Communication Specialist - 80 hours

- This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

**WBS Filter:** 1GAC  
**Activity Filter:** *  
**Starts In FY:** *

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**BOE**

**Cost Element** | **Skill** | **Quantity** | **Units** | **BOE Type** | **Labor Hours/Unit** | **Labor Hours Total** | **Labor Cost Total** | **Materials/Sub Cost** | **Contingency & Escalation** | **Total Prime Cost** | **Burden Cost** | **Total Cost** |
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**Total for Activity 1GHE0110R6:**  
240 10,685 240 6,406 6,406 3,772 42,859

**Cost Risk:** 1  
**Schedule Risk:** 1

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**Resources**

**BOE**

**Cost Element** | **Skill** | **Quantity** | **Units** | **BOE Type** | **Labor Hours/Unit** | **Labor Hours Total** | **Labor Cost Total** | **Materials/Sub Cost** | **Contingency & Escalation** | **Total Prime Cost** | **Burden Cost** | **Total Cost** |
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**Factors:**

- 750 STRAIGHT TIME BASE: MANAGERS (GRADE 69 - 72)  
- 750 STRAIGHT TIME BASE: ENVIRONMENTAL SCIENTISTS  
- 750 STRAIGHT TIME BASE: OTHER SCIENTISTS  
- ASC SUPPLIES: NONE  

**Burden Cost:**

- 120.00 Hours  
- 40.00 Hours  
- 80.00 Hours  
- 1,000.00 Dollars

**Burden Rate:**

- 6,406  
- 6,406  
- 6,406  
- 3,772

**Contingency & Escalation:**

- Final Remediation RSOP: 1.00 ea  
- Contingency: 1.00 ea  

---

**Estimator has more than 16 years of experience scheduling and costing projects of similar size and scope. The D&D Concrete RSOP costs were used as a basis for the Final Remediation RSOP because of the similarity in the scope of the documents.**

**Costs for the D&D Concrete RSOP:** completed FY00 - $50.  
**Resources for the D&D Concrete RSOP:** Project Manager, Environmental Engineer, Quality Assurance, Risk Assessment Specialist

**The Remediation RSOP will require the same resources as the Concrete RSOP but will also require Environmental Engineers, Risk Assessment Specialists, Administration, Technical Editing, Radiological Engineering, and Health and Safety resources.**

**The resource requirements are:**

- Project Manager - 120 hours  
- Environmental Engineer - 240 hours  
- Radiological Engineer - 20 hours  
- Health and Safety Specialist - 20 hours  
- Risk Assessment Specialist - 40 hours  
- Quality Assurance - 80 hours  
- Technical Editor - 40 hours  
- Computer Specialist (GIS) - 80 hours  
- Administrative - 40 hours

**This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.**

---

**Basis of Estimate:**

- 6/23/00 9:23:35 AM  
- Page 1041 of 1121  
- OFFICIAL USE ONLY
Basis of Estimate:
Estimator has more than 16 years of experience scheduling and costing projects of similar size and scope. The D&D Concrete RSOP costs were used as a basis for the Final Remediation RSOP because of the similarity in the scope of the documents.

Costs for the D&D Concrete RSOP - completed FY00 - $50.

Resources for the D&D Concrete RSOP: Project Manager, Environmental Engineer, Quality Assurance, Risk Assessment Specialist

The Remediation RSOP will require the same resources as the Concrete RSOP but will also require Environmental Engineers, Risk Assessment Specialists, Administration, Technical Editing, Radiological Engineering, and Health and Safety resources.

The resource requirements are:
- Project Manager - 120 hours
- Environmental Engineer - 240 hours
- Radiological Engineer - 20 hours
- Health and Safety Specialist - 20 hours
- Risk Assessment Specialist - 40 hours
- Quality Assurance - 80 hours
- Technical Editor - 40 hours
- Computer Specialist (GIS) - 80 hours
- Compliance Specialist - 80 hours
- Administrative - 40 hours

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### Rocky Flats Closure Project
#### Baseline Cost and Basis of Estimate

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| Activity ID: | 1GHE0110S1 |
| Description: | Prepare IA SAP Addenda |

#### Project: Rocky Flats Closure Project
#### WBS Filter: 1GAC
#### Activity Filter: * Start in FY *

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#### Baseline Devl

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| Activity ID: | 1GHE0110S1 |
| Description: | Prepare IA SAP Addenda |

#### Line Item SY - Draft IASAP Addenda

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#### Total for Activity 1GHE0110S1:

| BOE |

- Estimators Experience - 16 years of experience planning, estimating, and conducting projects of similar scope and size. Estimates also based on current level of effort required to evaluate current data and develop reports.
- Item Description - Prepare IASAP Addenda
- Item - Develop an IASAP Addenda
- Units - hours
- Unit Cost - 2600 hours
- Unit Cost Adjustment Factor - 0
- Revised Unit Cost - 2600 hours
- Basis for Adjustment -
### Rocky Flats Closure Project
#### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0B01  
**Activity ID:** 1GHE0110S1

**Baseline Devl**  
**WBS Filter:** 1GAC  
**Activity Filter:** *

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#### Line Item SYS - Contingency And Escalation

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**Activity ID:** 1GHE0110S3  
**Description:** Final IA SAP Addenda

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This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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### Breakdown of Cost Data

#### Item - Develop an IASAP Addenda
- **Units**: hours
- **Unit Cost**: 596 hours
- **Unit Cost Adjustment Factor**: 0
- **Revised Unit Cost**: 596 hours
- **Basis for Adjustment**: This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

#### BOE

Estimators Experience - Estimators Experience - 16 years of experience planning, estimating, and conducting projects of similar scope and size. Estimates also based on current level of effort required to evaluate current data and develop reports.

**Item Description - Final IASAP Addenda**
- Breakdown of Cost Data
- Item - Develop an IASAP Addenda
- Units - hours
- Unit Cost - 596 hours
- Unit Cost Adjustment Factor - 0
- Revised Unit Cost - 596 hours
- Basis for Adjustment -
- Units - dollars
- Unit Cost - $38978
- Experience Item Desc -

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
**Rocky Flats Closure Project**

### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0B01  
**Activity ID:** 1GHE0110S3  
**Starts In FY:** *  
**Baseline Devi:**  
**WBS Filter:** 1GAC  
**Activity Filter:** *

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#### Line Item SYS - Contingency And Escalation

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**Activity ID:** 1GHE0111AF  
**Description:** IA Char Sampling and Analysis Plan Preparation

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Total for Activity 1GHE0111AF: 510 16,467 1,040 17,674 8,013 25,687

**Line Item 0200 - sampling & analysis plan**

**BOE Resources**

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**Breakdown of Cost Data**

Item - Develop sampling and analysis plan, address comments.  
Units - hours  
Unit Cost - 820  
Unit Cost Adjustment Factor - .520  
Revised Unit Cost - 410  

Item - Develop sampling and analysis plan, address comments.  
Units - dollars  
Unit Cost - $9053  
Unit Cost Adjustment Factor - .520  
Revised Unit Cost - $4526.50  
Basis for Adjustment - adjustment based on duration of the prep of the SAP activity in comparison to the overall duration for SAP development and approval.

---

**Estimators Experience** - 15 years of experience planning, estimating, and conducting projects of similar scope and size.

**Item Description** - Sampling and Analysis Plan

---

**Basis for Adjustment** - adjustment based on duration of the prep of the SAP activity in comparison to the overall duration for SAP development and approval.
### Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

- **WBS No:** 1GAC0B01
- **Activity ID:** 1GHE0111AF
- **Baseline Devi:** 1GAC
- **Activity Filter:** "*
- **Starts In FY:** "*

#### Project Baseline Development

- **WBS Filter:** 1GAC

#### Activity Details

- **Activity ID:** 1GHE0111AM
- **Description:** IA Data Collection and Data Gap Analysis
- **Schedule Risk:** 2
- **Cost Risk:** 2

**Line Item Details**

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**Total for Activity 1GHE0111AM:**

- Labor Hours: 176
- Labor Cost: 81,933
- Materials/Sub Cost: 0
- Contingency & Escalation: 491
- Total Prime Cost: 87,079
- Burden Cost: 2,266
- Total Cost: 89,345

**Resources**

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**Activity Details**

- **Activity ID:** 1GHE0111AU
- **Description:** IA Char Project Management
- **Schedule Risk:** 1
- **Cost Risk:** 1

**Line Item Details**

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**Total for Activity 1GHE0111AU:**

- Labor Hours: 562
- Labor Cost: 27,878
- Materials/Sub Cost: 0
- Contingency & Escalation: 41,667
- Total Prime Cost: 48,396
- Burden Cost: 6,729
- Total Cost: 48,396

---

**Notes:**

- Estimators Experience – 15 years of experience planning, estimating, and conducting projects of similar scope and size.
- Item Description - Data collection and Data gap analysis
- Breakdown of Cost Data
- Units - hours
- Unit Cost Adjustment Factor - .74
- Revised Unit Cost - 294
- Units - dollars
- Unit Cost - $188789
- Unit Cost Adjustment Factor - .74
- Revised Unit Cost - $136555
- Basis for Adjustment: Labor hours and sub/c dollars were reduced/adjusted in an effort to meet the WADlet target

---

**Cost Element:**

- **Skill:** G010 ADMINISTRATIVE ASSISTANTS
- **BOE:** R100S
- **Department:** Linear
- **Quantity:** 48.00 Hours

---

**Factors:**

- 80 hrs $0.6 EV adjustment
- 160 hrs $0.6 EV adjustment
- 2080 hrs $41.27 $/hr $0.6 EV adjustment
- 320 hrs $44.08 $/hr $0.6 EV adjustment

---

**Line Item 0300 - data collection and analysis**

**BOE**

- Department: No Department
- Linear: Linear
- **Quantity:** 48.00 Hours

**Factors:**

- 80 hrs $0.6 EV adjustment
- 160 hrs $0.6 EV adjustment
- 2080 hrs $41.27 $/hr $0.6 EV adjustment
- 320 hrs $44.08 $/hr $0.6 EV adjustment

---

**Line Item SYS - Contingency And Escalation**

**BOE**

- Department: No Department
- Linear: Linear
- **Quantity:** 287.94 Hours

**Factors:**

- 287.94 Dollars $0.6 EV adjustment
- 202.98 Dollars $0.6 EV adjustment

---

**Activity Details**

- **Activity ID:** 1GHE0111AU
- **Description:** IA Char Project Management
- **Schedule Risk:** 1
- **Cost Risk:** 1

**Line Item Details**

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<thead>
<tr>
<th>Line Item</th>
<th>Description</th>
<th>Quantity</th>
<th>Units</th>
<th>BOE</th>
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<th>Materials/Sub Cost</th>
<th>Contingency &amp; Escalation</th>
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<td>48,396</td>
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**Total for Activity 1GHE0111AU:**

- Labor Hours: 562
- Labor Cost: 27,878
- Materials/Sub Cost: 0
- Contingency & Escalation: 41,667
- Total Prime Cost: 48,396
- Burden Cost: 6,729
- Total Cost: 48,396
### Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

**WBS No:** 1GAC0B01  
**Activity ID:** 1GHE0111AU

---

#### Line Item 0600 - project management

**BOE**

Estimators experience – 15 years of experience planning, estimating, and conducting projects of similar scope and size.

**Item Description** - Project Management

**Breakdown of Cost Data**

Item – Coordination of IA activities, Coordination with other RFETS organizations, Schedule coordination, Regulatory agency interface, Public meeting support

- **Units** - hours
- **Unit Cost** - $160
- **Unit Cost Adjustment Factor** - 0.36
- **Revised Unit Cost** - $94
- **Unit Cost** - $523
- **Unit Cost Adjustment Factor** - 0.36
- **Revised Unit Cost** - $294

Basis for adjustment – Labor hours and sub/c dollars were reduced/adjusted in an effort to meet WADlet target value

---

#### Resources

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<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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</thead>
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<td>750 Straight Time Base</td>
<td>G010 Administrative Assistants</td>
<td>RMRS Salaried</td>
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<tr>
<td>750 Straight Time Base</td>
<td>P050 Compliance Inspectors</td>
<td>RMRS Salaried</td>
<td>Linear</td>
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<td>Hours</td>
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<td>750 Straight Time Base</td>
<td>P170 Other Administrative &amp; Profes</td>
<td>RMRS Salaried</td>
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#### Activity ID: 1GHE0111BH2

**Description:** IA Strategy Yearly Report Preparation

**Cost Risk:** 1  
**Schedule Risk:** 1

Line Item None - IA Strategy Yearly Report

**Boe**

Estimator's experience - 16 years of experience planning, estimating, and conducting projects of similar scope and size.

**Item Description** - IA Strategy Yearly Report

**Breakdown of Cost Data:**

- **Units** - hours
- **Unit Cost** - $37146
- **Unit Cost Adjustment factor** - none
- **Revised Unit Cost** - none
- **Basis for adjustment** - none

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

#### Resources

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<tr>
<th>Cost Element</th>
<th>Skill</th>
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<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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<td>E050 Environmental Engineers</td>
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<td>ASH Subcontracted SRVS</td>
<td>E110 Quality Control Engineers</td>
<td>Independ Oversight &amp; Quality Assurance</td>
<td>Linear</td>
<td>5,412.86</td>
<td>Dollars</td>
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6/23/00 9:23:37 AM  
OFFICIAL USE ONLY
## Rocky Flats Closure Project

### Baseline Cost and Basis of Estimate

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#### Project: Baseline Deviation

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### Baseline Cost and Basis of Estimate

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<th>1GHE011BH2</th>
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### Activity Details

**Description:** IA Strategy Yearly Report Preparation

**Cost Risk:** 1

**Schedule Risk:** 1

#### Breakdown of Cost Data:

- **Experience:** 16 years of experience planning, estimating, and conducting projects of similar scope and size.
- **Item Description:** IA Strategy Yearly Report
- **Experience Item:** Development of guidelines for the preparation of the IA Annual Report. Prepare IA Annual Report that will include information on the progress of characterization and remediation activities; and modifications to the strategy based on changes to RFCA, risk assessment methodology, budgets, or schedules.

**Units:** dollars

**Unit Cost Adjustment Factor:** none

**Revised Unit Cost:** none

**Basis for adjustment:** none

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

#### Resources

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<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Quantity</th>
<th>Units</th>
<th>BOE Type</th>
<th>Labor Hours/Unit</th>
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<th>Labor Cost Total</th>
<th>Materials/Sub Contract Total</th>
<th>Contingency &amp; Escalation Total</th>
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**Total for Activity 1GHE011BH3:**

- **Labor Hours Total:** 0
- **Labor Cost Total:** 0
- **Materials/Sub Contract Total:** 0
- **Contingency & Escalation Total:** 0
- **Total Prime Cost:** 0
- **Burden Cost:** 0
- **Total Cost:** 0

#### Resources

**Cost Element:** None - IA Strategy Yearly Report

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<td>80</td>
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<td>0</td>
<td>0</td>
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<td>0</td>
<td>37,146</td>
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<tr>
<td>ASH</td>
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**Total for Activity 1GHE011BH3:**

- **Labor Hours Total:** 0
- **Labor Cost Total:** 0
- **Materials/Sub Contract Total:** 0
- **Contingency & Escalation Total:** 0
- **Total Prime Cost:** 0
- **Burden Cost:** 0
- **Total Cost:** 0
## Rocky Flats Closure Project

### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0B01  
**Activity ID:** 1GHE011BH3

#### ASH SUBCONTRACTED SRVS

**Description:** Technical Writers and Editor  
**WBS Filter:** K265  
**Cost Element:** ER Programs

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<th>$/hr</th>
<th>Hours</th>
<th>Quantity</th>
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<th>Materials/Sub Cost</th>
<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
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<tr>
<td>40 hrs</td>
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<td>50</td>
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**Subtotal for Activity 1GHE011BH3:**

- **None**
- **SYS**

**Total for Activity 1GHE011BH3:**

- **None**
- **SYS**

### Resources

**BOE Estimator's Experience:** 16 years of experience planning, estimating, and conducting projects of similar scope and size.

**Experience Item Description:** IA Strategy Yearly Report

**Breakdown of Cost Data:**

- Item - Develop guidelines for preparation of the IA Annual Report. Prepare IA Annual Report that will include information on the progress of characterization and remediation activities; and modifications to the strategy based on changes to RFCA, risk assessment methodology, budgets, or schedules.

**Units:**
- **Unit Cost:** $37,146
- **Unit Adjustment Factor:** none
- **Revised Unit Cost:** none
- **Basis for adjustment:** none

**This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.**

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Quantity</th>
<th>Units</th>
<th>BOE Type</th>
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<th>Materials/Sub Cost</th>
<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
<th>Burden Cost</th>
<th>Total Cost</th>
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**Resources**

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<th>Linear</th>
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<td>Factors</td>
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<td>80 $/hr</td>
<td>0.84576</td>
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<th>M020 MANAGERS (GRADE 69 - 72)</th>
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**Line Item None - IA Strategy Yearly Report**

- **Description:** IA Strategy Yearly Report Preparation

**Cost Risk:** 1  | **Schedule Risk:** 1
### Rocky Flats Closure Project
#### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0B01  
**Activity ID:** 1GHE011BH4

---

**Line Item SYS - Contingency And Escalation**

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<th>Skill</th>
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<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
<th>Cost</th>
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**Activity ID:** 1GHE011BJ2  
**Description:** IA Project Management

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**Total for Activity 1GHE011BJ2:**

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**Line Item None - Project Management**

Estimators experience - 16 years of experience planning, estimating, and conducting projects of similar scope and size.

- Item Description - Project Management
- Breakdown of Cost Data
  - Unit Cost - 3790
  - Unit Cost Adjustment Factor - 0
  - Revised Unit Cost - 3790 hours

Units - dollars

- Unit Cost - $223,957
- Unit Cost Adjustment Factor - 0
- Revised Unit Cost - $223,957

Basis for Adjustment - Labor hours and sub/c dollars were reduced/adjusted in an effort to meet WADlet target values.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

**Resources**

<table>
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<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
<th>Cost</th>
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<td>K265S ER Programs</td>
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**Line Item SYS - Contingency And Escalation**

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Line Item None - Project Management

Estimators Experience – 16 years of experience planning, estimating, and conducting projects of similar scope and size.

Item Description – Project Management

Breakdown of Cost Data

Item – Coordination of IA activities, Coordination with other RFETS organizations, Schedule coordination, Regulatory agency interface, Public meeting support

Units – hours

Unit Cost - $223,957

Unit Cost Adjustment Factor - 0

Revised Unit Cost - $223,957

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

Line Item SYS - Contingency And Escalation

BOE

Resources

Cost Element | Skill | Department | Curve | Quantity | Units | Factors
---|---|---|---|---|---|---
ASH SUBCONTRACTED SRVS | E050 ENVIRONMENTAL ENGINEERS | K26S ER Programs | Linear | 24,357.89 Dollars |
ASH SUBCONTRACTED SRVS | M020 MANAGERS (GRADE 69 - 72) | K26S ER Programs | Linear | 64,954.37 Dollars |
ASH SUBCONTRACTED SRVS | P070 COST ESTIMATORS PLANNERS AN | K26S ER Programs | Linear | 32,477.19 Dollars |
ASH SUBCONTRACTED SRVS | P170 OTHER ADMINISTRATIVE & PROFE | K26S ER Programs | Linear | 32,477.19 Dollars |

Line Item None - Project Management

Activity ID: 1GHE011BJ4

Line Item: Project Management

Cost Element | Skill | Department | Curve | Quantity | Units | Factors
---|---|---|---|---|---|---
CON CONTINGENCY | 0000 NONE | ZDEPT No Department | Linear | 33,511.12 Dollars |
ESC ESCALATION | 0000 NONE | ZDEPT No Department | Linear | 18,256.55 Dollars |

Total for Activity 1GHE011BJ4:

None Project Management

Total for Activity 1GHE011BJ3:

Total for Activity 1GHE011BJ4:
### Breakdown of Cost Data

**Item - Coordination of IA activities, Coordination with other RFETS organizations, Schedule coordination, Regulatory agency interface, Public meeting support**

- **Units - hours**
- **Unit Cost - 3790 hours**
- **Unit Cost Adjustment Factor - 0**
- **Revised Unit Cost - 3790 hours**

- **Units - dollars**
- **Unit Cost - $223,957**
- **Unit Cost Adjustment Factor - 0**
- **Revised Unit Cost - $223,957**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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### Line Item SYS - Contingency And Escalation

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### Activity ID: 1GHE011S12

**Description:** Prepare IA SAP Addenda

**Cost Risk:** 1 **Schedule Risk:** 1

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Total for Activity 1GHE011S12: 120 | 4,072 | 166,431 | 25,699 | 196,201 | 1,437 | 197,638 |

### Line Item None - IASAP Addenda

**BOE**

Estimators Experience - Estimators Experience - 16 years of experience planning, estimating, and conducting projects of similar scope and size. Estimates also based on current level of effort required to evaluate current data and develop reports.

**Item Description - Prepare IASAP Addenda**

**Breakdown of Cost Data**

**Item - Develop an IASAP Addenda**

- **Units - hours**
- **Unit Cost - 2600 hours**
- **Unit Cost Adjustment Factor - 0**
- **Revised Unit Cost - 2600 hours**
- **Basis for Adjustment -**

- **Units - dollars**
- **Unit Cost - $172643**
Experience Item Desc -
Breakdown of Cost Data:
Item -
Units - dollars
Unit Cost - $172643
Unit Cost Adjustment factor - 0
Revised Unit Cost - $172643
Basis for adjustment -

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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Line Item SYS - Contingency And Escalation

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Activity ID: 1GHE011S13
Description: Prepare IA SAP Addenda

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Total for Activity 1GHE011S13: 4,072 166,431 42,147 214,034 42,147 1,385 214,034

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## Rocky Flats Closure Project
### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0B01  
**Activity ID:** 1GHE011S13

#### Line Item None - IASAP Addenda

Estimators Experience - Estimators Experience - 16 years of experience planning, estimating, and conducting projects of similar scope and size. Estimates also based on current level of effort required to evaluate current data and develop reports.

Item Description - Prepare IASAP Addenda

Breakdown of Cost Data:
- **Item -** Develop an IASAP Addenda
- **Units -** hours
- **Unit Cost -** $2600
- **Unit Cost Adjustment Factor -** 0
- **Revised Unit Cost -** $2600

**Basis for Adjustment:**
- **Units -** dollars
- **Unit Cost -** $172907
- **Unit Cost Adjustment factor -** 0
- **Revised Unit Cost -** $172907

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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### Line Item SYS - Contingency And Escalation

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**Cost Risk**

- 1 Schedule Risk

**Activity ID:** 1GHE011S14  
**Description:** Prepare IA SAP Addenda

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**Total for Activity 1GHE011S14:**

- Labor Hours: 120
- Labor Cost Total: 166,431
- Materials/Sub Cost: 0
- Contingency & Escalation: 0
- Total Prime Cost: 211,014
- Burden Cost: 1,206
- Total Cost: 212,219

**Resources**

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### Rocky Flats Closure Project
#### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0B01  
**Activity ID:** 1GHE011S14

#### ASH - SUBCONTRACTED SRVS
- **description:** M020 MANAGERS (GRADE 69 - 72)  
- **WBS No:** 1GAC0B01  
- **Activity ID:** 1GHE011S14  
- **Hours:** 80  
- **Dollars/Hour:** 32.47718

#### ASH - SUBCONTRACTED SRVS
- **description:** P060 COMPUTER SYSTEMS ANALYSTS  
- **WBS No:** 1GAC0B01  
- **Activity ID:** 1GHE011S14  
- **Hours:** 80  
- **Dollars/Hour:** 33.83042

#### ASH - SUBCONTRACTED SRVS
- **description:** P160 TECHNICAL WRITERS AND EDITOR  
- **WBS No:** 1GAC0B01  
- **Activity ID:** 1GHE011S14  
- **Hours:** 80  
- **Dollars/Hour:** 1.89122

#### ASH - SUBCONTRACTED SRVS
- **description:** M170 OTHER ADMINISTRATIVE & PROFESSIONAL  
- **WBS No:** 1GAC0B01  
- **Activity ID:** 1GHE011S14  
- **Hours:** 80  
- **Dollars/Hour:** 1.35322

### Contingency and Escalation

#### Resources

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#### Activity ID: 1GHE011S32
- **Description:** Final IA SAP Addenda
- **Schedule Risk:** 1

**Total for Activity 1GHE011S32:**
- **Labor Hours:** 64
- **Total Labor Hours:** 2,264
- **Total Labor Cost:** 35,575
- **Total Prime Cost:** 38,623
- **Burden Cost:** 10,708
- **Total Cost:** 49,331

### Final IASAP Addenda

**BOE:** Estimators Experience - Estimators Experience - 16 years of experience planning, estimating, and conducting projects of similar scope and size. Estimates also based on current level of effort required to evaluate current data and develop reports.

**Item Description:** Final IASAP Addenda
- Breakdown of Cost Data
  - Item - Develop an IASAP Addenda
  - Units - hours
  - Unit Cost - 596 hours
  - Unit Cost Adjustment Factor - 0
  - Revised Unit Cost - 596 hours
  - Basis for Adjustment -
  - Costs - dollars
  - Unit Cost - $39030
  - Experience Item Desc -
- Breakdown of Cost Data:
  - Item -
  - Units - dollars
  - Unit Cost - 39030
  - Unit Cost Adjustment Factor - 0
  - Revised Unit Cost - 39030
  - Basis for adjustment -

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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### Rocky Flats Closure Project

#### Baseline Cost and Basis of Estimate

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#### Table: Costs Breakdown

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#### Total for Activity 1GHE011S33:

- Labor Hours Total: 64
- Labor Cost Total: 35,575
- Contingency & Escalation: 5,494
- Total Prime Cost: 43,333
- Burden Cost: 639
- Total Cost: 43,972

---

**Notes:**

- Estimators Experience - 16 years of experience planning, estimating, and conducting projects of similar scope and size.
- Estimates also based on current level of effort required to evaluate current data and develop reports.
- Item Description - Final IASAP Addenda
- Breakdown of Cost Data
- Item - Develop an IASAP Addenda
- Units - hours
- Unit Cost - $596
- Unit Cost Adjustment Factor - 0
- Revised Unit Cost - $596
- Basis for Adjustment -
- Units - dollars
- Unit Cost - $39177
- Experience Item Desc - Breakdown of Cost Data:
- Item -
- Units - dollars

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**Line Item SYS - Contingency And Escalation**

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**Activity ID:** 1GHE011S33

**Description:** Final IA SAP Addenda

**Line Item None - Final IASAP Addenda**

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**Total for Activity 1GHE011S33:**

- Labor Hours Total: 64
- Labor Cost Total: 35,575
- Contingency & Escalation: 5,494
- Total Prime Cost: 43,333
- Burden Cost: 639
- Total Cost: 43,972

---

**Notes:**

- Estimators Experience - Estimators Experience - 16 years of experience planning, estimating, and conducting projects of similar scope and size. Estimates also based on current level of effort required to evaluate current data and develop reports.
- Item Description - Final IASAP Addenda
- Breakdown of Cost Data
- Item - Develop an IASAP Addenda
- Units - hours
- Unit Cost - $596
- Unit Cost Adjustment Factor - 0
- Revised Unit Cost - $596
- Basis for Adjustment -
- Units - dollars
- Unit Cost - $39177
- Experience Item Desc - Breakdown of Cost Data:
- Item -
- Units - dollars
**Resources**

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**Line Item SYS - Contingency And Escalation**

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**Activity ID:** 1GHE011S34  
**Description:** Final IA SAP Addenda

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Total for Activity 1GHE011S34:

| None | IASAP Addenda | 64 | 2,264 | 35,575 | 20,663 | 0 | 58,502 | 788 | 59,290 |

---

*This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.*

Estimators Experience - Estimates Experience - 16 years of experience planning, estimating, and conducting projects of similar scope and size. Estimates also based on current level of effort required to evaluate current data and develop reports.
Item Description – Final IASAP Addenda
Breakdown of Cost Data
Item – Develop an IASAP Addenda
Units - hours
Unit Cost - 596 hours
Unit Cost Adjustment Factor - 0
Revised Unit Cost - 596 hours
Basis for Adjustment -

Units - dollars
Unit Cost - $39334
Experience Item Desc -
Breakdown of Cost Data:
- Item -
  - Units - dollars
  - Unit Cost - 39334
  - Unit Cost Adjustment factor - 0
  - Revised Unit Cost - 39334
  - Basis for adjustment -

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
Rocky Flats Closure Project
Baseline Cost and Basis of Estimate

Activity ID: 1GHE01DE10
Description: IA Sampling & Data Eval Coordination

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Total for Activity 1GHE01DE10: 0 0 1,751,086 271,982 2,023,069 0 2,023,069

Annual Operating Expenses
- Labor
  - Chemist 2020 hrs $100.00 = $202,000.00
  - GPS Technician 1010 hrs $75.00 = $75,750.00
  - QA/QC 1010 hrs $80.00 = $80,800.00
  - Environmental Engineer 2020 hrs $80 = $161,600
  - Geostatistical Specialist 2020 hrs @ 100 = $202,000
  - Computer Specialist 2020 hrs @ $80 = $161,600
  - Administrative 500 hours @ $40 = $20,000

- Gas Chromatograph
- Materials and Supplies
  - GC columns and fittings $6,500.00
  - Detector Lamp $650.00
  - HE Carrier gas ($4/day at 180 days) $720.00
  - Calibration Standards $3,500.00
  - Reagent water ($4/day at 180 days) $720.00
  - Vials ($175/case) $10,938.00
  - Spatulas $50.00
  - Syringes (15) $1,000.00
  - Coolers (3) $120.00
  - Solvents (40-L) $750.00
  - Maintenance Contract $1,000.00
- XRF
  - Supplies $3,000.00
  - Standards $3,500.00

Other equipment maintenance $3352

HPGE Costs
- FY02 3,180 samples @ $350.00 = $1,113,000.00
- FY03 8,820 samples @ $350.00 = $3,087,000.00
- FY04 13,730 samples @ $350.00 = $4,805,500.00

Vehicle Costs
- Maintenance (100/month) $1,200.00
- Fuel (20,000 miles/year at 1.50/gal) $3,000.00

Radiation Detection Instruments (IH)
- NE Electras Maintenance 4 each @ $1,350.00 = $5,400.00

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

**WBS No:** 1GAC0B01

**Activity ID:** 1GHE01DE10

#### ASC SUPPLIES

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#### A5H SUBCONTRACTED SRVS

**Factors** 1113000 dollars

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#### A5G CON CONTINGENCY

**Factors** 184,968.40 dollars

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#### A5G ESC ESCALATION

**Factors** 87,013.77 dollars

<table>
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<th>Labor Cost Total</th>
<th>Materials/Sub Cost</th>
<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
<th>Burden Cost</th>
<th>Total Cost</th>
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<tbody>
<tr>
<td>Contingency And Escalation</td>
<td>1.00</td>
<td>120</td>
<td>3,403</td>
<td>3,871,569</td>
<td>0</td>
<td>3,874,972</td>
<td>4,789,870</td>
<td>1,134</td>
<td>4,789,870</td>
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#### A5G SYS CONTINGENCY AND ESCALATION

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<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contingency And Escalation</td>
<td>1.00</td>
<td>120</td>
<td>3,403</td>
<td>3,871,569</td>
<td>0</td>
<td>3,874,972</td>
<td>4,789,870</td>
<td>1,134</td>
<td>4,789,870</td>
<td></td>
</tr>
</tbody>
</table>

### Line Item None - IA Sampling and Data Evaluation

**BOE Annual Operating Expenses**

- Labor
  - Chemist 2020 hrs @ $100.00 = $202,000.00
  - GPS Technician 1010 hrs @ $75.00 = $75,750.00
  - QA/QC 1010 hrs @ $80.00 = $80,800.00
  - Environmental Engineer 2020 hrs @ $80 = $161,600
  - Geostatistical Specialist 2020 hrs @ $102,000
  - Computer Specialist 2020 hrs @ $102,000
  - Administrative 500 hours @ $40.00 = $20,000
  - Set up and trouble shoot equipment
    - Chemist $100.00/hour @ 1010 hrs = $101,000.00
    - Computer Specialists $100.00/hour @ 1020 hrs = $102,000.00

---

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Administrative 120 hours @ $40 = $4,800

Gas Chromatograph
Materials and Supplies
GC columns and fittings $6,500.00
Detector Lamp $650.00
HE Carrier gas ($4/day at 180 days) $720.00
Calibration Standards $3,500.00
Reagent water ($4/day at 180 days) $720.00
Vials ($175/ case) $10,938.00
Spatulas $50.00
Syringes (15) $1,000.00
Coolers (3) $120.00
Solvents (40-L) $750.00
Maintenance Contract $1,000.00
$25,948.00

XRF
Supplies $3,000.00
Standards $3,500.00
Other equipment maintenance $3,352

HPGE Costs
FY02 3,180 samples @ $350.00 = $1,113,000.00
FY03 8,820 samples @ $350.00 = $3,087,000.00
FY04 13,730 samples @ $350.00 = $4,805,500.00

Vehicle Costs
Maintenance (100/month) $1,200.00
Fuel (20000 miles/year at 1.50/gal) $3,000.00

Radiation Detection Instruments (IH)
NE Electras Maintenance 4 each @ $1,350.00 = $5,400.00

Costs for instrumentation were developed from vendor quotes as follows:

Field XRF
Quote from EDAX Corporation (T. Howe 1-800-466-5323)
Field XRF - for Metals analysis basic unit $25,000.00 includes calibration, software, and standards
Additional NiCd batteries $130.00
Additional supplies $3,500.00
Maintenance Agreement $3,000

Field Gas Chromatograph for VOCs, SVOCs, PCBs, Pest/Herbs
Quote from Bruker Daltonics (M. Wilson 978-667-9580)
Bruker Viking 573 Gas Chromatograph $129,970.00
- includes detectors, oven, pumps, computer, software, controls
External LCD flat panel monitor and integrated keyboard $3,175.00
Spectra library $3,995.00
Transport Cases $2,760.00
Helium carrier gas cylinder $1,450.00
Field Tool and Supply Kit $4,850.00
4-day training at RFETS $19,000.00

Field HPGE - NA

GPS $2,000

Other instrumentation $3,770

Radiation Detection Instruments (IH)
NE Electras 4 each @ $2,700.00 = $10,800.00
Field Equipment Van $30,000.00
Quote from John Elway Ford

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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<tr>
<th>Cost Element</th>
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<th>Quantity</th>
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**Line Item SYS - Contingency And Escalation**

**BOE**

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6/23/00 9:23:41 AM OFFICIAL USE ONLY
Project Baseline Development

WBS Filter: 1GAC
Activity Filter: * Linear
Starts In FY: *

WBS No.: 1GAC0B01
Activity ID: 1GHE01DE20

Baseline Cost and Basis of Estimate

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Factors

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<th>Units</th>
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<th>Schedule</th>
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<td>Contingency And Escalation</td>
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Total for Activity 1GHE01DE30:

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<th>Cost</th>
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<tr>
<td>SYS</td>
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</table>

Annual Operating Expenses

**Labor**

- Chemist 2020 hrs @ $100.00 = $202,000.00
- GPS Technician 1010 hrs @ $75.00 = $75,750.00
- QA/QC 1010 hrs @ $80.00 = $80,800.00
- Environmental Engineer 2020 hrs @ $80 = $161,600
- Geostatistical Specialist 2020 hrs @ 100 = $202,000
- Computer Specialist 2020 hrs @ $80 = $161,600
- Administrative 500 hours @ $40 = $20,000

**Gas Chromatograph**

- GC columns and fittings $6,500.00
- Detector Lamp $650.00
- HE Carrier gas ($4/day at 180 days) $720.00
- Calibration Standards $3,500.00
- Reagent water ($4/day at 180 days) $720.00
- Vials ($75/case) $10,938.00
- Spatulas $50.00
- Syringes (15) $1,000.00
- Coolers (3) $120.00
- Solvents (40-L) $750.00
- Maintenance Contract $1,000.00
- $25,948.00

**XRF**

- Supplies $3,000.00
- Standards $3,500.00

**Other equipment maintenance $3352**

**Radiation Detection Instruments (IN)**

- NE Electras Maintenance 4 each @ $1,350.00 = $5,400.00

**HPGE Costs**

- FY02 3,180 samples @ $350.00 = $1,113,000.00
- FY03 8,820 samples @ $350.00 = $3,087,000.00
- FY04 13,730 samples @ $350.00 = $4,805,500.00

**Vehicle Costs**

- Maintenance (100/month) $1,200.00
- Fuel (20000 miles/year at 1.50/gal) $3,000.00

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
## Rocky Flats Closure Project
### Baseline Cost and Basis of Estimate

#### Project Baseline Deviation

<table>
<thead>
<tr>
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#### Activity: 1GHE01DE30

<table>
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<td>1GXXXHE011</td>
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#### Cost Estimate Breakdown

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<thead>
<tr>
<th>Line Item</th>
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<th>BOE Type</th>
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<tbody>
<tr>
<td>None</td>
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<tr>
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Total for Activity 1GXXXHE011: 351,685

### Breakdown of Cost Data

- **Estimators Experience** - 16 years of experience planning, estimating, and conducting projects of similar scope and size.
- **Item Description** - Project Management
- **Breakdown of Cost Data**
- **Item - Coordination of IA activities, Coordination with other RFETS organizations, Schedule coordination, Regulatory agency interface, Public meeting support**
- **Units - hours**
- **Unit Cost - 3790**
- **Unit Cost Adjustment Factor - 0**
- **Revised Unit Cost - 3790 hours**

### Resources

<table>
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<th>Skill</th>
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<th>Units</th>
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<tr>
<td>ESC ESCALATION</td>
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### Line Item - Project Management

- **BOE**
- **Resources**
- **Factors** 99,596

### Line Item None - Project Management

- **BOE**
- **Factors** 724,656

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

<table>
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<tr>
<td>1GHEUBC190</td>
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#### Line Item 1GHEUBC180 - Solicitation of Bids

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<th>Total Prime Cost</th>
<th>Burden Cost</th>
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<tbody>
<tr>
<td>Bid Solicitation</td>
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**Total for Activity 1GHEUBC180:**

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<tr>
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<td>EE</td>
<td>20</td>
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<td>0</td>
<td>0</td>
<td>591</td>
<td>557</td>
<td>1,148</td>
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#### Line Item 1GHEUBC190 - Review of Proposals

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**Total for Activity 1GHEUBC190:**

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<td>2,424</td>
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<td>2,424</td>
<td>2,115</td>
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### Rocky Flats Closure Project
#### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0B02  
**Activity ID:** 1GHEUBC190

**Project:** Baseline Devl  
**WBS Filter:** 1GAC  
**Activity Filter:** *  
**Starts In FY:** *

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#### Activity ID: 1GHEUBC211  
**Description:** Develop Health and Safety Plan (HSP)  
**Cost Risk:** 1  
**Schedule Risk:** 1

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**Total for Activity 1GHEUBC211:** 4,384

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#### Activity ID: 1GHEUBC220  
**Description:** Review Health & Safety Plan  
**Cost Risk:** 1  
**Schedule Risk:** 1

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**Total for Activity 1GHEUBC220:** 1,356

#### Resources

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<tbody>
<tr>
<td>750</td>
<td>STRAIGHT TIME BASE</td>
<td>E120 SAFETY ENGINEERS</td>
<td>R100S RMRS Salaried</td>
<td>Linear</td>
<td>20.00 Hours</td>
</tr>
</tbody>
</table>

#### Activity ID: 1GHEUBC230  
**Description:** Incorp Comments into Health & Safety Plan  
**Cost Risk:** 1  
**Schedule Risk:** 1

<table>
<thead>
<tr>
<th>Line Item</th>
<th>Description</th>
<th>Quantity</th>
<th>Units</th>
<th>BOE Type</th>
<th>Labor Hours/Unit</th>
<th>Labor Hours Total</th>
<th>Labor Cost Total</th>
<th>Materials/Sub Cost</th>
<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
<th>Burden Cost</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>0100</td>
<td>HSP comment incorporation</td>
<td>1.00 each</td>
<td>EE</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2,000</td>
<td>2,000</td>
<td>192</td>
<td>2,192</td>
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**Total for Activity 1GHEUBC230:** 2,192

---

**Unit Cost Adjustment factor - not applicable**  
**Revised Unit Cost - not applicable**  
**Basis for adjustment - not applicable**
### Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

**WBS No:** 1GAC0B02

**Activity ID:** 1GHEUBC230

#### Line Item 0100 - HSP comment incorporation

<table>
<thead>
<tr>
<th>BOE</th>
<th>Estimators Experience -</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Experience Item Desc -</td>
</tr>
</tbody>
</table>

**Breakdown of Cost Data:**

- Item - Comment Incorporation into the Health and Safety Plan
- Units - A5H
- Unit Cost - $2000 for the Subcontractor to Incorporate comments
- Unit Cost Adjustment factor - not applicable
- Revised Unit Cost - not applicable
- Basis for adjustment - not applicable

**Resources**

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASH</td>
<td>SUBCONTRACTED SRVS</td>
<td>E120 SAFETY ENGINEERS</td>
<td>Linear</td>
<td>2,000.00</td>
<td>Dollars</td>
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</table>

**Activity ID:** 1GHEUBC270

**Description:** Incorporate Comments into IWCP

#### Line Item 0100 - comment incorporation

**BOE**

**Estimators Experience -**

**Breakdown of Cost Data:**

- Item - Comment Incorporation into the Health and Safety Plan
- Units - hours each (750)
- Unit Cost - 70
- Unit Cost Adjustment factor - not applicable
- Revised Unit Cost - not applicable
- Basis for adjustment - not applicable

**Resources**

<table>
<thead>
<tr>
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<tr>
<td>ASH</td>
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<td>NOTE</td>
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**Activity ID:** 1GHEUBC320

**Description:** Training Requirements for Subcontractor

#### Line Item 0100 - conduct training

**BOE**

**Estimators Experience -**

**Breakdown of Cost Data:**

- Item - Conduct training of Subcontractor
- Units - hours each (750)
- Unit Cost - 40 Site wide training costs for the Subcontractor
### Activity ID: 1GAC0B02
#### Description: Conventional Readiness Review

<table>
<thead>
<tr>
<th>Line Item</th>
<th>Description</th>
<th>Quantity</th>
<th>Units</th>
<th>BOE Type</th>
<th>Labor Hours/Unit</th>
<th>Total Labor Hours</th>
<th>Total Labor Cost</th>
<th>Contingency &amp; Escalation</th>
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<tr>
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<td>1.00</td>
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<td>20</td>
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Total for Activity 1GAC0B02:

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<th>Units</th>
<th>BOE Type</th>
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<th>Total Labor Cost</th>
<th>Contingency &amp; Escalation</th>
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<tbody>
<tr>
<td>0100</td>
<td>conduct briefing</td>
<td>1.00</td>
<td>each</td>
<td>EE</td>
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<td>0</td>
<td>3,900</td>
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Total for Activity 1GHEUBC340:

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<th>Total Labor Cost</th>
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</thead>
<tbody>
<tr>
<td>0100</td>
<td>conduct final readiness review</td>
<td>1.00</td>
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## Rocky Flats Closure Project

### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0B02  
**Activity ID:** 1GHEUBC345  

<table>
<thead>
<tr>
<th>Line Item</th>
<th>Description</th>
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<th>BOE Type</th>
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<th>Labor Cost Total</th>
<th>Materials/Sub Cost</th>
<th>Contingency &amp; Escalation</th>
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<tr>
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<td>0.75</td>
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<td>270</td>
<td>203</td>
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Total for Activity 1GHEUBC345:

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### Activity ID: 1GHEUBC350  
**Description:** HDD/EMWD - B123

<table>
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<th>Materials/Sub Cost</th>
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</thead>
<tbody>
<tr>
<td>0100</td>
<td>HDD</td>
<td>1.00</td>
<td>each</td>
<td>VQ</td>
<td>565</td>
<td>565</td>
<td>12,893</td>
<td>307,640</td>
<td>0</td>
<td>320,533</td>
<td>40,575</td>
<td>361,108</td>
</tr>
<tr>
<td>0200</td>
<td>EMWD</td>
<td>1.00</td>
<td>each</td>
<td>VQ</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>36,750</td>
<td>0</td>
<td>36,750</td>
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<td>40,278</td>
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Total for Activity 1GHEUBC350:

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<tbody>
<tr>
<td>0100</td>
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### Resource Costs

<table>
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<tr>
<th>Cost Element</th>
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<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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<tbody>
<tr>
<td>750</td>
<td>STRAIGHT TIME BASE</td>
<td>E050 ENVIRONMENTAL ENGINEERS</td>
<td>R100S</td>
<td>RMRS Salaried</td>
<td>Linear</td>
</tr>
<tr>
<td>750</td>
<td>STRAIGHT TIME BASE</td>
<td>P170 OTHER ADMINISTRATIVE &amp; PROFESSIONAL</td>
<td>R100S</td>
<td>RMRS Salaried</td>
<td>Linear</td>
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Activity ID: 1GHEUBC350  
**Description:** HDD/EMWD - B123

<table>
<thead>
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<th>Line Item</th>
<th>Description</th>
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<th>Labor Cost Total</th>
<th>Materials/Sub Cost</th>
<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
<th>Burden Cost</th>
<th>Total Cost</th>
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<tbody>
<tr>
<td>0100</td>
<td>HDD</td>
<td>1.00</td>
<td>each</td>
<td>VQ</td>
<td>565</td>
<td>565</td>
<td>12,893</td>
<td>307,640</td>
<td>0</td>
<td>320,533</td>
<td>40,575</td>
<td>361,108</td>
</tr>
<tr>
<td>0200</td>
<td>EMWD</td>
<td>1.00</td>
<td>each</td>
<td>VQ</td>
<td>0</td>
<td>0</td>
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<td>36,750</td>
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<td>36,750</td>
<td>3,528</td>
<td>40,278</td>
</tr>
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Total for Activity 1GHEUBC350:

<table>
<thead>
<tr>
<th>Line Item</th>
<th>Description</th>
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<th>Units</th>
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<th>Materials/Sub Cost</th>
<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
<th>Burden Cost</th>
<th>Total Cost</th>
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<tbody>
<tr>
<td>0100</td>
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</tr>
<tr>
<td>0200</td>
<td>EMWD</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

### Summary

Breakdown of Cost Data:

- **Item - Readiness Assessment**
  - Unit Cost: $270
  - Unit Cost Adjustment factor:
    - Revised Unit Cost: None
  - Basis for adjustment: None

- **Unit Cost - Horizontal Directional Drilling at 123**
  - Unit Cost: $252,000 for HDD by Subcontractor at 123 includes 4 boreholes with associated support personnel (RCTs, Rad Foreman, KH field supervisor oversight, KH IH&S oversight, Rad Engineering, Field Sampler, etc.)
  - Unit Cost Adjustment factor:
    - Revised Unit Cost: None
  - Basis for adjustment: None

- **Unit Cost - Radiation Control Technologists**
  - Unit Cost: $11,000 for Radiation Control Technologists
  - Unit Cost Adjustment factor:
    - Revised Unit Cost: None
  - Basis for adjustment: None

- **Unit Cost - Geologists**
  - Unit Cost: $19,800 for Geologists
  - Unit Cost Adjustment factor:
    - Revised Unit Cost: None
  - Basis for adjustment: None

Breakdown of Cost Data:

- **Estimators Experience** - Vendor Quotes on HDD by Stearns Rogers and Corrocon
- **Unit Cost - Horizontal Directional Drilling at 123**
  - Unit Cost: $252,000 for HDD by Subcontractor at 123 includes 4 boreholes with associated support personnel (RCTs, Rad Foreman, KH field supervisor oversight, KH IH&S oversight, Rad Engineering, Field Sampler, etc.)
  - Unit Cost Adjustment factor:
    - Revised Unit Cost: None
  - Basis for adjustment: None

- **Unit Cost - Environmental Control Technologists**
  - Unit Cost: $19,800 for Environmental Control Technologists
  - Unit Cost Adjustment factor:
    - Revised Unit Cost: None
  - Basis for adjustment: None

- **Unit Cost - Geologists**
  - Unit Cost: $19,800 for Geologists
  - Unit Cost Adjustment factor:
    - Revised Unit Cost: None
  - Basis for adjustment: None

Breakdown of Cost Data:

- **Item - Horizontal Directional Drilling at 123**
  - Unit Cost: $252,000 for HDD by Subcontractor at 123 includes 4 boreholes with associated support personnel (RCTs, Rad Foreman, KH field supervisor oversight, KH IH&S oversight, Rad Engineering, Field Sampler, etc.)
  - Unit Cost Adjustment factor:
    - Revised Unit Cost: None
  - Basis for adjustment: None

- **Unit Cost - Radiation Control Technologists**
  - Unit Cost: $11,000 for Radiation Control Technologists
  - Unit Cost Adjustment factor:
    - Revised Unit Cost: None
  - Basis for adjustment: None

- **Unit Cost - Geologists**
  - Unit Cost: $19,800 for Geologists
  - Unit Cost Adjustment factor:
    - Revised Unit Cost: None
  - Basis for adjustment: None
### Line Item 0200 - EMWD

**BOE**

- Vendor Name: Vendor quote from Sandia National Laboratory
- Vendor Quote: $36,750 cost for SNL to perform real time monitoring costs with an HDD Subcontractor at UBC 123.
- Quote Received by: Tom Lindsay (RMRS)
- Item being quoted: similar work experience conducted at Hanford Site
- Availability: not applicable

#### Resources

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASH SUBCONTRACTED SRVS</td>
<td>0000</td>
<td>NONE</td>
<td>K268S</td>
<td>Linear</td>
<td>36,750.00 Dollars</td>
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</tbody>
</table>

#### Activity ID: 1GHEUBC360

**Description:** Conventional Drilling - B123

<table>
<thead>
<tr>
<th>Line Item</th>
<th>Description</th>
<th>Quantity</th>
<th>Units</th>
<th>BOE Type</th>
<th>Labor Hours/Unit</th>
<th>Labor Hours</th>
<th>Labor Cost</th>
<th>Materials/Sub Cost</th>
<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
<th>Burden Cost</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>0100</td>
<td>geoprobe drilling</td>
<td>1.00 each</td>
<td>EE</td>
<td>1.005</td>
<td>1.005</td>
<td>26,379</td>
<td>0</td>
<td>56,979</td>
<td>27,040</td>
<td>84,019</td>
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**Total for Activity 1GHEUBC360:**

- 1.005 hours
- 26,379 total labor cost
- 30,600 total material cost
- 56,979 total prime cost
- 27,040 burden cost
- 84,019 total cost

### Line Item 0100 - geoprobe drilling

**BOE**

- Estimators Experience - Vendor quote from Stearns Rogers/Corrocon Inc.
- Experience Item Desc -

#### Resources

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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</thead>
<tbody>
<tr>
<td>750 STRAIGHT TIME BASE</td>
<td>E050</td>
<td>ENVIRONMENTAL ENGINEERS</td>
<td>R100S</td>
<td>Linear</td>
<td>470.00 Hours</td>
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<tr>
<td>750 STRAIGHT TIME BASE</td>
<td>E110</td>
<td>QUALITY CONTROL ENGINEERS</td>
<td>K268S</td>
<td>Linear</td>
<td>20.00 Hours</td>
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<tr>
<td>750 STRAIGHT TIME BASE</td>
<td>E120</td>
<td>SAFETY ENGINEERS</td>
<td>R100S</td>
<td>Linear</td>
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<tr>
<td>ASH SUBCONTRACTED SRVS</td>
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<td>K268S</td>
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<td>30,600.00 Dollars</td>
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#### Activity ID: 1GHEUBC370

**Description:** HDD/EMWD - B886

<table>
<thead>
<tr>
<th>Line Item</th>
<th>Description</th>
<th>Quantity</th>
<th>Units</th>
<th>BOE Type</th>
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<tr>
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<td>1.00 each</td>
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**Total for Activity 1GHEUBC370:**

- 0 hours
- 73,000 total labor cost
- 73,000 total material cost
- 7,008 burden cost
- 80,088 total cost

### Line Item 0200 - hdd

**BOE**

- Estimators Experience - Vendor Quote from Stearns Rogers/Corrocon Inc.
- Experience Item Desc -

---

**Note:** Official Use Only
**WBS No:** 1GAC0B02  
**Activity ID:** 1GHEUBC370  
**Rocky Flats Closure Project**  
**Baseline Devl**  
**Baseline Cost and Basis of Estimate**  
**Project:** Rocky Flats Closure Project  
**WBS Filter:** 1GAC  
**Activity Filter:** *  
**Starts In FY:** *

**Unit Cost**  
- $48K for Subcontractor to perform one borehole at Bldg. 886.  
  KH support personnel are covered for this activity under HDD 123

**Unit Cost Adjustment factor**  
- None

**Revised Unit Cost**  
- None

**Basis for adjustment**  
- None

---

**Unit Cost - $48K for Subcontractor to perform one borehole at Bldg. 886. KH support personnel are covered for this activity under HDD 123**

**Unit Cost Adjustment factor - None**
**Revised Unit Cost - None**
**Basis for adjustment - None**

---

**Cost Element**  
- **Skills**
- **Department**
- **Curve**
- **Quantity**
- **Units**
- **Contingency & Escalation**
- **Total Cost**
- **Burden Cost**

**Activity ID:** 1GHEUBC380  
**Description:** Conventional Drilling - B886  
**Schedule Risk:** 3  
**Cost Risk:** 3

<table>
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<tr>
<th>Line Item</th>
<th>Description</th>
<th>Quantity</th>
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<th>Total Prime Cost</th>
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<tbody>
<tr>
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**Total for Activity 1GHEUBC380:**  
- 180
- 3,735
- 30,000
- 0
- 33,735
- 6,132
- 39,867

---

**Unit Cost - $30000 for a Subcontractor to perform characterization at rooms 101 and 103 in Bldg. 886**

**Unit Cost Adjustment factor - None**
**Revised Unit Cost - None**
**Basis for adjustment - None**

---

**Cost Element**  
- **Skills**
- **Department**
- **Curve**
- **Quantity**
- **Units**
- **Contingency & Escalation**
- **Total Cost**
- **Burden Cost**

**Activity ID:** 1GHEUBC390  
**Description:** Conduct Lab Analysis - B123  
**Schedule Risk:** 1  
**Cost Risk:** 1

<table>
<thead>
<tr>
<th>Line Item</th>
<th>Description</th>
<th>Quantity</th>
<th>Units</th>
<th>BOE Type</th>
<th>Labor Hours/Unit</th>
<th>Labor Hours Total</th>
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<th>Materials/Sub Cost</th>
<th>Contingency &amp; Escalation</th>
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<tr>
<td>0100</td>
<td>analytical labs</td>
<td>1.00 each</td>
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<td>0</td>
<td>0</td>
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<td>93,708</td>
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**Total for Activity 1GHEUBC390:**  
- 0
- 0
- 85,500
- 0
- 85,500
- 8,208
- 93,708

---

--
Breakdown of Cost Data:

Item - Analytical Labs
Units - lump sum subcontract dollars (A5H)
Unit Cost - $85,500 for Geoprobe and HDD sampling effort at UBC 123
Unit Cost Adjustment factor - not applicable
Revised Unit Cost - not applicable
Basis for adjustment - not applicable

Resources

<table>
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<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
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<tr>
<td>ASH</td>
<td>NONE</td>
<td>K267S</td>
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Factors: 95 samples
900 unit cost per sample (includes OA)

Activity ID: 1GHEUBC400
Description: Conduct Lab Analysis - B886

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<tr>
<th>Line Item</th>
<th>Description</th>
<th>Quantity</th>
<th>Units</th>
<th>BOE Type</th>
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Total for Activity 1GHEUBC400:

Breakdown of Cost Data:

Item - Analytical Labs
Units - lump sum subcontract dollars (A5H)
Unit Cost - $36,000 dollars for analytical analysis at Bldg. 886 for Geoprobe and HDD work.
Unit Cost Adjustment factor - not applicable
Revised Unit Cost - not applicable
Basis for adjustment - not applicable

Resources

<table>
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<tr>
<th>Cost Element</th>
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<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
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Factors: 40 samples
900 unit cost per sample (includes OA)

Activity ID: 1GHEUBC410
Description: Drum IDM - B123

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<th>Line Item</th>
<th>Description</th>
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<th>BOE Type</th>
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<th>Material/Sub Cost</th>
<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
<th>Total Cost</th>
<th>Burden Cost</th>
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<tr>
<td>0100</td>
<td>WM support - IDM drums</td>
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Total for Activity 1GHEUBC410:

Breakdown of Cost Data:

Item - Drumming on Investigative Derived Material
Units - hours each (750)
Unit Cost - 375 hours for the Waste Generator effort at 123. Contracted under Summit
Unit Cost Adjustment factor - not applicable
Revised Unit Cost - not applicable
Basis for adjustment - not applicable

Resources

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<tr>
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Factors: 375 hrs (Summit Contract for Waste)
55 $/hr.

Activity ID: 1GHEUBC420
Description: Drum IDM - B886

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<th>Line Item</th>
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Total for Activity 1GHEUBC420:
### Project Baseline Devl

#### WBS Filter
- 1GAC

#### Activity Filter
- Starts In FY

### Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

**WBS No:** 1GAC0B02  
**Activity ID:** 1GHEUBC420

#### Line Item 0100 - WM support - IDM drums

**BOE**

- Estimators Experience -
- Experience Item Desc -

**Breakdown of Cost Data:**
- Item - Drumming of Investigative Derived Material
- Units - hours each (750)
- Unit Cost - 100 hours for the Waste Generator Effort at Bldg. 886. Contracted under Summit
- Unit Cost Adjustment factor - not applicable
- Revised Unit Cost - not applicable
- Basis for adjustment - not applicable

**Resources**

<table>
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<th>Quantity</th>
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<td>S020 GEOLOGISTS</td>
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**Activity ID:** 1GHEUBC430  
**Description:** Develop Characterization Report

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<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
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<td>1.00</td>
<td>kach</td>
<td>EE</td>
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<td>170</td>
<td>5,025</td>
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<td>SYS</td>
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**Total for Activity 1GHEUBC430:**

- 170 hours
- 5,025 labor hours
- 7,560 labor cost total
- 12,585 total prime cost
- 5,337 total cost

### Line Item 0100 - project report

**BOE**

- Estimators Experience -
- Experience Item Desc - Final Characterization Report

**Breakdown of Cost Data:**
- Item - Characterization Report Development
- Units - Hours
- Unit Cost - 338 hours to develop the final characterization report. Effort by T. Lindsay and D. Strand - contracted under Arcadia
- Unit Cost Adjustment factor - not applicable
- Revised Unit Cost - not applicable
- Basis for adjustment - not applicable

**Resources**

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<tr>
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<th>Quantity</th>
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<td>R100S BMRS Salaried</td>
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**Activity ID:** 1GHEUBC430  
**Description:** Contingency And Escalation

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<th>Material/Sub Cost</th>
<th>Contingency &amp; Escalation</th>
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<tr>
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**WBS No:** 1GAC0B03  
**Title:** Industrial Area Road & Asphalt Removal

**Activity ID:** 1GEPER0200  
**Description:** SOW Preparation

**Line Item**

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<th>BOE Type</th>
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<td>CPEPER0220</td>
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<td>EE</td>
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**Total for Activity 1GEPER0200:**

- 495 labor hours
- 15,441 total labor hours
- 7,547 total labor cost
- 26,892 total prime cost
- 4,354 total burden
- 31,246 total cost
### Line Item CPEPER0220 - Health and Safety Plan

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<tr>
<td>Experience Item Desc - Trench T3/T4</td>
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#### Resources

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<td><strong>Factors</strong></td>
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<td><strong>40</strong></td>
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#### Breakdown of Cost Data:

- Item: Health and Safety Plan
- Units: hrs
- Unit Cost: $3073 sub/c
- Unit Cost Adjustment factor: none
- Basis for adjustment: none
- Revised Unit Cost: none

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Line Item CPEPER0405 - Scope and Estimate Prep

<table>
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<th>Cost Element</th>
<th>Skill</th>
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<td>Item - Scope and Estimate prep</td>
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<tr>
<td>Units - lot</td>
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<td>Revised Unit Cost - none</td>
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<tr>
<td>Basis for adjustment - none</td>
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#### Resources

<table>
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<tr>
<th>Cost Element</th>
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<th>Units</th>
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<tr>
<td><strong>BOE</strong></td>
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#### Breakdown of Cost Data:

- Item: Scope and Estimate Prep
- Units: lot
- Unit Cost: $3073 sub/c
- Unit Cost Adjustment factor: none
- Basis for adjustment: none
- Revised Unit Cost: none

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Line Item CPEPER0410 - Revise Schedule

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<tbody>
<tr>
<td><strong>Line Item CPEPER0410</strong></td>
<td><strong>Revise Schedule</strong></td>
<td></td>
<td></td>
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<tr>
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<td></td>
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<tr>
<td>Experience Item Desc - Trench T3/T4</td>
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<tr>
<td>Breakdown of Cost Data:</td>
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<tr>
<td>Item - Revise Schedule</td>
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<tr>
<td>Units - hrs</td>
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<td>Unit Cost - 75</td>
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<tr>
<td>Unit Cost Adjustment factor - none</td>
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<tr>
<td>Revised Unit Cost - none</td>
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<tr>
<td>Basis for adjustment - none</td>
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#### Resources

<table>
<thead>
<tr>
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<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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<tbody>
<tr>
<td><strong>BOE</strong></td>
<td><strong>SALARIED</strong></td>
<td><strong>RMRS Salaried</strong></td>
<td><strong>Linear</strong></td>
<td><strong>70.00</strong></td>
<td><strong>Hours</strong></td>
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<tr>
<td><strong>750</strong></td>
<td><strong>STRAIGHT TIME</strong></td>
<td><strong>E050</strong></td>
<td><strong>ENVIRONMENTAL ENGINEERS</strong></td>
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<td><strong>Factors</strong></td>
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<td></td>
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<td><strong>Hours</strong></td>
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#### Breakdown of Cost Data:

- Item: Revise Schedule
- Units: hrs
- Unit Cost: $3073 sub/c
- Unit Cost Adjustment factor: none
- Basis for adjustment: none

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
Rocky Flats Closure Project
Baseline Cost and Basis of Estimate

Project: Baseline Devl  
WBS Filter: 1GAC  
Activity Filter: *  
Starts In FY: *

WBS No: 1GAC0B03
Activity ID: 1GEPER0200

**Line Item CPEPER0415 - Davis-Bacon Determination**

**BOE**

Estimators Experience - Estimated costs based on experience from similar Environmental Restoration projects.

Experience Item Desc - Trench T3/T4

Breakdown of Cost Data:

- Item - DB Determination
- Units - hrs
- Unit Cost - 45
- Unit Cost Adjustment factor - none
- Revised Unit Cost - none
- Basis for adjustment - none

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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<thead>
<tr>
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<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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<tbody>
<tr>
<td>RMRS Salaried</td>
<td>STRAIGHT TIME BASE</td>
<td>E050</td>
<td>ENVIRONMENTAL ENGINEERS</td>
<td>R100S</td>
<td>Linear</td>
<td>20.00 Hours</td>
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<tr>
<td>RMRS Salaried</td>
<td>STRAIGHT TIME BASE</td>
<td>M040</td>
<td>MANAGERS (GRADE 64 - 68)</td>
<td>R100S</td>
<td>Linear</td>
<td>5.00 Hours</td>
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<td>RMRS Corp</td>
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<td>NONE</td>
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<td>Linear</td>
<td>761.18 Dollars</td>
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**Line Item CPEPER0425 - Baseline Change Control**

**BOE**

Estimators Experience - Estimated costs based on experience from similar Environmental Restoration projects.

Experience Item Desc - Trench T3/T4

Breakdown of Cost Data:

- Item - Change Control
- Units - hrs
- Unit Cost - 60
- Unit Cost Adjustment factor - none
- Revised Unit Cost - none
- Basis for adjustment - none

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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<thead>
<tr>
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<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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</thead>
<tbody>
<tr>
<td>RMRS Corp</td>
<td>SUBCONTRACTED SRVS</td>
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**Line Item SYS - Contingency And Escalation**

**BOE**

Contingency And Escalation

<table>
<thead>
<tr>
<th>Resource</th>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
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<tbody>
<tr>
<td>RMRS Corp</td>
<td>SUBCONTRACTED SRVS</td>
<td>P070</td>
<td>COST ESTIMATORS PLANNERS AN</td>
<td>K265S</td>
<td>Linear</td>
<td>2,283.55 Dollars</td>
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Activity ID: 1GEPER0205  
Description: Procurement & Field Preparation  
Cost Risk: 3  
Schedule Risk: 2
### Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

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<tr>
<th>Activity ID: 1GEPER0205</th>
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#### WBS No: 1GAC0B03

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<th>Labor Hours/Unit</th>
<th>Labor Hours Total</th>
<th>Labor Cost Total</th>
<th>Materials/ Sub Cost</th>
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<th>Total Prime Cost</th>
<th>Burden Cost</th>
<th>Total Cost</th>
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<td>EE</td>
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<td>EE</td>
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<td>EE</td>
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<tr>
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<td>Attend Pre-Evolution Meeting</td>
<td>20.00</td>
<td>ka</td>
<td>EE</td>
<td>6</td>
<td>100</td>
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<td>2,956</td>
<td>1,014</td>
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<td>Utility Clearance and Permitting</td>
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<td>Contingency And Escalation</td>
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<td>15,328</td>
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**Total for Activity 1GEPER0205:**

- **Labor Hours Total:** 707
- **Labor Cost Total:** 21,512
- **Materials/ Sub Cost:** 2,947
- **Total Prime Cost:** 39,788
- **Total Cost:** 47,165

#### Line Item CPEPER0430 - Procurement

**BOE**

- Estimators Experience - Estimated costs based on experience from similar Environmental Restoration projects.
- Experience Item Desc - Trench T3/T4

**Breakdown of Cost Data:**

- Item - Procurement
- Units - hrs
- Unit Cost - 170
- Unit Cost Adjustment factor - none
- Revised Unit Cost - none
- Basis for adjustment - none

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Resources**

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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</thead>
<tbody>
<tr>
<td>750 STRAIGHT TIME BASE</td>
<td>E050 ENVIRONMENTAL ENGINEERS</td>
<td>R100S RMRS Salaried</td>
<td>Linear</td>
<td>120</td>
<td>Hours</td>
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<tr>
<td>750 STRAIGHT TIME BASE</td>
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<td>R100S RMRS Salaried</td>
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<td>17</td>
<td>Hours</td>
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</table>

**Line Item CPEPER0435 - Readiness Assessment**

**BOE**

- Estimators Experience - Estimated costs based on experience from similar Environmental Restoration projects.
- Experience Item Desc - Trench T3/T4

**Breakdown of Cost Data:**

- Item - Readiness Assessment
- Units - lot
- Unit Cost - 55 hrs; $2000 sub/c
- Unit Cost Adjustment factor - none
- Revised Unit Cost - none
- Basis for adjustment - none

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Resources**

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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<tbody>
<tr>
<td>750 STRAIGHT TIME BASE</td>
<td>E050 ENVIRONMENTAL ENGINEERS</td>
<td>R100S RMRS Salaried</td>
<td>Linear</td>
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<td>750 STRAIGHT TIME BASE</td>
<td>M040 MANAGERS (GRADE 64 - 68)</td>
<td>R100S RMRS Salaried</td>
<td>Linear</td>
<td>5</td>
<td>Hours</td>
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</table>

**Line Item CPEPER0440 - Attend Training**

**BOE**

- Estimators Experience - Estimated costs based on experience from similar Environmental Restoration projects.
- Experience Item Desc - Trench T3/T4

**Breakdown of Cost Data:**

- Item - Attend Training
- Units - 20.00
- Unit Cost - 15
- Unit Cost Adjustment factor - none
- Revised Unit Cost - none
- Basis for adjustment - none

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Resources**

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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<tr>
<td>750 STRAIGHT TIME BASE</td>
<td>E050 ENVIRONMENTAL ENGINEERS</td>
<td>R100S RMRS Salaried</td>
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<td>Hours</td>
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**Rocky Flats Closure Project**  
Baseline Cost and Basis of Estimate

<table>
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<tr>
<td>Activity ID</td>
<td>1GEPER0205</td>
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</table>

### Line Item CPEPER0440 - Attend Training

**BOE**  
Estimators Experience - Estimated costs based on experience from similar Environmental Restoration projects.  
Experience Item Desc - Trench T3/T4  
Breakdown of Cost Data:  
Item - Training - 20 employees, 15 hrs ea  
Units - hrs  
Unit Cost - 15  
Unit Cost Adjustment factor - none  
Revised Unit Cost - none  
Basis for adjustment - none

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Line Item CPEPER0440 - Attend Training</td>
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<td>Straight Time Base</td>
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### Line Item CPEPER0450 - Attend Pre-Evolution Meeting

**BOE**  
Estimators Experience - Estimated costs based on experience from similar Environmental Restoration projects.  
Experience Item Desc - Trench T3/T4  
Breakdown of Cost Data:  
Item - Pre-Ev meetings - 20 employees, 5 hrs ea  
Units - hrs  
Unit Cost - 5  
Unit Cost Adjustment factor - none  
Revised Unit Cost - none  
Basis for adjustment - none

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<th>Cost Element</th>
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<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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<tbody>
<tr>
<td>Line Item CPEPER0450 - Attend Pre-Evolution Meeting</td>
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<td>Straight Time Base</td>
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### Line Item CPEPER0505 - Utility Clearance and Permitting

**BOE**  
Estimators Experience - Estimated costs based on experience from similar Environmental Restoration projects.  
Experience Item Desc - Trench T3/T4  
Breakdown of Cost Data:  
Item - Permitting  
Units - hrs  
Unit Cost - 25  
Unit Cost Adjustment factor - none  
Revised Unit Cost - none  
Basis for adjustment - none

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<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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<tbody>
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<td>Straight Time Base</td>
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<td>E050</td>
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### Line Item CPEPER0510 - Ecology Survey

**BOE**  
Estimators Experience - Estimated costs based on experience from similar Environmental Restoration projects.  
Experience Item Desc - Trench T3/T4  
Breakdown of Cost Data:  
Item - Survey  
Units - hrs

<table>
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<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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<tbody>
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<td>BOE</td>
<td>Straight Time Base</td>
<td>E050</td>
<td>E050</td>
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### Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

**WBS No:** 1GAC0B03  
**Activity ID:** 1GEPER0205  
**Project:** Baseline Devl  
**WBS Filter:** 1GAC  
**Activity Filter:** *  
**Starts In FY:** *

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#### Resources

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<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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<tbody>
<tr>
<td>750</td>
<td>STRAIGHT TIME BASE</td>
<td>S090 OTHER SCIENTISTS</td>
<td>R100S</td>
<td>RMRS Salaried</td>
<td>Linear</td>
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<td><strong>Factors:</strong></td>
<td><strong>BOE:</strong></td>
<td><strong>30:</strong></td>
<td><strong>Hours:</strong></td>
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#### Line Item CPEPER0520 - IWCP Package Preparation/Review

**BOE** Estimators Experience - Estimated costs based on experience from similar Environmental Restoration projects.  
**Experience Item Desc:** - Trench T3/T4  
**Breakdown of Cost Data:**

- **Item:** IWCP review  
- **Units:** hrs  
- **Unit Cost:** none  
- **Basis for adjustment:** none

<table>
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<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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<tr>
<td>750</td>
<td>STRAIGHT TIME BASE</td>
<td>E050 ENVIRONMENTAL ENGINEERS</td>
<td>R100S</td>
<td>RMRS Salaried</td>
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<tr>
<td><strong>Factors:</strong></td>
<td><strong>BOE:</strong></td>
<td><strong>30:</strong></td>
<td><strong>Hours:</strong></td>
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#### Line Item SYS - Contingency And Escalation

**BOE**

<table>
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<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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<tr>
<td>CON</td>
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<td>ZDEPT</td>
<td>No Department</td>
<td>Linear</td>
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<td><strong>Hours:</strong></td>
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#### Activity ID: 1GEPER0210

**Description:** Readiness Assessment  
**Cost Risk:**  
**Schedule Risk:** 1

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<th>Description</th>
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<th>BOE Type</th>
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<th>Labor Hours Total</th>
<th>Labor Cost Total</th>
<th>Material/Sub Cost</th>
<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
<th>Burden Cost</th>
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<tbody>
<tr>
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<td>EE</td>
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**Total for Activity 1GEPER0210:**

- **Labor Hours Total:** 55  
- **Labor Cost Total:** 1,749  
- **Material/Sub Cost:** 1,692  
- **Contingency & Escalation:** 0  
- **Total Prime Cost:** 3,440  
- **Burden Cost:** 609  
- **Total Cost:** 4,049

---

#### Line Item CPEPER0435 - Readiness Assessment

**BOE** Estimators Experience - Estimated costs based on experience from similar Environmental Restoration projects.  
**Experience Item Desc:** - Trench T3/T4  
**Breakdown of Cost Data:**

- **Item:** Readiness Assessment  
- **Units:** lot  
- **Unit Cost:** $2000 sub/c  
- **Unit Cost Adjustment factor:** none  
- **Basis for adjustment:** none

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### Rocky Flats Closure Project
#### Baseline Cost and Basis of Estimate

<table>
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**Project:** Rocky Flats Closure Project  
**Baseline Devl:** Baseline Cost and Basis of Estimate  
**WBS Filter:** 1GAC  
**Activity Filter:** *  
**Starts In FY:** *

<table>
<thead>
<tr>
<th>Activity ID:</th>
<th>1GEPER0215</th>
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</thead>
<tbody>
<tr>
<td>Description:</td>
<td>Demolition Field Work</td>
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</table>

#### Line Item CPEPER0525 - Mobilization

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Quantity</th>
<th>Units</th>
<th>BOE Type</th>
<th>Labor Hours/Unit</th>
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<th>Labor Cost Total</th>
<th>Materials/Sub Cost</th>
<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
<th>Burden Cost</th>
<th>Total Cost</th>
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</thead>
<tbody>
<tr>
<td>Mobilization</td>
<td>1.00 ea</td>
<td>20</td>
<td>677</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>912</td>
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</tbody>
</table>

**BOE:** Estimators Experience  
**Experience Item Desc:** Trench T3/T4

**Breakdown of Cost Data:**
- Item - mobilization
- Units - hrs
- Unit Cost - 0
- Revised Unit Cost - none
- Basis for adjustment - none

<table>
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<tr>
<th>Cost Element</th>
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<th>Quantity</th>
<th>Units</th>
<th>BOE Type</th>
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<td>677</td>
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**Resources:**

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<td>0</td>
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**Total for Activity 1GEPER0215:**

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<th>Materials/Sub Cost</th>
<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
<th>Burden Cost</th>
<th>Total Cost</th>
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</thead>
<tbody>
<tr>
<td>Mobilization</td>
<td>920</td>
<td>33,318</td>
<td>4,339,177</td>
<td>2,459,728</td>
<td>6,832,224</td>
<td>11,595</td>
<td>6,843,818</td>
<td></td>
<td></td>
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<td></td>
</tr>
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</table>

### Line Item CPEPER0530 - Infrastructure Removal

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Quantity</th>
<th>Units</th>
<th>BOE Type</th>
<th>Labor Hours/Unit</th>
<th>Labor Hours Total</th>
<th>Labor Cost Total</th>
<th>Materials/Sub Cost</th>
<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
<th>Burden Cost</th>
<th>Total Cost</th>
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</thead>
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<tr>
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<td>1.00 ea</td>
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<td>677</td>
<td>0</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2,519,728</td>
</tr>
</tbody>
</table>

**BOE:** Trade Publication - Means Heavy Construction  
**Publication Date:** 1995  
**Volume/Page:** page 24

**Breakdown of Trade Pub. Cost Data:**
- Item - Bituminous, 4-6"  
- Units - sy - total square yards - 513,427  
- Unit Cost - $9.29  
- Revised Unit Cost - none  
- Basis for adjustment - none

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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<thead>
<tr>
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<th>Skill</th>
<th>Quantity</th>
<th>Units</th>
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<th>Labor Hours Total</th>
<th>Labor Cost Total</th>
<th>Materials/Sub Cost</th>
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<td>1.00 ea</td>
<td>20</td>
<td>677</td>
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<td>0</td>
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**Resources:**

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<th>Quantity</th>
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<th>BOE Type</th>
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<th>Labor Cost Total</th>
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**Total for Activity CPEPER0530:**

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<th>Labor Cost Total</th>
<th>Materials/Sub Cost</th>
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<td>4,339,177</td>
<td>2,459,728</td>
<td>6,832,224</td>
<td>11,595</td>
<td>6,843,818</td>
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### Rocky Flats Closure Project
#### Baseline Cost and Basis of Estimate

**WBS Filter:** 1GAC  
**Activity Filter:**  
**Starts In FY:**

<table>
<thead>
<tr>
<th>ASH</th>
<th>SUBCONTRACTED SRVS</th>
<th>0000</th>
<th>NONE</th>
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<tbody>
<tr>
<td><strong>Activity ID:</strong></td>
<td>1GEPER0215</td>
<td><strong>Baseline Cost and Basis of Estimate</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Factors:</strong> 4769737 dollars</td>
<td><strong>K26SS ER Programs</strong></td>
<td><strong>Linear</strong></td>
<td>4,024,050.00 Dollars</td>
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</tbody>
</table>

**Line Item CPEPER0615 - Hauling Off Hiway**

**BOE**  
Trade Publication - Means Site Work and Landscape Data -  
Publication Date - 1995  
Breakdown of Trade Pub. Cost Data:
- Units - cy - total cy = 119,800
- Unit Cost - $2.69
- Unit Cost Adjustment factor - none
- Basis for adjustment - none

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

### Resources

**Cost Element** | **Skill** | **Department** | **Curve** | **Quantity** | **Units**
<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td><strong>ASH</strong> SUBCONTRACTED SRVS</td>
<td>0000</td>
<td>NONE</td>
<td>K26SS ER Programs</td>
<td><strong>Factors:</strong> 322262 Dollars</td>
<td><strong>Linear</strong></td>
</tr>
</tbody>
</table>

---

### Resources

**Cost Element** | **Skill** | **Department** | **Curve** | **Quantity** | **Units**
|-----------------|-----------|----------------|-----------|-------------|----------|
| **BOE** | Estimators Experience - Estimated costs based on experience from similar Environmental Restoration projects.  
Experience Item Desc - Trench T3/T4  
Breakdown of Cost Data:
- Item - Field Oversight  
Units - hrs  
Unit Cost - 880  
Unit Cost Adjustment factor - none  
Revised Unit Cost - none  
Basis for adjustment - none

---

### Resources

**Cost Element** | **Skill** | **Department** | **Curve** | **Quantity** | **Units**
|-----------------|-----------|----------------|-----------|-------------|----------|
| **BOE** | Estimators Experience - Estimated costs based on experience from similar Environmental Restoration projects.  
Experience Item Desc - Trench T3/T4  
Breakdown of Cost Data:
- Item - Demobilization  
Units - hrs  
Unit Cost - 20  
Unit Cost Adjustment factor - none  
Revised Unit Cost - none  
Basis for adjustment - none

---

### Resources

**Cost Element** | **Skill** | **Department** | **Curve** | **Quantity** | **Units**
|-----------------|-----------|----------------|-----------|-------------|----------|
| **BOE** | Trade Publication - Means Heavy Construction Cost Data  
Publication Date - 1995  
Volume/Page - page 6

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## Rocky Flats Closure Project

### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0B03  
**Activity ID:** 1GEPER0215

#### Trade Publication Item Desc - Surveying

- **Breakdown of Trade Pub. Cost Data:**
  - Units: $0.075
  - Unit Cost: $0.075
  - Basis for adjustment: none

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Activity ID: 1GEPER0220

**Description:** Prepare Road & Asphalt Removal Closeout Report

<table>
<thead>
<tr>
<th>Line Item 0100</th>
<th>Description</th>
<th>Quantity</th>
<th>Units</th>
<th>BOE Type</th>
<th>Labor Hours/Unit</th>
<th>Labor Hours Total</th>
<th>Labor Cost Total</th>
<th>Material/Sub Cost</th>
<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
<th>Burden Cost</th>
<th>Total Cost</th>
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<tbody>
<tr>
<td>0100</td>
<td>PREP CLOSEOUT REPORT</td>
<td>1.00 each</td>
<td>EE</td>
<td>196</td>
<td>196</td>
<td>5,794</td>
<td>5,794</td>
<td>0</td>
<td>0</td>
<td>2,016</td>
<td>7,810</td>
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<tr>
<td>SYS</td>
<td>Contingency And Escalation</td>
<td>1.00 ka</td>
<td>EE</td>
<td>0</td>
<td>0</td>
<td>6,630</td>
<td>6,630</td>
<td>0</td>
<td>0</td>
<td>6,630</td>
<td>13,440</td>
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</tbody>
</table>

Total for Activity 1GEPER0220:

- Labor Hours Total: 196
- Labor Cost Total: 5,794
- Contingency & Escalation: 0
- Total Prime Cost: 2,016
- Burden Cost: 7,810
- Total Cost: 14,440

### Activity ID: 1GEPER1715

**Description:** Decision Doc w/ Sampling and Analysis Plan Preparation

<table>
<thead>
<tr>
<th>Line Item 0100</th>
<th>Description</th>
<th>Quantity</th>
<th>Units</th>
<th>BOE Type</th>
<th>Labor Hours/Unit</th>
<th>Labor Hours Total</th>
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<th>Material/Sub Cost</th>
<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
<th>Burden Cost</th>
<th>Total Cost</th>
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</thead>
<tbody>
<tr>
<td>CPEPER1715</td>
<td>Decision Doc w/ Sampling and Analysis Plan</td>
<td>1.00 ka</td>
<td>EE</td>
<td>734</td>
<td>734</td>
<td>22,196</td>
<td>22,196</td>
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<td>0</td>
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### Rocky Flats Closure Project

#### Baseline Cost and Basis of Estimate

<table>
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<th>Project Baseline Devl: 1GAC0B04</th>
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<td>Activity ID: 1GEPER1600</td>
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#### Activity Filter: 

<table>
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<tr>
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<th>Description: Foundation Rem Procurement and Field Preparation</th>
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<tr>
<td>Cost Risk: 1</td>
<td>Schedule Risk: 1</td>
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**Line Item CPEPER1715 - Decision Doc w/ Sampling and Analysis Plan**

**BOE**

- **Estimators Experience** - Estimated costs for planning activities are based on experience from similar Environmental Restoration projects.

- **Experience Item Desc** - Ryan's Pit
  - Based on Ryan's Pit (INSS 108), the cost for the PAM was $50,000 (contractor costs).
  - Assume labor rate is $75/hour (based on a cost center 217).
  - Assume the total labor hours for the PAM (50,000/75 = 667 hours).
  - An additional 10% is added to the estimate to cover project management costs (667 + 67 = 734).

**Breakdown of Cost Data:**

- **Item** - Decision Document and SAP Prep
  - **Units** - hours
  - **Unit Cost** - 734
  - **Unit Cost Adjustment factor** - None
  - **Revised Unit Cost** - None
  - **Basis for adjustment** - None

**Resources**

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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<tbody>
<tr>
<td>750</td>
<td>STRAIGHT TIME BASE</td>
<td>E050 ENVIRONMENTAL ENGINEERS</td>
<td>R100S PMRS Salaried</td>
<td>Linear</td>
<td>667.00 Hours</td>
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</tbody>
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**Factors**

- **67** Hours

**Line Item CPEPER1735 - Waste Management Plan**

**BOE**

- **Estimators Experience** - Estimated costs for planning activities are based on experience from similar Environmental Restoration projects.

- **Experience Item Desc** - T-3/T-4
  - It is assumed that a waste management plan will be needed for the estimated 7 cy of low-level concrete waste.
  - It is assumed the document development and review time will take 40% the time needed for T-3/T-4 (0.4 x 220 hours).

**Breakdown of Cost Data:**

- **Item** - Waste Management Plan
  - **Units** - hours
  - **Unit Cost** - 90
  - **Unit Cost Adjustment factor** - None
  - **Revised Unit Cost** - None
  - **Basis for adjustment** - None

**Resources**

<table>
<thead>
<tr>
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<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
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</thead>
<tbody>
<tr>
<td>750</td>
<td>STRAIGHT TIME BASE</td>
<td>M040 MANAGERS (GRADE 64 - 68)</td>
<td>R100S PMRS Salaried</td>
<td>Linear</td>
<td>67.00 Hours</td>
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**Factors**

- **67** Hours

**Line Item SYS - Contingency And Escalation**

**BOE**

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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<tbody>
<tr>
<td>CON CONTINGENCY</td>
<td>0000</td>
<td>NONE</td>
<td>ZDEPT No Department</td>
<td>Linear</td>
<td>1,490.37 Dollars</td>
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<td>ESC ESCALATION</td>
<td>0000</td>
<td>NONE</td>
<td>ZDEPT No Department</td>
<td>Linear</td>
<td>3,059.59 Dollars</td>
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**Factors**

- **1490.37** Dollars

- **3059.59** Dollars

**Activity ID: 1GEPER1620**

<table>
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<tr>
<th>Description</th>
<th>Quantity</th>
<th>Units</th>
<th>BOE Type</th>
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## Rocky Flats Closure Project

### Baseline Cost and Basis of Estimate

#### WBS Filter
- **WBS No:** 1GAC0B04
- **Activity ID:** 1GEPER1620

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### Procurement

**Resources**

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<th>Units</th>
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</thead>
<tbody>
<tr>
<td>750</td>
<td>STRAIGHT TIME BASE</td>
<td>E050 ENVIRONMENTAL ENGINEERS</td>
<td>Linear</td>
<td>510.00</td>
<td>Hours</td>
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<tr>
<td>750</td>
<td>STRAIGHT TIME BASE</td>
<td>M040 MANAGERS (GRADE 64 - 68)</td>
<td>Linear</td>
<td>51.00</td>
<td>Hours</td>
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</table>

### Davis Bacon Documentation

**Resources**

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<td>Hours</td>
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### Subcontractor H&S Plan

**Resources**

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<th>Curve</th>
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<th>Units</th>
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<tr>
<td>750</td>
<td>STRAIGHT TIME BASE</td>
<td>E050 ENVIRONMENTAL ENGINEERS</td>
<td>Linear</td>
<td>32.00</td>
<td>Hours</td>
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</tbody>
</table>

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**Line Item 0100 - PROCUREMENT**

- **Estimators Experience** - Estimated costs for planning activities are based on experience from similar Environmental Restoration projects.
- **Experience Item Desc** - Ryan's Pit, T-3/T-4
- **Item** - Procurement
- **Units** - hours
- **Unit Cost** - 561
- **Unit Cost Adjustment factor** - None
- **Revised Unit Cost** - None
- **Basis for adjustment** - None

**Breakdown of Cost Data:**

- **Item** - Procurement
- **Units** - hours
- **Unit Cost** - 561
- **Unit Cost Adjustment factor** - None
- **Revised Unit Cost** - None
- **Basis for adjustment** - None

**Resources**

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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<tbody>
<tr>
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<td>STRAIGHT TIME BASE</td>
<td>E050 ENVIRONMENTAL ENGINEERS</td>
<td>Linear</td>
<td>510.00</td>
<td>Hours</td>
</tr>
<tr>
<td>750</td>
<td>STRAIGHT TIME BASE</td>
<td>M040 MANAGERS (GRADE 64 - 68)</td>
<td>Linear</td>
<td>51.00</td>
<td>Hours</td>
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</tbody>
</table>

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**Line Item 0200 - DAVIS BACON DOCUMENTATION**

- **Estimators Experience** - Estimated costs for planning activities are based on experience from similar Environmental Restoration projects.
- **Experience Item Desc** - Ryan's Pit
- **Item** - DB Documentation
- **Units** - hours
- **Unit Cost** - 32
- **Unit Cost Adjustment factor** - None
- **Revised Unit Cost** - None
- **Basis for adjustment** - None

**Breakdown of Cost Data:**

- **Item** - DB Documentation
- **Units** - hours
- **Unit Cost** - 32
- **Unit Cost Adjustment factor** - None
- **Revised Unit Cost** - None
- **Basis for adjustment** - None

**Resources**

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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</thead>
<tbody>
<tr>
<td>750</td>
<td>STRAIGHT TIME BASE</td>
<td>E050 ENVIRONMENTAL ENGINEERS</td>
<td>Linear</td>
<td>510.00</td>
<td>Hours</td>
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<tr>
<td>750</td>
<td>STRAIGHT TIME BASE</td>
<td>M040 MANAGERS (GRADE 64 - 68)</td>
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<td>51.00</td>
<td>Hours</td>
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</table>

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**Line Item 0300 - SUBCONTRACTOR H&S PLAN**

- **Estimators Experience** - Estimated costs for planning activities are based on experience from similar Environmental Restoration projects.
- **Experience Item Desc** - Ryan's Pit
- **Item** - H&S Plan
- **Units** - hours
- **Unit Cost** - 176
- **Unit Cost Adjustment factor** - None
- **Revised Unit Cost** - None
- **Basis for adjustment** - None

**Breakdown of Cost Data:**

- **Item** - H&S Plan
- **Units** - hours
- **Unit Cost** - 176
- **Unit Cost Adjustment factor** - None
- **Revised Unit Cost** - None
- **Basis for adjustment** - None

**Resources**

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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**Total for Activity 1GEPER1620:**

- **Total for Activity 1GEPER1620:** 1,509.00, 46,938.00, 20,014.00, 78,401.00, 13,236.00, 91,637.00
Breakdown of Cost Data:

- Labor hours are increased by 10% to adjust for project management costs.

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

<table>
<thead>
<tr>
<th>Cost Element</th>
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<td></td>
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</tr>
<tr>
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<td>P090 INDUSTRIAL HYGIENISTS</td>
<td>R100S RMRS Salaried</td>
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<td>Hours</td>
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**Line Item 0400 - RADIOLOGICAL WORK PERMIT**

**BOE**

Estimators Experience - Estimated costs for planning activities are based on experience from similar Environmental Restoration projects.

Experience Item Desc - Ryan's Pit

- It is assumed that an RWP will be prepared by one RCT, taking one (9 hour day) for each of the nine buildings.

Breakdown of Cost Data:

- Item - Radiological Work Permit
- Units - hours
- Unit Cost - $1
- Unit Cost Adjustment factor - None
- Revised Unit Cost - None
- Basis for adjustment - None

### Resources

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<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
</tr>
</thead>
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<td>T050 RADIATION CONTROL TECHNOLOGI</td>
<td>KG10H Remediation Steelworkers</td>
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<td>81.00</td>
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**Line Item 0500 - IMPLEMENTATION PLAN**

**BOE**

Estimators Experience - Estimated costs for planning activities are based on experience from similar Environmental Restoration projects.

Experience Item Desc - Ryan's Pit

- It is assumed that preparation of an Implementation Plan/Project Execution Plan will take one environmental engineer 13 weeks, including review and revision.

- Labor hours were increased by 10% to adjust for project management costs.

Breakdown of Cost Data:

- Item - Implementation Plan
- Units - hours
- Unit Cost - $1
- Unit Cost Adjustment factor - None
- Revised Unit Cost - None
- Basis for adjustment - None
### Resources

<table>
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<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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<td>ECOLOGY SURVEY/NEPA SUPPORT</td>
<td>ENVIRONMENTAL ENGINEERS</td>
<td>R100S</td>
<td>Linear</td>
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<td>HRS</td>
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<td>0700</td>
<td>UTILITY CLEARANCE/SOIL DISTURBANCE REPORT</td>
<td>ENVIRONMENTAL SCIENTISTS</td>
<td>R100S</td>
<td>Linear</td>
<td>750</td>
<td>HRS</td>
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<td>0800</td>
<td>PROJECT MGMT</td>
<td>ENVIRONMENTAL ENGINEERS</td>
<td>R100S</td>
<td>Linear</td>
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<td>HRS</td>
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**Line Item 0600 - ECOLOGY SURVEY/NEPA SUPPORT**

BOE

Estimators Experience - Estimated costs for planning activities are based on experience from similar Environmental Restoration projects.

Experience Item Desc - Ryan's Pit

- Labor hours were increased by 10% to adjust for project management costs.
- It is assumed that each location will require 10 hours of time for Ecology survey and NEPA work for a total of 90 hours (plus 10%).

Breakdown of Cost Data:

Item - Ecology Survey
Units - hours
Unit Cost - 99
Unit Cost Adjustment factor - None
Revised Unit Cost - None
Basis for adjustment - None

**Line Item 0700 - UTILITY CLEARANCE/SOIL DISTURBANCE REPORT**

BOE

Estimators Experience - Estimated costs for planning activities are based on experience from similar Environmental Restoration projects.

Experience Item Desc - Ryan's Pit

- Labor hours were increased by 10% to adjust for project management costs.
- It is assumed that soil disturbance permits and utility surveys will take 20 hours for each building (9 x 20 = 180).

Breakdown of Cost Data:

Item - Soil Disturbance Permit
Units - hours
Unit Cost - 198
Unit Cost Adjustment factor - None
Revised Unit Cost - None
Basis for adjustment - None

**Line Item 0800 - PROJECT MGMT**

BOE

Estimators Experience - Estimated costs for planning activities are based on experience from similar Environmental Restoration projects.

Breakdown of Cost Data:

Item - Project Mgmt
Units - hours
Unit Cost - 194
Unit Cost Adjustment factor - None
Revised Unit Cost - None
Basis for adjustment - None
**Line Item 0900 - QUALITY ASSURANCE**

<table>
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<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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<tbody>
<tr>
<td></td>
<td>750 STRAIGHT TIME BASE</td>
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**Line Item SY5 - Contingency And Escalation**

<table>
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<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
</tr>
</thead>
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<tr>
<td></td>
<td>CON CONTINGENCY</td>
<td>0000 NONE</td>
<td>ZDEPT No Department</td>
<td>Linear</td>
<td>3,750.45</td>
<td>Dollars</td>
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<td></td>
<td>ESC ESCALATION</td>
<td>0000 NONE</td>
<td>ZDEPT No Department</td>
<td>Linear</td>
<td>7,699.31</td>
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**Activity ID: 1GEPER1630**

**Description:** Foundation Removal Readiness Assessment

<table>
<thead>
<tr>
<th>Line Item</th>
<th>Description</th>
<th>Quantity</th>
<th>Units</th>
<th>BOE</th>
<th>Labor Hours/Unit</th>
<th>Labor Hours Total</th>
<th>Labor Cost Total</th>
<th>Materials/Sub Cost</th>
<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
<th>Burden Cost</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>0100</td>
<td>READINESS ASSESSMENT</td>
<td>1.00 each</td>
<td>EE</td>
<td>187</td>
<td>187</td>
<td>5,780</td>
<td>4,260</td>
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<td>9,840</td>
<td>1,630</td>
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<tr>
<td>0200</td>
<td>TRAINING</td>
<td>1.00 each</td>
<td>EE</td>
<td>132</td>
<td>132</td>
<td>3,001</td>
<td>10,149</td>
<td>0</td>
<td>13,459</td>
<td>991</td>
<td>14,450</td>
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<tr>
<td>0300</td>
<td>PRE-EVOLUTION MEETING</td>
<td>1.00 each</td>
<td>EE</td>
<td>66</td>
<td>66</td>
<td>1,951</td>
<td>5,075</td>
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<td>7,026</td>
<td>550</td>
<td>7,576</td>
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<tr>
<td>SYS</td>
<td>Contingency And Escalation</td>
<td>1.00 ea</td>
<td>EE</td>
<td>0</td>
<td>0</td>
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Total for Activity 1GEPER1630:

|         | 385 | 11,033 | 19,283 | 4,773 | 35,089 | 3,111 | 38,200 |

**Line Item 0100 - READINESS ASSESSMENT**

Estimators Experience - Estimated costs for planning activities are based on experience from similar Environmental Restoration projects.

Experience Item Desc - Ryan's Pit

- It is assumed that only one readiness assessment is needed for all work in this scope, requiring 120 hours to prepare (plus 10% to cover project management costs). It is assumed that subcontractor involvement will require 80 hours at $60/hour = $4800.
- Labor hours were increased by 10% to adjust for project management costs.

Breakdown of Cost Data:

<table>
<thead>
<tr>
<th>Item</th>
<th>Readiness Assessment</th>
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</thead>
<tbody>
<tr>
<td>Units</td>
<td>- lot</td>
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<tr>
<td>Unit Cost</td>
<td>187 hours; $4800 Sub/c</td>
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<tr>
<td>Unit Cost Adjustment factor</td>
<td>None</td>
</tr>
<tr>
<td>Revised Unit Cost</td>
<td>None</td>
</tr>
<tr>
<td>Basis for adjustment</td>
<td>None</td>
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</table>

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
**Rocky Flats Closure Project**

**Baseline Cost and Basis of Estimate**

<table>
<thead>
<tr>
<th>WBS No:</th>
<th>1GAC0B04</th>
<th>Project</th>
<th>Baseline Devl</th>
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<tbody>
<tr>
<td>Activity ID:</td>
<td>1GEPER1650</td>
<td>WBS Filter</td>
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**WBS Filter**

- Activity Filter: *
- Starts In FY: *

<table>
<thead>
<tr>
<th>Task Code</th>
<th>Task Name</th>
<th>Start Date</th>
<th>Hours</th>
<th>Resource</th>
<th>Rate</th>
<th>Cost</th>
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</thead>
<tbody>
<tr>
<td>P090</td>
<td>INDUSTRIAL HYGIENISTS</td>
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<td>22.00</td>
<td>R100S</td>
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<td>ER Programs</td>
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</table>

**Factors**

- 22 HRS
- 0.84576 (SYS 061400) 84576000 - System

**Breakdown of Cost Data:**

**Line Item 0200 - TRAINING**

**Experience Item Desc**

- It is assumed that training will cost $1,000 per subcontract worker and that 12 subcontract employees will require training.
- It is assumed that onsite employees will require the equivalent of 15 hours of training including instructor time and eight onsite employees will be trained.
- All labor hour costs were increased by 10% to adjust for project management costs.

**Breakdown of Cost Data:**

**Resources**

<table>
<thead>
<tr>
<th>Task Code</th>
<th>Task Name</th>
<th>Start Date</th>
<th>Hours</th>
<th>Resource</th>
<th>Rate</th>
<th>Cost</th>
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</thead>
<tbody>
<tr>
<td>P150</td>
<td>TRAINERS</td>
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<td>132.00</td>
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<td>ER Programs</td>
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**Factors**

- 192 HRS
- 0.84576 (SYS 061400) 84576000 - System

**Line Item 0300 - PRE-EVOLUTION MEETING**

**Experience Item Desc**

- It is assumed that 20 subcontract personnel and 12 Site employees will participate in the pre-evolution briefing. It is assumed that the briefing will take 5 hours.
- RFETS labor hours were increased by 10% to adjust for project management costs.

**Breakdown of Cost Data:**

**Resources**

<table>
<thead>
<tr>
<th>Task Code</th>
<th>Task Name</th>
<th>Start Date</th>
<th>Hours</th>
<th>Resource</th>
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<tbody>
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<td>R100S</td>
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<tr>
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**Factors**

- 600 HRS
- 0.84576 (SYS 061400) 84576000 - System

**Line Item SYS - Contingency And Escalation**

**Experience Item Desc**

- It is assumed that 20 subcontract personnel and 12 Site employees will participate in the pre-evolution briefing. It is assumed that the briefing will take 5 hours.
- RFETS labor hours were increased by 10% to adjust for project management costs.

**Breakdown of Cost Data:**

**Resources**

<table>
<thead>
<tr>
<th>Task Code</th>
<th>Task Name</th>
<th>Start Date</th>
<th>Hours</th>
<th>Resource</th>
<th>Rate</th>
<th>Cost</th>
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<td>K265S</td>
<td>ER Programs</td>
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**Factors**

- 600 HRS
- 0.84576 (SYS 061400) 84576000 - System
### Rocky Flats Closure Project

#### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0B04  
**Activity ID:** 1GEPER1650  
**Baseline Deviation:** 1GAC

**Activity ID:** 1GEPER1640  
**Description:** Foundation Removal

#### Cost Element

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<th>Units</th>
<th>BOE Type</th>
<th>Labor Hours/Unit</th>
<th>Labor Hours</th>
<th>Labor Cost</th>
<th>Materials/Sub Cost</th>
<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
<th>Burden Cost</th>
<th>Total Cost</th>
</tr>
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<td>FOUNDATION REMOVAL</td>
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<td>EE</td>
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<td>92,864</td>
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<td>ka</td>
<td>EE</td>
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**Total for Activity 1GEPER1640:**

- **Total Cost:** $1,313,766

---

**Line Item 0100 - FOUNDATION REMOVAL**

**BOE**

1. Foundation Removal

- Foundation removal is based on a previous estimate dated December 30, 1996.
- It is assumed that these costs were escalated 4%.
- Cost per cubic yard for slab removal is:
  - Slab Removal = $73.50
  - Dispositioning of clean material = $6.30
  - Backhoe = $18.00
  - Cost per cubic yard = $97.80
- Escalation = 4%
- Total Subcontractor cost per cubic yard = $104.06
- Total Subcontractor Cost for 6,167 cubic yards = $641,738

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

**Line Item 0200 - WASH/SEGREGATE/SAMPLE/PACK WASTE**

**BOE**

- Additionally, it is assumed that two subcontractor personnel would be spray washing, segregating, sampling, and packaging waste over 122 days of foundation removal @ $50/hour.
- 122 days x 2 x 9 hours/day x $50/hour = $109,800

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

**Line Item 0300 - ANALYTICAL**

**BOE**

- Analytical Samples
  - It is assumed that every 20 cubic yards of concrete will require the equivalent of the following analysis suite:
    - Gamma Spectroscopy $300
    - Gross alpha beta $35
    - TCLP Metals $175
    - $510 per 20 cubic yards

---

**Resources**

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
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<th>Units</th>
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**Factors**

- 0.84576 [SYS 061400], 84576000 - System

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**Resources**

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<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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<tbody>
<tr>
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<td>NONE</td>
<td>K26SS ER Programs</td>
<td>Linear</td>
<td>92,864.45 Dollars</td>
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</tbody>
</table>

**Factors**

- 122 DAYS
  - 2 FTEs
  - 9 HRS PER DAY
  - 50 ESTIMATED $/HR

**Factors**

- 0.84576 [SYS 061400], 84576000 - System
This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

<table>
<thead>
<tr>
<th>Cost Element</th>
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<th>Curve</th>
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**Factors** 25.5 COST PER CY OF CONCRETE

### Line Item 0400 - PROJECT SUPPORT

**BOE**

- **Description**: Estimating Experience - Estimated cost for planning activities are based on experience from similar Environmental Restoration projects.

**Experience Item Desc**: Ryan's Pit

**Breakdown of Cost Data**:

- **Units - hours**: 3843
- **Unit Cost - 3843**: $25.50 per cubic yard
- **Unit Cost Adjustment factor - None**: Total estimated cost for 6,167 cubic yards = $157,259
- **Revised Unit Cost - None**: This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
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<tbody>
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<td>750 $STRAIGHT TIME BASE</td>
<td>E050</td>
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<td>Linear</td>
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**Factors** 1098 HRS

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**Factors** 1098 HRS

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**Factors** 549 HRS

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**Factors** 1098 HRS

### Line Item 0500 - WASTE HANDLING

**BOE**

- **Description**: Waste Handling:

  This activity includes completing waste generator paperwork and waste container costs for low-level concrete waste.

  It is assumed that Lift Liner Bags will be used to contain the low-level concrete waste with a weight limit of 24,000 lbs and capacity limit of 9 cy.

  It is assumed that the total volume of concrete waste is 7 cy (185 cf). Assume specific gravity of concrete is 2.4, which gives (2.4 x 62.4 lbs/cf = 149.76 lbs/cf).

  Total weight: (185 cf x 150 lbs/cf = 27,750 lbs).

  Assume that the Lift Liner Bags are only filled to 19,000 lbs due to transportation vehicle weight limitations.

  Total containers: (27,750 lbs/19,000 lbs per Lift Liner Bag = 1.46).

  Assume cost for each Lift Liner Bag: $400

  - Assume misc. materials cost per bag is $20

  Total container cost: (2 x $420 = $840)

**Breakdown of Cost Data**:

- Prepare Waste Acceptance Forms
- Environmental Engineer - 20 hours
- Unit Cost (container): $840
- Cost for 7 cy (185 cf): $840

### Resources

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**Factors** 20 HRS

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**Factors** 840 CRATE/MATL COSTS
## Line Item SYS - Contingency And Escalation

**BOE**

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**Factors**
- BOE: 261,407.70 Dollars
- ZDEPT: 126,689.80 Dollars

### Activity ID: 1GEPER1650
**Description:** Prepare Foundation Removal Closeout Report

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<th>Description</th>
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**Total for Activity 1GEPER1650:** 352, 10,643, 0, 7,675, 18,318, 3,704, 22,022

### Breakdown of Cost Data:

- **Item - Report Preparation**
  - Units - hours
  - Unit Cost - 200
  - Unit Cost Adjustment factor - None
  - Revised Unit Cost - None
  - Basis for adjustment - None

- **Item - Report Review**
  - Units - hours
  - Unit Cost - 80
  - Unit Cost Adjustment factor - None
  - Revised Unit Cost - None
  - Basis for adjustment - None

- **Item - Report Revision**
  - Units - hours
  - Unit Cost - 40
  - Unit Cost Adjustment factor - None
  - Revised Unit Cost - None
  - Basis for adjustment - None

- **Item - Project Management**
  - Units - HRS
  - Unit Cost - 32
  - Unit Cost Adjustment factor - None
  - Revised Unit Cost - None
  - Basis for adjustment - None

### Resources

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<th>Quantity</th>
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**Factors**
- BOE: 320.00 HRS
- ZDEPT: 32.00 HRS

### Activity ID: 1GEPER1650
**Description:** Prepare Foundation Removal Closeout Report

**Cost Risk:** 1  **Schedule Risk:** 3
Rocky Flats Closure Project
Baseline Cost and Basis of Estimate

WBS No: 1GAC0B04
Activity ID: 1GEPER1650

Baseline Cost and Basis of Estimate

WBS No: 1GAC0B04
Activity ID: 1GEPER1650

CON CONTINGENCY 0000 NONE ZDEPT No Department Linear 5,452.06 Dollars
ESC ESCALATION 0000 NONE ZDEPT No Department Linear 2,222.58 Dollars

WBS No: 1GAC0B05
Title: Industrial Area Regrade & Revegetation

Activity ID: 1GEPERS0000
Description: Develop Regrade/Revegetation Plan

Line Item CPEPER5010 - DEVELOP PLAN

For more complete detail refer to Timberline estimate No. 111111-08 "Industrial Area Regrade & Revegetate" by John Hopkins.

Estimators Experience - 15 years of experience budgeting, scheduling, and conducting environmental projects of a similar size and scope.

Experience Item Desc - Plan Development
Breakdown of Cost Data:
Item - Plan Development
Units - lot
Unit Cost - $7287 Sub/c
Unit Cost Adjustment factor - none
Revised Unit Cost - none
Basis for adjustment - none

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

Line Item SYS - Contingency And Escalation

BOE

Resources

Cost Element Skill Department Curve Quantity Units
750 STRAIGHT TIME BASE E050 ENVIRONMENTAL ENGINEERS R100S RMRS Salaried Linear 996.00 Hours
Factors 996 HRS
750 STRAIGHT TIME BASE G010 ADMINISTRATIVE ASSISTANTS R100S RMRS Salaried Linear 100.00 Hours
Factors 100 HRS
750 STRAIGHT TIME BASE M020 MANAGERS (GRADE 69 - 72) R100S RMRS Salaried Linear 166.00 Hours
Factors 166 HRS
750 STRAIGHT TIME BASE P050 COMPLIANCE INSPECTORS R100S RMRS Salaried Linear 664.00 Hours
Factors 664 HRS
750 STRAIGHT TIME BASE P090 INDUSTRIAL HYGIENISTS R100S RMRS Salaried Linear 664.00 Hours
Factors 664 HRS
664 SUBCONTRACTED SRVS P070 COST ESTIMATORS PLANNERS AN K265S ER Programs Linear 6,163.39 Dollars
Factors 6/23/00 9:23:48 AM 0.84576 [SYS 061400].84576000 - System

Activity ID: 1GEPERS010
Description: Procurement of Subcontractors for Regrade/Reveg

Line Item CPEPER5105 - PROCUREMENT

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0.84576 [SYS 061400].84576000 - System
For more complete detail refer to Timberline estimate No. 11111-08 "Industrial Area Rgrade & Revegetate" by John Hopkins.

Estimators Experience - 15 years of experience budgeting, scheduling, and conducting environmental projects of a similar size and scope.

Experience Item Desc - Plan Development

Breakdown of Cost Data:

Item - Procurement
Units - lot
Unit Cost - 1162 hrs; $35408 Sub/c
Unit Cost Adjustment factor - none
Revised Unit Cost - none
Basis for adjustment - none

Estimators Experience -
Experience Item Desc -
Breakdown of Cost Data:
Item -
Units -
Unit Cost -
Unit Cost Adjustment factor -
Revised Unit Cost -
Basis for adjustment -

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

Resources

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Line Item SYS - Contingency And Escalation

BOE

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<th>Curve</th>
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Activity ID: 1GEPERS0502
Description: Install Culverts

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<th>BOE Type</th>
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For more complete detail refer to Timberline estimate No. 1111-08 "Industrial Area Regrade & Revegetate" by John Hopkins.

Estimators Experience - 15 years of experience budgeting, scheduling, and conducting environmental projects of a similar size and scope.

Experience Item Desc - Plan Development

Breakdown of Cost Data:

Item - Project Mgmt
Units - lot
Unit Cost - 824 hrs; $7287 Sub/c
Unit Cost Adjustment factor - none
Revised Unit Cost - none
Basis for adjustment - none

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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**Line Item CPEPER5205 - Install 30" dia. Culverts**

Excavating, trench, 4'-6" d, 3/4 cy hyd backhoe
Labor: 622 cy x .0533 mh/cy x $26.015 = $864
Eq: 622 cy x .02667 mh/cy x $23.443 = $896
Backfill trench
Labor: 532 cy x .03000 mh/cy x $23.443 = $374
Eq: 532 cy x .02000 mh/cy x $54 = 297
Compaction
Compaction, vibratory plate, 8" lifts
Labor: 532 cy x .04000 mh/cy x $7.57 = $374
Eq: 532 cy x .04000 mh/cy x $23.443 = $297
Ref: Richardson 2-5, Page 4

Piping, plain, 30" dia, 14 ga
Labor: 500 lf x .21538 x $27.666 = $2,979
Mat: 500 lf x $21.221 /lf = $10,611
Eq: 500 lf x .03077 mh/cy x $25.90 = $398
End Sections
Labor: 10 ea x 3.33333 x $27.666 = $2,979
Mat: 10 ea x $208.98 /lf = $2,090
Eq: 10 ea x 3.333 mh/cy x $25.90 = $86
Total: $19,770/500 lf = $39.54
For more complete detail refer to Timberline estimate No. 111111-08 "Industrial Area Regrade & Revegetate" by John Hopkins.

Breakdown of Cost Data:

Item - Culvert Installation
Units - lf
Unit Cost - 39.54
Unit Cost Adjustment factor - none
Revised Unit Cost - none
Basis for adjustment - none

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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Line Item CPEPERS5220 - Place Rip-Rap at Culverts

**BOE**

Rip-rap, machine places for slope protection

Labor: 120 cy x .25806 mh/cy x $26.015 = 806
Mat: 120 cy x $12.9/cy = $1,548
Eq: 120 cy x .25806 mh/cy x $28.19 = $873

Total: $3,227/120 cy = $26.89/cy

For more complete detail refer to Timberline estimate No. 111111-08 "Industrial Area Regrade & Revegetate" by John Hopkins.

Breakdown of Cost Data:

Item - Procurement
Units - cy
Unit Cost - 26.89
Unit Cost Adjustment factor - none
Revised Unit Cost - none
Basis for adjustment - none

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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Line Item CPEPERS5230 - Excavate Surface Water Ditch

**BOE**

Excavating, trench, 4'-6", d, 5/8cy hyd backhoe

Labor: 12,500 cy x .064 mh/cy x $26.015 = $20,812
Eq: 622 cy x .0320 mh/cy x $47.30 = $18,920

Fill, by dozer, no compaction

Labor: 12,500 cy x .01200 mh/cy x $23.443 = $3,516
Eq: 12,500 cy x .0080 mh/cy x $102.45 = $10,245

Total: $53,493/12,500 cy = $4.28/cy

For more complete detail refer to Timberline estimate No. 111111-08 "Industrial Area Regrade & Revegetate" by John Hopkins, RMRS X4974.

Estimators Experience - 15 years of experience budgeting, scheduling, and conducting environmental projects of a similar size and scope.
Experience Item Desc - Plan Development

Breakdown of Cost Data:

- Item - Procurement
  - Units: 6414 hrs
  - Unit Cost: $30862 Sub/c
  - Unit Cost Adjustment factor: none
  - Revised Unit Cost: none
  - Basis for adjustment: none

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

Estimators Experience - 15 years of experience budgeting, scheduling, and conducting environmental projects of a similar size and scope.

Breakdown of Cost Data:

- Item - Project mgmt
  - Units: lot
  - Unit Cost: 6414 hrs; $30862 Sub/c
  - Unit Cost Adjustment factor: none
  - Revised Unit Cost: none
  - Basis for adjustment: none

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

For more complete detail refer to Timberline estimate No. 111111-08 "Industrial Area Regrade & Revegetate" by John Hopkins.

---

**Resources**

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**Factors**: 53493 Dollars

**Line Item SYS - Contingency And Escalation**

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**Factors**: 69029.9 Dollars

**BOE**

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**Factors**: 23536.3 Dollars

**Activity ID:** 1GEPER5030 - Description: Regrade Industrial Area

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### Rocky Flats Closure Project

#### Baseline Cost and Basis of Estimate

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| WBS No: 1GAC0B05 |  |

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<td><strong>BOE</strong></td>
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<tr>
<td><strong>Excavation, bulk, scrapers, 21 cy, 1500' haul</strong></td>
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<tr>
<td><strong>Regrade and shape area:</strong></td>
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<tr>
<td>Labor: (445 acre x 6&quot;) 358,967 cy x .02109 mh/cy x $23.789 = $180,097</td>
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<tr>
<td>Eq: 358,967 cy x .01488 mh/cy x $207.725 = $1,109,548</td>
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<tr>
<td>Spotter (4ea): 358,967 cy x .02109 mh/cy x $16.92 = $128,094</td>
</tr>
<tr>
<td>Water Truck (3,000 gallon): (358,967 cy)</td>
</tr>
<tr>
<td>Labor: 2798 mh x 24.55 = $568,691</td>
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<tr>
<td>Eq: 358,967 cy x 0.39 mh/cy = $139,997</td>
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<tr>
<td>Replace 4&quot; topsoil:</td>
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<tr>
<td>Labor: (488 acre x 4&quot;) 262,436 cy x .02109 mh/cy x $23.789 = $131,667</td>
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<tr>
<td>Eq: 262,436 cy x .01488 mh/cy x $207.725 = $5811,176</td>
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<tr>
<td>Topsoil: (1.6 ton/cy x 262,436) x $7.50/ton = $3,149,232</td>
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<tr>
<td>Spotter (4ea): 358,967 cy x .02109 mh/cy x $16.92 = $128,094</td>
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<tr>
<td>Water Truck (3,000 gallon): (358,967 cy)</td>
</tr>
<tr>
<td>Labor: 2798 mh x 24.55 = $568,691</td>
</tr>
<tr>
<td>Eq: 358,967 cy x 0.39 mh/cy = $139,997</td>
</tr>
<tr>
<td>Total: $6,055,284/621,403cy = $9.74/cy</td>
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<tr>
<td>For more complete detail refer to Timberline estimate No. 111111-08 &quot;Industrial Area Regrade &amp; Revegetate&quot; by John Hopkins.</td>
</tr>
<tr>
<td>Estimators Experience - 15 years of experience budgeting, scheduling, and conducting environmental projects of a similar size and scope.</td>
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<tr>
<td>Experience Item Desc - Plan Development</td>
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#### Breakdown of Cost Data:

- **Item** - Regrade and Place Topsoil - Industrial Area
- **Units** - cy
- **Unit Cost** - 9.74
- **Unit Cost Adjustment factor** - none
- **Revised Unit Cost** - none
- **Basis for adjustment** - none

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

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| Factors | 6055284 Dollars |

#### Line Item CPEPERS225 - Remove Misc. Items

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<td>Eq: 36 ea x $2100= $75,600</td>
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<td>Haul to Landfill</td>
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<td>Total: $220,645/36 ea = $6129/ea</td>
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6/23/00 9:23:49 AM
For more complete detail refer to Timberline estimate No. 111111-08 "Industrial Area Regrade & Revegetate" by John Hopkins.

Estimators Experience - 15 years of experience budgeting, scheduling, and conducting environmental projects of a similar size and scope.

Experience Item Desc - Plan Development

Breakdown of Cost Data:

- Item - item removal
- Units - ea
- Unit Cost - $6129
- Unit Cost Adjustment factor - none
- Revised Unit Cost - none
- Basis for adjustment - none

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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<th>Resources</th>
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Line Item SYS - Contingency And Escalation

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Activity ID: 1GEPERS030 Description: Dam Conversion

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Total for Activity 1GEPERS035:

5,280 | 156,077 | 338,304 | 397,065 | 691,446 | 91,328 | 982,774 |

Line Item 010 - Engineering Design/Planning

Estimate based on Estimator Experience obtained per discussions with Keith Motyl to add spillway - 50% capacity level for each of four dams.

Breakdown of Cost Data:

- Item - Engineering Design/Planning
- Units - lot
- Unit Cost - 585 hrs; $8,100 Sub/c
- Unit Cost Adjustment factor - none
- Revised Unit Cost - none
- Basis for adjustment - none

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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Line Item 020 - Construction Activities

Estimate based on Estimator Experience obtained per discussions with Keith Motyl to add spillway - 50% capacity level for each of four dams.
Breakdown of Cost Data:

Item - Construction Activities
Units - lot
Unit Cost - $91,900 Sub/c
Unit Cost Adjustment factor - none
Revised Unit Cost - none
Basis for adjustment - none

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

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Line Item 030 - Construction Oversight

BOE

Estimate Based on Estimator Experience obtained per discussions with Keith Motyl to add spillway - 50% capacity level for each of four dams.

Breakdown of Cost Data:

Item - Construction Oversight
Units - lot
Unit Cost - Hours - 755
Unit Cost Adjustment factor - none
Revised Unit Cost - none
Basis for adjustment - none

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Line Item SYS - Contingency And Escalation

BOE

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<td>SYS</td>
<td>Contingency And Escalation</td>
<td>1.00</td>
<td>EE</td>
<td></td>
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Total for Activity 1GEPERS040:

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<th>Units</th>
<th>BOE</th>
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<th>Labor Hours/Unit</th>
<th>Labor Hours</th>
<th>Labor Cost</th>
<th>Materials/Sub</th>
<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
<th>Burden Cost</th>
<th>Total Cost</th>
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<tbody>
<tr>
<td>CPER5051</td>
<td>Project Management</td>
<td>1.00</td>
<td>EE</td>
<td></td>
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<td></td>
<td></td>
<td>3,941,683</td>
<td>6,469,596</td>
<td>6,549,297</td>
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Line Item CPER5051 - Project Management

BOE

For more complete detail refer to Timberline estimate No. 111111-08 "Industrial Area Regrade & Revegetate" by John Hopkins.

Estimators Experience - 15 years of experience budgeting, scheduling, and conducting environmental projects of a similar size and scope.

Experience Item Desc - Plan Development

Breakdown of Cost Data:

Item - Project mgmt
Units - lot
Unit Cost - 2739 hrs; $15431 Sub/c
Unit Cost Adjustment factor - none
Revised Unit Cost - none
Basis for adjustment - none

OFFICIAL USE ONLY
### Resources

<table>
<thead>
<tr>
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<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
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<tr>
<td>750 STRAIGHT TIME BASE</td>
<td>E050 ENVIRONMENTAL ENGINEERS</td>
<td>R100S RMRS Salaried</td>
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<td>498.00</td>
<td>Hours</td>
</tr>
<tr>
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<td>498 HRS</td>
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<tr>
<td>750 STRAIGHT TIME BASE</td>
<td>G010 ADMINISTRATIVE ASSISTANTS</td>
<td>R100S RMRS Salaried</td>
<td>Linear</td>
<td>249.00</td>
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<td>M020 MANAGERS (GRADE 69 - 72)</td>
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<td>Hours</td>
</tr>
<tr>
<td>Factors</td>
<td>498 Hours</td>
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<tr>
<td>750 STRAIGHT TIME BASE</td>
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<tr>
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### Line Item CPEPERS215 - Revegetate Industrial Area

**BOE**

- **Seeding (including Fine grade, Lime, Fertilizer and Seed, with Equipment):**
  
  \[(488 \text{ acres} \times 4,840 \text{ sy/acre} = 2,361,920 \text{ sy})\]

  Labor: \[2,361,920 \text{ sy} \times 0.048\text{hrs/sy} \times $24.99 = $2,833,170\]

  Material: \[2,361,920 \text{ sy} \times 0.194\text{/sy} = $458,212\]

  Equip: \[2,361,920 \text{ sy} \times 0.22\text{/sy} = $519,622\]

  Total: \[3,811,004/2,361920 \text{ sy} = $1.61 \text{ sy}\]

  For more complete detail refer to Timberline estimate No. 111111-08 "Industrial Area Regrade & Revegetate" by John Hopkins.

- **Estimators Experience:** 15 years of experience budgeting, scheduling, and conducting environmental projects of a similar size and scope.

- **Experience Item Desc:** Plan Development

**Breakdown of Cost Data:**

- **Item - revegetate**
- **Units - sy**
- **Unit Cost - $1.61**
- **Unit Cost Adjustment factor - none**
- **Revised Unit Cost - none**
- **Basis for adjustment - none**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
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<th>Quantity</th>
<th>Units</th>
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### Line Item SYS - Contingency And Escalation

**BOE**

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<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
</tr>
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<tr>
<td>ESC ESCALATION</td>
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<td>833857 Dollars</td>
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</table>
## SWB Work Plan Development

**BOE**

- **Description:** SWB Work Plan Development
- **Quantity:** 1.00 each
- **Hours/Unit:** VQ
- **Labor Hours:** 0
- **Total Labor Hours:** 0
- **Labor Cost:** 16,830
- **Total Labor Cost:** 16,830
- **Units:** 0
- **Total Units:** 0
- **Materials/Sub Contingency:** 0
- **Total Materials/Contingency:** 0
- **Total Prime Cost:** 16,830
- **Burden Cost:** 16,830
- **Total Cost:** 16,830

### Resources

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<th>Units</th>
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</thead>
<tbody>
<tr>
<td>ASH</td>
<td>SUBCONTRACTED SRVS</td>
<td>0000</td>
<td>NONE</td>
<td>K109S</td>
<td>Env Sys, Stewardship &amp; Compliance</td>
</tr>
</tbody>
</table>
The RMRS labor hours for environmental engineers, geologists, scientists, and management personnel are based on estimates from the above vendors for support needed, and on Estimator’s Experience in the fields of project management, groundwater modeling, and environmental remediation.

Estimators Experience - C. Dayton = 13 years of project management, hydrogeology and environmental remediation experience.
L. Gregory-Frost = 21 years experience in project management, geology, hydrogeology, and environmental remediation.

Experience Item Desc - Site Water Balance. Vendor technical estimates and detailed spreadsheets located in the Water Balance project management files.

(C.Dayton, T130C)

Breakdown of Cost Data:
- Item - direct labor hours and ODC dollars based on past project actuals and vendor technical estimates
- Units - labor hour by discipline and ODCs by procurement line item
- Unit Cost - summary of direct labor hours at current labor rates: 54 hrs for environmental field engineer; 164 hours for technical management; 621 hours for groundwater modeling geologist; 14 hours for RCT; 1080 hours for other scientists; 100 hours for environmental scientists; $9000 for RTG to support data collection activities
- Unit Cost Adjustment factor - none

Vendor Name - Rocky Mountain Remediation Services (RMRS)

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
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<th>Curve</th>
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<td>750</td>
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<td>E050</td>
<td>R100S</td>
<td>RMRS Salaried</td>
<td>Front Loaded</td>
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<tr>
<td>Factors 54</td>
<td>G Squibb or Env Eng hours</td>
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<td>Factors 164</td>
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<td>STRAIGHT TIME BASE</td>
<td>S020</td>
<td>R100S</td>
<td>RMRS Salaried</td>
<td>Front Loaded</td>
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<td>Factors 100</td>
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<td>S030</td>
<td>R100S</td>
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<tr>
<td>Factors 621</td>
<td>R Smith or Geol. Hours</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>750</td>
<td>STRAIGHT TIME BASE</td>
<td>S090</td>
<td>R100S</td>
<td>RMRS Salaried</td>
<td>Front Loaded</td>
</tr>
<tr>
<td>Factors 1080</td>
<td>Other Scientists hours</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>750</td>
<td>STRAIGHT TIME BASE</td>
<td>T050</td>
<td>K109S</td>
<td>Env Sys, Stewardship &amp; Compliance</td>
<td>Linear</td>
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<tr>
<td>Factors 96556</td>
<td>IEC SW support dollars</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>ASH</td>
<td>SUBCONTRACTED SRVS</td>
<td>0000</td>
<td>K109S</td>
<td>Env Sys, Stewardship &amp; Compliance</td>
<td>Front Loaded</td>
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<tr>
<td>Factors 9000</td>
<td>RTG sampling dollars</td>
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<td></td>
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<table>
<thead>
<tr>
<th>Line Item</th>
<th>Description</th>
<th>Quantity</th>
<th>Units</th>
<th>BOE Type</th>
<th>Labor Hours/Unit</th>
<th>Labor Hours Total</th>
<th>Labor Cost Total</th>
<th>Materials/ Sub Cost</th>
<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
<th>Burden Cost</th>
<th>Total Cost</th>
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</thead>
<tbody>
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<td>SWB Initiate water Balance</td>
<td>1.00</td>
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<td>0</td>
<td>0</td>
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</table>
**Rocky Flats Closure Project**

**Baseline Cost and Basis of Estimate**

**WBS No:** 1GAC0B06  
**Activity ID:** 1GAC221020

**Basis of Estimate:**
The estimate is based on a combination of vendor quotes, vendor technical estimates, and estimator experience. The following vendor quotes and vendor technical estimates were used to prepare the cost estimate for the SWB Work Plan Development.

**Vendor Name:** Applied Hydrology Associates (AHA)

Vendor Quotes - Negotiated KH subcontract (KH001055MB) and subsequent vendor quotes included in E-mails to L. Gregory-Frost dated April 7, 2000 and April 11, 2000. Vendor accrual estimates through May 21, 2000 received by e-mail on May 17, 2000. (copies in Estimator’s (C.Dayton’s) Site Water Balance project management files located in T130C)

**Date Received:** see above

Item being quoted - Technical subcontracted services to complete a Water Balance evaluation

Availability - currently under contract to do described scope of work

**Activity ID:** 1GAC221030  
**Description:** SWB Model Calibration

**Cost Risk:** 3  
**Schedule Risk:** 2

**Cost Element** | **Skill** | **Department** | **Curve** | **Quantity** | **Units** | **Labor Hours/Unit** | **Labor Hours Total** | **Labor Cost Total** | **Materials/Sub Cost** | **Contingency & Escalation** | **Total Prime Cost** | **Burden Cost** | **Total Cost**
---|---|---|---|---|---|---|---|---|---|---|---|---|---
 1 | SWB Calibration of Model | 1.00 each | QO | 0 | 0 | 0 | 54,003 | 0 | 54,003 | 0 | 54,003 | 0 | 54,003 | 0 | 54,003
 2 | Contingency And Escalation | 1.00 ea | FE | 0 | 0 | 0 | 2,914 | 0 | 2,914 | 0 | 2,914 | 0 | 2,914 | 0 | 2,914

**Total for Activity 1GAC221030:**

| **Description** | **Quantity** | **Units** | **Labor Hours/Unit** | **Labor Hours Total** | **Labor Cost Total** | **Materials/Sub Cost** | **Contingency & Escalation** | **Total Prime Cost** | **Burden Cost** | **Total Cost** |
---|---|---|---|---|---|---|---|---|---|---|
| SWB Calibration of Model | 1.00 each | QO | 0 | 0 | 0 | 54,003 | 0 | 54,003 | 0 | 54,003 |
| Contingency And Escalation | 1.00 ea | FE | 0 | 0 | 0 | 2,914 | 0 | 2,914 | 0 | 2,914 |

**Activity ID:** 1GAC221020  
**Description:** SWB Initiate Water Balance

**BOE**

**Resources**

| **Skill** | **Quantity** | **Units** | **BOE** | **Labor Hours/Unit** | **Labor Hours Total** | **Labor Cost Total** | **Materials/Sub Cost** | **Contingency & Escalation** | **Total Prime Cost** | **Burden Cost** | **Total Cost** |
---|---|---|---|---|---|---|---|---|---|---|---|
| ASH | SUBCONTRACTED SRVS | 0000 | NONE | K109S | Env Sys, Stewardship & Compliance | Linear | 23,796.00 | Dollars |

**Factors:** 23,796  
AHA dollars

**Line Item SYS - Contingency And Escalation**

**BOE**

**Resources**

| **Skill** | **Quantity** | **Units** | **BOE** | **Labor Hours/Unit** | **Labor Hours Total** | **Labor Cost Total** | **Materials/Sub Cost** | **Contingency & Escalation** | **Total Prime Cost** | **Burden Cost** | **Total Cost** |
---|---|---|---|---|---|---|---|---|---|---|---|
| CON | CONTINGENCY | 0000 | NONE | ZDEPT | No Department | Linear | 78.42 | Dollars |

**Factors:** 78.42  
SIEM dollars

**ESC | ESCALATION | 0000 | NONE | ZDEPT | No Department | Linear | 54.39 | Dollars |

**Factors:** 54.39  
SIEM dollars

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

**WBS No:** 1GAC0B06  
**Activity ID:** 1GAC221030

**Project:** Baseline Devi  
**WBS Filter:** 1GAC  
**Activity Filter:** *  
**Starts In FY:** *

### CON - CONTINGENCY

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### ESC - ESCALATION

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</table>

### Activity ID: 1GAC221040  
**Description:** SWB Modeling Scenarios  
**Schedule Risk:** 2  
**Cost Risk:** 3

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<th>Description</th>
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<th>Units</th>
<th>BOE Type</th>
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<th>Materials/Sub Cost</th>
<th>Contingency &amp; Escalation</th>
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<th>Burden Cost</th>
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**Total for Activity 1GAC221040:**

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<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
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<th>Burden Cost</th>
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### Activity ID: 1GAC221050  
**Description:** SWB Modeling Report  
**Schedule Risk:** 2  
**Cost Risk:** 3

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<td>SWB Modeling Report</td>
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### Cost Element - Skill Department

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<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASH SUBCONTRACTED SRVS</td>
<td>0000</td>
<td>NONE</td>
<td>K109S</td>
<td>Environ Sys, Stewardship &amp; Compliance</td>
<td>Linear</td>
<td>79,273.09 Dollars</td>
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<tr>
<td>ASR MISC EXPENSES</td>
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<td>573.00 Dollars</td>
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### Line Item SYS - Contingency And Escalation

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<th>Cost Element</th>
<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CON CONTINGENCY</td>
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<td>ZDEPT</td>
<td>No Department</td>
<td>Linear</td>
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<tr>
<td>ESC ESCALATION</td>
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<td>NONE</td>
<td>ZDEPT</td>
<td>No Department</td>
<td>Linear</td>
<td>1,743.12 Dollars</td>
</tr>
</tbody>
</table>

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**BOE Basis of Estimate:**

The estimate is based on a combination of vendor quotes, vendor technical estimates, and estimator experience. The following vendor quotes and vendor technical estimates were used to prepare the cost estimate for the SWB Work Plan Development.

**Vendor Name – Applied Hydrology Associates (AHA)**

Vendor Quotes - Negotiated KH subcontract (RH001055MB) and subsequent vendor quotes included in E-mails to L. Gregory-Frost dated April 7, 2000 and April 11, 2000. Vendor accrual estimates through May 21, 2000 received by e-mail on May 17, 2000. (copies in Estimator’s (C.Dayton’s) Site Water Balance project management files located in T130C)

Quotes Received by - C. Dayton and L. Gregory-Frost  
**Date Received - see above**

**Item being quoted - Technical subcontracted services to complete a Water Balance evaluation**

**Availability - currently under contract to do described scope of work**

**Breakdown of Cost Data:**

- Item – ODC dollars from past project actuals
- Units – ODC dollars by procurement line item
- Unit Cost – estimated cost of procuring ODCs totaling: $573 for room rental and food/beverage service for one public meeting
- Unit Cost Adjustment factor - none
- Revised Unit Cost - NA
- Basis for adjustment - no adjustment made for current estimate

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
Basis of Estimate:
The estimate is based on a combination of vendor quotes, vendor technical estimates, and estimator experience. The following vendor quotes and vendor technical estimates were used to prepare the cost estimate for the SWB Work Plan Development.

Vendor Name - Applied Hydrology Associates (AHA)
Vendor Quotes - Negotiated KH subcontract (KH001055MB) and subsequent vendor quotes included in E-mails to L. Gregory-Frost dated April 7, 2000 and April 11, 2000. Vendor accrual estimates through May 21, 2000 received by e-mail on May 17, 2000. (copies in Estimator’s (C.Dayton’s) Site Water Balance project management files located in T130C)

Date Received - see above
Item being quoted - Technical subcontracted services to complete a Water Balance evaluation
Availability - currently under contract to do described Scope of Work

Breakdown of Cost Data:
Units - ODC dollars by procurement line item
Unit Cost - estimated cost of procuring ODCs totaling: $573 for room rental and food/beverage service for one public meeting
Unit Cost Adjustment factor - none
Revised Unit Cost - NA
Basis for adjustment - no adjustment made for current estimate

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
**Rocky Flats Closure Project**

**Baseline Cost and Basis of Estimate**

**WBS No:** 1GAC0B06  
**Activity ID:** 1GAC221060

**Baseline Development Filter**

**WBS Filter:** 1GAC

**Vendor Quotes** - Negotiated KH subcontract (KH001055MB) and subsequent vendor quotes included in E-mails to L. Gregory-Frost dated April 7, 2000 and April 11, 2000. Vendor accrual estimates through May 21, 2000 received by e-mail on May 17, 2000. (copies in Estimator’s files)

**Project Management files located in T130C**

**Cost Element**

<table>
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<tr>
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<th>Cost Element</th>
<th>Skill</th>
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**BOE Resources**

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**Line Item**

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<th>Labor Hours</th>
<th>Labor Cost Total</th>
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This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
**Rocky Flats Closure Project**

**Baseline Cost and Basis of Estimate**

**WBS No:** 1GAC0B06  
**Activity ID:** 1GAC221070

---

### Line Item 1 - SWB Peer Review

**BOE**

- **Basis of Estimate:** Peer review estimate based on A. Freeze (or other independent internationally respected hydrogeologist or hydrologist) providing peer review services throughout the duration of the project. Based on peer review and advisor costs associated with the Actinide Migration project in FY 98 and FY99 (at $250/hour rate), $60,000 (at $250 per hour) will be required for the peer review services contract. This cost estimate will be updated upon negotiation of a contract with the peer reviewer. Anticipated contract award date is early August 2000.

- **Estimators Experience - C. Dayton = 13 years of project management, hydrogeology and environmental remediation experience.** Cost estimate based on professional experience related to the technical and stakeholder needs for credible Peer Reviewers. Project manager and Wadlet manager for previous AME studies (WAD 1, WBS 1.1.03.06.01.08 and WAD 1, 1.1.03.07.01). 1998 and 1999 BEST estimates and budget expenditures for work completed. Detailed spreadsheets located in the Actinide Migration project management files (C.Dayton, T130C).

- **Experience Item Desc - Activity includes contracting with an internationally respected Peer Reviewer for the Site Water Balance project.

- **Breakdown of Cost Data:**
  - Item - subcontracted labor hours
  - Units - subcontract dollars
  - Cost Estimation...  
  - Basis for adjustment - no adjustment made for current estimate

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

### Resources

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### Line Item SYS - Contingency And Escalation

**BOE**

**Resources**

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**WBS No:** 1GAC0B07  
**Title:** Land Configuration Design Basis

**Activity ID:** 1GCRDB1000  
**Description:** PROCURE SUB/C FOR LAND CONFIGURATION WORK PLAN

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<th>Units</th>
<th>BOE Type</th>
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<th>Labor Hours Total</th>
<th>Labor Cost Total</th>
<th>Materials/ Sub Cost</th>
<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
<th>Burden Cost</th>
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<tr>
<td>0100</td>
<td>PREPARE SOW/PROCUREMENT</td>
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<td>EE</td>
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**Total for Activity 1GCRDB1000:**

- 384  
- 12,384  
- 3,112  
- 1,145  
- 1,145  
- 1,145  
- 5,907  
- 22,548

---

### Line Item 0100 - PREPARE SOW/PROCUREMENT

**BOE**

- **Estimators Experience - Project manager's experience with similar type work (7 years)**

- **Experience Item Desc - Statement of Work/Procurement**

**Breakdown of Cost Data:**

- Item - SOW Prep/Procurement and Mgmt Oversight
  - Units - lot
  - Cost - $3680 sub/c dollars
- Basis for adjustment - no

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

### Resources

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### Activity ID: 1GCRDB1100
**Description:** Develop Conceptual Level DQO's

#### BOE

**Line Item 0100 - CONCEPTUAL LEVEL/DQOs**

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<th>Labor Hours/Unit</th>
<th>Labor Hours</th>
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<th>Burden Cost</th>
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**Summary:**
- **Total for Activity 1GCRDB1100:** 182 hours, Total Labor Cost 6,089 dollars

---

### Activity ID: 1GCRDB1200
**Description:** Existing Data Compilation/Assessment

#### BOE

**Line Item SY$ - Contingency And Escalation**

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<tr>
<th>Description</th>
<th>Quantity</th>
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<th>Labor Hours/Unit</th>
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<th>Total Prime Cost</th>
<th>Burden Cost</th>
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<tr>
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**Summary:**
- **Total for Activity 1GCRDB1200:** 6,089 dollars

---

### Breakdown of Cost Data:

- **Item - Design/DQO Prep and Mgmt Oversight**
- **Units - lot**
- **Unit Cost - 182 hrs; $7200 sub/c dollars**
- **Unit Cost Adjustment factor - none**
- **Revised Unit Cost - none**
- **Basis for adjustment - none**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### Rocky Flats Closure Project

#### Baseline Cost and Basis of Estimate

<table>
<thead>
<tr>
<th>Activity ID: 1GCRDB1300</th>
<th>Description: Work Plan Development</th>
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<tbody>
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#### Line Item 0100 - WORK PLAN DEVELOPMENT

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<tr>
<th>BOE</th>
<th>Estimators Experience - Project manager's experience with similar type work (7 years)</th>
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<tbody>
<tr>
<td></td>
<td>Experience Item Desc - Work Plan Development</td>
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</tbody>
</table>

#### Breakdown of Cost Data:

- **Item**: Data Compilation and Mgmt Oversight
- **Units**: lot
- **Unit Cost**: 90 hrs; $80640 sub/c dollars
- **Unit Cost Adjustment factor**: none
- **Revised Unit Cost**: none
- **Basis for adjustment**: none

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

<table>
<thead>
<tr>
<th>Cost Element</th>
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Total for Activity 1GCRDB1300:

- **Labor Hours/Unit**: 180
- **Labor Cost Total**: 36,432
- **Material/ Sub Cost**: 0
- **Total Prime Cost**: 38,832
- **Burden Cost**: 38,832
- **Total Cost**: 42,664

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### Line Item 01000 - EXISTING DATA COMPILATION

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#### Breakdown of Cost Data:

- **Item**: Data Compilation and Mgmt Oversight
- **Units**: lot
- **Unit Cost**: 90 hrs; $80640 sub/c dollars
- **Unit Cost Adjustment factor**: none
- **Revised Unit Cost**: none
- **Basis for adjustment**: none

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

<table>
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<tr>
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Total for Activity 1GCRDB1200:

- **Labor Hours/Unit**: 90
- **Labor Cost Total**: 2,989
- **Material/ Sub Cost**: 0
- **Total Prime Cost**: 3,288
- **Burden Cost**: 3,288
- **Total Cost**: 3,636

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### Line Item SYS - Contingency And Escalation

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<th>Contingency And Escalation</th>
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#### Breakdown of Cost Data:

- **Item**: Contingency And Escalation
- **Units**: lot
- **Unit Cost**: 75 hrs; $2,400 sub/c dollars
- **Unit Cost Adjustment factor**: none
- **Revised Unit Cost**: none
- **Basis for adjustment**: none

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### Breakdown of Cost Data:

**Item** - Work Plan Development and Mgmt Oversight  
**Units** - lot  
**Unit Cost** - 20 hrs; $0 sub/c dollars  
**Unit Cost Adjustment factor** - none  
**Revised Unit Cost** - none  
**Basis for adjustment** - none

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Line Item SYS - Contingency And Escalation  
**BOE**

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### Activity ID: 1GCRDB1330  
**Description**: REVIEW WORK PLAN BY KH & DOE

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**Total for Activity 1GCRDB1330**:  
20  
740  
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0  
58  
58  
8  
58  
756  
353  
1,151

### Line Item 0100 - WORK PLAN REVIEW  
**BOE**

- **Estimators Experience** - Project manager's experience with similar type work (7 years)  
- **Experience Item Desc** - Work Plan review

**Breakdown of Cost Data:**  
**Item** - Mgmt Oversight  
**Units** - lot  
**Unit Cost** - 20 hrs; $0 sub/c dollars  
**Unit Cost Adjustment factor** - none
### Rocky Flats Closure Project

**Baseline Cost and Basis of Estimate**

- **WBS No:** 1GAC0B07
- **Activity ID:** 1GCDB1330

#### Baseline Development

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#### Revised Unit Cost - none

Basis for adjustment - none

#### Resources

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<th>Quantity</th>
<th>Units</th>
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**Factors:** 20 HRS

#### Line Item SYS - Contingency And Escalation

**BOE**

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**Factors:** 34.9622 Dollars

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**Factors:** 22.9829 Dollars

**Activity ID:** 1GCDB1340

**Description:** INCORP KH/DOE COMMENTS INTO WORK PLAN

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<td>EE</td>
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Total for Activity 1GCDB1340: 65 2,192 6,773 531 9,496 1,046 10,541

#### Breakdown of Cost Data:

**Estimators Experience - Project manager's experience with similar type work (7 years)**

**Experience Item Desc - Work Plan revisions**

**Item - Draft Final Work Plan revisions**

- **Units - lot**
- **Unit Cost - 65 hrs; $8008 sub/c dollars**
- **Unit Cost Adjustment factor - none**
- **Revised Unit Cost - none**
- **Basis for adjustment - none**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

#### Resources

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<th>Skill</th>
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**Factors:** 20 HRS

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**Factors:** 16 HRS

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**Factors:** 16 HRS

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**Factors:** 16 HRS

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**Factors:** 80 HRS

#### Line Item SYS - Contingency And Escalation

**BOE**

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**Factors:** 0.84576 [SYS 061400] 84576000 - System

**Factors:** 0.84576 [SYS 061400] 84576000 - System

**Factors:** 0.84576 [SYS 061400] 84576000 - System

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**Factors:** 0.84576 [SYS 061400] 84576000 - System
## Resources

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### Activity ID: 1GCRDB1440

**Description:** CDPHE/EPA WORK PLAN REVIEW AND COMMENT INCORP

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<th>Labor Cost Total</th>
<th>Materials/Sub Cost</th>
<th>Contingency &amp; Escalation</th>
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<th>Total Cost</th>
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<td>SYS</td>
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**Activity ID:** 1GCRDB1500

**Description:** PREPARE HASP AND READINESS REVIEW CHKLST

### Line Item 0100 - REVIEW and COMMENT INCORPORATION

**BOE**

Estimators Experience - Project manager's experience with similar type work (7 years)

Experience Item Desc - Review and Comment Incorporation

Breakdown of Cost Data:

- Item - Comment Incorporation
- Units - lot
- Unit Cost - 65 hrs; $7128 sub/c dollars
- Unit Cost Adjustment factor - none
- Revised Unit Cost - none
- Basis for adjustment - none

This estimate includes a project productivity/eficiency factor for committed but as yet undefined cost reductions.

### Resources

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## Line Item SYS - Contingency And Escalation

**BOE**

### Resources
### Line Item 0100 - PREP HASP/READINESS REVIEW CHECKLIST

**BOE**
- Estimators Experience - Project manager's experience with similar type work (7 years)

**Experience Item Desc:** HASP Prep and Readiness Review

**Breakdown of Cost Data:**

- **Item:** HASP Prep, Readiness Review and Mgmt Oversight
  - **Units:** lot
  - **Unit Cost:** 428 hrs; $1600 sub/c dollars
  - **Unit Cost Adjustment factor:** none
  - **Revised Unit Cost:** none

**This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.**

### Resources

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<th>Curve</th>
<th>Quantity</th>
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**Factors:**
- 20 HRS ESTIMATED $/HR for H&S 0.84576 [SYS 061400] .84576000 - System

### Line Item SYS - Contingency And Escalation

**BOE**
- No Department

**Factors:**
- 706.09 Dollars
- 464.157 Dollars

### Activity ID: 1GCRDB1600

**Description:** Perform Geologic Hazard Field Mapping

| Line Item | Description | Quantity | Units | BOE Type | Labor Hours/Unit | Labor Hours | Labor Cost Total | BOE Type | Labor Hours/Unit | Labor Hours | Labor Cost Total | BOE Type | Labor Hours/Unit | Labor Hours | Labor Cost Total | BOE Type | Labor Hours/Unit | Labor Hours | Labor Cost Total | BOE Type | Labor Hours/Unit | Labor Hours | Labor Cost Total | BOE Type | Labor Hours/Unit | Labor Hours | Labor Cost Total |
|-----------|-------------|----------|-------|----------|-----------------|-------------|-----------------|----------|-----------------|-------------|-----------------|----------|-----------------|-------------|-----------------|----------|-----------------|-------------|-----------------|----------|-----------------|-------------|-----------------|----------|-----------------|-------------|-----------------|----------|-----------------|-------------|-----------------|
| 0100      | GEOLOGIC HAZARD MAPPING | 1.00 inch | EE | 264 | 264 | 8,936 | 18,607 | 0 | 22,542 | 4,262 | 31,804 |
| SYS       | Contingency And Escalation | 1.00 | EE | 264 | 264 | 8,936 | 18,607 | 0 | 22,542 | 4,262 | 31,804 |

**Total for Activity 1GCRDB1600:**
- 264 | 8,936 | 18,607 | 1,686 | 29,226 | 4,262 | 33,491

### Line Item 0100 - GEOLOGIC HAZARD MAPPING

**BOE**
- Estimators Experience - Project manager's experience with similar type work (7 years)

**Experience Item Desc:** Hazards Mapping

**Breakdown of Cost Data:**

- **Item:** Hazards Mapping
  - **Units:** lot
  - **Unit Cost:** 264 hrs; $22000 sub/c dollars
  - **Unit Cost Adjustment factor:** none
  - **Revised Unit Cost:** none
Resources

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BOE

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Activity ID: 1GCRDB1700

Description: Analyze Slope Stability and Seismic Risk

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<td>104</td>
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Total for Activity 1GCRDB1700:

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<td>104</td>
<td>3,507</td>
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<td>0</td>
<td>42,209</td>
<td>1,673</td>
<td>43,882</td>
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Estimators Experience - Project manager's experience with similar type work (7 years)

Item - Slope Stability, Seismic Risk and Erosion Analysis

Breakdown of Cost Data:

- Units - lot
- Unit Cost - 104 hrs; $45760 sub/c dollars
- Unit Cost Adjustment factor - none
- Revised Unit Cost - none
- Basis for adjustment - none

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### Rocky Flats Closure Project

#### Baseline Cost and Basis of Estimate

**WBS No:** 1GAC0B07  
**Activity ID:** 1GCRDB1700  
**Activity Filter:** 

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**Activity ID:** 1GCRDB1800  
**Description:** DEVELOP GEOMORPHIC STABILITY DESIGN CRITERIA

**Schedule Risk:** 1  
**Cost Risk:** 1

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**Total for Activity 1GCRDB1800:**  
104 | 3,507 | 38,702 | 44,536 | 46,209 | 1,673 | 2,326 | 46,209 |

**BOE**  
Estimators Experience - Project manager's experience with similar type work (7 years)  
Experience Item Desc - Criteria Development

**Breakdown of Cost Data:**  
Item - Criteria Development  
Units - lot  
Unit Cost - 104 hrs; $45760 sub/c dollars  
Unit Cost Adjustment factor - none  
Revised Unit Cost - none  
Basis for adjustment - none

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Resources**  

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<th>Curve</th>
<th>Quantity</th>
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<td>R100S</td>
<td>RMRS Salaried</td>
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<td>R100S</td>
<td>RMRS Salaried</td>
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**Line Item SYS - Contingency And Escalation**

**BOE**

**Resources**  

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**Activity ID:** 1GCRDB1900  
**Description:** INCORP SITE DESC, SOIL & GEOTECH DATA INTO DRAFT

**Schedule Risk:** 1  
**Cost Risk:** 1

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<th>Units</th>
<th>Labor Hours/Unit</th>
<th>Labor Hours Total</th>
<th>Labor Cost Total</th>
<th>Materials/ Sub Cost</th>
<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
<th>Burden Cost</th>
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**Total for Activity 1GCRDB1900:**  
132 | 4,468 | 23,411 | 30,819 | 32,662 | 1,843 | 2,941 | 32,662 |

**BOE**

Estimators Experience - Project manager's experience with similar type work (7 years)  
Experience Item Desc - Prepare Draft Report

**Breakdown of Cost Data:**
Rocky Flats Closure Project
Baseline Cost and Basis of Estimate

WBS Filter: 1GAC
Activity Filter: *

Project: Baseline Devi

Item - Prepare report
Units - lot
Unit Cost - 132 hrs; $27680 sub/c dollars
Unit Cost Adjustment factor - none
Revised Unit Cost - none
Basis for adjustment - none

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Resources

<table>
<thead>
<tr>
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<th>Skill</th>
<th>Department</th>
<th>Curve</th>
<th>Quantity</th>
<th>Units</th>
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Factors:
- 44 HRS
- 88 HRS

Line Item 0100 - PRODUCE DRAFT REPORT

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Total for Activity 1GCRDB2100:
- Labor Hours Total: 132
- Labor Cost Total: 4,468
- Material/Sub Cost: 19,077
- Contingency & Escalation: 0
- Total Prime Cost: 23,545
- Burden Cost: 1,577
- Total Cost: 25,122

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

### Line Item SYS - Contingency And Escalation

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<th>Material/Sub Cost</th>
<th>Contingency &amp; Escalation</th>
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Factors:
- 1922.12 Dollars
- 1018.88 Dollars

Activity ID: 1GCRDB2100
Description: Prepare Draft Report

---

### Notes

- **Item - Prepare report**
- **Units - lot**
- **Unit Cost - 132 hrs; $27680 sub/c dollars**
- **Unit Cost Adjustment factor - none**
- **Revised Unit Cost - none**
- **Basis for adjustment - none**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

### Resources

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<th>Skill</th>
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**BOE**
- **Estimators Experience** - Project manager's experience with similar type work (7 years)
- **Experience Item Desc** - Produce Draft Report

**Breakdown of Cost Data:**
- **Item - Draft Report**
- **Units - lot**
- **Unit Cost - 132 hrs; $22520 sub/c dollars**
- **Unit Cost Adjustment factor - none**
- **Revised Unit Cost - none**
- **Basis for adjustment - none**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.
### Rocky Flats Closure Project

#### Baseline Cost and Basis of Estimate

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**WBS Filter:** 1GAC

**Activity Filter:** *

**Starts In FY:** *

#### Cost Element Details

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### Line Item 0100 - REVIEW DRAFT

**BOE Resources**

- **Estimators Experience:** Project manager's experience with similar type work (7 years)
- **Experience Item Desc:** Report review

**Breakdown of Cost Data:**

- **Item - Mgmt Oversight**
- **Units - lot**
- **Unit Cost - 20 hrs; $0 sub/c dollars**
- **Unit Cost Adjustment factor - none**
- **Revised Unit Cost - none**
- **Basis for adjustment - none**

**Schedule Risk:** 1

**Cost Risk:** 1

**Total for Activity 1GCRDB2400:**

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### Line Item SYS - Contingency And Escalation

**BOE Resources**

- **Contingency And Escalation:**
  - **Resources:**
    - **BOE:**
      - **Contingency And Escalation**
      - **Quantity:** 1.00
      - **Units:** Ea
      - **Labor Hours/Unit:** 20
      - **Labor Hours Total:** 20
      - **Labor Cost Total:** 740
      - **Materials/Sub Cost:** 0
      - **Contingency & Escalation:** 0
      - **Total Prime Cost:** 740
      - **Burden Cost:** 0
      - **Total Cost:** 740

**Total Cost:**

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**Line Item 0100 - REVIEW DRAFT**

- **BOE Resources**
  - **Contingency And Escalation**
    - **Resources:**
      - **BOE:**
        - **Contingency And Escalation**
        - **Quantity:** 1.00
        - **Units:** Ea
        - **Labor Hours/Unit:** 20
        - **Labor Hours Total:** 20
        - **Labor Cost Total:** 740
        - **Materials/Sub Cost:** 0
        - **Contingency & Escalation:** 0
        - **Total Prime Cost:** 740
        - **Burden Cost:** 0
        - **Total Cost:** 740

### Line Item SYS - Contingency And Escalation

- **BOE Resources**
  - **Contingency And Escalation**
    - **Resources:**
      - **BOE:**
        - **Contingency And Escalation**
        - **Quantity:** 1.00
        - **Units:** Ea
        - **Labor Hours/Unit:** 20
        - **Labor Hours Total:** 20
        - **Labor Cost Total:** 740
        - **Materials/Sub Cost:** 0
        - **Contingency & Escalation:** 0
        - **Total Prime Cost:** 740
        - **Burden Cost:** 0
        - **Total Cost:** 740

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### Line Item 0100 - DRAFT FINAL REPORT REVISIONS

**Description**: INCORP KH/DOE COMMENTS INTO DRAFT REPORT

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<th>Materials/Sub Cost</th>
<th>Contingency &amp; Escalation</th>
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<th>Burden Cost</th>
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**Activity Filter**

* Starts In FY

**Activity ID**: 1GCRDB2500

**WBS Filter**: 1GAC

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**Line Item 0100 - DRAFT FINAL REPORT REVISIONS**

- **Description**: INCORP KH/DOE COMMENTS INTO DRAFT REPORT
- **Quantity**: 1.00
- **Units**: each
- **Labor Hours/Unit**: EE
- **Total Labor Hours**: 65
- **Labor Cost Total**: 6,157
- **Materials/Sub Cost**: 8,349
- **Contingency & Escalation**: 774
- **Total Prime Cost**: 9,123
- **Burden Cost**: 9,123
- **Total Cost**: 10,487

**Breakdown of Cost Data**:

- **Item - Report revisions**
- **Units - lot**
- **Unit Cost - 65 hrs; $7280 sub/c dollars**
- **Unit Cost Adjustment factor - none**
- **Revised Unit Cost - none**
- **Basis for adjustment - none**

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

---

**Resources**

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**Line Item 0100 - Contingency And Escalation**

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**Activity ID**: 1GCRDB2600

**Description**: Review Draft Final Report by EPA/CDPHE

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**Total for Activity 1GCRDB2600**

- **Labor Hours Total**: 20
- **Labor Cost Total**: 740
- **Materials/Sub Cost**: 1,001
- **Contingency & Escalation**: 261
- **Total Prime Cost**: 1,262
- **Burden Cost**: 1,262
- **Total Cost**: 1,523

---

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### Line Item 0100 - REVIEW DRAFT FINAL REPORT

**BOE**

**Cost Element**  | **Skill** | **Department** | **Curve** | **Quantity** | **Units**
--- | --- | --- | --- | --- | ---
750 | STRAIGHT TIME BASE | M040 MANAGERS (GRADE 64 - 68) | R100S RMRS Salaried | Linear | 20.00 Hours

#### Breakdown of Cost Data:
- **Item**: Mgmt Oversight
- **Units**: lot
- **Unit Cost**: $0 sub/c dollars
- **Revised Unit Cost**: none
- **Basis for adjustment**: none

**Resources**

**Cost Element**  | **Skill** | **Department** | **Curve** | **Quantity** | **Units**
--- | --- | --- | --- | --- | ---
102.86 | CON CONTINGENCY | ZDEPT No Department | Linear | 102.86 Dollars
46.79 | ESC ESCALATION | ZDEPT No Department | Linear | 46.79 Dollars

#### Activity ID: 1GCRDB2700, Description: Produce Final Report

**BOE**

**Cost Element**  | **Skill** | **Department** | **Curve** | **Quantity** | **Units**
--- | --- | --- | --- | --- | ---
750 | STRAIGHT TIME BASE | M040 MANAGERS (GRADE 64 - 68) | R100S RMRS Salaried | Linear | 20.00 Hours

#### Breakdown of Cost Data:
- **Item**: Prep report
- **Units**: lot
- **Unit Cost**: $7480 sub/c dollars
- **Revised Unit Cost**: none
- **Basis for adjustment**: none

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Resources**

**Cost Element**  | **Skill** | **Department** | **Curve** | **Quantity** | **Units**
--- | --- | --- | --- | --- | ---
20 | ASC SUPPLIES | K26S ER Programs | Linear | 200.00 Dollars

#### Activity ID: 1GCRDB2700, Description: Produce Final Report

**BOE**

**Cost Element**  | **Skill** | **Department** | **Curve** | **Quantity** | **Units**
--- | --- | --- | --- | --- | ---
750 | STRAIGHT TIME BASE | M040 MANAGERS (GRADE 64 - 68) | R100S RMRS Salaried | Linear | 45.00 Hours

**Resources**

**Cost Element**  | **Skill** | **Department** | **Curve** | **Quantity** | **Units**
--- | --- | --- | --- | --- | ---
55 | ASH SUBCONTRACTED SRVS | K26S ER Programs | Linear | 2,977.08 Dollars

#### Activity ID: 1GCRDB2700, Description: Produce Final Report

**BOE**

**Cost Element**  | **Skill** | **Department** | **Curve** | **Quantity** | **Units**
--- | --- | --- | --- | --- | ---
75 | ASH SUBCONTRACTED SRVS | K26S ER Programs | Linear | 1,014.91 Dollars

#### Activity ID: 1GCRDB2700, Description: Produce Final Report

**BOE**

**Cost Element**  | **Skill** | **Department** | **Curve** | **Quantity** | **Units**
--- | --- | --- | --- | --- | ---
16 | ASH SUBCONTRACTED SRVS | K26S ER Programs | Linear | 1,014.91 Dollars

#### Activity ID: 1GCRDB2700, Description: Produce Final Report

**BOE**

**Cost Element**  | **Skill** | **Department** | **Curve** | **Quantity** | **Units**
--- | --- | --- | --- | --- | ---
84 | ASH SUBCONTRACTED SRVS | K26S ER Programs | Linear | 2,977.08 Dollars

**Factors**

**Cost Element**  | **Skill** | **Department** | **Curve** | **Quantity** | **Units**
--- | --- | --- | --- | --- | ---
200 | ASH SUBCONTRACTED SRVS | K26S ER Programs | Linear | 1,014.91 Dollars

**Factors**

**Cost Element**  | **Skill** | **Department** | **Curve** | **Quantity** | **Units**
--- | --- | --- | --- | --- | ---
64 | ASH SUBCONTRACTED SRVS | K26S ER Programs | Linear | 2,977.08 Dollars

**Factors**

**Cost Element**  | **Skill** | **Department** | **Curve** | **Quantity** | **Units**
--- | --- | --- | --- | --- | ---
84 | ASH SUBCONTRACTED SRVS | K26S ER Programs | Linear | 1,014.91 Dollars
### Rocky Flats Closure Project
#### Baseline Cost and Basis of Estimate

**Project**

Baseline Devl

**WBS Filter**

1GAC

**Activity Filter**

*  

**WBS No:** 1GAC0B07

**Activity ID:** 1GCRDB2700

---

#### Cost Element

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<tr>
<th>Skill</th>
<th>Quantity</th>
<th>Units</th>
<th>BOE Type</th>
<th>Labor Hours/Unit</th>
<th>Labor Hours Total</th>
<th>Labor Cost Total</th>
<th>Materials/Sub Cost</th>
<th>Contingency &amp; Escalation</th>
<th>Total Prime Cost</th>
<th>Burden Cost</th>
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#### Line Item 0100 - Conceptual Design

**BOE**

Estimators Experience - Project manager's experience with similar type work (10 years)

Experience Item Desc - Conceptual Design

Breakdown of Cost Data:

- Item - Conceptual Design
- Units - lot
- Unit Cost - 320 hrs; $50,000 sub/c dollars
- Unit Cost Adjustment factor - none
- Revised Unit Cost - none
- Basis for adjustment - none

This estimate includes a project productivity/efficiency factor for committed but as yet undefined cost reductions.

**Resources**

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Skill</th>
<th>Quantity</th>
<th>Units</th>
<th>BOE Type</th>
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<th>Labor Cost Total</th>
<th>Materials/Sub Cost</th>
<th>Contingency &amp; Escalation</th>
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<td>STRAIGHT TIME BASE</td>
<td>E050</td>
<td>320</td>
<td>EE</td>
<td>R100S</td>
<td>PMRS Salaried</td>
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#### Line Item SYS - Contingency And Escalation

**BOE**

**Resources**

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<th>Cost Element</th>
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<th>Units</th>
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<th>Contingency &amp; Escalation</th>
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**Report Totals:**

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<th>Materials/Sub Cost</th>
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