

**FLUOR FERNALD CLOSURE PLAN  
BASIS OF ESTIMATE**

**PBS-07  
SILOS PROJECT**

**SEPTEMBER 2001**

**40000-PL-0001  
REVISION 1**



### Section 3: HSWR – AWR

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**Section 3: HSWR – AWR**

**ACRONYMS AND ABBREVIATIONS**

ACA	Amended Consent Agreement
ADSS	Arm Deployed Sluicing System
ALARA	As Low As Reasonable Achievable
API	American Petroleum Institute
ARAR	Applicable or Relative and Appropriate Requirement
AWR	Accelerated Waste Retrieval
AWWT	Advanced Wastewater Treatment
BAT	Best Available Technology
BOP	Balance of Plant
CAT	Construction Acceptance Testing
CAT	Critical Analysis Team
CATS	Conditioning and Transfer System
CBA	Collective Bargaining Agreement
CCTV	Closed-Circuit Television
CFC	Certified for Construction
DCN	Design Change Notices
D&D	Decontamination and Dismantlement
DNFSB	Defense Nuclear Facilities Safety Board
DOE	Department of Energy
DOF	Degree of Freedom
DWRS	Decant Sump Waste Retrieval System
EHS/TR	Environmental, Health and Safety/Training Requirements
EMMA™	Easily Manipulated Mechanical Arm
EPA	Environmental Protection Agency
FAT&LC	Fernald Atomic Trades and Labor Council
FDS	Facility Decontamination System
FHAR	Final Hazard Analysis Report
FRF	Final Remediation Facility
FSMS	Full-Scale Mock-up System
FSS	Fixative Spray System
FTE	Full-Time Equivalent
FWENC	Foster Wheeler Environmental Corporation
FY	Fiscal Year
GEES	Gripper End-Effector System
GFE	Government-Furnished Equipment
gpm	gallons per minute
HEO	Heavy Equipment Operator
HEPA	High-Efficiency Particulate Air
I&C	Instrumentation and Controls
ICAT	Integrated Construction Acceptance Test

**Section 3: HSWR – AWR**

**ACRONYMS AND ABBREVIATIONS (CONTINUED)**

ISA	Integrated Safety Assessment
ISRC	Independent Safety Review Committee
LOE	Level of Effort
MVO	Motor Vehicle Operator
NTS	Nevada Test Site
OEPA	Ohio Environmental Protection Agency
OSDF	On-Site Disposal Facility
OU4	Operable Unit 4
ORR	Operational Readiness Review
PEP	Project Execution Plan
P&ID	Piping and Instrumentation Diagram
PLA	Project Labor Agreement
PLC	Programmable Logic Control
QAR	Quality Assurance Requirements
psi	pounds per square inch
RA	Readiness Assessment
RA	Remedial Action
RCRA	Resource Conservation and Recovery Act
RCS	Radon Control System
RD	Remedial Design
SOP	Standard Operating Procedures
SOT	System Operability Test
SP	Soil Pile
SPP	Site Preparation Package
SREE	Silo Retrieval End Effector
SSC	Structures, Systems, and Components
SSR	Standard Start-up Review
SWP	Safe Work Plans
SWRS	Silos Waste Retrieval System
TFA	Tanks Focus Area
TRB	Technical Review Board
TRD	Technical Requirements Document
TTA	Transfer Tank Area
TWRS	Tank Waste Retrieval System
U.S. EPA	United States Environmental Protection Agency
VitPP	Vitrification Pilot Plant
WAC	Waste Acceptance Criteria



ACRONYM  
LIST



## ACRONYMS

ACE	Army Corp of Engineers
AEA	Atomic Energy Act
AEDO	Assistant Emergency Duty Officer
ALARA	As Low As Reasonably Achievable
ARAR	Applicable, Relevant and Appropriate Requirement
ASR	Auditable Safety Record
ATSDR	Association of Toxic Substance and Disease Registry
AWP	Automated Work Package
AWR	Advanced Waste Retrieval
AWWT	Advance Wastewater Treatment
CADD	Computer Aided Drafting and Design
CAM	Control Account Manager
CAT	Critical Analysis Team
CAT	Construction Acceptance Testing
CC	Construction Coordinator
CCM	Construction Contracts Manager
CCTV	Closed Circuit Television
CE	Construction Engineer
CEDE	Committed Effective Dose Equivalent
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFC	Certified for Construction
CFR	Code of Federal Regulations
D&D	Decontamination and Dismantlement
DCF	Dose Conversion Factor
DCN	Design Change Notice
DFS	Duratek Federal Services
DNFSB	Defense Nuclear Facility Safety Board
DOE	Department of Energy
DOE-FEMP	Department of Energy – Fernald Environmental Management Project
DOE-HQ	Department of Energy - Headquarters
DOE-OFO	Department of Energy – Ohio Field Office
DOP	Diocetyl Phthalate
DOT	Department of Transportation
ECDC	Engineering/Construction Documentation Control
EIP	Energy Isolation Plan
EOC	Emergency Operations Center
EP	Extraction Procedure
EPA	Environmental Protection Agency
ESD	Explanation of Significant Differences
FAM	Functional Area Manager
FAT&LC	Fernald Atomic Trades and Labor Council
FEMP	Fernald Environmental Management Project
FHA	Fire Hazard Analysis

FHAR	Final Hazard Analysis Report
FIU	Florida International University
FMEA	Failure Modes and Effects Analysis
GAO	General Accounting Office
GCBCTC	Greater Cincinnati Building and Construction Trades Council
GFE	Government Furnished Equipment
GSA	Government Services Administration
H&S	Health and Safety
H&SC	Health and Safety Controls
HAR	Hazard Analysis Report
HASP	Health and Safety Plan
HC	Hazard Category
HCC	Hazard Category Calculations
HDPE	High Density Polyethylene
HEPA	High Efficiency Particulate Air
HFE	Human Factors Evaluation
HPP	Health Physics Plan
ICE	Independent Cost Evaluation
IFB	Invitation for Bid
IG	Inspector General
IHA	Integrated Hazard Analysis
INEEL	Idaho National Engineering and Environmental Laboratory
IP-2	Industrial Package Type 2
IRT	Independent Review Team
ISA	Interim Storage Area
LLW	Low-Level Waste
LSA	Low Specific Activity
MCC	Motor Control Center
NC	Nuclear Criticality
NMD	Nuclear Materials Disposition
NPDES	National Pollutant Discharge Elimination System
NRC	Nuclear Regulatory Commission
NSOA	Nuclear Safety Operational Authorization
NTS	Nevada Test Site
ODC	Other Direct Cost
OEPA	Ohio Environmental Protection Agency
OJT	On-the-job Training
ORR	Operational Readiness Review
OSDF	On-Site Disposal Facility
OSHA	Occupational Safety and Health Administration
OU	Operable Unit 4
pCi/g	Pico Curies Per Gram
PCR	Project Closure Report
PEP	Project Execution Plan
PFD	Process Flow Diagram

PHAR	Preliminary Hazard Analysis Report
P&ID	Piping and Instrumentation Diagram
PLA	Project Labor Agreement
POD	Plan of the Day
PPE	Personal Protective Equipment
PSHSRM	Project Specific Health and Safety Requirements Matrix
PWID	Project Waste Identification and Disposition
QA	Quality Assurance
QAJSP	Quality Assurance Job-Specific Plan
QC	Quality Control
QEP	Quality Evaluation Plan
RAWP	Remedial Action Work Plan
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RDWP	Remedial Design Work Plan
RFI	Request for Clarification of Information
RFP	Request for Proposal
RI/FS	Remedial Investigation/Feasibility Study
RMRS	Rocky Mountain Remediation Services
ROD	Record of Decision
SAP	Sampling and Analysis Plan
SIP	Service Interruption Permit
SOT	System Operability Testing
SOW	Statement of Work
SSC	System, Structures and Components
SSR	Standard Startup Review
SWP	Safe Work Plan
T&QP	Training and Qualification Plan
TCLP	Toxicity Characteristic Leaching Procedure
TSR	Technical Safety Requirement
TRB	Technical Review Board
UC	University of Cincinnati
ULPA	Ultra Low Penetration Air
USEPA	United States Environmental Protection Agency
USQ	Unreviewed Safety Question
WAC	Waste Acceptance Criteria
WGS	Waste Generators Services
WPRAP	Waste Pits Remediation Action Project

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**WBS DICTIONARY  
CONTROL ACCOUNT/CHARGE NUMBER**



U.S. DEPARTMENT OF ENERGY  
 WORK BREAKDOWN STRUCTURE DICTIONARY  
 PART II - ELEMENT DEFINITION

1. PROJECT TITLE  FEMP (DEFENSE)	2. DATE OF CONTRACT  12/01/2000
3. IDENTIFICATION NUMBER  DE-AC24-01OH20115	4. INDEX LINE NO.  52
5. WBS ELEMENT CODE  1.1.H.C	6. WBS ELEMENT TITLE  AWR
7. APPROVED CP NO.  NEW PER CP# FY01-0115-0007-00	8. DATE OF CHANGES  12/01/2000
9. SYSTEM DESIGN DESCRIPTION  CERCLA / ACA	10. BUDGET AND REPORTING NUMBER  EW05H3070
11. ELEMENT TASK DESCRIPTION  <p><b><u>a. ELEMENTS OF COST:</u></b></p> <p>Labor          Material          ODCs          Subcontractor</p> <p><b><u>b. TECHNICAL CONTENT:</u></b></p> <p>Provide for the retrieval and transfer of the material in Silos 1 and 2 to a newly constructed Transfer Tank Area (TTA) for safe interim storage pending final treatment and disposal. The project also includes construction of a Radon Control System (RCS) to provide mitigation of radon emissions from the Silos, the TTA, and from the future Silos 1 and 2 Full-scale Remediation Facility.</p> <p><b><u>c. SCOPE OF WORK:</u></b></p> <p>The objective of the Accelerated Waste Retrieval (AWR) Project is to retrieve the material from Silos 1 and 2, transfer tanks for staging before final remediation. The project also includes the installation and operation of a Radon Control System (RCS) to reduce the radon concentration in each of the silos' headspace, and provide radon control during retrieval, material storage, and future operation of the final remediation facility. The final stage involves the gross decontamination of the interior surfaces of Silos 1 and 2 and the Decant Sump Tank, and decontamination and decommissioning contaminated retrieval equipment for system closure.</p> <p>The facilities required to accomplish the AWR Project comprise the following seven major systems:</p> <ul style="list-style-type: none"> <li>- Radon Control System (RCS), Phase 1 and 2. RCS Phase 1 controls and reduces radon concentrations in the silo headspace. RCS Phase 2 ensures radon control during retrieval, transfer, and storage of the silos material.</li> </ul>	

U.S. DEPARTMENT OF ENERGY  
 WORK BREAKDOWN STRUCTURE DICTIONARY  
 PART II - ELEMENT DEFINITION

1. PROJECT TITLE  FEMP (DEFENSE)	2. DATE OF CONTRACT  12/01/2000
3. IDENTIFICATION NUMBER  DE-AC24-010H20115	4. INDEX LINE NO.  52
5. WBS ELEMENT CODE  1.1.H.C	6. WBS ELEMENT TITLE  AWR
7. APPROVED CP NO.  NEW PER CP# FY01-0115-0007-00	8. DATE OF CHANGES  12/01/2000
9. SYSTEM DESIGN DESCRIPTION  CERCLA / ACA	10. BUDGET AND REPORTING NUMBER  EW05H3070
11. ELEMENT TASK DESCRIPTION  <p>- Full Scale Mock-Up System (FSMS). A Full-Scale Mock-Up Integrated Construction Acceptance Test (ICAT)/System Operability Test (SOT) is to be performed with the Silo 4 Full Scale Mock-Up System (FSMS). FWENC will incorporate the lessons learned from the FSM ICAT/SOT into the AWR Project before beginning operations and use the FSMS for training and troubleshooting during SWRS operations.</p> <p>- Silos Waste Retrieval System (SWRS). The SWRS retrieves material from the silos; transfers residues, BentoGrout™, and heel material to the transfer tanks; retrieves and packages discrete objects; and performs gross decontamination of the silos.</p> <p>- Decant Sump Waste Retrieval System (DWRS). The DWRS retrieves waste from the decant sump tank (approximately 1,000 gallons of residue/solids in a heel), segregates and transfers/packages material, and performs gross decontamination of the decant sump.</p> <p>- Transfer Tank Area (TTA). The TTA consists of transfer tanks to be used as a storage area for K-65 Material/BentoGrout™ slurry for future remediation activity. Provisions will be made for sampling and sample storage.</p> <p>- Transfer Tank Waste Retrieval System (TWRS). The TWRS will retrieve the K-65 Material/BentoGrout™ slurry from the TTA and transfer it for processing at the Silos 1 and 2 Full Scale Remediation Facility, which will be designed and constructed in a separate project.</p> <p>- Facilities Decontamination System (FDS). The Facilities Decontamination System (FDS) functions to remove gross contamination from the silos, the decant sump tank, and contaminated process equipment as part of facility demobilization and closure. The FDS will also accomplish decontamination of temporary tools, equipment, and facilities used on the project.</p>	

**WORK SCOPE DEFINITION  
(Control Account)**

1. PROJECT TITLE <b>FEMP (DEFENSE)</b>		2. DATE <b>12/01/2000</b>	Page 1
3. WBS ELEMENT CODE <b>1.1.H.C</b>	4. WBS ELEMENT TITLE/NAME <b>AWR</b>		
5. PERFORMING DIV/DEPARTMENT CODE <b>4302</b>	6. ORIGINATOR NAME/PHONE <b>R. FELLMAN</b>	7. WBS ELEMENT MANAGER <b>R. FELLMAN</b>	
8. BUDGET AND REPORTING NUMBER <b>EW05H3070</b>	9. BUDGET TITLE <b>SILOS</b>		
10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE? <b>NEW PER CP# FY01-0115-0007-00</b>		11. ESTIMATED START / COMPLETION DATE <b>12/00 - 03/05</b>	
12. TASK IDENTIFICATION (CONTROL ACCOUNT) <b>HWR1</b>	13. TASK DESCRIPTION (ONE LINE) <b>ACCELERATED WASTE RETRIEVAL TRANSITION</b>		
14. ELEMENT TASK DESCRIPTION			
<p><b><u>a. ELEMENTS OF COST:</u></b></p> <p>Labor ODCs Subcontractors Material</p> <p><b><u>b. TECHNICAL CONTENT:</u></b></p> <p>The technical scope of the AWR Project is to retrieve the material from Silos 1 and 2, and transfer the residue to transfer tanks for staging before final remediation. The project also includes the installation and operation of a RCS to reduce the radon concentration in each of the silos' headspace, and provide radon control during retrieval, material storage, and future operation of the Silos 1 and 2 Remediation Facility. The final stage involves the gross decontamination of the interior surfaces of Silos 1 and 2 and the Decant Sump Tank, and D&amp;D of contaminated retrieval equipment for system closure.</p> <p><b><u>c. SCOPE OF WORK:</u></b></p> <p>The object of the Accelerated Waste Retrieval (AWR) Project is to design, construct, start-up, and operate the systems required to retrieve the material from Silos 1 and 2 and transfer it to a newly constructed Transfer Tank Area (TTA) for safe interim storage pending final treatment and disposal. To accomplish this scope of work Fluor Fernald, Inc. (Fluor Fernald) will manage the design, construction, start-up, testing, and operation of the systems and facilities required for the implementation of the AWR Project. The AWR Project consists of five phases:</p> <ul style="list-style-type: none"> <li>Radon Control System (RCS) Design, Construction, and Operation. The RCS will provide mitigation of radon emissions from the silos, the TTA, and from the</li> </ul>			
Project Manager <i>Robert Fellman</i>	Control Account Manager <i>Robert Fellman</i>	Control Team Manager <i>Howard Edwards</i>	

**WORK SCOPE DEFINITION  
(Control Account)**

1. PROJECT TITLE <b>FEMP (DEFENSE)</b>		2. DATE 12/01/2000	Page 2
3. WBS ELEMENT CODE 1.1.H.C	4. WBS ELEMENT TITLE/NAME AWR		
5. PERFORMING DIV/DEPARTMENT CODE 4302	6. ORIGINATOR NAME/PHONE R. FELLMAN	7. WBS ELEMENT MANAGER R. FELLMAN	
8. BUDGET AND REPORTING NUMBER EW05H3070	9. BUDGET TITLE SILOS		
10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE? NEW PER CP# FY01-0115-0007-00		11. ESTIMATED START / COMPLETION DATE 12/00 - 03/05	
12. TASK IDENTIFICATION (CONTROL ACCOUNT) HWR1	13. TASK DESCRIPTION (ONE LINE) ACCELERATED WASTE RETRIEVAL TRANSITION		

14. ELEMENT TASK DESCRIPTION

Silos 1 and 2 Remediation Facility.

- Waste Retrieval System on Silo 4 Design, Construction, and Testing. The purpose of the Full-Scale Mock-up System (FSMS) is to test, on Silo 4, the waste retrieval activities. Also, the FSMS will provide an ideal hands-on training facility prior to the Silos 1 and 2 waste retrieval activities.
- Silo Waste Retrieval System (SWRS) Design, Construction, and Operation. The purpose of the SWRS is to retrieve the material from Silos 1 and 2 and transfer it to the TTA for safe interim storage.
- Facility Decontamination System (FDS) Design, Construction, and Operation. The purpose of the FDS system is to perform gross decontamination and application of a fixative to the interior of the silos and decant sump tank.
- Tank Waste Retrieval System (TWRS) Design, Construction, and Testing. The purpose of the TWRS is to provide a means of retrieving from the TTA and transferring the Silos 1 and 2 material to the Silos 1 and 2 Remediation Facility.

The AWR Project has been broken down into the following tasks (charge numbers):

Due Diligence - Fluor Fernald (HWR1A)  
 Due Diligence - Jacobs Engineering Group (JEG) (HWR1B)  
 Radon Control System (RCS) Construction (HWR1C)  
 JEG Construction Support (HWR1D)  
 Balance of Plant (BOP) Construction (HWR1E)  
 Construction Management (HWR1F)  
 Engineering Support - Fluor Fernald (HWR1G)  
 JEG Engineering Execution (HWR1H)  
 Start-up and Readiness (HWR1G)  
 Operations (HWR1K)  
 Safe Shutdown (HWR1L)  
 Silos Project Maintenance Facility (HWR1M)  
 Project Management (HWR1P)

**d. WORK SPECIFICALLY EXCLUDED:**

None

**WORK SCOPE DEFINITION**  
(Work Package)

1. PROJECT TITLE <b>FEMP (DEFENSE)</b>		2. DATE <b>12/01/2000</b>	Page 1
3. WBS ELEMENT CODE <b>1.1.H.C</b>	4. WBS ELEMENT TITLE/NAME <b>AWR</b>		
5. PERFORMING DIV/DEPARTMENT CODE <b>4302</b>	6. ORIGINATOR NAME/PHONE <b>R. FELLMAN</b>	7. WBS ELEMENT MANAGER <b>R. FELLMAN</b>	
8. BUDGET AND REPORTING NUMBER <b>EW05H3070</b>	9. BUDGET TITLE <b>SILOS</b>		
10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE? <b>NEW PER CP# FY01-0115-0007-00</b>		11. ESTIMATED START / COMPLETION DATE <b>12/00 - 01/02</b>	
12. TASK IDENTIFICATION (WORK PACKAGE) <b>HWR1A</b>	13. TASK DESCRIPTION (ONE LINE) <b>AWR TRANSITION (DUE DILIGENCE) FFI</b>		
14. ELEMENT TASK DESCRIPTION			
<p><b><u>a. ELEMENTS OF COST:</u></b></p> <p>Labor Teaming Partners ODC Materials</p> <p><b><u>b. TECHNICAL CONTENT:</u></b></p> <p>Accomplish the termination of the AWR contract with Foster Wheeler Environmental Corporation. Enhance the schedule and expedite a return to the field to re-engage on construction activities for the Radon Control System. Five teams, under the direction of a steering Committee composed of senior Fluor Fernald Managers, will be utilized:</p> <ul style="list-style-type: none"> <li>- Contract Closeout Team</li> <li>- Due Diligence Engineering</li> <li>- Due Diligence Subcontracts/Procurement Team</li> <li>- Due Diligence Readiness and Operations Review Team</li> <li>- Due Diligence EMMA System</li> </ul> <p><b><u>c. SCOPE OF WORK:</u></b></p> <p>The key transition activities are:</p> <ul style="list-style-type: none"> <li>- negotiate termination settlement</li> <li>- review design using value engineering principles</li> <li>- decide whether design changes are required</li> <li>- identify design changes</li> <li>- review subcontracts and procurements</li> <li>- decide whether Fluor Fernald should assume the subcontracts</li> <li>- negotiate subcontracts with suppliers.</li> </ul>			

Project Manager <i>Robert Fellman</i>	Control Account Manager <i>Robert Fellman</i>	Control Team Manager <i>Howard J. Wells</i>
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**WORK SCOPE DEFINITION**  
(Work Package)

1. PROJECT TITLE <b>FEMP (DEFENSE)</b>		2. DATE <b>12/01/2000</b>	Page 2
3. WBS ELEMENT CODE <b>1.1.H.C</b>	4. WBS ELEMENT TITLE/NAME <b>AWR</b>		
5. PERFORMING DIV/DEPARTMENT CODE <b>4302</b>	6. ORIGINATOR NAME/PHONE <b>R. FELLMAN</b>	7. WBS ELEMENT MANAGER <b>R. FELLMAN</b>	
8. BUDGET AND REPORTING NUMBER <b>EW05H3070</b>	9. BUDGET TITLE <b>SILOS</b>		
10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE? <b>NEW PER CP# FY01-0115-0007-00</b>		11. ESTIMATED START / COMPLETION DATE <b>12/00 - 01/02</b>	
12. TASK IDENTIFICATION (WORK PACKAGE) <b>HWR1A</b>	13. TASK DESCRIPTION (ONE LINE) <b>AWR TRANSITION (DUE DILIGENCE) FFI</b>		

14. ELEMENT TASK DESCRIPTION

**d. WORK SPECIFICALLY EXCLUDED:**

Jacobs support for AWR Transition.

**WORK SCOPE DEFINITION**  
(Work Package)

1. PROJECT TITLE <b>FEMP (DEFENSE)</b>	2. DATE 12/01/2000	Page 1
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3. WBS ELEMENT CODE 1.1.H.C	4. WBS ELEMENT TITLE/NAME AWR
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5. PERFORMING DIV/DEPARTMENT CODE 4302	6. ORIGINATOR NAME/PHONE R. FELLMAN	7. WBS ELEMENT MANAGER R. FELLMAN
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8. BUDGET AND REPORTING NUMBER EW05H3070	9. BUDGET TITLE SILOS
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10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE? NEW PER CP# FY01-0115-0007-00	11. ESTIMATED START / COMPLETION DATE 06/01 - 12/01
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12. TASK IDENTIFICATION (WORK PACKAGE) HWR1B	13. TASK DESCRIPTION (ONE LINE) AWR TRANSITION (DUE DILIGENCE) JACOBS
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14. ELEMENT TASK DESCRIPTION

**a. ELEMENTS OF COST:**

Teaming Partners  
ODC  
Materials  
Subcontractors

**b. TECHNICAL CONTENT:**

Due Diligence - JEG consists of those activities JEG must support to accomplish the termination of the AWR contract with FWENC, enhance the schedule, and expedite the return to the field to initiate construction activities for the RCS. The Due Diligence, JEG scope consists of the following tasks:

- Review Design Using Value Engineering Principles;
- Decide Whether Design Changes are Required;
- Identify Design Changes;
- Assist in Readiness and Operations Reviews as Required; and
- Assist in Vendor Visits, Vendor Specification Reviews, and Subcontractor Reviews.

**c. SCOPE OF WORK:**

This covers all activities required by JEG to support the Due Diligence process defined in the Silos 1 and 2 Accelerated Waste Retrieval (AWR) Project Transition and Execution Strategy (40710-RP-0009, Rev. 0) submitted to DOE-FEMP on July 27, 2001 (Appendix B) and to comply with the Advanced Understanding Regarding Settlement of Subcontract Issues Between FWENC and Fluor Fernald. The scope of the AWR Due Diligence is defined by three project tasks: RCS Due Diligence, BOP Due Diligence, and EMMA™ Due Diligence.  
Task #1 - RCS Due Diligence

Project Manager <i>Robert Fellman</i>	Control Account Manager <i>Robert Fellman</i>	Control Team Manager <i>Joseph J. Seck</i>
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3. WBS ELEMENT CODE <b>1.1.H.C</b>	4. WBS ELEMENT TITLE/NAME <b>AWR</b>		
5. PERFORMING DIV/DEPARTMENT CODE <b>4302</b>	6. ORIGINATOR NAME/PHONE <b>R. FELLMAN</b>	7. WBS ELEMENT MANAGER <b>R. FELLMAN</b>	
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10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE? <b>NEW PER CP# FY01-0115-0007-00</b>		11. ESTIMATED START / COMPLETION DATE <b>06/01 - 12/01</b>	
12. TASK IDENTIFICATION (WORK PACKAGE) <b>HWR1B</b>	13. TASK DESCRIPTION (ONE LINE) <b>AWR TRANSITION (DUE DILIGENCE) JACOBS</b>		
14. ELEMENT TASK DESCRIPTION  <p>The scope of the RCS Due Diligence task consists of those Due Diligence activities needed to support the transition of the RCS related construction, procurement, and design functions from the FWENC to Fluor Fernald. These activities require resources drawn from JEG. There is expected to be a need for significant levels of travel to vendor and equipment storage/fabrication locations and travel for JEG staff to the FEMP to support RCS Due Diligence.</p> <p><b>Task #2 - BOP Due Diligence</b> The scope of the BOP Due Diligence task consists of those Due Diligence activities needed to support the transition of the BOP related construction, procurement, and design functions from the FWENC to Fluor Fernald. These activities require resources drawn from JEG. There is expected to be a need for significant levels of travel to vendor and equipment storage/fabrication locations and travel for JEG staff to the FEMP to support BOP Due Diligence.</p> <p><b>Task #3 - EMMA™ Due Diligence</b> The scope of the EMMA™ Due Diligence task consists of those Due Diligence activities needed to support the transition of the EMMA™ related construction, procurement, and design functions from the FWENC to Fluor Fernald. These activities require resources drawn from JEG. There is expected to be a need for significant levels of travel to vendor and equipment storage/fabrication locations and travel for JEG staff to the FEMP to support EMMA™ Due Diligence.</p> <p><b><u>d. WORK SPECIFICALLY EXCLUDED:</u></b></p> <p>Fluor Fernald Inc. support for AWR Transition.</p>			

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8. BUDGET AND REPORTING NUMBER <b>EW05H3070</b>	9. BUDGET TITLE <b>SILOS</b>		
10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE? <b>NEW PER CP# FY01-0115-0007-00</b>		11. ESTIMATED START / COMPLETION DATE <b>06/01 - 12/01</b>	
12. TASK IDENTIFICATION (WORK PACKAGE) <b>HWR1C</b>	13. TASK DESCRIPTION (ONE LINE) <b>RADON CONTROL SYSTEM (RCS) CONSTRUCTION</b>		

14. ELEMENT TASK DESCRIPTION

**a. ELEMENTS OF COST:**

ODC  
Subcontractors

**b. TECHNICAL CONTENT:**

Activities required to cover construction of the Radon Control System (RCS)

**c. SCOPE OF WORK:**

The scope of the RCS Construction consists of:

1. Equipment and subcontractor procurement
2. Execution of Construction

These activities proceed after the appropriate Due Diligence actions have been completed under HWR1A and HWR1B

**d. WORK SPECIFICALLY EXCLUDED:**

All activities associated with the transition of the contract from FWENC

Project Manager <i>Robert Fellman</i>	Control Account Manager <i>Robert Fellman</i>	Control Team Manager <i>Howard P. [Signature]</i>
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<b>5. PERFORMING DIV/DEPARTMENT CODE</b> 4302	<b>6. ORIGINATOR NAME/PHONE</b> R. FELLMAN	<b>7. WBS ELEMENT MANAGER</b> R. FELLMAN	
<b>8. BUDGET AND REPORTING NUMBER</b> EW05H3070	<b>9. BUDGET TITLE</b> SILOS		
<b>10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE?</b> NEW PER CP# FY01-0115-0007-00		<b>11. ESTIMATED START / COMPLETION DATE</b> 07/01 - 01/06	
<b>12. TASK IDENTIFICATION (WORK PACKAGE)</b> HWR1D	<b>13. TASK DESCRIPTION (ONE LINE)</b> JACOBS CONSTRUCTION SUPPORT		
<b>14. ELEMENT TASK DESCRIPTION</b>  <p><b><u>a. ELEMENTS OF COST:</u></b></p> <p>Teaming Partners ODC Materials</p> <p><b><u>b. TECHNICAL CONTENT:</u></b></p> <p>Activities required by Jacobs Engineering to provide design and engineering support of the AWR Project</p> <p><b><u>c. SCOPE OF WORK:</u></b></p> <p>The scope of Jacobs Engineering Support of Construction consists of those activities necessary to support construction, (eg Title III services). This scope also consists of conducting reviews, planning and bidding support, and acceptance testing.</p> <p><b><u>d. WORK SPECIFICALLY EXCLUDED:</u></b></p> <p>All activities associated with transition of the contract from FWENC</p>			
<b>Project Manager</b> <i>Robert Fellman</i>	<b>Control Account Manager</b> <i>Robert Fellman</i>	<b>Control Team Manager</b> <i>Howard Carter</i>	



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10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE? <b>NEW PER CP# FY01-0115-0007-00</b>		11. ESTIMATED START / COMPLETION DATE <b>08/01 - 01/06</b>	
12. TASK IDENTIFICATION (WORK PACKAGE) <b>HWR1E</b>	13. TASK DESCRIPTION (ONE LINE) <b>BALANCE OF PLANT CONSTRUCTION</b>		

14. ELEMENT TASK DESCRIPTION

**a. ELEMENTS OF COST:**

ODC  
Subcontractors

**b. TECHNICAL CONTENT:**

Activities required to cover resumption of Balance of Plant (BOP) construction for the Accelerated Waste Retrieval Project

**c. SCOPE OF WORK:**

The scope of the BOP Construction consists of:

1. Equipment and subcontractor procurement
2. Execution of construction

These activities proceed after the appropriate Due Diligence actions have been completed under HWR1A and HWR1B

**d. WORK SPECIFICALLY EXCLUDED:**

All activities associated with transition of the contract from FWENC

Project Manager <i>Robert Fellman</i>	Control Account Manager <i>Robert Fellman</i>	Control Team Manager <i>Howard J. Hill</i>
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8. BUDGET AND REPORTING NUMBER <b>EW05H3070</b>	9. BUDGET TITLE <b>SILOS</b>		
10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE? <b>NEW PER CP# FY01-0115-0007-00</b>		11. ESTIMATED START / COMPLETION DATE <b>07/01 - 01/06</b>	
12. TASK IDENTIFICATION (WORK PACKAGE) <b>HWR1F</b>	13. TASK DESCRIPTION (ONE LINE) <b>CONSTRUCTION MANAGEMENT</b>		
14. ELEMENT TASK DESCRIPTION			
<p><b><u>a. ELEMENTS OF COST:</u></b></p> <p>Teaming Partners Labor ODC Materials Subcontractors</p> <p><b><u>b. TECHNICAL CONTENT:</u></b></p> <p>Construction Management consists of those activities necessary to support construction including reviews, infrastructure coordination, planning and bidding support, subcontract oversight, and acceptance testing. Fluor Fernald will act as the General Contractor for Construction of all the AWR facilities and structures.</p> <p><b><u>c. SCOPE OF WORK:</u></b></p> <p>In accordance with Silo 1 and 2 Accelerated Waste Retrieval (AWR) Project Transition and Execution Strategy (Appendix B), Fluor Fernald will act as the General Contractor for the balance of the construction associated with the AWR facilities and structures. These facilities include the RCS, the TTA, the FSMS, the SWRS, the TWRS, and the DWRS.</p> <p>The AWR Project team will strategically divide the design and specifications of the construction scope into logical bid packages, i.e., by discipline - Civil, Mechanical, and Electrical. Fixed-Price Contracts will be secured through an Invitation for Bid (IFB) process for each bid package. Wise Services, Inc. will be used for interface work between the Fixed-Price Contracts. Fluor Fernald will perform CAT and ICAT. Fluor Fernald and JEG will jointly provide Title III service support.</p>			
Project Manager <i>Robert Fellman</i>	Control Account Manager <i>Robert Fellman</i>	Control Team Manager <i>George P. [Signature]</i>	

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8. BUDGET AND REPORTING NUMBER <b>EW05H3070</b>	9. BUDGET TITLE <b>SILOS</b>		
10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE? <b>NEW PER CP# FY01-0115-0007-00</b>		11. ESTIMATED START / COMPLETION DATE <b>07/01 - 01/06</b>	
12. TASK IDENTIFICATION (WORK PACKAGE) <b>HWR1F</b>	13. TASK DESCRIPTION (ONE LINE) <b>CONSTRUCTION MANAGEMENT</b>		

14. ELEMENT TASK DESCRIPTION

Fluor Fernald will perform Construction Design Support including constructability reviews. The design constructability review process involves evaluating and integrating practical construction practices and requirements into the engineering execution design modification's.

Fluor Fernald will perform Construction Subcontracting which includes the planning, bidding, and field oversight, and support of the Construction Subcontracts needed for the AWR construction activities.

**d. WORK SPECIFICALLY EXCLUDED:**

All D&D Activities

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8. BUDGET AND REPORTING NUMBER <b>EW05H3070</b>	9. BUDGET TITLE <b>SILOS</b>		
10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE? <b>NEW PER CP# FY01-0115-0007-00</b>		11. ESTIMATED START / COMPLETION DATE <b>03/01 - 05/06</b>	
12. TASK IDENTIFICATION (WORK PACKAGE) <b>HWR1G</b>	13. TASK DESCRIPTION (ONE LINE) <b>ENGINEERING SUPPORT</b>		

14. ELEMENT TASK DESCRIPTION

**a. ELEMENTS OF COST:**

Labor  
Teaming Partners  
ODC  
Materials  
Subcontractors

**b. TECHNICAL CONTENT:**

Activities required by Fluor Fernald Site Engineering to provide support of the AWR design and construction activities

**c. SCOPE OF WORK:**

The scope of Engineering Support of Construction consists of those activities necessary to support construction, including oversight of design, including design modifications, reviews, infrastructure coordination, planning and bidding support, and acceptance testing.

**d. WORK SPECIFICALLY EXCLUDED:**

None

Project Manager <i>Robert Fellman</i>	Control Account Manager <i>Robert Fellman</i>	Control Team Manager <i>Howard [Signature]</i>
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5. PERFORMING DIV/DEPARTMENT CODE <b>4302</b>	6. ORIGINATOR NAME/PHONE <b>R. FELLMAN</b>	7. WBS ELEMENT MANAGER <b>R. FELLMAN</b>	
8. BUDGET AND REPORTING NUMBER <b>EW05H3070</b>	9. BUDGET TITLE <b>SILOS</b>		
10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE? <b>NEW PER CP# FY01-0115-0007-00</b>		11. ESTIMATED START / COMPLETION DATE <b>07/01 - 05/06</b>	
12. TASK IDENTIFICATION (WORK PACKAGE) <b>HWR1H</b>	13. TASK DESCRIPTION (ONE LINE) <b>JACOBS EXECUTION ENGINEERING</b>		
14. ELEMENT TASK DESCRIPTION  <b>a. ELEMENTS OF COST:</b>  Teaming Partners ODC Materials  <b>b. TECHNICAL CONTENT:</b>  Activities Required by Jacobs Engineering for execution of engineering related work on the AWR Project  <b>c. SCOPE OF WORK:</b>  These activities include specific redesign activities required pursuant to the funding of the AWR Due Diligence teams. This scope also consists of conducting reviews, planning and bidding support, and acceptance testing  <b>d. WORK SPECIFICALLY EXCLUDED:</b>  None			
Project Manager <i>Robert Fellman</i>	Control Account Manager <i>Robert Fellman</i>	Control Team Manager <i>Howard J. West</i>	



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12. TASK IDENTIFICATION (WORK PACKAGE) <b>HWR1J</b>	13. TASK DESCRIPTION (ONE LINE) <b>START- UP AND READINESS</b>		
<p>14. ELEMENT TASK DESCRIPTION</p> <p><b><u>a. ELEMENTS OF COST:</u></b></p> <p>Labor Teaming Partners ODC Materials Subcontracts</p> <p><b><u>b. TECHNICAL CONTENT:</u></b></p> <p>Start-up and Readiness consists of those activities necessary to demonstrate that the AWR Project has been properly constructed and is ready for operation and that the workforce has been properly trained and is ready to safely operate the AWR facilities. The start-up and readiness activities include project preparation and evaluation of personnel and qualifications, facility and process hardware, engineering and administrative controls, procedures, and training against the documented safety and design basis. In addition, the scope includes an evaluation of operational readiness by Fluor Fernald and a subsequent readiness evaluation by DOE-FEMP.</p> <p><b><u>c. SCOPE OF WORK:</u></b></p> <p>Startup and Readiness ensures that the facility and personnel are prepared to operate safely and effectively. The startup and readiness activities include project preparation and evaluation of personnel and qualifications, facility and process hardware, engineering and administrative controls, procedures and training against documented safety and design bases. Additionally, Fluor Fernald will complete an evaluation of operational readiness consistent with site requirements. Subsequent to satisfactory completion of Fluor Fernald's readiness evaluation, DOE-FEMP will complete its readiness</p>			

Project Manager <i>Robert Fellman</i>	Control Account Manager <i>Robert Fellman</i>	Control Team Manager <i>Howard Wolfe</i>
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8. BUDGET AND REPORTING NUMBER <b>EW05H3070</b>	9. BUDGET TITLE <b>SILOS</b>		
10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE? <b>NEW PER CP# FY01-0115-0007-00</b>		11. ESTIMATED START / COMPLETION DATE <b>12/00 - 02/06</b>	
12. TASK IDENTIFICATION (WORK PACKAGE) <b>HWR1J</b>	13. TASK DESCRIPTION (ONE LINE) <b>START- UP AND READINESS</b>		
14. ELEMENT TASK DESCRIPTION <p>evaluation per DOE Orders, as applicable.</p> <p>The scope, schedule and resources for the Startup and Readiness activities will be managed by the following five (5) key activities:</p> <ul style="list-style-type: none"> <li>· Training;</li> <li>· Readiness Review and Planning;</li> <li>· SOT;</li> <li>· Plans and Procedures; and</li> <li>· Preventative Maintenance.</li> </ul> <p><b>Training</b></p> <p>The scope of the Training task activities includes Fluor Fernald labor to develop and approve the training documentation for the AWR Project. This task also includes Fluor Fernald cost for FAT&amp;LC labor and supervision training. The training activities will be segmented into the following three phases to support the operation activities:</p> <ul style="list-style-type: none"> <li>· RCS;</li> <li>· FSMS Testing; and</li> <li>· Silo Waste Retrieval.</li> </ul> <p><b>Readiness Self-Assessment</b></p> <p>The scope of the Readiness Self-Assessment task includes Fluor Fernald's labor to prepare and to perform readiness activities [Operational Readiness Review (ORR) or Readiness Assessment or Standard Start-up Review] for the AWR project. The scope of this task also includes Fluor Fernald cost associated with readiness.</p> <p>The Project Readiness Team will ensure that the facility and personnel are prepared to operate safely and effectively. The Project Readiness Team will use a graded approach to verify that the project is ready to commence operations.</p> <p>The scope of the Systems Operability Test (SOT) task includes Fluor Fernald cost associated with the planning and performing SOTs on the AWR Project.</p> <p>SOT involves the following activities:</p> <ul style="list-style-type: none"> <li>· SOT Plan and Procedures;</li> <li>· SOTs; and</li> <li>· System Operability Final Test Report.</li> </ul> <p>Fluor Fernald will develop a SOT Plan to establish the testing program for AWR</p>			

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8. BUDGET AND REPORTING NUMBER <b>EW05H3070</b>	9. BUDGET TITLE <b>SILOS</b>		
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12. TASK IDENTIFICATION (WORK PACKAGE) <b>HWRLJ</b>	13. TASK DESCRIPTION (ONE LINE) <b>START- UP AND READINESS</b>		

14. ELEMENT TASK DESCRIPTION

startup. Fluor Fernald will also develop SOT procedures on equipment in the following systems, identifying personnel, testing requirements, system boundaries and standards to be met to ensure that the AWR systems meet the design requirements.

The Plans and Procedures task consists of Fluor Fernald resources needed to review and approve the AWR Project O&M plans and procedures.

**Operations Procedures Development**  
Fluor Fernald will develop operating procedures to direct personnel in the safe operation of the AWR systems and equipment during normal, off-normal, and emergency conditions. Existing Fluor Fernald operating procedures will be used by the Fluor Fernald labor force in performing routine RCS, bulk waste retrieval, discreet object, and heel removal operations. It is assumed that operating procedures will be developed for the following activities:

- Operation of the RCS;
- Operation of the SWRS and DWRS;
- Operation of EMMA™;
- Operation of the TTA;
- Operation of the HEPA ventilation system;
- Operation of Breathing Air System;
- Operation of CCTV system;
- Emergency Operating Procedures;
- System Shut-down (short-duration); and
- Decontamination (including tools and equipment).

Operating procedures will be drafted and reviewed prior to start of SOTs. However, procedures will not be finalized until SOTs have been completed, and lessons learned from SOT can be incorporated into the procedures.

**Maintenance Plan Development**  
A maintenance plan will be prepared to document the maintenance strategy and maintenance requirements during operations. The maintenance plan will determine what maintenance work orders, procedures, or other documentation will need to be prepared to support maintenance activities. These documents will be prepared prior to initiating operations, where appropriate.

**d. WORK SPECIFICALLY EXCLUDED:**

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12. TASK IDENTIFICATION (WORK PACKAGE) <b>HWR1J</b>	13. TASK DESCRIPTION (ONE LINE) <b>START- UP AND READINESS</b>		

14. ELEMENT TASK DESCRIPTION

**None**

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12. TASK IDENTIFICATION (WORK PACKAGE) <b>HWR1K</b>	13. TASK DESCRIPTION (ONE LINE) <b>OPERATIONS/MAINTENANCE</b>		
14. ELEMENT TASK DESCRIPTION			
<p><b><u>a. ELEMENTS OF COST:</u></b></p> <p>Labor Teaming Partners ODC Materials Subcontracts</p> <p><b><u>b. TECHNICAL CONTENT:</u></b></p> <p>Operations consists of those activities necessary to support the proper operation of the TTA and the RCS. The scope will include retrieval of material from Silos 1 and 2 and the decant sump tank, treatment of radionuclides, particulate, and radon in the RCS, and excavation of the silo berm soils.</p> <p><b><u>c. SCOPE OF WORK:</u></b></p> <p>This covers all of the O&amp;M labor, spare parts, equipment, and consumable costs to support the AWR O&amp;M activities. The O&amp;M task is defined as any activity associated with the implementation and coordination of the operation of the RCS, SWRS, TTA, and DWRS. Flour Fernald will provide technical direction of the O&amp;M in accordance with the Standard Operating Procedures and maintenance procedures. The O&amp;M activities will be performed by Fernald Atomic Trades and Labor Council (FAT&amp;LC) labor. The O&amp;M tasks include the silo berm removal and silo gross decontamination using EMMATM. AWR Operations has been segmented into the following activities:</p> <ul style="list-style-type: none"> <li>· RCS, Phase I O&amp;M activities - The objective of the RCS, Phase I operation is to reduce silo headspace radon concentrations;</li> <li>· SWRS O&amp;M activities - This segment includes the bulk sluicing, berm removal, heel removal, discrete object removal, silo gross decontamination, and fixative</li> </ul>			
Project Manager <i>Robert Fellman</i>	Control Account Manager <i>Robert Fellman</i>	Control Team Manager <i>Howard E. Weeks</i>	

**WORK SCOPE DEFINITION**  
(Work Package)

1. PROJECT TITLE <b>FEMP (DEFENSE)</b>		2. DATE <b>12/01/2000</b>	Page 2
3. WBS ELEMENT CODE <b>1.1.H.C</b>	4. WBS ELEMENT TITLE/NAME <b>AWR</b>		
5. PERFORMING DIV/DEPARTMENT CODE <b>4302</b>	6. ORIGINATOR NAME/PHONE <b>R. FELLMAN</b>	7. WBS ELEMENT MANAGER <b>R. FELLMAN</b>	
8. BUDGET AND REPORTING NUMBER <b>EW05H3070</b>	9. BUDGET TITLE <b>SILOS</b>		
10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE? <b>NEW PER CP# FY01-0115-0007-00</b>		11. ESTIMATED START / COMPLETION DATE <b>09/02 - 03/06</b>	
12. TASK IDENTIFICATION (WORK PACKAGE) <b>HWR1K</b>	13. TASK DESCRIPTION (ONE LINE) <b>OPERATIONS/MAINTENANCE</b>		

14. ELEMENT TASK DESCRIPTION

application to silo walls;

- DWRS O&M activities - This segment addresses the waste retrieval and gross decontamination of the Decant Sump Tank;
- O&M activities associated with the transfer of wastewater from the AWR Project to the High Nitrate Tank for staging for treatment at AWWT; and
- O&M activities associated with the gross decontamination of the silos and the application of a fixative spray to the silo interior.

**Berm Soil Handling**

This task consists of the Fluor Fernald resources associated with berm soil handling activities as defined in the Remedial Design Package Berm Excavation Plan. This task consists of FAT&LC labor and Fluor Fernald supervision.

**d. WORK SPECIFICALLY EXCLUDED:**

**WORK SCOPE DEFINITION**  
(Work Package)

1. PROJECT TITLE <b>FEMP (DEFENSE)</b>		2. DATE <b>12/01/2000</b>	Page 1
3. WBS ELEMENT CODE <b>1.1.H.C</b>	4. WBS ELEMENT TITLE/NAME <b>AWR</b>		
5. PERFORMING DIV/DEPARTMENT CODE <b>4302</b>	6. ORIGINATOR NAME/PHONE <b>R. FELLMAN</b>	7. WBS ELEMENT MANAGER <b>R. FELLMAN</b>	
8. BUDGET AND REPORTING NUMBER <b>EW05H3070</b>	9. BUDGET TITLE <b>SILOS</b>		
10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE? <b>NEW PER CP# FY01-0115-0007-00</b>		11. ESTIMATED START / COMPLETION DATE <b>03/06 - 05/06</b>	
12. TASK IDENTIFICATION (WORK PACKAGE) <b>HWR1L</b>	13. TASK DESCRIPTION (ONE LINE) <b>SAFE SHUTDOWN</b>		
14. ELEMENT TASK DESCRIPTION			
<p><b><u>a. ELEMENTS OF COST:</u></b></p> <p>Labor Teaming Partners ODC Materials Subcontracts</p> <p><b><u>b. TECHNICAL CONTENT:</u></b></p> <p>Safe Shutdown consists of those activities necessary to support safe shutdown of Silos 1 and 2, the SWRS, and the DWRS. The scope of Safe Shutdown includes: isolation of utilities, removal of all residual material with transfer to the TTA, and gross decontamination of Silos 1 and 2, the decant sump tank, and contaminated process equipment.</p> <p><b><u>c. SCOPE OF WORK:</u></b></p> <p>This covers those activities necessary to support safe shutdown of Silos 1 and 2, the SWRS, and the DWRS. The scope of Safe Shutdown includes: isolation of utilities from the SWRS and DWRS, removal of all residual material with transfer to the TTA, and gross decontamination of Silos 1 and 2, the decant sump tank, and contaminated process equipment. Fluor Fernald will perform safe shutdown activities in accordance with the FEMP Collective Bargaining Agreement with FAT&amp;LC labor. Isolation of Utilities Fluor Fernald will isolate all utilities including, but not limited to, electric power, steam, water, and compressed air from the SWRS and DWRS. Fluor Fernald will develop an Energy Isolation Plan that describes when, where, and how, the utilities will be isolated.</p>			
Project Manager <i>Robert Fellman</i>	Control Account Manager <i>Robert Fellman</i>	Control Team Manager <i>Howard E. Wicks</i>	

**WORK SCOPE DEFINITION**  
(Work Package)

1. PROJECT TITLE <b>FEMP (DEFENSE)</b>		2. DATE <b>12/01/2000</b>	Page 2
3. WBS ELEMENT CODE <b>1.1.H.C</b>	4. WBS ELEMENT TITLE/NAME <b>AWR</b>		
5. PERFORMING DIV/DEPARTMENT CODE <b>4302</b>	6. ORIGINATOR NAME/PHONE <b>R. FELLMAN</b>	7. WBS ELEMENT MANAGER <b>R. FELLMAN</b>	
8. BUDGET AND REPORTING NUMBER <b>EW05H3070</b>	9. BUDGET TITLE <b>SILOS</b>		
10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE? <b>NEW PER CP# FY01-0115-0007-00</b>		11. ESTIMATED START / COMPLETION DATE <b>03/06 - 05/06</b>	
12. TASK IDENTIFICATION (WORK PACKAGE) <b>HWR1L</b>	13. TASK DESCRIPTION (ONE LINE) <b>SAFE SHUTDOWN</b>		
14. ELEMENT TASK DESCRIPTION <p>Utilities will be safely disconnected outside the facility early in the safe shutdown process, by physically cutting, air gapping, and tagging the lines. Fluor Fernald will remove all grounding conductors to grade level. Fluor Fernald will verify that all utilities are capped and/or controlled and notify the Assistant Emergency Duty Officer of the completion of utilities isolation.</p> <p>Gross Decontamination Fluor Fernald will perform gross decontamination of the remaining SWRS, DWRS, and FSMS equipment and the interior of the Silos 1 and 2 structures. Gross decontamination is defined as general housekeeping to remove contaminated debris, vacuum loose dust, wet wipe equipment, ductwork, piping, and the interior of the structure walls, and remove loose, visible residues.</p> <p><b><u>d. WORK SPECIFICALLY EXCLUDED:</u></b></p>			

**WORK SCOPE DEFINITION**  
(Work Package)

1. PROJECT TITLE <b>FEMP (DEFENSE)</b>		2. DATE 12/01/2000	Page 1
3. WBS ELEMENT CODE 1.1.H.C	4. WBS ELEMENT TITLE/NAME AWR		
5. PERFORMING DIV/DEPARTMENT CODE 4302	6. ORIGINATOR NAME/PHONE R. FELLMAN	7. WBS ELEMENT MANAGER R. FELLMAN	
8. BUDGET AND REPORTING NUMBER EW05H3070	9. BUDGET TITLE SILOS		
10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE? NEW PER CP# FY01-0115-0007-00		11. ESTIMATED START / COMPLETION DATE 12/01 - 02/02	
12. TASK IDENTIFICATION (WORK PACKAGE) HWR1M	13. TASK DESCRIPTION (ONE LINE) MAINTENANCE FACILITY		
14. ELEMENT TASK DESCRIPTION			
<p><b><u>a. ELEMENTS OF COST:</u></b></p> <p>Labor Teaming Partners ODC Materials Subcontracts</p> <p><b><u>b. TECHNICAL CONTENT:</u></b></p> <p>Silo Project Maintenance Facility consists of all the activities and resources needed to support the conversion of the existing VITPP Building into a maintenance facility to support the Silos Division maintenance activities. The scope of Silos Project Maintenance Facility has been broken down into the following tasks:</p> <ul style="list-style-type: none"> <li>· Planning;</li> <li>· Removal; and</li> <li>· Facility Upgrade.</li> </ul> <p><b><u>c. SCOPE OF WORK:</u></b></p> <p>The scope of the Silos Project Maintenance Facility consists of all activities and resources needed to support the conversion of the existing VITPP facility into a maintenance facility to support the Silos Division maintenance activities. The scope, schedule, and resources for renovation of the existing VITPP facility will be managed by the following three key activities:</p> <ul style="list-style-type: none"> <li>· Planning</li> <li>· Equipment Removal; and</li> <li>· Facility Upgrade.</li> </ul>			
Project Manager <i>Robert Fellman</i>	Control Account Manager <i>Robert Fellman</i>	Control Team Manager <i>Stephen West</i>	

**WORK SCOPE DEFINITION**  
(Work Package)

<b>1. PROJECT TITLE</b>  FEMP (DEFENSE)		<b>2. DATE</b>  12/01/2000	Page 2
<b>3. WBS ELEMENT CODE</b>  1.1.H.C	<b>4. WBS ELEMENT TITLE/NAME</b>  AWR		
<b>5. PERFORMING DIV/DEPARTMENT CODE</b>  4302	<b>6. ORIGINATOR NAME/PHONE</b>  R. FELLMAN	<b>7. WBS ELEMENT MANAGER</b>  R. FELLMAN	
<b>8. BUDGET AND REPORTING NUMBER</b>  EW05H3070	<b>9. BUDGET TITLE</b>  SILOS		
<b>10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE?</b>  NEW PER CP# FY01-0115-0007-00		<b>11. ESTIMATED START / COMPLETION DATE</b>  12/01 - 02/02	
<b>12. TASK IDENTIFICATION (WORK PACKAGE)</b>  HWR1M	<b>13. TASK DESCRIPTION (ONE LINE)</b>  MAINTENANCE FACILITY		
<b>14. ELEMENT TASK DESCRIPTION</b>  Task #1 - Planning The Planning task consists of the Task Orders for renovation of the Silos Project Maintenance Facility.  Task #2 - Equipment Removal The Equipment Removal task consists of the removal of the vitrification melter, roller conveyor, and electrical transformer. The balance of the VITPP components were removed during previous Safe Shutdown activities.  Task #3 - Facility Upgrade The Facility Upgrade task consists of re-energizing the heating, ventilation, and air-conditioning system, the ventilation system, and fire detection system, and moving and setting up maintenance equipment.  <b><u>d. WORK SPECIFICALLY EXCLUDED:</u></b>			

**WORK SCOPE DEFINITION**  
(Work Package)

1. PROJECT TITLE <b>FEMP (DEFENSE)</b>		2. DATE 12/01/2000	Page 1
3. WBS ELEMENT CODE 1.1.H.C	4. WBS ELEMENT TITLE/NAME AWR		
5. PERFORMING DIV/DEPARTMENT CODE 4302	6. ORIGINATOR NAME/PHONE R. FELLMAN	7. WBS ELEMENT MANAGER R. FELLMAN	
8. BUDGET AND REPORTING NUMBER EW05H3070	9. BUDGET TITLE SILOS		
10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE? NEW PER CP# FY01-0115-0007-00		11. ESTIMATED START / COMPLETION DATE 12/00 - 05/06	
12. TASK IDENTIFICATION (WORK PACKAGE) HWR1P	13. TASK DESCRIPTION (ONE LINE) PROJECT MANAGEMENT		

14. ELEMENT TASK DESCRIPTION

**a. ELEMENTS OF COST:**

Labor  
Teaming Partners  
ODC  
Materials  
Subcontracts

**b. TECHNICAL CONTENT:**

Project Management consists of those activities necessary to support the implementation of the AWR Project and develop and manage the documentation the Site Closure Contract requires to demonstrate the ability to execute the AWR Project. The scope of Project Management consists of the following two tasks:

- Project Oversight; and
- Project Documentation.

**c. SCOPE OF WORK:**

The scope of Project Management, Charge No. HWR1P, for the AWR Project is defined by two project tasks: Project Oversight and Project Documentation.

Task #1 - Project Oversight

The scope of the Project Oversight task consists of project related activities necessary to support the implementation of the AWR Project. These tasks include, maintenance of this closure plan, quarterly updates to the baseline risk management plan, workforce planning, daily filing and maintenance of project documentation and records, annual training updates for matrixed project personnel, contract administration, engineering and design oversight and

Project Manager <i>Robert Fellman</i>	Control Account Manager <i>Robert Fellman</i>	Control Team Manager <i>Howard West</i>
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**WORK SCOPE DEFINITION**  
(Work Package)

1. PROJECT TITLE <b>FEMP (DEFENSE)</b>		2. DATE <b>12/01/2000</b>	Page 2
3. WBS ELEMENT CODE <b>1.1.H.C</b>	4. WBS ELEMENT TITLE/NAME <b>AWR</b>		
5. PERFORMING DIV/DEPARTMENT CODE <b>4302</b>	6. ORIGINATOR NAME/PHONE <b>R. FELLMAN</b>	7. WBS ELEMENT MANAGER <b>R. FELLMAN</b>	
8. BUDGET AND REPORTING NUMBER <b>EW05H3070</b>	9. BUDGET TITLE <b>SILOS</b>		
10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE? <b>NEW PER CP# FY01-0115-0007-00</b>		11. ESTIMATED START / COMPLETION DATE <b>12/00 - 05/06</b>	
12. TASK IDENTIFICATION (WORK PACKAGE) <b>HWR1P</b>	13. TASK DESCRIPTION (ONE LINE) <b>PROJECT MANAGEMENT</b>		
14. ELEMENT TASK DESCRIPTION <p>support, regulatory submittal support, procurement support, stakeholder support, project-specific clerical support, quality assurance and operational readiness self-assessments, audits, surveillances, inspections, and client interface.</p> <p>Task #2 - Project Documentation</p> <p>This task involves development and maintenance of documentation necessary to support AWR Project execution, as required by the terms of the Site Closure Contract under this Closure Plan. The project documents will represent the highest-level project documents generated, and effectively describe the methods and reflect the FEMP Programs and Plans that will be used in order to complete the defined scope of work. The execution of activities will be consistent with the methods described in these documents.</p> <p><b><u>d. WORK SPECIFICALLY EXCLUDED:</u></b></p>			

**WORK SCOPE DEFINITION  
(Control Account)**

1. PROJECT TITLE <b>FEMP (DEFENSE)</b>		2. DATE <b>12/01/2000</b>	Page 1
3. WBS ELEMENT CODE <b>1.1.H.C</b>	4. WBS ELEMENT TITLE/NAME <b>AWR</b>		
5. PERFORMING DIV/DEPARTMENT CODE <b>4302</b>	6. ORIGINATOR NAME/PHONE <b>R. FELLMAN</b>	7. WBS ELEMENT MANAGER <b>R. FELLMAN</b>	
8. BUDGET AND REPORTING NUMBER <b>EW05H3070</b>	9. BUDGET TITLE <b>SILOS</b>		
10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE? <b>NEW PER CP# FY01-0115-0007-00</b>		11. ESTIMATED START / COMPLETION DATE <b>12/00 - 03/05</b>	
12. TASK IDENTIFICATION (CONTROL ACCOUNT) <b>HSWR</b>	13. TASK DESCRIPTION (ONE LINE) <b>ACCELERATED WASTE RETRIEVAL</b>		
14. ELEMENT TASK DESCRIPTION			
<p><b><u>a. ELEMENTS OF COST:</u></b></p> <p>Labor ODCs Subcontractors Material</p> <p><b><u>b. TECHNICAL CONTENT:</u></b></p> <p>The FWENC Contract Closeout covers the payments expected to be made to FWENC pursuant to their contract closeout settlement proposal, and in accordance with the advanced Understanding Regarding Settlement of Subcontract Issues between FWENC and Fluor Fernald.</p> <p>Fluor Fernald's resources required to stage and transport the contaminated test equipment from the rheology studies performed on Silos 1 &amp; 2 material at Florida International University. The contaminated test equipment is packaged in twenty 55 gallon drums and is located in the Plant 1 Pad. The plan is to ship these drums to the Nevada Test Site (NTS) for final disposition. The actual rheology studies were performed under the previous contract.</p> <p><b><u>c. SCOPE OF WORK:</u></b></p> <p>The scope of the FWENC Closure covers the FWENC Settlement proposal identified by the basis of all amounts believed to be payable to FWENC pursuant to the Advanced Understanding Regarding Settlement of Subcontract Issues.</p> <p>The scope of the Rheology Studies task consists of all the activities and resources needed for the shipping and final disposition of the contaminated equipment from the K-65 rheology studies performed at Florida International</p>			
Project Manager <i>Robert Fellman</i>	Control Account Manager <i>Robert Fellman</i>	Control Team Manager <i>Howard E. White</i>	

**WORK SCOPE DEFINITION**  
(Control Account)

1. PROJECT TITLE  <b>FEMP (DEFENSE)</b>		2. DATE  12/01/2000	Page 2
3. WBS ELEMENT CODE  1.1.H.C	4. WBS ELEMENT TITLE/NAME  AWR		
5. PERFORMING DIV/DEPARTMENT CODE  4302	6. ORIGINATOR NAME/PHONE  R. FELLMAN	7. WBS ELEMENT MANAGER  R. FELLMAN	
8. BUDGET AND REPORTING NUMBER  EW05H3070	9. BUDGET TITLE  SILOS		
10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE?  NEW PER CP# FY01-0115-0007-00		11. ESTIMATED START / COMPLETION DATE  12/00 - 03/05	
12. TASK IDENTIFICATION (CONTROL ACCOUNT)  HSWR	13. TASK DESCRIPTION (ONE LINE)  ACCELERATED WASTE RETRIEVAL		
14. ELEMENT TASK DESCRIPTION  University.  <b><u>d. WORK SPECIFICALLY EXCLUDED:</u></b>  None			

**WORK SCOPE DEFINITION**  
(Work Package)

1. PROJECT TITLE <b>FEMP (DEFENSE)</b>	2. DATE <b>12/01/2000</b>	Page 1
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3. WBS ELEMENT CODE <b>1.1.H.C</b>	4. WBS ELEMENT TITLE/NAME <b>AWR</b>
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5. PERFORMING DIV/DEPARTMENT CODE <b>4302</b>	6. ORIGINATOR NAME/PHONE <b>R. FELLMAN</b>	7. WBS ELEMENT MANAGER <b>R. FELLMAN</b>
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8. BUDGET AND REPORTING NUMBER <b>EW05H3070</b>	9. BUDGET TITLE <b>SILOS</b>
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10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE? <b>NEW PER CP# FY01-0115-0007-00</b>	11. ESTIMATED START / COMPLETION DATE <b>12/00 - 03/05</b>
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12. TASK IDENTIFICATION (WORK PACKAGE) <b>HSWRB</b>	13. TASK DESCRIPTION (ONE LINE) <b>AWR SUBCONTRACTOR</b>
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14. ELEMENT TASK DESCRIPTION

**a. ELEMENTS OF COST:**

Subcontractors

**b. TECHNICAL CONTENT:**

The scope of the FWENC Contract Closeout covers the payments expected to be made to FWENC pursuant to their contract closeout settlement proposal, and in accordance with the advanced Understanding Regarding Settlement of Subcontract Issues between FWENC and Fluor Fernald.

**c. SCOPE OF WORK:**

The scope of the FWENC Closure covers the FWENC Settlement proposal identified by the basis of all amounts believed to be payable to FWENC pursuant to the Advanced Understanding Regarding Settlement of Subcontract Issues.

**d. WORK SPECIFICALLY EXCLUDED:**

None

Project Manager <i>Robert Fellman</i>	Control Account Manager <i>Robert Fellman</i>	Control Team Manager <i>Howard Eberts</i>
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**WORK SCOPE DEFINITION**  
(Work Package)

1. PROJECT TITLE <b>FEMP (DEFENSE)</b>		2. DATE <b>12/01/2000</b>	Page 1
3. WBS ELEMENT CODE <b>1.1.H.C</b>	4. WBS ELEMENT TITLE/NAME <b>AWR</b>		
5. PERFORMING DIV/DEPARTMENT CODE <b>4302</b>	6. ORIGINATOR NAME/PHONE <b>R. FELLMAN</b>	7. WBS ELEMENT MANAGER <b>R. FELLMAN</b>	
8. BUDGET AND REPORTING NUMBER <b>EW05H3070</b>	9. BUDGET TITLE <b>SILOS</b>		
10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE? <b>NEW PER CP# FY01-0115-0007-00</b>		11. ESTIMATED START / COMPLETION DATE <b>12/00 - 10/01</b>	
12. TASK IDENTIFICATION (WORK PACKAGE) <b>HSWRC</b>	13. TASK DESCRIPTION (ONE LINE) <b>RHEOLOGY STUDIES</b>		

14. ELEMENT TASK DESCRIPTION

**a. ELEMENTS OF COST:**

Labor  
Subcontractors  
ODCs  
Material

**b. TECHNICAL CONTENT:**

Fluor Fernald's resources required to stage and transport the contaminated test equipment from the rheology studies performed on Silos 1 & 2 material at Florida International University. The contaminated test equipment is packaged in twenty 55 gallon drums and is located in the Plant 1 Pad. The plan is to ship these drums to the Nevada Test Site (NTS) for final disposition. The actual rheology studies were performed under the previous contract.

**c. SCOPE OF WORK:**

The scope of the Rheology Studies task consists of all the activities and resources needed for the shipping and final disposition of the contaminated equipment from the K-65 rheology studies performed at Florida International University.

**d. WORK SPECIFICALLY EXCLUDED:**

None

Project Manager <i>Robert Fellman</i>	Control Account Manager <i>Robert Fellman</i>	Control Team Manager <i>Herzhu Ewert</i>
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## **SECTION 3**

### **1.0 NARRATIVE**



**FEMP BASELINE CLOSURE PLAN**

**VOLUME VII: SILOS PROJECT**

**SILOS 1 AND 2**

**ACCELERATED WASTE RETRIEVAL PROJECT**

**(40000-PL-0011)**

**REV. 0**

**AUGUST 2001**



**FERNALD**

**Environmental Management Project**



1. PROJECT TITLE: SILOS PROJECT	2. DATE: 09/10/01	3. PBS#: 07
4. WBS ELEMENT CODE: 1.1.H.C	5. WBS ELEMENT TITLE: ACCELERATED WASTE RETRIEVAL	
6. CAM NAME/ PHONE: ROBERT FELLMAN/MIKE KUNTZ	7. CAM SIGNATURE:	
8. ORIGINAL/ CHANGE SCOPE/ PER CP#:	9. CONTROL ACCOUNT: HS1R	

**SECTION 3: HSWR – ACCELERATED WASTE RETRIEVAL**

1.0 PROJECT SCOPE

1.1 OVERVIEW

This Closure Plan defines the scope of work to be performed during the Operable Unit 4 Silos 1 and 2 Accelerated Waste Retrieval (AWR) Project at the U.S. Department of Energy (DOE) Fernald Environmental Management Project (FEMP) in Hamilton County, Ohio. The object of the AWR project is to design, construct, start-up, and operate the systems required to retrieve the material from Silos 1 and 2 and transfer it to a newly constructed Transfer Tank Area (TTA) for safe interim storage pending final treatment and disposal. In order to accomplish these objectives, the Silos 1 and 2 Project has been divided into the following tasks (Charge Numbers):

- Due Diligence - Fluor Fernald (HWR1A);
- Due Diligence - Jacobs Engineering Group (JEG) (HWR1B)
- Radon Control System (RCS) Construction (HWR1C);
- JEG Construction Support (HWR1D);
- Balance of Plant (BOP) Construction (HWR1E);
- Construction Management (HWR1F);
- Engineering Support - Fluor Fernald (HWR1G);
- JEG Engineering Execution (HWR1H);
- Start-up and Readiness (HWR1J);
- Operations (HWR1K);
- Safe Shutdown (HWR1L);
- Silos Project Maintenance Facility (HWR1M);
- Project Management (HWR1P);
- Foster Wheeler Environmental Corporation (FWENC) Contract Closure (HSWRB); and
- Rheology Studies (HSWRM).

**1.2 ASSUMPTIONS, EXCLUSIONS, AND GOVERNMENT FURNISHED EQUIPMENT**

**1.2.1 Contracting Strategy**

The implementation strategy for the execution of the AWR Project will utilize the combined strengths of FEMP teaming partners and carefully selected subcontractors for engineering, design, procurement, construction, operations, and maintenance. Work under this closure plan will be performed using the contracting strategy outlined in **Table 1.2-1**. This strategy is the Engineering, Procurement, Construction, and Operation approach defined in the "Silos 1 and 2 Accelerated Waste Retrieval (AWR) Project Transition and Execution Strategy" (40710-RP-0009, Rev.0) submitted to DOE-FEMP on 7/27/01 (**Appendix B**).

**1.2.2 Assumptions and Criteria**

Throughout this closure plan, assumptions and criteria are documented to facilitate the reader's understanding of the regulatory and technical basis supporting the development of the baseline for the AWR Project. **Table 1-2.2** summarizes key assumptions and criteria found in this closure plan that form the basis of the scope of work, schedule, resource and risk management planning. "Assumptions," as used in the context of this closure plan, refer to facts or statements taken for granted based upon agreements between projects, demonstrated performance, third party published data or warranted claims. "Criteria," as used in the context of this closure plan, refer to either requirements or general information that form the basis for design.

**TABLE 1.2-1  
 AWR PROJECT – CONTRACTING STRATEGY**

<b>PROJECT SCOPE</b>	<b>CONTRACT STRATEGY</b>
Project Documentation	Fluor Fernald, Inc. (Fluor Fernald) will manage the development and implementation of project documentation with full integration with the JEG Design Team.
Design	JEG Design Team will evaluate and update the FWENC design and become the Designer of Record for the AWR project as a fully integrated Teaming Partner at their Oak Ridge, TN office.
Remedial Design/ Remedial Action (RD/RA) Deliverables	JEG will perform this scope, with Fluor Fernald managing the regulatory agency interface.
Safety Basis Documentation	JEG will perform this scope with full integration with the Fluor Fernald Silos Project Team.
Construction	Fluor Fernald will act as the General Contractor for the construction of all the AWR facilities and structures. The Project Team will strategically divide the construction into logical bid packages, i.e. by discipline, Civil, Mechanical, and Electrical. Fixed-Price subcontracts will be secured through an Invitation For Bid procurement process. Fluor Fernald will manage and coordinate the subcontractors. Wise Services, Inc. will be utilized for interface work between the Fixed-Price subcontracts. Fluor Fernald will perform Construction Acceptance Testing (CAT) and Integrated CAT (ICAT). Fluor Fernald and JEG will provide Title III services support.

**TABLE 1.2-1  
 AWR PROJECT – CONTRACTING STRATEGY (CONT'D)**

PROJECT SCOPE	CONTRACT STRATEGY
System Operability Testing (SOT)	Fluor Fernald will perform this scope of work.
Start-up	Fluor Fernald will perform this scope with technical assistance from the equipment manufacturer(s).
Operational Procedures and Documentation	Fluor Fernald will perform this scope of work with support from JEG.
Training	Fluor Fernald will perform this scope of work.
Operational Readiness	Fluor Fernald will perform this scope of work.
Operations	Fluor Fernald will perform this scope of work.

**TABLE 1.2-2  
 SUMMARY OF ASSUMPTIONS**

ITEM NO	DESCRIPTION
<b>ADMINISTRATIVE</b>	
A1	AWR Project will utilize the design developed by FWENC with no changes incorporated into it pursuant to any findings, conclusion, or amendments derived from the Due Diligence process.
A3	The AWR Safe Shutdown activities will be "fill in" work for the Silos Division Maintenance staff, for better utilization of resources.
<b>REGULATORY</b>	
R1	<p>U.S. Environmental Protection Agency (EPA) and Ohio EPA (OEPA) Interface: AWR Project will submit the following documentation to the EPA and OEPA for review and approval.</p> <p>Site Preparation Package - STATUS: Approved            [Consisting of documentation describing site preparation activities for the AWR Project, Certified for Construction (CFC) drawings for the civil site preparation, CFC construction specifications]. Reference EPA-approved Site Preparation Package, May 2000.</p> <p>Remedial Design (RD) Package - STATUS: Conditional Approval Received            [Consisting of design documentation based on the preliminary design, CFC Process Flow Diagrams, Piping and Instrumentation Diagrams, General Arrangement Drawings, Mass Balance, and documentation on Operational Environmental Planning].</p> <p>Remedial Action (RA) Work Plan for RCS Phase I Operations - STATUS: Conditional Approval Received            RA Work Plan for Silo Waste Retrieval Operations - In accordance with the milestones to be established.            Silo Penetration Plan - In accordance with the milestones to be established.</p> <p>Design Change Notices (DCNs) that impact any of the EPA review and approved documentation. Design changes that do not affect the RD Package documentation will not require EPA approval. The final design submittal will not be a submittal to the EPA for review and approval. For design submittals it is assumed that only DCNs will be presented to the EPA for review.</p>

**TABLE 1.2-2  
 SUMMARY OF ASSUMPTIONS (CONT'D)**

ITEM NO	DESCRIPTION
R2	EPA will not require detailed commitments on the completion and scope of the Full Scale Mockup System (FSMS) testing.
R3	EPA reviews - Review cycles of the RA Work Plans will be consistent with the primary document review cycles specified in the Amended Consent Agreement. DCN review will be conducted in three business days.
R4	AWR Project activities are performed in compliance with the applicable environmental laws and regulations, as noted in the Applicable or Relative and Appropriate Requirements Table in Appendix 5.1, of the Operational Environmental Control Plan, approved as part of the AWR RD Package.
R5	Berm Excavation Plan sampling requirements defined and approved by EPA and OEPA in the AWR RD Package will not be changed.
R6	Design modification identified as part of the AWR Due Diligence process will be submitted to the EPA as part of a DCN. Design modification does not require a complete revised RD Package or RA Work Plan, which have already been conditionally approved. The DCN summarizing the AWR Due Diligence findings will be reviewed by the agencies within 30 calendar days.
<b>SITE SUPPORT</b>	
SS1	Fluor Fernald will provide the operation and maintenance (O&M) work force to support the AWR Project in accordance with the current Collective Bargaining Agreement.
SS2	Fluor Fernald will provide and maintain the site infrastructure roads for access to the Silo Project Area.
SS3	Fluor Fernald will provide utility tie-ins (e.g., electricity, water, telecommunication, etc.) into the site existing systems.
SS4	The utilities required are available and maintained to support the AWR Project.
SS5	Fluor Fernald will maintain the necessary site support functions throughout the AWR Project (security, medical, fire department).
SS6	Fluor Fernald will maintain the support of the Advanced Wastewater Treatment (AWWT) facility to treat the AWR Project's wastewater in accordance with the contractual wastewater discharge requirements.
SS7	High Nitrate Tank will be available to collect and store the AWR Project wastewater prior to treatment by AWWT.
SS8	Soil Pile No. 1 is available and has the capacity to handle the berm excavation soils.
SS9	Utility requirements are covered by PBS 01 and the utility costs are paid by DOE and excluded from the PBS07 baseline cost for the AWR Project.
SS10	The AWWT influent requirements set for the AWR Project and defined in the Technical Requirements Document (TRD) TRD-40710-RP-0001 ( <b>Appendix A</b> ) are not changed.
<b>TECHNICAL</b>	
T1	AWR Project is a water user and has limited wastewater generation. The High Nitrate Tank has the capacity to handle all of the AWR Project generated wastewater.
T2	Wastewater generated will not require any additional treatment to meet the AWWT requirements.
T3	Berm excavation during silo waste retrieval activities does not impact or impede the silo waste retrieval activities.

**TABLE 1.2-2**  
**SUMMARY OF ASSUMPTIONS (CONT'D)**

ITEM NO.	DESCRIPTION
T4	Berm excavation soil sampling laboratory is available and will have a timely turnaround time so as to not impact waste retrieval activities.
T5	No archive samples during the waste retrieval activities are required to support the Silos 1 and 2 final remediation project.
T6	No archive samples from the transfer tanks are required to support the Silos 1 and 2 final remediation project.
T7	It is assumed that the BentoGrout™ Cap installed in Silos 1 and 2 is approximately 730 metric tons and the surface layer of the cap is now likely to be somewhat dry, cracked and stiff and is 50% by weight solid. Below the surface layer the BentoGrout™ retains its original gelatinous consistency and contains approximately 25 to 35% solid by weight.
T8	During the bulk slurry waste retrieval activities the BentoGrout™ Cap will be rehydrated and sluiced along with the K-65 material.
T9	Discrete objects can be size-reduced and handled by the AWR discrete object removal methods defined in the AWR BOP design.
T10	Berm excavation activities are not impacted by discrete unidentified objects that require special handling and disposal.
T11	Detailed Design Assumptions in accordance with the AWR Design Criteria Document, Document No. 624-P622-03, Rev 2 are incorporated here by reference.
T12	The Radon Adsorption Coefficient for the government-furnished equipment (GFE) carbon is $K_a = 9$ and the commercial supplied carbon is $K_a = 13$ as defined by FWENC laboratory testing.
T13	The in-leakage through the silos during the RCS operations is negligible and does not impact the RCS system operation.
T14	There is no appreciable leakage from the silos to the decant sump tank, which would impede the silo waste retrieval activities.
T15	The RCS uses the carbon beds designed by FWENC. The two carbon beds excessed in the Vitrification Pilot Plant (VITPP) will not be used by the AWR Project.
T16	FWENC and its subcontractors provide complete and accurate information in a timely manner to facilitate a smooth transition and to support the AWR Due Diligence process defined in the Silos 1 and 2 Accelerated Waste Retrieval (AWR) Project Transition and Execution Strategy ( <b>Appendix B</b> ) and the Contract Closure Agreement between Fluor Fernald and FWENC.
T17	All procurements initiated by FWENC can be assigned to Fluor Fernald and all procured equipment meets the AWR Project requirements.
T18	Operability and safety issues associated with the use of Easily Manipulated Mechanical Arm (EMMA™) can be addressed with minor design modifications and administrative controls. No significant redesign of EMMA™ is required.
T19	Contract closure settlement is completed in an equitable fashion without lawsuits and the funding for this settlement is not in excess of the current limitations of liability.
T20	The operational basis for retrieving material from Silos 1 and 2 is 10% solids.
T21	The physical conditions of Silos 1 and 2 specified in Appendix H of the AWR Project TRD ( <b>Appendix A</b> ) accurately represents the current conditions of the silos.
T22	The silo penetration activities identified and evaluated by structural analysis are not impacted by silo integrity concerns.
T23	The physical and chemical characteristics of the silo contents defined in the AWR Project TRD ( <b>Appendix A</b> ) accurately represents the current conditions of the silo contents.

**TABLE 1.2-2  
 SUMMARY OF ASSUMPTIONS (CONT'D)**

ITEM NO.	DESCRIPTION
<b>SAFETY</b>	
S1	Final Hazard Analysis Report (FHAR): Two revisions to the FHAR are required for the following phases of the AWR Project: <ul style="list-style-type: none"> <li>• FHAR, Rev. 0 - RCS, Phase I Operation</li> <li>• FHAR, Rev. 1 - AWR Waste Retrieval Operation</li> </ul> No FHAR revision will be needed to support the FSMS testing activity.
S2	FSMS testing is a non-radioactive activity and is covered by the Integrated Safety Assessment for non-radiological hazards and is not the subject of the FHAR.
<b>READINESS</b>	
RD1	Two Readiness Assessments are required for this project: <ul style="list-style-type: none"> <li>• RCS, Phase I Operation</li> <li>• AWR Waste Retrieval Operation</li> </ul> No readiness assessment is required for the FSMS testing or DWRS operations.
RD2	The readiness assessments for the AWR Project will not be impacted by the involvement of external reviews by the Defense Nuclear Facilities Safety Board, and the Critical Analysis Team.

1.2.3 Exclusions

**TABLE 1.2-3  
 EXCLUSIONS**

ITEM NO.	DESCRIPTION
1	Operation of the RCS after the completion of the Decant Sump Tank Waste Retrieval System (DWRS) activity is covered in the Silos 1 and 2 Project scope of work.
2	Operation of the Transfer Tank Area Waste Retrieval System (TWRS) is covered in the Silos 1 and 2 Project scope of work. The construction and testing of the TWRS is in the AWR Project scope of work.
3	Treatment of any wastewater, that meets the contractual wastewater discharge requirements, will be done by the AWWT facility. The AWR Project envisions generation of wastewater during the RCS operation and during the decontamination activities after waste retrieval.
4	The transfer of wastewater from the High Nitrate Tank to the AWWT facility. The AWR Project plans to stage wastewater in the High Nitrate Tank prior to treatment in the AWWT facility.
5	The decontamination and dismantlement (D&D) of the facilities and equipment provided in support of the AWR Project is in the Silos 1 and 2 Project scope of work.
6	The D&D of the silos is included in the Silos 1 and 2 Project Scope of Work. The gross decontamination and application of fixative to Silos 1 and 2 is within the AWR Project scope of work.
7	Reviews, comment responses, and support for any DOE independent assessment of the AWR Project (e.g., Tank Focus Area, Defense Nuclear Facilities Safety Board, Corps of Engineers).
8	Support for Critical Analysis Team reviews is addressed in the Silos Project, Project Management Control Account.

**TABLE 1.2-3  
 EXCLUSIONS**

ITEM NO.	DESCRIPTION
9	The transfer and disposal of the berm excavated soil from SP1 to the On-site Disposal Facility. This scope of work is included in the Soils Project.
10	The existing Radon Treatment System facility will not interfere with the AWR Project. The D&D of the Radon Treatment System is in the Silos 1 and 2 Project scope of work.

1.2.4 Government Furnished Equipment/Services

**TABLE 1.2-1  
 SUMMARY OF GOVERNMENT-FURNISHED EQUIPMENT**

ITEM NO.	DESCRIPTION
1	80,000 pounds of activated carbon excessed from the VITPP.
2	8 radon monitors excessed from the VITPP.
3	2 dump trucks to support berm soil removal
4	2 gradealls to support berm soil removal

1.3 DRIVERS

The AWR Project is based on Fluor Fernald's management decision to mitigate the risk associated with silo waste retrieval from the Silos 1 and 2 Final Remediation Project. The AWR Project was established to address the technical issues with silo waste retrieval activities without impacting the baseline critical path.

1.4 PROJECT PHYSICAL DESCRIPTION

The objective of the AWR Project is to retrieve the material from Silos 1 and 2, segregate discrete objects, and transfer the residue to transfer tanks for staging before final remediation. The project also includes the installation and operation of a RCS to reduce the radon concentration in each of the silos' headspace, and provide radon control during retrieval, material storage, and future operation of the Silos 1 and 2 Remediation Facility. The final stage involves the gross decontamination of the interior surfaces of Silos 1 and 2 and the Decant Sump Tank, and D&D of contaminated retrieval equipment for system closure.

The AWR Project is being implemented within the Silos Projects area in the western portion of the FEMP. The physical boundaries of the AWR Project are identified on Drawing No. 94X-5500-G-SK-5500, Space Allocation Site Plan, Operable Unit 4. The facilities required to accomplish the AWR Project include the following seven major systems:

- **RCS**, Phases 1 and 2 - RCS, Phase 1 controls and reduces radon concentrations in the silos' headspace. RCS, Phase 2 ensures radon control during retrieval, transfer, and storage of the silos material.
- **FSMS** - A FSMS ICAT/ SOT is to be performed with the Silo 4 FSMS. Fluor Fernald plans to incorporate the lessons learned from the FSMS ICAT/SOT into the AWR Project before beginning operations and use the FSMS for training and troubleshooting during Silos Waste Retrieval System (SWRS) operations.
- **SWRS** - The SWRS retrieves material from the silos; transfers residues, BentoGrout™, and heel material to the transfer tanks; retrieves and packages discrete objects; and performs gross decontamination of the silos.
- **DWRS** - The DWRS retrieves waste from the decant sump tank (approximately 1,000 gallons of residue/solids in a heel), segregates and transfers/packages material, and performs gross decontamination of the decant sump tank.
- **TTA** - The TTA consists of transfer tanks to be used as a storage area for K-65 Material/BentoGrout™ slurry for future remediation activity. Provisions will be made for sampling and sample storage.
- **TWRS** - The TWRS will retrieve the K-65 Material/BentoGrout™ slurry from the TTA and transfer it for processing at the Silos 1 and 2 Full-Scale Remediation Facility, which will be designed and constructed in a separately.
- **Facility Decontamination System (FDS)** - The FDS will function to remove gross contamination from the silos and contaminated process equipment as part of facility demobilization and closure. The FDS will also accomplish decontamination of temporary tools, equipment, and facilities used on the project.

The systems, equipment, and methods utilized to implement the AWR Project are summarized in the remainder of this section.

#### Radon Control System (RCS)

The RCS is a treatment system that employs air conditioning, dehumidification, activated carbon adsorption, and high-efficiency particulate air (HEPA) filtration to control and monitor emission of radon and other contaminants. The RCS receives gas streams from the following sources:

- Silos 1 and 2;
- SWRS;

- DWRS;
- TTA System;
- TWRS; and
- Silos 1 and 2 Remediation Facility.

The RCS is operated in two phases. Phase 1 is a recycle loop used to treat the Silos 1 and 2 radon concentration in the silos headspaces prior to any activity on or near the silos. Phase 2 of the RCS is a once-through system to support the waste retrieval activities.

The RCS is designed to remove radon-laden air from the various system components, provide Best Available Technology control of radon emission to the atmosphere, detect and measure releases to the atmosphere, and mitigate system upsets. The fans, ducting system, and automated process controls are designed to prevent over or under pressurization of the silos and transfer tanks. The ducting system is balanced using a redundant programmable logic control system.

The carbon adsorption system consists of four insulated carbon steel vessels, approximately 16' x 11' x 11', which contain a total of 160,000 pounds of carbon (40,000 pounds per vessel). The four carbon beds are operated in parallel splitting the flow equally.

The treated gas stream flows from the carbon adsorption units to redundant HEPA filtration units. Air from the carbon beds, makeup air, and fan recycle combine before entering the HEPA filters.

After exiting the operating HEPA filter unit, the treated air stream will enter the operating recirculation fans for redistribution to the silos, TTA tanks, or exhaust through the monitored stack. Quantities of makeup air, fan recycle air, and stack exhaust will be based upon maintaining a certain static pressure at the discharge of the fan. These flows will be closely controlled so that the air discharged to the exhaust stack will be minimized to maintain the appropriate negative pressure and flow through the system.

The stack is a 150-foot tapered carbon steel stack that is approximately 6 feet 4 inches at the base and tapers to approximately 3 feet at the top. The stack is provided with an isokinetic sampling system and will include continuous monitoring for both radionuclide particulate and for radon.

#### Full Scale Mockup System (FSMS)

The FSMS is designed to provide the equipment at Silo 4 for the operator training and proof of principle testing of the AWR systems. This testing includes the removal and transfer of K-65 silo surrogate material and debris. The testing will be performed in a nonradioactive environment using Silo 4 and modified Silo 4 superstructure facilities. FSMS refers to the specific systems, structures, and components that are installed at the Silo 4 facility.

The FSMS tie-ins to the AWR system will be removed at the completion of the FSMS ICAT and SOT. The FSMS will remain as a stand-alone system ensuring continued availability for training, system optimization, and troubleshooting throughout the AWR operations phase. The FSMS will utilize the exact model of equipment used in the SWRS, TWRS, and TTA to gain the most accurate testing and training.

#### Silo Waste Retrieval System (SWRS)

The purpose of the SWRS is:

- Bulk Material (K-65 residue and BentoGrout™) waste retrieval and transfer to the transfer tanks;
- Heel material retrieval and transfer to the transfer tanks; and
- Discrete object retrieval and packaging.

The bulk retrieval system is a sluicing system based on past practices. The main components of the bulk retrieval system are as follows:

- Sluicer Module – contains sluicing nozzle, which is used to convert the silo contents into a slurry.
- Slurry Pump Module – pumps the slurry from the silos to the TTA.
- Supernate Pump Module – pumps the decanted supernate water from the transfer tanks to the sluicer module and slurry pump. The decanted supernate water is the main water supply for the sluicer module and slurry pump.

The sluicing module and the slurry pump module are used for sluicing the BentoGrout™ cap and K-65 waste material. Initially, the sluicing stream is directed as close to the pump inlet as possible to induce a small, localized slurry pool. Additionally, the slurry pump module has the capability to operate in reverse, using sluice water, to assist in making a slurry pool. The slurry pump module also has a high-pressure water jet ring at the pump suction, which can blast hard material into pumpable slurry. A key objective of this waste retrieval activity is to minimize, and closely monitor, the inventory of water added to the silos. The slurry pump module is designed to withstand occasional impact by the sluicer module jet stream during operation.

Upon creating the cavity, the sluicer module cuts a canyon for slurry to flow through to the slurry pump module. The canyon will progress in depth and length toward the sluicer module. The slurry pool size at the slurry pump module suction will be minimized to minimize free water in the silo. The sluicer module will "push" the slurry towards the slurry pump module for retrieval. This type of operation occurs as long as it is effective. The width of the canyon will increase with priority being given to increasing the depth of the canyon, and the slurry pump module is periodically lowered (remotely) further into the silos, until it reaches the bottom. The sluicer module nozzle is also lowered periodically further into the silos. If the sluicer module nozzle is inadequate to break up a waste agglomeration, the Easily Manipulated Mechanical Arm (EMMA™) assists with the small arm-based sluicing nozzle. This allows a focused stream to be applied close to the waste.

The waste stream is monitored to determine the point at which solids loading in the waste stream are the same as the return supply supernatant. Upon a determination that effective sluicing is complete, the bulk waste retrieval operation will be completed and waste retrieval using the Conditioning and Transfer System (CATS) mode will be used. The sluicer module will be retracted back into its containment housing above the silo on the platform. The slurry pump system will be retracted back into its containment housing and modified for CATS Mode operation.

To minimize the secondary wastewater, the slurry water is supplied by a supernate pump module installed into the TTA. The supernate water could also be processed through the ultra-filtration skids for use by the high-pressure pumps for the heel removal and back flushing. In support of the silo waste retrieval activities, the silo berm will be lowered in stages as defined in the Berm Excavation Plan to minimize the load on the silo wall.

To ensure containment in the unlikely event of a failure of the silo walls, the level of the berm will be at least five feet above the level of residue inside the silos.

Heel removal follows the bulk sluicing activities. The heel is defined as the slurry, supernate, and K-65 material located on the silo bottom left after the bulk sluicing.

The heel removal operation consists of the following major components:

- EMMA™ - EMMA™ is used to place the Silo Retrieval End Effector (SREE) and other equipment in various locations where heel is present.
- Slurry Pump Module – Pump slurry from heel waste surge tank to the TTA.
- SREE – The SREE consists of three rotating jets that are used to locally slurry material. The SREE jet nozzles operate at up to a maximum of 10,000 pounds per square inch. Water to SREE comes from the SREE high-pressure pump.
- Jet Pump – Used to vacuum the slurry out of SREE and transfer the slurry to the heel waste surge tank.
- Heel Waste Surge Tank – located under the slurry pump module to create a reservoir

from which the slurry pump can operate.

The CATS is lowered to the silo floor from the slurry pump module by a hoist. Then the EMMA™ grasps and maneuvers the SREE in the tank to where heel is present.

When the SREE inlet is placed over the heel and submerged in liquid, the jet pump can remove up to 100 gallons per minute of motive water and liquid. When the inlet begins to pump air, the overall retrieval rate is decreased significantly. However, the system is able to continue to vacuum the bottom of the silo floor. Both the SREE and the jet pump require filtered water for the small nozzles that are used. The ultrafiltration skid supplies filtered water.

The slurry from the SREE inlet port is sucked into the three jets and it is pressurized and “pushed” through the jet pump discharge nozzle and into the Heel Waste Surge Tank. The slurry in the Heel Waste Surge Tank is then pumped by the slurry pump module to the TTA.

A simple basket system design allows the debris that remains at the bottom of the tank to be removed and packaged for disposal. The basket is lowered through the same riser used by the Sluicer Module during Bulk Waste Retrieval activities. The basket is lowered from the containment housing at the top of the platform by a cable and winch system. EMMA™ uses the gripper to collect and place debris into the basket until the basket is either full or all the reachable debris has been placed into the basket. The basket is raised back into the containment housing where it is placed in a drum to allow for removal from the bridge and disposition by Fluor Fernald.

The EMMA™ System is a major component of the SWRS, and is critical to the success of the AWR program. Two EMMA™ systems are planned for delivery to the Fernald site. These systems will be used for the FSMS testing activities planned for Silo 4 and the AWR operations on Silos 1 and 2.

The EMMA™ System is designed to assist in all mining and silo closure operations for BentoGrout™ removal through final inspection and fixative application activities. The proposed mining strategy will be achieved through effective employment of the EMMA™. The EMMA™ will facilitate operations from initial entrance into the silo through final clean out, inspection, and closure acceptance.

The EMMA™ manipulator is a 52.5-foot long, 30-inch diameter (maximum), cylindrical serpentine manipulator composed of five independent stages and a wrist assembly. Stages 1 through 3 are single degree of freedom stages, capable of bending only in a vertical direction (pitch). Stages 4 and 5 are two degrees of freedom stages, and provide pitch and yaw capability, which allows the stages to bend both in vertical and horizontal directions. The 2 degrees of freedom wrist at the end of the manipulator provides local dexterity in support of silo waste retrieval activities. The manipulator's length ensures access to the complete working envelope within the silo. The dexterity offered by the five discrete manipulator stages and wrist assembly enables the manipulator to move effectively around in-silo obstacles such as the SREE umbilical, the sluicer module, and the slurry pump module.

The EMMA™ is used to support all activities within the silos. EMMA™ features include:

- Deploying the high-pressure Arm Deployed Sluicing System nozzles to mobilize the BentoGrout™ layer and force the dislodged material toward the slurry pump;
- Forcing the waste and debris away from the slurry pump module and SREE to facilitate continuous operations;
- Supporting the camera and lighting system, inspection, and cleaning of all wall-mounted silo sampling ports;
- Cleaning the in-silo cameras and lights to ensure optimum visibility for remote operations;
- Transferring debris to different locations in the silos before removal to minimize retrieval obstructions;
- Performing wall washing and inspection operations as the headroom within the silo is increased (eliminates need for high-pressure water cannon on walls and minimizes the potential for silo damage caused by high-pressure wall washing activities);
- Forming debris piles for size-reduction and removal activities;
- Strategically placing the debris size-reduction tool off-center from the riser location near debris piles and providing a flat surface under the silo riser for placement of the debris collection and transport basket;
- Transferring debris from the pile to the size reduction tool to the retrieval basket;
- Providing close visual inspection capabilities throughout operations and final inspection;
- Employing the Arm Deployed Sluicing System for fixative application; and
- Employing the Gripper End-Effector System camera and lighting system to assist in initial and final wall, floor, and ceiling inspection activities.

### Decant Sump Tank Waste Retrieval System (DWRS)

The DWRS will retrieve the waste from the K-65 Decant Sump Tank located within the silo area. During SWRS operation, a submersible pump with level indicator will be lowered into the K-65 Decant Sump Tank. This submersible pump and level indicator will be utilized for water management during SWRS activities. If the K-65 Decant Sump Tank needs to be emptied during the SWRS operation, the liquid will be pumped from the K-65 Decant Sump Tank to one of the TTA Tanks. The DWRS system will also be utilized to remove the sludge located within the K-65 Decant Sump Tank after the SWRS activities are completed. A flanged, mounted sluicer will inject filtered water into the K-65 Decant Sump Tank to create a slurry. An air-operated pump will retrieve the slurry and transfer the slurry to the TTA via a double-contained hose system.

### Transfer Tank Area

The TTA System is provided to store residues received from Silos 1 and 2 and the Decant Sump Tank. The TTA consists of a building that provides shielding and containment for the TTA, a water makeup system, and a piping network for receiving and transferring residues from the silos to a future remediation facility. The TTA System communicates with and supports the following systems:

- SWRS;
- DWRS;
- TWRS;
- FSMS; and
- RCS.

The TTA System supports SWRS and DWRS by receiving the slurry from the waste retrieval activity into the TTA. The slurry waste will settle and the supernate will be decanted and used as sluice water supply. The system is designed to allow the slurry feed tank and sluice water supply tank to change roles to allow for settling and minimize water usage.

During heel removal activities the CATS mode is utilized. The CATS mode requires high-pressure water that is provided by the high-pressure pumps located near the bridge. The supply to the high-pressure pumps is from the TTA Filtrate Transfer Pumps that transfer water from the TTA Filtrate Storage Tank. Level in the TTA Filtrate Storage Tank is maintained by water transferred from the sluice water header to the Ultra-Filtration Skid via the filter process tank. Makeup water for the TTA Filtrate Storage Tank is also available from the Makeup Water Tank. The slurry from heel removal is transferred to a TTA tank for settling and decanting. The sluice water is supplied from another TTA tank where the settling activity is complete and supernate is available.

The TTA System supports the FSMS in the same manner as the SWRS and TWRS. The FSMS will test the SWRS and TWRS equipment with surrogate material prior to Silos 1 and 2 waste retrieval activities.

During operation of the TWRS, the K-65/BentoGrout™ is slurried from the TTA tanks to the remediation facility in a similar fashion as it was removed from the silos except two sluicer modules are deployed in the storage tank being emptied, and the CATS system and EMMA™ are not required. The storage tank bottoms are sloped to a center sump to facilitate heel removal. The Slurry Pump is deployed in the center tank nozzle. When one tank is completely emptied, instrumentation, cameras, pumps, and sluicers are moved to the next tank. The operation is repeated until all four tanks are emptied.

Four transfer tanks are provided for storage of residues from Silos 1 and 2, and from the K-65 Decant Sump Tank. The K-65 material and BentoGrout™ from Silo 1 are stored in two of the four tanks, and the K-65 material and BentoGrout™ from Silo 2 are stored in the other two tanks. The residue in the K-65 Decant Sump Tank is transferred to the storage tanks assigned for receipt of wastes from Silo 2.

The carbon steel transfer tanks each have a capacity of 750,000 gallons and are constructed in accordance with American Petroleum Institute-650 standard. The tank volume was selected to allow for a maximum storage level of 90% of total capacity, although the tanks are designed to be filled to their maximum capacity. The tanks are 66-feet in diameter, have a straight side dimension of 30 feet, and are provided with 1/4-inch corrosion allowance. The exterior surfaces of the tanks are painted.

The tank roofs are dome shaped and are supported by rafters to minimize the overall height to 33-feet, 6-inches (excluding nozzle risers) from the top of their concrete foundations. The tank bottoms are sloped to a center sump to facilitate residue removal during TWRS.

#### Transfer Tank Waste Retrieval System (TWRS)

The TWRS is designed to access, mobilize, and transfer residue stored in the TTA System. The TWRS is comprised of the TTA System and support features included within the future remediation facility. Sluicer modules, slurry pump modules, and equipment used for the SWRS are also deployed for the TWRS.

The function of the TWRS is to retrieve and transfer the entire inventory of waste from the TTA to a future remediation facility for final treatment and disposal. The same equipment used for the SWRS will also be deployed by the TWRS, with one major design enhancement. The TTA storage tanks will have two opposing sluicer modules per tank with a central slurry pump module, thereby eliminating the need for heel removal. All of the equipment will be of the same design and fully interchangeable. Thereby, the sluicer module used in the silos will be the same as the sluicer module used in the TTA storage tanks. The two sluicer modules and the central slurry pump module will permit a "swirl" movement of the waste within the tank as the waste is removed. This will result in providing a more uniform mix of waste material.

Equipment is provided for the transfer of stored residues from one TTA tank at a time. Connections are provided for connecting slurry and sluice water piping to and from the future remediation facility. Sluice water for TWRS operations is supplied from the future remediation facility. The TTA System provides piping and valves between the future remediation facility interface point and each of the four TTA storage tanks. The two sluicer modules and the Slurry Pump module are connected to the storage tank being emptied.

#### Facility Decontamination System

The FDS removes gross contamination from the silos, decant sump tank, and contaminated process equipment as part of facility demobilization and closure. There are two categories of gross decontamination activities. First, is gross decontamination of silos, decant sump tank and process equipment, as well as permanent facilities erected during the project, especially those left behind for management of the waste and radon emanation until the time that the waste is remediated. The second type of gross decontamination is the processing of temporary tools, equipment, and facilities used on the project.

Gross decontamination of permanent facilities includes decontamination of the internal surfaces of the silos. The Fixative Spray System is used after the internal surfaces of the silos are accessed and decontaminated to remove all visible loose contamination, as verified by closed-circuit television (CCTV) inspection. The Fixative Spray System applies a fixative to the walls and floors of the silos after completion of waste and debris removal to prevent any radionuclides in the concrete surfaces from becoming airborne. The fixative is a water-based, paint-like liquid material that has properties that allows it to contain radioactive contamination under the fixative layer after it dries. More than one layer of fixative may be applied as necessary to achieve the necessary level of sealing of the silo walls. The Fixative Spray System consists of pump, hose, nozzle, and small, positive-displacement pump and uses EMMA™ to reach all points within the silos.

Decontamination of discrete objects and failed equipment will be performed in a portable, truck-mounted decontamination facility. It will provide for the cleaning of equipment and collection of water and abrasive cleaning media used in the cleaning process. The survey of material for unrestricted release (that precedes making the material available to Fluor Fernald for verification survey) is done in an area within a facility reserved for this function where background radiation level is low enough to achieve the desired instrument sensitivity. This facility is located in the southwest section of the project site.

The following is a list of tasks (charge numbers) and subtasks that will be used to manage the AWR Project.

#### 1.4.1 HSR1A - Due Diligence - Fluor Fernald

The scope of Due Diligence - Fluor Fernald consists of the multi-disciplinary resources needed to conduct reviews of the status of completion and technical adequacy of the products developed by FWENC as a result of FWENC's partial execution of Subcontract No. FSC-624, Silos 1 and 2 AWR project.

Overall, the Due Diligence process is comprised of the following activities:

- Disposition of the termination inventory through a negotiated settlement with FWENC;
- Determination of the status of the engineering performed by FWENC;
- Determination of the payment progress, status, and disposition of FWENC subcontracts;
- Determination of the status of operations and readiness products prepared by FWENC; and
- Determination of the viability of the EMMA™.

The scope of the Due Diligence activities identified above is defined in greater detail in the DOE-approved document: Silos 1 and 2 Accelerated Waste Retrieval (AWR) Project Transition and Execution Strategy (40710-RP-0009, Rev. 0) submitted to DOE-FEMP on July 27, 2001 (**Appendix B**).

#### 1.4.2 HWR1B - Due Diligence - JEG

The scope of Due Diligence - JEG consists of those activities JEG must support to accomplish the termination of the AWR contract with FWENC, enhance the schedule, and expedite the return to the field to initiate construction activities for the RCS. The Due Diligence, JEG scope consists of the following tasks:

- Review Design Using Value Engineering Principles;
- Decide Whether Design Changes are Required;

- Identify Design Changes;
- Assist in Readiness and Operations Reviews as Required; and
- Assist in Vendor Visits, Vendor Specification Reviews, and Subcontractor Reviews.

#### 1.4.3 HWR1C - RCS Construction

The scope of RCS Construction consists of those activities necessary for construction of the RCS. The scope of RCS Construction consists of the following tasks:

- Equipment and Subcontractor Procurement; and
- Execution of Construction.

#### 1.4.4 HWR1D - JEG Construction Support

The scope of JEG Construction Support consists of those activities required by JEG to support construction, including conducting reviews, developing and processing design changes to support construction, planning and bidding support, and acceptance testing.

#### 1.4.5 HWR1E - Balance of Plant Construction

The scope of Balance of Plant Construction consists of those activities necessary for the construction of the balance of plant for the AWR Project. The scope of the Balance of Plant Construction consists of the following tasks:

- Equipment and Subcontractor Procurement; and
- Execution of Construction.

#### 1.4.6 HWR1F - Construction Management

The scope of Construction Management consists of those activities necessary to support construction including reviews, infrastructure coordination, planning and bidding support, subcontract oversight, and acceptance testing. Fluor Fernald will act as the General Contractor for Construction of all the AWR facilities and structures.

#### 1.4.7 HWR1G - Engineering Support - Fluor Fernald

The scope of Engineering Support consists of those activities necessary to ensure that the project technical baseline is maintained. In addition, the Engineering Support tasks consist of those activities necessary to support construction and operation of the AWR Project facilities and structures including, oversight of design, design modifications, reviews, infrastructure coordination, planning and bidding support, and acceptance testing. The Engineering Support scope also includes any technical interface between the AWR Project and stakeholders.

#### 1.4.8 HWR1H - JEG Engineering Execution

The scope of JEG Engineering Execution covers the activities of JEG as it participates in the work that is required pursuant to decisions flowing from Due Diligence (Charge No. HWR1A) and the residual engineering support required as JEG takes on the scope of work formerly assigned to FWENC. The JEG Engineering Execution will consist of the following activities:

- Evaluating Alternatives to EMMA™;
- Engineering Execution Support (Developing and Processing DCNs, Evaluating the Effect of BentogROUT™ Settling, and Evaluating Slurry Management Alternatives); and
- Developing Safety Basis Documentation.

#### 1.4.9 HWR1J - Start-up and Readiness

The scope of Start-up and Readiness consists of those activities necessary to demonstrate that the AWR Project has been properly constructed and is ready for operation and that the workforce has been properly trained and is ready to safely operate the AWR facilities. The start-up and readiness activities include project preparation and evaluation of personnel and qualifications, facility and process hardware, engineering and administrative controls, procedures, and training against the documented safety and design basis. In addition, the scope includes an evaluation of operational readiness by Fluor Fernald and a subsequent readiness evaluation by DOE-FEMP.

#### 1.4.10 HWR1K - Operations

The scope of Operations consists of those activities necessary to support the proper operation of the TTA and the RCS. The scope will include retrieval of material from Silos 1 and 2 and the decant sump tank, treatment of radionuclides, particulate, and radon in the RCS, and excavation of the silo berm soils.

#### 1.4.11 HWR1L - Safe Shutdown

The scope of Safe Shutdown consists of those activities necessary to support safe shutdown of Silos 1 and 2, the SWRS, and the DWRS. The scope of Safe Shutdown includes: isolation of utilities, removal of all residual material with transfer to the TTA, and gross decontamination of Silos 1 and 2, the decant sump tank, and contaminated process equipment.

#### 1.4.12 HWR1M - Silos Project Maintenance Facility

The scope of Silo Project Maintenance Facility consists of all the activities and resources needed to support the conversion of the existing VITPP Building into a maintenance facility to support the Silos Division maintenance activities. The scope of Silos Project Maintenance Facility has been broken down into the following tasks:

- Planning;
- Removal; and
- Facility Upgrade.

#### 1.4.13 HWR1P - Project Management

The scope of Project Management consists of those activities necessary to support the implementation of the AWR Project and develop and manage the documentation the Site Closure Contract requires to demonstrate the ability to execute the AWR Project. The scope of Project Management consists of the following two tasks:

- Project Oversight; and
- Project Documentation.

#### 1.4.14 HSWRB - FWENC Contract Closeout

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The scope of the FWENC Contract Closeout covers the payments ~~expected to be made to FWENC pursuant to their Contract Closeout Settlement proposal, and in accordance with the Advanced Understanding Regarding Settlement of Subcontract Issues between FWENC and Fluor Fernald.~~

#### 1.4.15 HSWRM - Rheology Studies

The scope of Rheology Studies consists of all the activities and resources needed for the shipping and final disposition of the contaminated equipment from the K-65 rheology studies performed at Florida International University.

### 1.5 PROJECT PLAN AND TASK DESCRIPTION

The objective of the AWR Project is to transfer the contents of Silos 1 and 2 [approximately 6,800 cubic meters (240,000 cubic feet) of material, including residue, water, and Bentogrout™] from the silos to newly constructed transfer tanks. To minimize worker exposure, the AWR Project scope of work also includes the implementation of a RCS to reduce and mitigate radon emissions.

To accomplish the AWR Project scope of work, Fluor Fernald developed and implemented a fixed price contract with FWENC. In February 1999, Contract No. FSC 624 was placed with FWENC for the design, construction, testing, operation, and maintenance of the AWR Project. Fluor Fernald is terminating the FWENC contract and transitioning the scope of the AWR Project to the Fluor Fernald team for completion of the Project in accordance with the tasks defined in this Closure Plan.

#### 1.5.1 HWR1A - Due Diligence - Fluor Fernald

##### 1) Plan/Scope - Due Diligence - Fluor Fernald

Charge No. HWR1A covers all activities required by Fluor Fernald to support the transition process defined in the Silos 1 and 2 Accelerated Waste Retrieval (AWR) Project Transition and Execution Strategy (40710-RP-0009, Rev. 0) submitted to DOE-FEMP on July 27, 2001 (**Appendix B**) and to comply with the Advanced Understanding Regarding Settlement of Subcontract Issues between FWENC and Fluor Fernald. The scope of the AWR Due Diligence is defined by five project tasks: RCS Due Diligence, BOP Due Diligence, EMMA™ Due Diligence, Execution Change Proposal, and AWR Contract Settlement. In compliance with DOE Order 413.1, approval of the performance baseline Critical Decision-2 will be accomplished with the validation of the BOP design after Due Diligence is complete.

##### 1.1) Task #1 - RCS Due Diligence

The scope of the RCS Due Diligence task consists of those Due Diligence activities needed to support the transition of the RCS related construction, procurement, and design functions from the FWENC to Fluor Fernald. These activities include resources drawn from non-centralized project-specific support, contract administration, clerical support, and client interface. There is expected to be a need for significant levels of travel to vendor and equipment storage/fabrication locations and travel to JEG's office in Oak Ridge, Tennessee.

##### 1.2) Task #2 - BOP Due Diligence

The scope of the BOP Due Diligence task consists of those Due Diligence activities needed to support the transition of the BOP related construction, procurement, and design functions from the FWENC to Fluor Fernald. These activities include resources drawn from non-centralized project-specific support, contract administration, clerical support, and client interface. There is expected to be a need for significant levels of travel to vendor and equipment storage/fabrication locations and travel to JEG's office in Oak Ridge, Tennessee.

1.3) Task #3 - EMMA™ Due Diligence

The scope of the EMMA™ Due Diligence task consists of those Due Diligence activities needed to support the transition of the EMMA™ related construction, procurement, and design functions from the FWENC to Fluor Fernald. These activities include resources drawn from non-centralized project-specific support, contract administration, clerical support, and client interface. There is expected to be a need for significant levels of travel to vendor and equipment storage/fabrication locations and travel to JEG's office in Oak Ridge, Tennessee.

1.4) Task #4 - Execution Change Proposal

The scope of the Execution Change Proposal consists of developing and issuing a baseline change proposal to incorporate the recommendations and path forward determined as a result of the Due Diligence reviews. This change proposal will define the cost and schedule, to which the project will be managed once Due Diligence activities are completed.

1.5) Task #5 - AWR Contract Settlement

The scope of the AWR Contract Settlement consists of the negotiation and finalization of the contract settlement with FWENC.

2) Quantification - Due Diligence - Fluor Fernald

The resources needed to support the AWR Due Diligence task were estimated based on the experience with FWENC and its subcontractors and the organizational requirements defined in the Silos 1 and 2 Accelerated Waste Retrieval (AWR) Project Transition and Execution Strategy (**Appendix B**).

The Fluor Fernald resources to support the Due Diligence for AWR Project are assumed to be constant throughout the activity. The Due Diligence - Fluor Fernald resource requirements are summarized in **Tables 1.5-1 through 1.5-11**. Progress will be apportioned based upon the completion of the Due Diligence tasks.

**TABLE 1.5-1**  
**RCS DUE DILIGENCE - FLUOR FERNALD RESOURCES**  
**SCHEDULE DURATION: 6/05/01 - 8/24/01**

RESOURCE CODE	FULL TIME EQUIVALENTs (FTEs)
PRJMGR	0.4
ENGINR	0.6
PURMGR	0.5
CNSMGR	0.4
ENGMGR	0.4
OPSMGR	0.3
RADENG	0.3
TPSREP	0.3
QACENG	0.7
DEPADM	0.4

**TABLE 1.5-2**  
**SUBCONTRACTOR RESOURCES - RCS DUE DILIGENCE - FLUOR FERNALD**

RESOURCE CODE	FTEs
Coleman Research	0.3

**TABLE 1.5-3**  
**NON-LABOR COST - RCS DUE DILIGENCE - FLUOR FERNALD**

ITEM	ESTIMATE BASIS	COST
Travel to visit Vendors/ Subcontractors	15 vendor visits for 4 FTEs @ \$200 room/board + \$500 airfare per FTE	\$42,000
Travel to JEG Oak Ridge to support Due Diligence Design	6 trips for 2 FTEs at \$200 room/board + \$500 airfare per FTE	\$8,400

**TABLE 1.5-4**  
**BOP DUE DILIGENCE - FLUOR FERNALD RESOURCES**  
**SCHEDULE DURATION: 6/05/01 - 12/06/01**

RESOURCE CODE	FTEs
PRJMGR	0.3
ENGINR	0.5
PURMGR	0.4
CNSMGR	0.4
ENGMGR	0.5
OPSMGR	0.3
RADENG	0.3
TPSREP	0.3
QACENG	0.7
DEPADM	0.4

**TABLE 1.5-5**  
**SUBCONTRACTOR RESOURCES - BOP DUE DILIGENCE - FLUOR FERNALD**

RESOURCE CODE	FTEs
Coleman Research	0.2

**TABLE 1.5-6**  
**NON-LABOR COST - BOP DUE DILIGENCE - FLUOR FERNALD**

ITEM	ESTIMATE BASIS	COST
Travel to visit Vendors/ Subcontractors	5 vendor visits for 4 FTEs @ \$500 room/board + \$1000 airfare per FTE	\$30,000
Travel to JEG Oak Ridge to support Due Diligence Design	6 trips for 2 FTEs at \$200 room/board + \$500 airfare per FTE	\$8,400

**TABLE 1.5-7**  
**EMMA™ DUE DILIGENCE - FLUOR FERNALD RESOURCES**  
**SCHEDULE DURATION: 6/05/01 - 12/06/01**

RESOURCE CODE	FTEs
ENGINR	0.3
TPSREP	0.3

**TABLE 1.5-8**  
**SUBCONTRACTOR RESOURCES - EMMA™ DUE DILIGENCE - FLUOR FERNALD**

RESOURCE CODE	FTEs
Coleman Research	1.0

**TABLE 1.5-9**  
**NON-LABOR COST - EMMA™ DUE DILIGENCE - FLUOR FERNALD**

ITEM	ESTIMATE BASIS	COST
Travel for EMMA™ Review	2-day trip to Grey Pilgrim; 4 FTEs; \$1000/trip	\$4,000

**TABLE 1.5-10**  
**CONTRACT CLOSURE - FLUOR FERNALD RESOURCES**  
**SCHEDULE DURATION: 8/01/01 - 9/30/03**

RESOURCE CODE	FTEs
ENGINR	0.2
CNSENG	0.2
PURMGR	1.1
Home Office Teaming Partner	0.3

**TABLE 1.5-11**  
**AWR EXECUTION - CHANGE PROPOSAL**  
**SCHEDULE DURATION: 12/07/01 - 1/29/02**

RESOURCE CODE	FTEs
ENGINR	0.2

Progress of the Due Diligence - Fluor Fernald activities will be based on the monthly status of the weighted milestone process for each task presented in Tables 1.5-12 through 1.5-16.

**TABLE 1.5-12**  
**RCS DUE DILIGENCE - MILESTONE PROCESS**

TASK DESCRIPTION	DURATION	EARN VALUE MILESTONE
<b>DUE DILIGENCE DESIGN</b>	05 JUN 01 - 24 AUG 01	
START		4%
MIDPOINT		20%
COMPLETE		20%
<b>DUE DILIGENCE - SUBCONTRACT/ PROCUREMENT</b>	05 JUN 01 - 29 AUG 01	
START		4%
MIDPOINT		20%
COMPLETE		20%
<b>DUE DILIGENCE - READINESS/OPERATION</b>	05 JUN 01 - 18 JUL 01	
START		2%
MIDPOINT		5%
COMPLETE		5%

**TABLE 1.5-13**  
**BOP DUE DILIGENCE - MILESTONE PROCESS**

TASK DESCRIPTION	DURATION	EARN VALUE MILESTONE
<b>DUE DILIGENCE DESIGN</b>	18 JUL 01 - 29 OCT 01	
START		4%
MIDPOINT		20%
COMPLETE		20%
<b>DUE DILIGENCE - SUBCONTRACT/ PROCUREMENT</b>	06 JUN 01 - 06 DEC 01	
START		4%
MIDPOINT		20%
COMPLETE		20%
<b>DUE DILIGENCE - READINESS/OPERATION</b>	18 JUL 01 - 08 AUG 01	
START		2%
MIDPOINT		5%
COMPLETE		5%

**TABLE 1.5-14**  
**EMMA™ DUE DILIGENCE - MILESTONE PROCESS**

TASK DESCRIPTION	DURATION	EARN VALUE MILESTONE
<b>DUE DILIGENCE - EMMA™</b>	18 JUN 01 - 04 DEC 01	
START		10%
MIDPOINT		40%
COMPLETE		50%

**TABLE 1.5-15  
 CONTRACT CLOSURE - MILESTONE PROCESS**

TASK DESCRIPTION	DURATION	EARN VALUE MILESTONE
<b>AWR CONTRACT CLOSURE</b>		
START	07 DEC 01 - 03 JAN 02	50%
COMPLETE		50%

**TABLE 1.5-16  
 CHANGE PROPOSAL - MILESTONE PROCESS**

TASK DESCRIPTION	DURATION	EARN VALUE MILESTONE
<b>AWR EXECUTION CHANGE PROPOSAL</b>		
START	04 JAN 02 - 29 JAN 02	50%
COMPLETE		50%

1.5.2 HWR1B - Due Diligence - JEG

1) Plan/Scope - Due Diligence - JEG

Charge No. HWR1B covers all activities required by JEG to support the Due Diligence process defined in the Silos 1 and 2 Accelerated Waste Retrieval (AWR) Project Transition and Execution Strategy (40710-RP-0009, Rev. 0) submitted to DOE-FEMP on July 27, 2001 (**Appendix B**) and to comply with the Advanced Understanding Regarding Settlement of Subcontract Issues Between FWENC and Fluor Fernald. The scope of the AWR Due Diligence is defined by three project tasks: RCS Due Diligence, BOP Due Diligence, and EMMA™ Due Diligence.

1.1) Task #1 - RCS Due Diligence

The scope of the RCS Due Diligence task consists of those Due Diligence activities needed to support the transition of the RCS related construction, procurement, and design functions from the FWENC to Fluor Fernald. These activities require resources drawn from JEG. There is expected to be a need for significant levels of travel to vendor and equipment storage/fabrication locations and travel for JEG staff to the FEMP to support RCS Due Diligence.

1.2) Task #2 - BOP Due Diligence

The scope of the BOP Due Diligence task consists of those Due Diligence activities needed to support the transition of the BOP related construction, procurement, and design functions from the FWENC to Fluor Fernald. These activities require resources drawn from JEG. There is expected to be a need for significant levels of travel to vendor and equipment storage/fabrication locations and travel for JEG staff to the FEMP to support BOP Due Diligence.

1.3) Task #3 - EMMA™ Due Diligence

The scope of the EMMA™ Due Diligence task consists of those Due Diligence activities needed to support the transition of the EMMA™ related construction, procurement, and design functions from the FWENC to Fluor Fernald. These activities require resources drawn from JEG. There is expected to be a need for significant levels of travel to vendor and equipment storage/fabrication locations and travel for JEG staff to the FEMP to support EMMA™ Due Diligence.

2) Quantification - Due Diligence - JEG

The resources needed to support the AWR Due Diligence task were estimated based on the experience with FWENC and its subcontractors and the organizational requirements defined in the Silos 1 and 2 Accelerated Waste Retrieval (AWR) Project Transition and Execution Strategy (**Appendix B**).

The JEG resources to support the Due Diligence for AWR Project are assumed to be constant throughout the activity. The Due Diligence, JEG resource requirements are summarized in **Tables 1.5-17** and **1.5-18**. Progress of the Due Diligence - JEG activities will be based on the monthly status of the weighted milestone process of the tasks as presented in **Table 1.5-19**.

**TABLE 1.5-17**  
**DUE DILIGENCE - JEG RESOURCES**  
**SCHEDULE DURATION: 6/05/01 - 12/04/01**

R1-F07-022, Rev. 1	RESOURCE CODE	FTEs
	JEG Home Office Teaming Partner	11

**TABLE 1.5-18  
 NON-LABOR COST - DUE DILIGENCE - JEG**

ITEM	ESTIMATE BASIS	COST
Travel; Due Diligence	11 FTEs to site (45 days @ \$100/day + \$1000 airfare)	\$60,500

**TABLE 1.5-19  
 DUE DILIGENCE - JEG MILESTONE PROCESS**

TASK DESCRIPTION	DURATION	EARN VALUE MILESTONE
<b>DUE DILIGENCE - RCS DESIGN</b>	05 JUN 01 - 24 AUG 01	
START		5%
MIDPOINT		10%
COMPLETE		15%
<b>DUE DILIGENCE - BOP DESIGN</b>	18 JUL 01 - 29 OCT 01	
START		5%
MIDPOINT		20%
COMPLETE		25%
<b>DUE DILIGENCE - EMMA™ DESIGN</b>	18 JUN 01 - 04 DEC 01	
START		5%
MIDPOINT		5%
COMPLETE		10%

1.5.3 HWR1C - RCS Construction

1) Plan/Scope RCS Construction

The scope of the RCS construction task consists of all construction activities needed to complete the RCS in accordance with the approved FWENC CFC design. The construction of the RCS and support facilities will be performed by subcontractors using Greater Cincinnati Building and Construction Trades Council (GCBCTC) labor in accordance with the FEMP Project Labor Agreement. Wise Construction will be utilized to support and augment construction activities when needed.

Construction - Current Status

FWENC has completed the site preparation and concrete work associated with the RCS and the TTA. All other construction activities are pending the completion of the Due Diligence process.

2) Quantification - RCS Construction

The subcontractors selected for construction of the RCS and support facilities will submit a detailed project schedule and pay item schedule, which upon approval by Fluor Fernald, will be incorporated into the AWR Project baseline. Progress of these subcontractors will be statused on a monthly basis based on progress and completion of milestones within the detailed schedule and pay item schedule.

Table 1.5-20 summarizes the cost estimate for construction of the RCS. The RCS construction costs are based on Estimate #C4.01.08.01.

**TABLE 1.5-20  
 RCS CONSTRUCTION COST**

COST ELEMENT	ESTIMATED COST
Mobilization	\$62,800
Civil, Structural, and Architectural	\$969,000
Heating, Ventilation, and Air-conditioning	\$514,300
Equipment	\$1,577,700
Piping	\$207,300
Electrical	\$788,800
Instrumentation	\$476,400
<b>SUBTOTAL DIRECT FIELD COST</b>	<b>\$4,596,300</b>
<b>SUBTOTAL INDIRECT COST</b>	<b>\$3,399,200</b>
Less FWENC construction cost performed under Charge No. HSWRB in the Closure Plan	0
Less FWENC construction cost performed prior to Closure Plan	(\$221,230)
<del>Less FWENC equipment expenditure covered in Settlement Cost</del>	<del>(\$802,243)</del>
<b>TOTAL RCS CONSTRUCTION COST</b>	<b>\$6,972,027</b>
	<b>\$7,774,270</b>

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1.5.4 HWR1D - JEG Construction Support

1) Plan/Scope - JEG Construction Support

Charge No. HWR1D covers all activities requested by JEG to undertake JEG's Construction Support role.

JEG, as designer of record, is responsible for making all necessary changes to, and interpretations of, its design during construction and operations. This role is akin to the traditional provision of Title III construction services.

JEG will provide engineering support during construction and operation of the AWR project. This effort will include the following activities and deliverables:

- Approve vendor submittals;
- Participate in equipment inspection and tests during fabrication;
- Participate in equipment receipt inspection;
- Participate in field inspections during construction;
- Disposition Nonconformance Reports under the direction of the Project Quality Manager;
- Process Design Change Requests;
- Process Field Change Requests; and
- Participate in systems start-up and turnover to Operations.

2) Quantification - JEG Construction Support

The resources needed to support AWR construction were estimated based on site experience and the organizational requirements defined in the Silos 1 and 2 Accelerated Waste Retrieval (AWR) Project Transition and Execution Strategy (**Appendix B**).

The JEG resources to support the AWR Project are assumed to be constant throughout the activity. The JEG Construction Support resource requirements are summarized in **Tables 1.5-21** and **1.5-22**. Progress will be apportioned based upon the completion of the construction tasks under the Charge Nos. HWR1C and HWR1E.

**TABLE 1.5-21**  
**JEG CONSTRUCTION SUPPORT RESOURCE SUMMARY**  
**SCHEDULE DURATION: 7/09/01 - 9/20/05**

R1-F07-022, Rev. 1	RESOURCE CODE	FTEs (AVERAGE)
	<del>JEG Home Office Teaming Partner</del>	6.0

**TABLE 1.5-22  
 NON-LABOR COST - JEG CONSTRUCTION SUPPORT**

ITEM	ESTIMATE BASIS	COST
Travel - JEG Oak Ridge Office to FEMP	2 FTEs - 40 trips to site @ \$400/trip	\$32,000

1.5.5 HWR1E - BOP Construction

1) Plan/Scope - BOP Construction

The scope of the BOP construction task consists of all construction activities needed to complete the construction of the BOP in accordance with the approved FWENC CFC design. The construction of the BOP and support facilities will be performed by subcontractors using GCBCTC labor in accordance with the FEMP Project Labor Agreement. Wise Construction will be utilized to support and augment construction activities when needed.

Construction - Current Status

FWENC has completed the site preparation and concrete work associated with the RCS and the TTA. All other construction activities are pending completion of the Due Diligence process.

2) Quantification - BOP Construction

The subcontractors selected for construction of the RCS and support facilities will submit a detailed project schedule and pay item schedule, which upon approval by Fluor Fernald, will be incorporated into the AWR Project baseline. Progress of these subcontractors will be statused on a monthly basis based on progress and completion of milestones within the detailed schedule and pay item schedule.

**Table 1.5-23** summarizes the cost estimate for construction of the BOP. The BOP construction costs are based on Estimates #C4.01.06.01, #C4.01.06.02, #C4.01.06.03, #C4.01.06.04, and #C4.01.06.05.

**TABLE 1.5-23**  
**BOP CONSTRUCTION COSTS**

COST ELEMENT	TRANSFER TANK ERECTION	BOP MECHANICAL	BOP SUPPORT	BOP ELECTRICAL	BOP CIVIL/ STRUCTURAL
Mobilization	\$27,000	\$90,600	-	\$90,600	\$57,600
Tank Erection	\$857,000	-	-	-	-
Tank Painting	\$82,700	-	-	-	-
Civil, Structural, and Architectural	-	-	-	-	\$3,902,100
Equipment	-	-	\$16,123,200	-	-
Equipment Installation	-	\$178,300	-	\$141,300	-
Piping	-	\$737,500	-	-	-
Electrical	-	-	-	\$1,065,130	-
Demobilization	\$2,400	\$22,300	-	\$22,300	\$5,900
<b>SUBTOTAL DIRECT FIELD COST</b>	\$969,100	\$1,028,700	\$16,123,200	\$1,319,330	\$3,965,600
<b>SUBTOTAL INDIRECT COST</b>	\$531,200	\$2,067,500	\$1,012,400	\$2,127,300	\$4,144,700
Less FWENC construction cost performed in Closure Plan	0	0	0	0	(\$553,550)
Less FWENC construction cost performed prior to Closure Plan	0	0	0	0	(\$833,517)
Less FWENC equipment expenditure covered in Settlement Cost	0	0	<del>(\$13,577,343)</del>	0	0
<b>TOTAL BOP CONSTRUCTION COST</b>	\$1,500,300	\$3,096,200	<del>\$3,558,257</del> \$17,135,600	\$3,446,630	\$6,723,233

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### 1.5.6 HWR1F - Construction Management

#### 1) Plan/Scope - Construction Management

In accordance with Silo 1 and 2 Accelerated Waste Retrieval (AWR) Project Transition and Execution Strategy (**Appendix B**), Fluor Fernald will act as the General Contractor for the balance of the construction associated with the AWR facilities and structures. These facilities include the RCS, the TTA, the FSMS, the SWRS, the TWRS, and the DWRS.

The AWR Project team will strategically divide the design and specifications of the construction scope into logical bid packages, i.e., by discipline - Civil, Mechanical, and Electrical. Fixed-Price Contracts will be secured through an Invitation for Bid (IFB) process for each bid package. Wise Services, Inc. will be used for interface work between the Fixed-Price Contracts. Fluor Fernald will perform CAT and ICAT. Fluor Fernald and JEG will jointly provide Title III service support.

The scope of work for Construction Management consists of two tasks: Construction Design Support and Construction Subcontracts.

#### 1.1) Task #1 - Construction Design Support

Fluor Fernald will perform this scope of work including constructability reviews. The design constructability review process involves evaluating and integrating practical construction practices and requirements into the engineering execution design modification configuration by ensuring the following:

- Safety;
- Efficiency;
- Cost and schedule benefits;
- Productivity in field construction operations;
- Safe accessibility of personnel, material, and equipment;
- Facilitation of construction during adverse weather;
- Sequencing activities to facilitate system turnover and start-up; and
- The use of innovative construction methods to enhance constructability.

#### 1.2) Task #2 - Construction Subcontracting

Fluor Fernald will perform this scope of work encompassing the planning, bidding, and field oversight, and support of the Construction Subcontracts needed for the AWR construction activities.

It is assumed that IFB/Request for Proposals (RFPs) will be prepared using the nine (9) part model contract pursuant to FEMP Procedure CT-2.1.1 (Rev. 11).

When the Due Diligence process and engineering execution design package reaches a sufficient level of detail for a bid package, construction personnel will begin preparing these packages for construction subcontractors. IFB preparation includes:

- IFB/RFP Package;
- Draft Safe Work Plans for inclusion in the IFB/RFP, Part 8;
- Draft construction testing requirements (Quality Evaluation Plans (QEPs) or Source Inspection Plans (SIPs), Part 9;
- Draft Turnover Plan;
- Contractor Submittal Register, Part 6;
- Scope of Work, Part 6;
- Pay-item Description, Part 6; and
- Assembly of Certified for Construction drawings and specifications, Part 7.

The final construction estimates will be developed during this stage of the project, as well as the Project Waste Identification and Disposition Report for waste identification and disposition.

The IFB bid process starts by releasing the IFB package and conducting a pre-bid meeting with subcontractors. The bidding and award phase includes:

- Completing the government estimate;
- Bidder comment resolution;
- Bid/proposal review and technical evaluation;
- Awarding the contract; and
- Revising the baseline to reflect contract award.

Construction Safe Work Plans will be developed by Fluor Fernald with input from the subcontractor. The safe work plan will describe the work in sufficient detail to provide assurance that the risks associated with the work have been assessed and preventive measures for hazards addressed, and the work has been safely planned in sufficient detail. A draft of each safe work plan will be included in the IFB package. The safe work plans will be finalized by the subcontractor after contract award.

During construction, Fluor Fernald will perform daily oversight of subcontractors. Oversight will ensure that the requirements of the contract are being followed in the field, including safety performance, compliance with Remedial Design plans, and verification of installation per approved drawings and specifications. Subcontract management also involves providing permits in accordance with the planned work and tracking the subcontractor's schedule. Subcontract management also includes:

- Submittal(s) review and approval;
- Safe Work Plans;
- Safety Meetings;
- Permits;
- Mobilization;
- Construction Testing Requirements (QEPs, SIPs);
- Coordinate Request for Information/DCNs with Title III support;
- Witness and verification of CAT and ICAT testing and support of start-up;
- Contract Modifications;
- Quality Assurance (surveillance(s) and assessments);
- Progress reporting (cost and schedule); and
- Coordinate red-line and as-built drawings with Title III support.

#### FSMS (ICAT) Testing

To mitigate the risks associated with the waste retrieval activities, the AWR Project has employed a FSMS testing program, using Silo 4 and surrogate material. The objective of the FSMS ICAT and SOT testing is to validate the AWR design prior to "hot" deployment. Using construction labor, Fluor Fernald will perform a FSMS ICAT test and will issue a FSMS ICAT Report, which documents the FSMS Test activities and lessons learned. Fluor Fernald will implement the lessons learned from this test prior to turning over the FSMS to Start-up for additional testing and operation training.

#### 2) Quantification - Construction Management

The resources for performing Construction Management oversight are summarized in **Table 1.5-24**. Progress reported against the subcontractors' milestone schedules will be used to apportion earned value.

**TABLE 1.5-24  
 CONSTRUCTION MANAGEMENT RESOURCE SUMMARY**

RESOURCE CODE	FTEs				
	FY-01	FY-02	FY-03	FY-04	FY-05
CNSMGR	0.3	0.7	0.5	0.4	-
DEPADM	0.3	0.7	0.5	0.4	-
PURMGR	0.3	0.8	1.0	1.0	-
BUYCON	-	0.75	1.0	1.0	-
ENGMEC	0.5	0.5	0.5	0.5	-
RADENG	0.5	0.6	0.5	0.5	-
RADTECH	3.0	1.5	-	-	-
RADMGR	1.0	0.5	-	-	-
INDHYG	0.5	0.5	0.3	0.3	-
S&HENG	1.0	0.9	0.8	0.8	-
QACENG	1.0	1.0	1.0	1.0	-
QACMGR	-	-	0.5	0.5	-
CNSCOD	2.0	2.0	1.5	1.0	-
CNSENG	6.8	6.8	6.0	5.0	-
ENGMGR	0.3	0.8	1.0	1.0	-
S&HTEC	1.0	1.0	1.0	1.0	-

It is assumed that the Construction Management labor will be required to work overtime (OT) to support the subcontractors' field activities. In order to provide off-shift support to the subcontractors, based upon past experience, a 10% overtime labor factor has been assumed based on regular work hours. **Table 1.5-25** summarizes the planned overtime hours.

**TABLE 1.5-25  
 CONSTRUCTION MANAGEMENT OVERTIME SUMMARY**

RESOURCE CODE	WORK HOURS		
	REGULAR	OVERTIME	TOTAL
BUYCON	4,800	480	5,280
CNSCOD	8,732	873	9,605
CNSENG	34,048	3,405	37,453
CNSMGR	2,925	293	3,218
DEPADM	2,925	293	3,218
ENGMEC	2,837	284	3,121
ENGMGR	5,019	502	5,521
INDHYG	2,139	214	2,353
PURMGR	5,019	502	5,521
QACENG	5,674	567	6,241
QACMGR	871	87	958
RADENG	3,012	301	3,313
RADMGR	1,311	131	1,442
RADTEC	3,932	393	4,326
S&HENG	4,801	480	5,281
S&HTEC	5,674	567	6,241

**1.5.7 HWR1G - Engineering Support - Fluor Fernald**

**1) Plan/Scope - Engineering Support - Fluor Fernald**

Charge No. HWR1G covers those activities necessary to ensure that the project technical baseline is maintained. In addition, the Engineering Support tasks consists of those activities necessary to support construction and operation of the AWR Project facilities and structures including, oversight of design, design modifications, reviews, infrastructure coordination, planning and bidding support, and acceptance testing. The Engineering Support scope also includes any technical interface between the AWR Project and stakeholders.

2) Quantification - Engineering Support

The resources for performing Engineering Support are summarized in **Table 1.5-26**.

**TABLE 1.5-26**  
**ENGINEERING SUPPORT RESOURCE SUMMARY**  
**SCHEDULE DURATION: 7/09/01 - 1/09/06**

RESOURCE CODE	FTEs					
	FY-01	FY-02	FY-03	FY-04	FY-05	FY-06
ENGINR	1.0	1.2	1.2	1.2	1.2	1.0
CLERK	1.0	0.6	0.4	0.4	0.4	0.4
ENGPRC	0.2	0.1	-	-	-	-
ENGCVL	0.3	0.3	0.3	0.3	0.3	-

Progress will be apportioned based upon the completion of the tasks under Charge Nos. HWR1D, HWR1H, and HWR1K.

1.5.8 HWR1H - JEG Engineering Execution

1) Plan/Scope -JEG Engineering Execution

Charge No. HWR1H covers all activities required by JEG in becoming the Designer of Record for the AWR Project. In addition, this task includes the execution of the AWR Due Diligence recommendations and results. In compliance with DOE 413.1, the approval to start construction (Critical Decision-3) will be accomplished with the approval of the final design and associated cost estimate. The AWR Due Diligence recommendations include the following items:

- DCNs on the RCS;
- DCNs on the BOP;
- EMMA™ Alternative Evaluation;
- BentoGrout™ Settling Evaluation; and
- Slurry Management Evaluation.

The JEG activities necessary to become the Designer of Record include:

- Updating the FHAR Revision 0;
- Preparing/Issuing the FHAR Revision 1;

- Preparing the Final Design Closeout Report; and
- Issuing/Signing Off on CFC Drawings and Specifications.

2) Quantification - JEG Engineering Evaluation

The JEG Engineering Execution resources are segmented into two activities: JEG Engineering Execution DCNs and JEG Engineering Execution Reports.

The resources necessary to address the DCNs resulting from the AWR Due Diligence process are presented in **Table 1.5-27**. The resources were estimated using the following assumptions:

- An estimated 50 DCNs will be required; and
- DCNs will not result in a total redesign of the systems, structures, and components.

**TABLE 1.5-27**  
**JEG ENGINEERING EXECUTION DCNS RESOURCE SUMMARY**  
**SCHEDULE DURATION: 7/23/01 - 12/06/01**

R1-F07-022,  
 Rev. 1

RESOURCE CODE	FTEs
JEG Home Office Teaming Partner	10

Progress of the JEG Engineering Execution DCNs activities will be based on the number of DCNs processed out of the assumed total of 50 DCNs.

The resources necessary to address the JEG Engineering Execution Report is presented in **Table 1.5-28**.

**TABLE 1.5-28**  
**JEG ENGINEERING EXECUTION REPORT RESOURCE SUMMARY**  
**SCHEDULE DURATION: 7/23/01 - 8/20/03**

RESOURCE CODE	FTEs
JEG Home Office Teaming Partner	1.6 avg

The progress of the JEG Engineering Execution Report will be based on the monthly status of the weighted milestone process of the tasks as presented in **Table 1.5-29**.

**TABLE 1.5-29**  
**JEG ENGINEERING EXECUTION REPORT MILESTONE PROCESS**

TASK DESCRIPTION	DURATION	EARN VALUE MILESTONE
<b>EMMA™ ALTERNATIVE EVALUATION</b>		
START	23 JUL 01 - 06 DEC 01	10%
COMPLETE		20%
<b>BENTOGROUT™ SETTLING EVALUATION</b>		
START	23 JUL 01 - 11 OCT 01	5%
COMPLETE		5%
<b>SLURRY MANAGEMENT EVALUATION</b>		
START	23 JUL 01 - 19 OCT 01	5%
COMPLETE		5%
<b>UPDATE FHAR REV 0</b>		
START	01 AUG 01 - 24 JUN 02	10%
COMPLETE		20%
<b>ISSUE FHAR REV 1</b>		
START	16 SEP 02 - AUG 03	10%
COMPLETE		10%

1.5.9 HWR1J - Start-up and Readiness

1) Plan/Scope - Start-up and Readiness

Startup and Readiness ensures that the facility and personnel are prepared to operate safely and effectively. The startup and readiness activities include project preparation and evaluation of personnel and qualifications, facility and process hardware, engineering and administrative controls, procedures and training against documented safety and design bases.

Additionally, Fluor Fernald will complete an evaluation of operational readiness consistent with site requirements. Subsequent to satisfactory completion of Fluor Fernald's readiness evaluation, DOE-FEMP will complete its readiness evaluation per DOE Orders, as applicable. Fluor Fernald will provide support to DOE as needed.

The scope, schedule and resources for the Startup and Readiness activities will be managed by the following five (5) key activities:

- Training;
- Readiness Review and Planning;
- SOT;
- Plans and Procedures; and
- Preventative Maintenance.

1) Task #1 - Training

1.1) Plan/Scope - Training

The scope of the Training task activities includes Fluor Fernald labor to develop and approve the training documentation for the AWR Project. This task also includes Fluor Fernald cost for FAT&LC labor and supervision training. The training activities will be segmented into the following three phases to support the operation activities:

- RCS;
- FSMS Testing; and
- Silo Waste Retrieval.

The Training task is broken down into two activities: Develop Training and Conduct Training.

Develop Training

The Training and Qualification Plan (T&QP) prepared for the AWR Project will be updated annually to reflect the project-specific training that will be required for operators, supervisors, and support personnel who will be implementing the remedial action. Based on the revised T&QP, lesson plans and briefings will be developed for project-specific training. Training will be performance-based, focused on training personnel to perform tasks, not procedure-specific. It is assumed that the following training courses will be developed:

- Waste transfer operation (FSMS, SWRS, DWRS, and TWRS);
- RCS operation;
- HEPA ventilation system operation;
- Air-supplied respirator operation;
- Breathing air system operation;
- CCTV system operation;
- Emergency response;

- Standing Orders; and
- Safety Basis.

### Conduct Training

Training courses will be developed and administered by Fluor Fernald to train personnel to a level commensurate with their job duties and responsibilities. Training will provide the worker with the knowledge of the processes, procedures, tools, and safety measures required to ensure the safety of personnel, property, the public, and the environment. Based on the revised T&QP, lesson plans and briefings will be developed for project-specific training. Training will be performance-based, focused on training personnel to perform tasks, not procedure-specific. Training will consist of classroom training, tabletop exercises, and on-the-job training, as appropriate.

It is assumed that classroom training and on the job training (OJT) will be required for all the courses identified, with the exception that classroom training only will be required for the following training courses in order to obtain qualification:

- Standing Orders; and
- Safety Basis.

### 1.2) Quantification - Training

The Training task is estimated based on the Silos Project evaluation of required operating staffs as interpreted by the AWR Final Design Packages. The Fluor Fernald resources trained for the RCS will be dedicated to operating the RCS and will not be covered in the other phases of training. The resources for training are stated and shared with other start-up and readiness activities and are presented in **Tables 1.5-30, 1.5-31, 1.5-33, and 1.5-34**. Progress is reported on the task level as presented in **Tables 1.5-32 and 1.5-35**.

The following assumptions were used in estimating the resources for the Training task:

- Training classroom facilities are available on-site when needed at no additional cost to the project;
- Training will be performed on day shift; and
- No overtime is required for training.

### 2) Task #2 - Readiness Self-Assessment

The scope of the Readiness Self-Assessment task includes Fluor Fernald's labor to prepare and to perform readiness activities [Operational Readiness Review (ORR) or Readiness Assessment or Standard Start-up Review] for the AWR project. The scope of this task also includes Fluor Fernald cost associated with readiness.

The Project Readiness Team will ensure that the facility and personnel are prepared to operate safely and effectively. The Project Readiness Team will use a graded approach to verify the following five (5) areas are satisfactory to commence operations from site requirements:

- **Hardware and Systems** - Procedures and controls for operating the process systems and utility systems are correct and adequate. Project safety documentation is in place that describes the safety envelope and implements adequate and safe controls. Structures, systems and components are operable and in satisfactory condition as defined in the project plans and safety requirements.
- **Personnel and Organization** - Training and qualification programs for operations and operations support personnel have been established, documented, and implemented. There are sufficient numbers of qualified personnel to support safe operations. A routine emergency operations drill program including program records, has been developed, established, and implemented. Technical management qualification of personnel responsible for facility operations are adequate. Level of knowledge of operations and operations support personnel is adequate. Personnel exhibit an awareness of public and worker safety, health, and environmental protection requirements, and through their actions, demonstrate a high priority commitment to comply with these requirements. Functions, assignments, responsibilities, and reporting relationships are clearly defined, understood, and effectively implemented with line management for control of safety. The formality and discipline of operations are adequate to work safely.
- **Management Programs** - A process has been established to identify, evaluate, and resolve deficiencies and recommendations made by oversight groups, review teams, and audit organizations. A systematic review of the facility's conformance to applicable DOE Orders has been performed. Functional areas programs such as Maintenance, Radiological Protection, Industrial Safety and Health, and Quality Assurance are adequate to support project.
- **Operating Procedures** - Procedures necessary for operation have been identified, prepared, and approved. Operational constraints, terms, and conditions or limiting conditions (if any) have been identified in operating procedures or other documents. Workability and completeness of procedures have been verified in the field. Procedures are controlled and have been distributed and made available to workers.
- **Support Organizations** - Training and qualification programs that cover the entire range of duties for operations support personnel have been established, documented, and implemented. Level of knowledge of support personnel is adequate based upon reviews of test results, personnel interviews, and observation of work practices.

Fluor Fernald will develop a readiness plan for the AWR Project. The Fluor Fernald AWR Project team and/or Fluor Fernald Readiness Team will then develop and implement a Plan of Action and a Readiness Implementation Plan, as appropriate. At this time, it is expected that an ORR will be required for the AWR Project.

### Fluor Fernald ORR

An ORR is an independent, disciplined, systematic, documented, performance-based examination of facilities, equipment, personnel, procedures, and management control systems to ensure that an activity will be operated safely within its approved safety envelope as defined by the AWR safety basis. The ORR will base its scope on the relationship of the AWR activities to a minimum set of core requirements defined in site procedure and DOE orders. A graded approach will be used to define the depth of the ORR based on these core requirements.

The facility/system start-up authority is a function of the final hazard categorization of the facility. For facilities that are HC 1 and HC 2, the DOE Ohio Field Office has startup authority. For HC 3 facilities, such as the AWR facilities, the DOE-FEMP has startup authority. For radiological or other industrial hazard and standard industrial hazards, Fluor Fernald has been delegated startup authority.

The AWR Project has two ORR's planned, one for RCS Phase I operation and one for Waste Retrieval operation.

### 2.2) Quantification - Readiness Self Assessment

The Readiness Self-Assessment task estimate consists of the following assumptions:

- Based on a graded approach, an ORR is required for the RCS, Phase I operation;
- Based on a graded approach, an ORR is required for the AWR Waste Retrieval operation (SWRS);
- Based on a graded approach, a standard restart is required for DWRS operation, with no formal readiness review;
- FSMS testing is a construction activity and no formal readiness reviews are required;
- Assume Readiness Review conducted with no overtime; and
- Assume DOE readiness activities are performed after Fluor Fernald's declaration of readiness.

The resources and progress reporting are summarized on the task level as presented in **Tables 1.5-30 through 1.5-35.**

### 3) Task #3 - SOT

### 3.1) Plan/Scope - SOT

The scope of the SOT task includes Fluor Fernald cost associated with the planning and performing SOTs on the AWR Project.

SOT involves the following activities:

- SOT Plan and Procedures;
- SOTs; and
- System Operability Final Test Report.

#### SOT Plan and Procedures

Fluor Fernald will develop a SOT Plan to establish the testing program for AWR startup. Fluor Fernald will also develop SOT procedures on equipment in the following systems, identifying personnel, testing requirements, system boundaries and standards to be met to ensure that the AWR systems meet the design requirements.

- Waste Transfer system (FSMS, SWRS, and TWRS);
- HEPA and RCS; and
- Breathing Air system.

Fluor Fernald will perform SOTs to verify process design and proper construction. SOTs will also verify the systems are operational in accordance with the applicable functional facility requirements and that each structure, system, or component can be operated in a manner that is safe to personnel, equipment, and the environment. Successful completion of SOTs will document the formalized process by which the AWR facilities can be turned over to operations.

SOTs will be performed on equipment in the following systems. A physical surrogate will be used to test equipment during SOT.

- Waste transfer system (FSMS, SWRS, and TWRS);
- HEPA and RCS; and
- Breathing air system.

OJT for the following training classes will be accomplished during SOT:

- Waste transfer operation;
- RCS operation;
- TTA operation;
- HEPA ventilation system operation;
- Breathing air system operation;
- Air-supplied respirator operation;

- CCTV system operation; and
- Emergency response.

### System Operability Final Test Report

Fluor Fernald will prepare a Final Test Report when all sections of the SOT Procedure(s) and identified retests are complete. The Final Test Report will contain the following information:

- Form FS-F-3982;
- Explanations of Test Exceptions;
- Test Procedure Change Notices;
- System modifications;
- Corrective actions;
- DCNs;
- Comparison of the test data with the acceptance criteria; and
- Conclusion regarding acceptance of facility/process.

#### 3.2) Quantification - SOT

The SOT task estimate consists of the following assumptions:

- FAT&LC labor will be used in performing SOT activities;
- SOT will be performed after the systems have completed ICAT and have been turned over to Start-up; and
- No overtime is required for performing SOT.

Resources and progress for this effort are summarized on the task level as presented in **Tables 1.5-30** through **1.5-35**. The SOT has been divided into the following segments to support the operations phase:

- RCS, Phase I;
- FSMS; and
- Silo Waste Retrieval.

#### 4) Task #4 - Plans and Procedures

##### 4.1) Plan/Scope - Plans and Procedures

The Plans and Procedures task consists of Fluor Fernald resources needed to review and approve the AWR Project O&M plans and procedures.

### Operations Procedures Development

Fluor Fernald will develop operating procedures to direct personnel in the safe operation of the AWR systems and equipment during normal, off-normal, and emergency conditions. Existing Fluor Fernald operating procedures will be used by the Fluor Fernald labor force in performing routine RCS, bulk waste retrieval, discreet object, and heel removal operations. It is assumed that operating procedures will be developed for the following activities:

- Operation of the RCS;
- Operation of the SWRS and DWRS;
- Operation of EMMA™;
- Operation of the TTA;
- Operation of the HEPA ventilation system;
- Operation of Breathing Air System;
- Operation of CCTV system;
- Emergency Operating Procedures;
- System Shut-down (short-duration); and
- Decontamination (including tools and equipment).

Operating procedures will be drafted and reviewed prior to start of SOTs. However, procedures will not be finalized until SOTs have been completed, and lessons learned from SOT can be incorporated into the procedures.

### Maintenance Plan Development

A maintenance plan will be prepared to document the maintenance strategy and maintenance requirements during operations. The maintenance plan will determine what maintenance work orders, procedures, or other documentation will need to be prepared to support maintenance activities. These documents will be prepared prior to initiating operations, where appropriate.

#### 4.2) Quantification - Plans and Procedures

The Fluor Fernald resources needed to generate and approve these documents is assumed to be dedicated and part of Fluor Fernald's AWR Project staff and the estimated hours for these activities are included within readiness and start-up task level activities. Resources and progress will be reported on the task level as presented in **Tables 1.5-30 through 1.5-35**.

5) Task #5 - Preventative Maintenance

5.1) Plan/Scope - Preventative Maintenance

The Preventative Maintenance task consists of the Fluor Fernald Maintenance labor to perform the calibration and preventative maintenance prior to the declaration of readiness.

5.2) Quantification - Preventative Maintenance

The Maintenance staff to perform this scope of work is dedicated to the Silos Project and will be shared resources with the Silos 1 and 2 and Silo 3 Projects. Resources and progress for this effort will be tracked and reported on the task level as presented in **Tables 1.5-30 through 1.5-35.**

**TABLE 1.5-30**  
**RCS PHASE I START-UP AND READINESS LABOR RESOURCES**  
**SCHEDULE DURATION 03 AUG 01 - 12 SEP 02**

RESOURCE CODE	FTEs
CHEMOPR	4.5 avg
CRPNTR	0.3 avg
DEPADM	1.0
ELECTN	2.0 avg
ENGMEC	0.5
ENGPRC	1.0
HAZWAT	1.0 avg
HEOOPR	0.5 avg
INDHYG	0.3 avg
INSMEC	1.0 avg
MILWRT	1.0 avg
MNTMGR	2.0
MNTREP	1.0
MVOOPR	0.5 avg
OPRMGR	2.0 avg
OILER	0.1 avg
PAINTR	0.1 avg
PIPFTR	1.0 avg
PJSREP	1.4
PRGMGR	1.0
QACENG	0.8 avg
RADENG	0.3 avg
RADMGR	0.5 avg
RADTCH	8.0 avg
RIGGER	0.5 avg
S&HENG	0.1 avg
TPSREP	1.6 avg
WELDER	0.1 avg
TRNREP	1.0
WSTENG	0.5

**TABLE 1.5-31**  
**RCS PHASE I START-UP AND READINESS SUBCONTRACTOR RESOURCES**

RESOURCE CODE	FTEs
Coleman Research	3.7 avg

Progress of RCS Start-up and Readiness are based on the monthly status of the weighted milestones of the tasks presented in Table 1.5-32.

**TABLE 1.5-32**  
**RCS PHASE I START-UP AND READINESS MILESTONE PROCESS**

TASK DESCRIPTION	DURATION	EARN VALUE MILESTONE
<b>RCS PHASE I TRAINING</b>		
START	28 MAR 02 - 13 MAY 02	5%
COMPLETE		5%
<b>RCS PHASE I READINESS PREPARATION</b>		
START	01 AUG 01 - 26 JUN 02	10%
MIDPOINT		10%
COMPLETE		10%
<b>RCS PHASE I PLANS AND PROCEDURES</b>		
START	04 SEP 01 - 21 NOV 01	5%
COMPLETE		5%
<b>RCS PHASE I SOT</b>		
START	14 MAY 02 - 25 JUN 02	5%
COMPLETE		5%
<b>RCS PHASE I READINESS REVIEW</b>		
DECLARE READINESS	26 JUN 02 - 12 SEP 02	10%
COMPLETE FLUOR FERNALD READINESS REVIEW		20%
COMPLETE DOE READINESS REVIEW		10%

**TABLE 1.5-33**  
**WASTE RETRIEVAL START-UP AND READINESS LABOR RESOURCES**  
**SCHEDULE DURATION 16 AUG 02 - 06 OCT 04**

RESOURCE CODE	FTEs
CHEMOPR	24 avg
DEPADM	1.0
ENGMEC	0.5
ENGPRC	1.0
HAZWAT	2.0
HEOOPR	5.0
INDHYG	0.4
INSMEC	2.0
MILWRT	2.0
MNTMGR	1.0
MNTREP	0.5
MVOOPR	1.0
OPRMGR	1.0
PIPFTR	2.0
PJSREP	0.7
PRGMGR	0.4 avg
QACENG	1.0 avg
RADENG	0.5 avg
RIGGER	1.0 avg
S&HENG	0.2 avg
TPSREP	2.0 avg
TRNREP	0.6
WSTENG	0.5

**TABLE 1.5-34**  
**WASTE RETRIEVAL START-UP AND READINESS SUBCONTRACTOR RESOURCES**

RESOURCE CODE	FTEs
Coleman Research	3.0

Progress of Waste Retrieval Start-up and Readiness are based on the monthly status of the weighted milestones of the tasks presented in Table 1.5-35.

**TABLE 1.5-35**  
**WASTE RETRIEVAL START-UP AND READINESS MILESTONE PROCESS**

TASK DESCRIPTION	DURATION	EARN VALUE MILESTONE
<b>WASTE RETRIEVAL TRAINING</b>		
START	28 MAR 04 - 04 MAY 04	5%
COMPLETE		5%
<b>WASTE RETRIEVAL READINESS PREPARATION</b>		
START	16 SEP 02 - 21 JUN 04	5%
MIDPOINT		5%
COMPLETE		5%
<b>FSMS INTEGRATED DEMONSTRATION</b>		
START	06 MAY 03 - 19 AUG 03	5%
COMPLETE		20%
<b>WASTE RETRIEVAL SOT</b>		
START	09 DEC 03 - 15 JUN 04	5%
COMPLETE		5%
<b>WASTE RETRIEVAL READINESS REVIEW</b>		
DECLARE READINESS	21 JUN 04 - 06 OCT 04	10%
COMPLETE FLUOR FERNALD READINESS REVIEW		20%
COMPLETE DOE READINESS REVIEW		10%

#### 1.5.10 HWR1K - Operations

Operations consists of two tasks: Operations and Berm Soil Handling.

##### 1) Task #1 - Operations

##### 1.1) Plan/Scope - Operations

Charge No. HWR1K covers all of the O&M labor, spare parts, equipment, and consumable costs to support the AWR O&M activities.

The O&M task is defined as any activity associated with the implementation and coordination of the operation of the RCS, SWRS, TTA, and DWRS. Fluor Fernald will provide technical direction of the O&M in accordance with the Standard Operating Procedures and maintenance procedures. The O&M activities will be performed by Fernald Atomic Trades and Labor Council (FAT&LC) labor. The O&M tasks include the silo berm removal and silo gross decontamination using EMMA™.

AWR Operations has been segmented into the following activities:

- RCS, Phase I O&M activities - The objective of the RCS, Phase I operation is to reduce silo headspace radon concentrations;
- SWRS O&M activities - This segment includes the bulk sluicing, berm removal, heel removal, discrete object removal, silo gross decontamination, and fixative application to silo walls;
- DWRS O&M activities - This segment addresses the waste retrieval and gross decontamination of the Decant Sump Tank;
- O&M activities associated with the transfer of wastewater from the AWR Project to the High Nitrate Tank for staging for treatment at AWWT; and
- O&M activities associated with the gross decontamination of the silos and the application of a fixative spray to the silo interior.

##### 1.2) Quantification - Operations

This activity consists of Fluor Fernald cost to support the AWR Project O&M activities. This activity consists of FAT&LC labor and supervision, vendor support, spare parts, consumables, and operating support equipment.

The AWR O&M activities are segmented into two groups: RCS Operation and SWRS Operation.

The RCS Operation group consists of the O&M of the RCS System throughout the AWR Project until the RCS system is turned over to the Silos 1 and 2 Project.

The SWRS Operation group consists of the O&M of the TTA, SWRS, DWRS, and TWRS during waste retrieval (bulk, heel, and discrete object) and facility decontamination activities.

The following assumptions were used to estimate O&M resources:

- RCS operation is 10 hours per day, 4 days per week;
- RCS operation has limited overtime to support key operation periods;
- SWRS operation is 10 hours per day, 4 days per week;
- Maintenance staff are shared resources supporting AWR, Silo 3, and Silos 1 and 2 Projects;
- Maintenance staff work 10 hours per day, 4 days per week;
- No maintenance overtime is necessary to support operation;
- Personal protective equipment and tools are provided by Fluor Fernald;
- Vendor Maintenance Support are provided by Fluor Fernald; and
- Spare parts are provided by Fluor Fernald.

The following crew sizes are estimated for operations:

- RCS Operation Crew - Four RCS Operation crews are needed to support continual operation.
  - 3 Rad. Techs
  - 2 Chemical Operators
  - 1 Operation Manager
  - 1 Start-up/Process Engineer
- Silo Waste Retrieval Crew
  - 8 Chemical Operators
  - 1 Operation Manager (shared with RCS operations)
  - 1 Start-up/Process Engineer (shared with RCS operations)
- Transfer Tank Crew During Silo Waste Retrieval
  - 8 Chemical Operators
  - 1 Operation Manager (shared with RCS operations)
  - 1 Start-up/Process Engineer

- Control Room Crew During Silo Waste Retrieval
  - 8 Chemical Operators
  - 1 Operation Manager (shared with RCS operations)
  - 1 Start-up/Process Engineer (shared with RCS operations).

Resources necessary for RCS and Silos Waste Retrieval operations are presented in **Tables 1.5-36 through 1.5-41**. Progress for Silo Waste Retrieval operations will be apportioned to the amount of waste retrieved. The progress for RCS operations will be apportioned to waste retrieval construction progress.

**TABLE 1.5-36**  
**RCS OPERATIONS RESOURCE SUMMARY**  
**SCHEDULE DURATION 09/16/02 - 03/01/06**

RESOURCE CODE	FTEs
CHEMOPR	8
RADMGR	1 avg
OPRMGR	4
Start-up Process Engineer (supplied by Coleman Research)	4 avg

**TABLE 1.5-37**  
**SWRS OPERATIONS RESOURCE SUMMARY**  
**SCHEDULE DURATION 10/04/04 - 03/01/06**

RESOURCE CODE	FTEs
CHEMOPR	24
OPRMGR (shared with RCS operations)	3
ENGPRC	0.4 avg

**TABLE 1.5-38**  
**MAINTENANCE RESOURCE SUMMARY**  
**SCHEDULE DURATION 09/16/02 - 03/01/06**

RESOURCE CODE	FTEs
PJSMGR	1.0 avg
OILER	0.1 avg
PAINTR	0.1 avg
WELDER	0.2 avg
RIGGER	1.4 avg
INSMEC	3 avg
HAZWAT	3 avg
MNTREP	0.7 avg
MNTMGR	0.9 avg
CRPNTR	0.5
ELECTN	4
PIPFTR	3 avg
MILWRT	3 avg

**TABLE 1.5-39**  
**OPERATION RESOURCE SUMMARY**  
**SCHEDULE DURATION 09/16/02 - 03/01/06**

RESOURCE CODE	FTEs
QACENG	0.4 avg
INDHYG	0.4 avg
S&HENG	0.4 avg
WSTENG	0.7 avg
HEOOPR	1.4 avg
MVOOPR	1.0 avg
DEPADM	0.5 avg
PRGMGR	0.1 avg
PJSREP	1.0 avg
RADENG	0.4 avg
ENGMEC	0.5
RADTCH	12
BUYCON	0.4 avg

**TABLE 1.5-40**  
**RCS OPERATION OVERTIME RESOURCE SUMMARY**

RESOURCE CODE	WORK HOURS			
	REGULAR	OVERTIME	DOUBLETIME	TOTAL
CHEMOPR	4,160	1,600	960	6,720
RADTCH	6,240	2,400	1,440	10,080
OPRMGR	1,560	600	360	2,520
RADMGR	520	200	120	840

**TABLE 1.5-41**  
**RCS OPERATION SUBCONTRACT RESOURCE SUMMARY**  
**SCHEDULE DURATION: 09/16/03 - 03/01/06**

RESOURCE CODE	FTEs
Coleman Research	3

The resources planning for the RCS Operations also includes the need for the following consumable items and services which are considered "other direct costs." Table 1.5-42 summarizes these items and their costs.

**TABLE 1.5-42**  
**RCS OTHER DIRECT COSTS**

ITEM NO.	DESCRIPTION	BASIS FOR COST	COST (\$)
1	LABORATORY SERVICES (LIQUID AWWT ACCEPTANCE CRITERIA)	1 wastewater sample/month (of filtrate prior to discharge to AWWT)	\$45,000
		30 samples collected and analyzed	
		Analyte suite attached	
		\$1,500/sample assumed	
2	LABORATORY SERVICES (STACK FILTER PAPER)	1 air filter paper sample (biweekly)	\$97,500
		65 samples	
		Analyte suite attached	
		\$1,500/sample	
SUBTOTAL LABORATORY SERVICES			\$142,500

**TABLE 1.5-42**  
**RCS OTHER DIRECT COSTS (CONT'D)**

ITEM NO	DESCRIPTION	BASIS FOR COST	COST (\$)
<b>PPE EQUIPMENT</b>			
3	TYVEKS	Tyvek coverall units	\$3,000
		Hood	
		Coverall	
		25 units/month	
4	RUBBER BOOTIES	30 months	\$3,000
		\$4/unit	
		12 in., 20 mil latex	
		Model 10241, boot/shoecover	
5	BUBBLE SUITS	ARAMSCO, pg 16	\$10,700
		25 units/month for 30 months	
		\$4/unit	
		Bubblesuit with hood	
6	PAPR (WITH FILTERS)	Qty (100)	\$14,700
		\$42/suit, \$65/hood	
		\$107/unit	
		PAPRs with belts	
		ARAMSCO, ISI Typhoon, pg 35	
		20 units @ \$500/unit	
7	APR (WITH FILTERS)	20 battery packs @ \$175/pk	\$108,000
		20 battery chargers @ \$60/unit	
8	POCKET DOSIMETER	18,000 HEPA filters (20/day x 30 days/month x 30 months) \$6 each (Model P-100)	\$2,800
		APRs	
		Qty (20) @ \$140/each	
		Respirator Cartridges	
		2 Cartridges per set	
		1 set/person	
		20 person/day	
9	LEAD BLANKETS	30 months	\$360,000
		\$20/set of cartridges	
		Qty (30) @ \$50 each	
8	POCKET DOSIMETER	Qty (30) @ \$50 each	\$1,500
9	LEAD BLANKETS	Qty (6)	\$600
		Lead wool blankets (12" x 48")	
		\$100 each	
Sales Tax PPE Equipment (6%)			\$30,258
<b>SUBTOTAL PPE EQUIPMENT</b>			<b>\$534,558</b>

**TABLE 1.5-42**  
**RCS OTHER DIRECT COSTS (CONT'D)**

ITEM NO.	DESCRIPTION	BASIS FOR COST	COST (\$)
MISCELLANEOUS			
10	MISCELLANEOUS	Operation & maintenance of RCS for 2.5 years Leather palm gloves, tape, bags, B-Z filters, Camlox, hoses, buckets, Carharts, sorbents, glasses, etc.	\$62,500
11	BOTTLED WATER	\$3.50/bottle (stores item) Consumption rate – 20 bottles/month for 30 months Cost = (3.50 x 20 x 30)	\$2,100
Sales Tax Miscellaneous Equipment (6%)			\$3,876
<b>SUBTOTAL MISCELLANEOUS EQUIPMENT</b>			<b>\$68,476</b>

The resource planning for Waste Retrieval operations also includes the following other direct costs:

- Consumables;
- PPE (tyveks, respirators, etc.);
- Safety Equipment;
- General Supplies; and
- Laboratory Analyses.

The following **Table 1.5-43** summarizes the basis for calculating the other direct costs incurred during the O&M activities.

**TABLE 1.5-43  
 WASTE RETRIEVAL OTHER DIRECT COSTS**

ITEM NO.	DESCRIPTION	BASIS FOR COST	COST (\$)
<b>LABORATORY SERVICES</b>			
1	LABORATORY SERVICES (PROCESS CONTROL)	1 sample/day during retrieval operations. Operations 4 days/week for 1.5 years of operation	\$23,088
		312 samples collected and analyzed for Total Suspended Solids and Total Dissolved Solids	
		\$74/sample assumed	
2	LABORATORY SERVICES OSHA COMPLIANCE SAMPLES	280 samples at \$100 per sample	\$28,000
3	MISCELLANEOUS (SOLID SECONDARY WASTE)	HEPA Filters	\$124,800
		PPE	
		1 TCLP sample/day of operations, 312 days	
		TCLP at \$400/sample	
<b>SUBTOTAL LABORATORY SERVICES</b>			<b>\$175,888</b>
<b>PPE EQUIPMENT</b>			
4	SARANEX	Saranex Units Hood Booty Coverall	\$528,840
		75 units/day	
		312 days	
		\$22.60/unit	
5	TYVEKS	Tyvek coverall units Hood Coverall	\$93,600
		75 units/day	
		312 days	
		\$4/unit	
6	RUBBER BOOTIES	12 in., 20 mil latex Model 10241, boot/shoecover	\$93,600
		ARAMSCO, pg 16	
		75 units/day	
		312 days	
7	BUBBLE SUITS	Bubblesuit with hood	\$21,400
		Qty (200) units	
		\$42/suit, \$65/hood	
		\$107/unit	

**TABLE 1.5-43  
 WASTE RETRIEVAL OTHER DIRECT COSTS (CONT'D)**

ITEM NO.	DESCRIPTION	BASIS FOR COST	COST (\$)	
8	TENNELEC	Smear Test Analyzer	\$45,000	
		Qty (1)		
9	PORTABLE AIR MOVEMENT HEPA UNITS WITH FILTERS	NFS RPS, Model PFB-800	\$22,000	
		2 units @ \$5,000 each		
		24 Replacement filters @ \$500 each		
10	WET VAC HEPA	Power Products	\$12,000	
		4 units required		
		\$3,000/unit		
		4 long hose connections		
		4 filters/weeks for 52 weeks		\$9,360
		208 filters @ \$45 each		
11	POWERED AIR PURIFYING RESPIRATORS (PAPR) (WITH FILTERS)	3M PAPRs with belts	\$22,050	
		30 units @ \$500/unit		
		30 battery packs @ \$175		
		30 battery chargers @ \$60		
		9,360 HEPA filters (30/day, 312 days, \$6 each (Model P-100))		\$56,160
12	APR (WITH FILTERS)	Full Face 3M APRs	\$8,400	
		Qty (60) @ \$140/each		
		Respirator Cartridges	\$187,200	
		2 Cartridges per set		
		1 set/person		
		30 person/day		
		312 days		
		\$20/set of cartridges		
13	PERMACON	NFS RPS	\$20,000	
		Stainless steel Enclosure Model CS103, (12' w x16' l x 8' h)		
		Installed costs \$20,000		
		NFS Portable HEPA Filtration Unit, SP-505, \$3,500	\$9,500	
		12 Replacement HEPA filters @ \$500 each		
14	WORKING LEVEL RADON MONITOR	Model WLX	\$17,000	
		Qty (2)		
		\$8,500 each		

**TABLE 1.5-43  
 WASTE RETRIEVAL OTHER DIRECT COSTS (CONT'D)**

ITEM NO.	DESCRIPTION	BASIS FOR COST	COST (\$)
15	POCKET DOSIMETER	Aerotech Self Reading Pocket Dosimeter	\$1,500
		Qty (24) @ \$50 each	
		Qty (2) charges @ \$150 each	
16	COOL VESTS	Occunomics Phase Change Cold Pack Vest, Qty (50)	\$24,450
		\$350 each	
		Replacement Gelpacks @ \$139 each, Qty (50)	
17	FREEZER	Commercial Grade	\$1,500
		Holds 50 cold vests	
18	FLOOR SCRUBBER	Industrial grade	\$1,500
		Scrub Pads	
19	GLOVE BAGS	Qty (200)	\$2,240
		ARAMSCO, Item 56011, 66" x 84"	
		\$160/roll, 15 bags/roll	
20	LEAD BLANKETS	Qty (40)	\$4,000
		Lead wool blankets (12" x 48")	
		\$100 each	
21	BREATHING ZONE AIR SAMPLERS	30 new samplers at \$600 each	\$18,000
22	ALPHA FRISKERS	Model ASP-23 with alpha probe	\$3,000
		Qty (2)	
		\$1,500 each	
23	OSHA COMPLIANCE EQUIPMENT	Provide equipment, repair, calibration for: <ul style="list-style-type: none"> <li>• (5) Air Sampling Pumps</li> <li>• (1) Pump Charger</li> <li>• (1) Particulate Monitor</li> <li>• (1) Gas Monitor</li> <li>• (2) Noise Dosimeters</li> <li>• (1) Noise Meter</li> <li>• (1) Heat Stress Meter</li> <li>• (1) Detector Tube</li> <li>• (1) CO Meter</li> <li>• Calibration Gas</li> <li>• Equipment Calibration</li> <li>• Sample Media</li> <li>• Equipment Repairs/Supplies</li> </ul>	\$23,500
24	SCAFFOLDING	Tube Lock Scaffolding	\$50,000

**TABLE 1.5-43  
 WASTE RETRIEVAL OTHER DIRECT COSTS (CONT'D)**

ITEM NO.	DESCRIPTION	BASIS FOR COST	COST (\$)
24	MISCELLANEOUS	<ul style="list-style-type: none"> <li>• Leather Palm gloves</li> <li>• Duct Tape</li> <li>• B-Z Filters</li> <li>• Camlox</li> <li>• Hoses</li> <li>• Buckets</li> <li>• Carharts</li> <li>• Rubber gloves</li> <li>• Latex gloves</li> <li>• Sorbents</li> <li>• Hard hats</li> <li>• Hearing protection</li> <li>• Glasses</li> <li>• Reinforced disposable ductwork</li> <li>• Etc., etc., etc.</li> </ul>	\$200,000
Sales Tax PPE Equipment (6%)			\$88,548
SUBTOTAL PPE EQUIPMENT			\$1,564,348
<b>MISCELLANEOUS</b>			
25	RUMPKE DUMPSTER	40 yd <sup>3</sup> rolloff with liner \$150/load delivery \$230 (\$23/ton disposal fee) \$30 (3/ton handling fee) \$40 (liner) Assumes 10 tons/load Assumes 1 dumpster/month for 18 months	\$8,100
26	RUMPKE PORT-A-LETS	Assume 6 units \$5/month rental/unit \$100 service/month/unit 18 months duration	\$11,340
27	SPARE PARTS	10% of equipment cost [(1,800,000 + 14,763,800) * 0.1]	\$1,656,000

**TABLE 1.5-43  
 WASTE RETRIEVAL OTHER DIRECT COSTS (CONT'D)**

ITEM NO	DESCRIPTION	BASIS FOR COST	COST (\$)
28	EQUIPMENT RENTAL	Air Compressor - \$4,000 per month for 20 months	80,000
29	BOTTLED WATER	\$3.50/bottle (stores item)	\$2,520
		Consumption rate - 40 bottles/month for 18 months	
		Cost = (3.50 x 40 x 18)	
Sales Tax Miscellaneous Equipment (6%)			\$105,478
<b>SUBTOTAL MISCELLANEOUS EQUIPMENT</b>			<b>\$1,863,438</b>
<b>TRAILER LEASES</b>			
37	MONTHLY LEASE OF TRAILER NOS. 414 AND 415	Lessor: William Scottsman, Inc	\$18,720
		Trailer 414, Lease \$290/month for 18 months	
		Trailer 415, Lease \$750/month for 18 months	
<b>SUBTOTAL TRAILER LEASES</b>			<b>\$18,720</b>

2) Task #2 - Berm Soil Handling

2.1) Plan/Scope - Berm Soil Handling

This task consists of the Fluor Fernald resources associated with berm soil handling activities as defined in the Remedial Design Package Berm Excavation Plan. This task consists of FAT&LC labor and Fluor Fernald supervision.

2.2) Quantification - Berm Soil Handling

The following assumptions were used in estimating resources for berm soil handling:

- Excavation equipment for berm excavation is provided by Fluor Fernald;
- Excavation of berm soil will be in accordance with the Berm Excavation Plan;
- Rad. Tech. used for soils surveys is budgeted in the RCS crew and is shared; and
- The two dump trucks and two gradealls used for transporting berm soil are GFE and available on-site.

Progress reported against the milestone schedule will be used to apportion earned value against the resources presented in **Table 1.5-44**.

**TABLE 1.5-44**  
**BERM EXCAVATION RESOURCE SUMMARY**  
**SCHEDULE DURATION: 10/18/04 - 01/25/06**

RESOURCE CODE	FTEs
HEOOPR	4
MVOOPR	1

1.5.11 HWR1L - Safe Shutdown

1) Plan/Scope - Safe Shutdown

Charge No. HWR1L covers those activities necessary to support safe shutdown of Silos 1 and 2, the SWRS, and the DWRS. The scope of Safe Shutdown includes: isolation of utilities from the SWRS and DWRS, removal of all residual material with transfer to the TTA, and gross decontamination of Silos 1 and 2, the decant sump tank, and contaminated process equipment.

Fluor Fernald will perform safe shutdown activities in accordance with the FEMP Collective Bargaining Agreement with FAT&LC labor.

Isolation of Utilities

Fluor Fernald will isolate all utilities including, but not limited to, electric power, steam, water, and compressed air from the SWRS and DWRS. Fluor Fernald will develop an Energy Isolation Plan that describes when, where, and how, the utilities will be isolated.

Utilities will be safely disconnected outside the facility early in the safe shutdown process, by physically cutting, air gapping, and tagging the lines. Fluor Fernald will remove all grounding conductors to grade level. Fluor Fernald will verify that all utilities are capped and/or controlled and notify the Assistant Emergency Duty Officer of the completion of utilities isolation.

Gross Decontamination

Fluor Fernald will perform gross decontamination of the remaining SWRS, DWRS, and FSMS equipment and the interior of the Silos 1 and 2 structures. Gross decontamination is defined as general housekeeping to remove contaminated debris, vacuum loose dust, wet wipe equipment, ductwork, piping, and the interior of the structure walls, and remove loose, visible residues.

2) Quantification - Safe Shutdown

Silo Waste Retrieval Operation and Maintenance resources will be used to perform the AWR Safe Shutdown activities and are presented in **Table 1.5-45**.

The following assumptions were used in estimating resources for safe shutdown activities:

- No overtime is required for AWR Safe Shutdown activities;
- RCS, TTA, and TWRS operations are not impacted or interrupted by AWR Safe Shutdown activities; and
- RCS, TTA, and TWRS operations are turned over to Silos 1 and 2 Project after decant sump tank waste retrieval and prior to Safe Shutdown.

**TABLE 1.5-45**  
**SAFE SHUTDOWN AND DEMOBILIZATION RESOURCES**  
**SCHEDULE DURATION 3/02/06 - 5/10/06**

RESOURCE CODE	FTEs
PJSREP	0.2
TECH/PROGRAM SUPPORT REP	1.0
S&HENG	0.5
RADENG	1.0
RADTCH	3.0
WSTENG	2.0
MNTREP	0.5
MILWRT	4.0
OPRMGR	2.0
START-UP/PROCESS ENGINEER	4.0
CHEMOPR	10
CRPNTR	1.0
ELECTN	2.0
PIPFTR	2.0
HEOOPR	2.0
MVOOPR	2.0
INSMEC	2.0
HAZWAT	4.0

### 1.5.12 HWR1M - Silos Project Maintenance Facility

#### 1) Plan/Scope - Silos Project Maintenance Facility

The scope of the Silos Project Maintenance Facility consists of all activities and resources needed to support the conversion of the existing VITPP facility into a maintenance facility to support the Silos Division maintenance activities. The scope, schedule, and resources for renovation of the existing VITPP facility will be managed by the following three key activities:

- Planning
- Equipment Removal; and
- Facility Upgrade.

##### 1.1) Task #1 - Planning

The Planning task consists of the Task Orders for renovation of the Silos Project Maintenance Facility.

##### 1.2) Task #2 - Equipment Removal

The Equipment Removal task consists of the removal of the vitrification melter, roller conveyor, and electrical transformer. The balance of the VITPP components were removed during previous Safe Shutdown activities.

##### 1.3) Task #3 - Facility Upgrade

The Facility Upgrade task consists of re-energizing the heating, ventilation, and air-conditioning system, the ventilation system, and fire detection system, and moving and setting up maintenance equipment.

#### 2) Quantification - Silos Project Maintenance Facility

Charge No. HWR1M covers all cost resources associated with the renovation of the existing VITPP facility into a Silos Project Maintenance Facility. The following assumptions were used in developing a cost estimate for the Silos Project Maintenance Facility:

- Maintenance equipment existing on-site;
- VITPP has sufficient available power;
- All work will be performed using existing central maintenance personnel; and

- Property administration will cover the disposition (excess, scrap) of the removed equipment.

Progress for this effort will be tracked and recorded based upon the use of a 0/100 milestone. Tables 1.5-46 and 1.5-47 summarize the resources planned for completing activities associated with the Silos Project Maintenance Facility.

**TABLE 1.5-46**  
**SILOS PROJECT MAINTENANCE FACILITY COSTS**

ITEM	COST
Material (see Detail Estimate)	\$38,300
Shipping Cost	4,200
PPE/Absorbent/Material	\$7,440
NTS Burial Fee	\$1,200

**TABLE 1.5-47**  
**SILOS PROJECT MAINTENANCE FACILITY RESOURCE SUMMARY**

RESOURCE CODE	FTEs
Manitenance Representative	0.1
Heavy Equipment Operator	1.0
Millwright	3.0
Electrician	3.0
Pipefitter	0.2
Welder	0.2
Instrument Mechanic	0.2
Rigger	0.3
Carpenter	0.1
Maintenance Manager	1.0
Safety Engineer	1.0
Start-up/Process Engineer	0.1

1.5.13 HWR1P - Project Management

1) Plan/Scope - Project Management

The scope of Project Management, Charge No. HWR1P, for the AWR Project is defined by two project tasks: Project Oversight and Project Documentation.

1.1) Task #1 - Project Oversight

The scope of the Project Oversight task consists of project related activities necessary to support the implementation of the AWR Project. These tasks include, maintenance of this closure plan, quarterly updates to the baseline risk management plan, workforce planning, daily filing and maintenance of project documentation and records, annual training updates for matrixed project personnel, contract administration, engineering and design oversight and support, regulatory submittal support, procurement support, stakeholder support, project-specific clerical support, quality assurance and operational readiness self-assessments, audits, surveillances, inspections, and client interface.

1.2) Task #2 - Project Documentation

This task involves development and maintenance of documentation necessary to support AWR Project execution, as required by the terms of the Site Closure Contract under this Closure Plan. The project documents will represent the highest-level project documents generated, and effectively describe the methods and reflect the FEMP Programs and Plans that will be used in order to complete the defined scope of work. The execution of activities will be consistent with the methods described in these documents.

2) Quantification - Project Management

The resources needed to support the Project Management task are presented in **Table 1.5-48**. The resources were estimated based on the actual labor needed to support the project management activities and project documentation activities on the AWR Project for the past 2 years and the planned Project Management organizational chart. The Project Management resources are constant throughout the AWR project schedule and are broken down into the subsequent resources for the tasks. It is assumed that the Project Management resources can support the tasks. To minimize resources, the resources identified by an "\*" are shared resources with the Silos 1 and 2 Project and Silo 3 Project. Progress will be apportioned based status of the following tasks:

- Due Diligence - HWR1A;
- RCS Construction - HWR1C;
- BOP Construction - HWR1E;
- JEG Engineering Support - HWR1H;
- Start-up and Readiness - HWR1J;
- Operation - HWR1K; and
- Safe Shutdown - HWR1L.

**TABLE 1.5-48**  
**PROJECT OVERSIGHT RESOURCE SUMMARY**

Resource Code	FTEs
PRJMGR*	1.6 avg
ENGINR*	1.5 avg
SECRET	1.2 avg
MNTMGR*	0.4 avg
TPSREP*	0.8 avg
QACMGR	0.4 avg
PJSREP*	0.2 avg
S&HMGR*	0.4 avg
TPSMGR*	0.2 avg

\* Shared resource with Silos 1 and 2 Project, Silo 3 Project, and Silos Division activities.

1.5.14 HSWRB - FWENC Contract Closure

1) Plan/Scope - FWENC Contract Closure

R1-  
 F07-  
 022,  
 Rev. 1

~~The scope of the FWENC Closure covers the FWENC Settlement proposal identified by the basis of all amounts believed to be payable to FWENC pursuant to the Advanced Understanding Regarding Settlement of Subcontract Issues.~~

~~The scope of the FWENC Contract Closeout covers the payments made to FWENC.~~

2) Quantification - FWENC Contract Closure

It is assumed that this task is covered by the previous year's funding and no additional budget is required.

1.5.15 HSWRC - Rheology Studies

1) Plan/Scope - Rheology Studies

Charge No. HSWRC covers the Fluor Fernald's resources required to stage and transport the contaminated test equipment from the rheology studies performed on Silos 1 and 2 material at Florida International University. The contaminated test equipment is packaged in twenty 55-gallon drums and is located on the Plant 1 Pad. The plan is to ship these drums to the Nevada Test Site (NTS) for final disposition. The actual rheology studies were performed under the previous contract. Progress for this effort will be tracked and reported based upon the use of 0/100 milestone.

2) Quantification - Rheology Studies

**Table 1.5-49** summarizes the resources planned for completing activities associated with the Rheology Studies.

The following assumptions were used in estimating the resources for rheology study activities:

- No repacking, overpacking, or sampling required.
- Contaminated test equipment, which contains Silos 1 and 2 residue is shipped to NTS for final disposal.
- NTS disposal fee is \$7.50 per cubic foot.

**TABLE 1.5-49  
 RHEOLOGY STUDIES RESOURCE SUMMARY**

Resource	FTE	Comments
Waste Engineer	0.3	Q3 2001 – Receipt and staging of drums
Waste Engineer	1.3	Q1 2002 – Shipping to NTS



## **SECTION 3**

### **2.0 SCHEDULE**





Activity ID	Activity Description	Early Start	Early Finish	Orig Dur	FY01	FY02	FY03	FY04	FY05	FY06	FY07	FY08	FY09	FY10	FY11
<b>HWR1C RCS CONSTRUCTION</b>															
HS08000099	RCS Phase 1 Procurement/Construction	01AUG01	13MAY02	156											
HS07050025	RCS Phase 1 Construction Complete		13MAY02	0											
<b>HWR1D JACOBS CONSTRUCTION SUPPORT</b>															
HS300105	JEG Title III Design	03JUL01	13JUL04	678											
<b>HWR1E BALANCE OF PLANT CONSTRUCTION</b>															
HS15000001	Mob Crane/Del Tank Sections/Erect Transfer Tnks	08AUG01	14MAR02	119											
HS12050299	Full Scale Mock-up System (FSMS) Construction	10DEC01	15OCT02	171											
HS12050205	Balance of Plant Civil/Structural Construction	10DEC01	27APR04	477											
HS12050210	Balance of Plant Mechanical Construction	10DEC01	27APR04	477											
HS12050215	Balance of Plant Electrical Construction	10DEC01	27APR04	477											
HS12050220	Balance of Plant Construction Equipment	10DEC01	27APR04	477											
HS15000010	Complete TTA Construction	18MAR02	04DEC02	146											
HS16030010	Tank Waste Retrieval System (TWRS) Construction	05DEC02	05MAY03	82											
HS18130010	Silo Waste Retrieval System (SWRS) Construction	22APR03	04MAY04	209											
HS18100500	DWRS Construction	13DEC05	24JAN06	23											
HS07050030	BOP Construction Complete		24JAN06	0											
<b>HWR1F CONSTRUCTION MANAGEMENT</b>															
HS500100	Construction Management	03JUL01	29SEP04	650											
<b>HWR1G ENGINEERING SUPPORT</b>															
HS2C0100	Draft RAWP for RCS Ph 1 - AWR	02MAR01		0											
HS300100	FFI Title III Design	03JUL01	13JUL04	678											
HS300005	FFI EMMA Support	23JUL01	06DEC01	86											
HS300012	FFI Support FHAR Rev 0	01AUG01	24JUN02	200											

**SILOS PROJECT**

**1.1.H.C AWR**

Sheet 2 of 5

Early Bar  
Progress Bar  
Critical Activity

Start Date: 01DEC00  
Finish Date: 23JUN08  
Data Date: 01DEC00  
Run Date: 10SEP01 16:48

BLCF - HS01

Revision: F07-022  
Date: F07-022

**FLUOR FERNALD**

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## **SECTION 3**

### **3.0 MANPOWER PLANS**



# Manpower Planning Sheet (CR2)

## MPS # 1HC03 CONSTRUCTION MANAGEMENT

DRIVERS	FY 2001				FY 2002				FY 2003				FY 2004				FY 2005				FY 2006					
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4		
785 AWR - Construction Management	06/19/2000	10/03/2003	10.40	0	0	0	0	0	0.8	0.8	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
786 AWR - DWRS Construction Management	08/12/2004	09/22/2004	10.00	0	0	0	1	1	1	1	1	1	0.5	0.5	0.5	0.5	0.5	0.5	0	0	0	0	0	0	0	0
787 AWR - RGS Phase 1 Construction	06/19/2000	10/22/2002	10.00	0	0	0	1	1	1	1	1	1	0.5	0.5	0.5	0.5	0.5	0.5	0	0	0	0	0	0	0	0
788 AWR - TTA Construction	06/19/2000	04/30/2003	11.50	0	0	0	0.9	0.9	0.9	0.9	1	1	1	1	1	1	0.5	0.5	0	0	0	0	0	0	0	0
789 AWR - FSMS Construction	07/05/2001	05/13/2002	13.00	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
790 AWR - TWRS Construction	03/05/2002	07/29/2002	13.00	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
791 AWR - SWRS Construction	08/01/2002	04/03/2003	9.00	0	0	0	1	1	1	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0	0	0	0	0	0	0	0
792 AWR - DWRS Construction	08/12/2004	09/22/2004	11.00	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
Procurement	Buyer/Contracts Administrator		11.00	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
Construction	Construction Coordinator		11.00	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
Construction	Construction Coordinator		8.40	0	0	0	0.7	0.7	1	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0	0	0	0	0	0	0	0
Construction	Construction Engineer		6.70	0	0	0	0.3	0.7	0.7	0.7	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0	0	0	0	0	0	0	0
Construction	Construction Engineer		6.70	0	0	0	0.3	0.7	0.7	0.7	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0	0	0	0	0	0	0	0
Construction	Construction Engineer		6.60	0	0	0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0	0	0	0	0	0	0	0
Construction	Construction Engineer		11.50	0	0	0	0.3	0.8	0.8	0.8	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
Construction	Construction Engineer		5.40	0	0	0	0.6	0.6	0.6	0.6	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0	0	0	0	0	0	0	0
Construction	Construction Engineer		11.50	0	0	0	0.3	0.8	0.8	0.8	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
QA/QC	QA Engineer		6.50	0	0	0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0	0	0	0	0	0	0	0
QA/QC	QA Engineer		6.50	0	0	0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0	0	0	0	0	0	0	0
Environmental Safety & H	Rad Engineer		6.90	0	0	0	0.5	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0	0	0	0	0	0	0	0
Environmental Safety & H	Rad Supervisor/Manager		3.00	0	0	0	1	0.5	0.5	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Environmental Safety & H	Rad Tech		9.00	0	0	0	3	1.5	1.5	1.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Environmental Safety & H	Safety Engineer		11.00	0	0	0	1	0.9	0.9	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0	0	0	0	0	0	0	0
Environmental Safety & H	Safety Tech.		13.00	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
QA/QC	QA Manager		4.00	0	0	0	0	0	0	0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0	0	0	0	0	0	0	0















# Manpower Planning Sheet (CR2)

**MPS # 1HC05 OPERATIONS & MAINTENANCE**

DRIVERS	START DATE	END DATE	TOT	FY 2001				FY 2002				FY 2003				FY 2004				FY 2005				FY 2006			
				Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
796 AWR - RCS Ph 1-Operation Stage 1	06/26/2002	07/09/2002	5.40	0	0	0	0	0	0	0	0.1	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
797 AWR - RCS Ph 1---- Operation Stage 2	07/10/2002	01/09/2003	270.80	0	0	0	0	0	0	4.3	13.3	9.6	8	10	9.4	9.6	9.6	9.6	33	38.9	39	38.9	37.6	0	0	0	
798 AWR - RCS Phase 2 Operations	01/13/2003	03/22/2004	5.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0	0	0
799 AWR OPERATIONS	10/06/2003	05/04/2005	5.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
7001 AWR - Berm Removal	10/08/2003	09/09/2004	5.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
7002 AWR - Decant Sump Waste Retrieval Process	10/12/2004	10/27/2004	7.80	0	0	0	0	0	0	0	0	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0	0	0
Procurement	Buyer/Contracts Administrator		6.70	0	0	0	0	0	0	0.2	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0	0	0	
General Labor	Chemical Operator		62.10	0	0	0	0	0	0	0.7	4.6	4.6	4.6	4.6	4.6	5	4.8	4.8	4.5	4.8	4.8	4.8	4.7	0	0	0	
Subcontract	Subcontract Staff		6.70	0	0	0	0	0	0	0.2	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0	0	0	
Subcontract	Subcontract Staff		25.20	0	0	0	0	0	0	0.7	0.9	0	0	0	0	0	0	0	0	0	0	0	4.5	4.8	4.8	4.8	
Subcontract	Subcontract Staff		48.80	0	0	0	0	0	0	0.5	3.5	3.7	3.7	4	3.6	3.8	3.8	3.7	3.7	3.7	3.7	3.7	3.7	0	0	0	
Craft Labor	Carpenter		5.30	0	0	0	0	0	0	0.1	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	3.6	5.4	5.4	5.4	5.3	0	0	0	
Administration	Department Administrator		47.80	0	0	0	0	0	0	1.1	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.5	0	0	0	
Craft Labor	Electrician		53.10	0	0	0	0	0	0	1.1	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
Engineering & Design	Engineer Piping/Mechanic		13.00	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Operations Labor	Engineer: Process & Startup		10.40	0	0	0	0	0	0	0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0	0	0	
General Labor	Hazwat		19.70	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	2	2	2	2	2	0.7	0	0	
Transportation Labor	Heavy Equipment Operator		1.30	0	0	0	0	0	0	0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0	0	0	
Environmental Safety & H	Industrial Hygienist		35.30	0	0	0	0	0	0	0	1.9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Craft Labor	Instrument Mechanic		10.50	0	0	0	0	0	0	0	2	2	2	2	2	2	2	2	3.5	4	4	4	3.8	0	0	0	
Craft Labor	Millwright		1.30	0	0	0	0	0	0	0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0	0	0	
Maintenance	Maintenance Manager		19.60	0	0	0	0	0	0	0	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	
Maintenance	Maintenance Rep.																										
Transportation Labor	Motor Vehicle Operator																										
Craft Labor	Oilier (Maintenance)																										
Operations	Operations Manager																										
Operations	Operations Manager																										
Operations	Operations Manager																										
Craft Labor	Painter																										
Craft Labor	Pipefitter																										
Maintenance	Project Support Manager																										

X



# Manpower Planning Sheet (CR2)

**MPS # 1HC05 OPERATIONS & MAINTENANCE**

DRIVERS	START DATE	END DATE	TOT	FY 2001				FY 2002				FY 2003				FY 2004				FY 2005				FY 2006			
				Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Maintenance			6.50	0	0	0	0	0	0	0	0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Project Support Rep.																											
Maintenance			7.50	0	0	0	0	0	0	0	0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1.5	0.5	0.5	0.5	1.5	0.5	0.5	0.5
Project Support Rep.																											
Project Management			1.30	0	0	0	0	0	0	0	0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Program Mgr.																											
QA/QC				0	0	0	0	0	0	0	0	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
QA Engineer																											
Environmental Safety & H			5.20	0	0	0	0	0	0	0	0	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Rad Engineer																											
Environmental Safety & H			15.60	0	0	0	0	0	0	0	0	1	1	1	3	1.2	1	1.2	1.2	1	1	1	1	1	1	1	1
Rad Supervisor/Manager																											
Environmental Safety & H			201.90	0	0	0	0	0	0	0	6.4	20	14.6	14	16	14.9	15	14.6	14.6	13.5	14.6	14.6	14.6	14.1	0	0	0
Rad Tech																											
Craft Labor			19.50	0	0	0	0	0	0	0	0	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	0	0	0
Rigger																											
Environmental Safety & H			6.50	0	0	0	0	0	0	0	0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0	0	0
Safety Engineer																											
Craft Labor			6.40	0	0	0	0	0	0	0	0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	2	2	0
Welder																											
Waste Management			10.00	0	0	0	0	0	0	0	0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	1	1	1	1	1	1	0
Waste Engineer																											

**Sheet Totals:** 1048.30 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 16.80 73.40 61.10 56.90 65.20 61.30 62.00 62.20 61.50 97.50 106.4 106.5 106.4 105.4 3.70 0.00 0.00



















# Manpower Planning Sheet (CR2)

MPS # 1HC14 ENGINEERING SUPPORT

DRIVERS	START DATE	END DATE	TOT	FY 2001				FY 2002				FY 2003				FY 2004				FY 2005				FY 2006			
				Q1	Q2	Q3	Q4																				
Administration			8.60	0	0	0	1	0.6	0.6	0.6	0.6	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Engineering & Design			5.10	0	0	0	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Engineering & Design			21.20	0	0	0	1	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Engineering & Design			0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Operations Labor			0.60	0	0	0	0.2	0.1	0.1	0.1	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Engineer: Process & Startup			0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Sheet Totals:</b>			<b>35.60</b>	0.00	0.00	0.00	2.50	2.20	2.20	2.20	2.20	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.40	1.40	1.40	1.40



# Manpower Planning Sheet (CR2)

MPS # 1HC15 PROJECT MANAGEMENT

DRIVERS	FY 2001				FY 2002				FY 2003				FY 2004				FY 2005				FY 2006			
	#Er	#Er	#Er	#Er	#Er	#Er	#Er	#Er	#Er	#Er	#Er	#Er	#Er	#Er	#Er	#Er	#Er	#Er	#Er	#Er	#Er	#Er	#Er	#Er
TOT	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Engineering & Design	1	1	1	1	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0	0	0	0
Engineer																								
Engineering & Design	0.5	0.5	0.5	0.5	0.5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
Engineer																								
Maintenance	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0
Maintenance Manager																								
Maintenance	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0
Project Support Rep.																								
Maintenance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Project Support Manager																								
Project Management	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0
Project Mgr.																								
Project Management	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
Project Mgr.																								
Project Management	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0	0
Project Mgr.																								
QA/QC	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0
QA Manager																								
Environmental Safety & H	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0
Safety & Health Mgr.																								
Administration	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.8	0
Secretaries																								
Administration	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0	0
Secretaries																								
Project Management	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0
Tech/Program Support Mgr.																								
Project Management	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0
Tech/Program Support Rep.																								
Project Management	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.2	0
Tech/Program Support Rep.																								
Project Management	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tech/Program Support Rep.																								
<b>Sheet Totals:</b>	<b>148.30</b>	<b>6.70</b>	<b>6.50</b>	<b>6.20</b>	<b>6.20</b>	<b>4.50</b>	<b>0.00</b>																	



## **SECTION 3**

### **4.0 ESTIMATE**



**HSWRB**

**AWR SUBCONTRACTOR**



# Fluor Fernald, Inc.

ESTIMATE SUPPORT WORKSHEET  
FOR ACTIVITY BASED ESTIMATING

DATE: 5-Sep-01  
PROJECT MGR: R. FELLMAN  
CAM: R. FELLMAN  
PREPARED BY: M. KOPP  
FISCAL YEAR: FY01 - FY09

PBS: PBS07  
WBS: 1.1.H.C  
CTRL ACCT: HSWR  
CHARGE NO: HSWRB FWENC ACTUALS  
COMMENT#: F07-022, F07-62

Resource: Res Dept:	USUBS 943	UNESCALATED SUBS Overtime:	Class:		EOC:		SUBCONTRACTORS							
			Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10			
Yr Units:			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Units:			5,295,403.0	5,295,403.0	5,295,403.0	5,295,403.0	5,295,403.0	5,295,403.0	5,295,403.0	5,295,403.0	5,295,403.0	5,295,403.0	5,295,403.0	5,295,403.0
Yr Total Cost:			0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:			5,295,403	5,295,403	5,295,403	5,295,403	5,295,403	5,295,403	5,295,403	5,295,403	5,295,403	5,295,403	5,295,403	5,295,403

**GRAND TOTALS:**

Yr Total Cost:			0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:			5,295,403	5,295,403	5,295,403	5,295,403	5,295,403	5,295,403	5,295,403	5,295,403	5,295,403	5,295,403	5,295,403	5,295,403

CAM: *Robert Fellman*

CONTROL TEAM: *[Signature]*



**HSWRC**

**ACCELERATED WASTE RETRIEVAL**



# Fluor Fernald, Inc.

DATE: 5-Sep-01  
PROJECT MGR: R. FELLMAN  
CAM: R. FELLMAN  
PREPARED BY: M. KOPP  
FISCAL YEAR: FY01 - FY09

ESTIMATE SUPPORT WORKSHEET  
FOR ACTIVITY BASED ESTIMATING  
[REDACTED]  
(1 FTE EQUALS 1747 HOURS)

PBS: PBS07  
WBS: 1.1.H.C  
CTRL ACCT: HSWR  
CHARGE NO: HSWRC  
COMMENT#: F07-022

Resource: ENGINEER      EOC: LABOR  
Res Dept: 943      Class: SAL

	Oct 00-		Oct 01-		Oct 02-		Oct 03-		Oct 04-		Oct 05-		Oct 06-		Oct 07-		Oct 08-		Oct 09-	
	Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10	Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10
Yr Hours:	40.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0
Yr Total Cost:	2,750	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:	2,750	2,750	2,750	2,750	2,750	2,750	2,750	2,750	2,750	2,750	2,750	2,750	2,750	2,750	2,750	2,750	2,750	2,750	2,750	2,750

Resource: MAT300      EOC: MATERIAL  
Res Dept: 943      Class: MAT

	Oct 00-		Oct 01-		Oct 02-		Oct 03-		Oct 04-		Oct 05-		Oct 06-		Oct 07-		Oct 08-		Oct 09-	
	Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10	Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10
Yr Units:	-29.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Units:	-29.0	-29.0	-29.0	-29.0	-29.0	-29.0	-29.0	-29.0	-29.0	-29.0	-29.0	-29.0	-29.0	-29.0	-29.0	-29.0	-29.0	-29.0	-29.0	-29.0
Yr Total Cost:	-29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:	-29	-29	-29	-29	-29	-29	-29	-29	-29	-29	-29	-29	-29	-29	-29	-29	-29	-29	-29	-29

Resource: MVOOPR      EOC: LABOR  
Res Dept: 943      Class: HOU

	Oct 00-		Oct 01-		Oct 02-		Oct 03-		Oct 04-		Oct 05-		Oct 06-		Oct 07-		Oct 08-		Oct 09-	
	Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10	Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10
Yr Hours:	10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Yr Total Cost:	289	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:	289	289	289	289	289	289	289	289	289	289	289	289	289	289	289	289	289	289	289	289

Resource: ODC700      EOC: ODC  
Res Dept: 943      Class: ODC

	Oct 00-		Oct 01-		Oct 02-		Oct 03-		Oct 04-		Oct 05-		Oct 06-		Oct 07-		Oct 08-		Oct 09-	
	Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10	Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10
Yr Units:	8,000.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Units:	8,000.0	8,000.0	8,000.0	8,000.0	8,000.0	8,000.0	8,000.0	8,000.0	8,000.0	8,000.0	8,000.0	8,000.0	8,000.0	8,000.0	8,000.0	8,000.0	8,000.0	8,000.0	8,000.0	8,000.0

# Fluor Fernald, Inc.

DATE: 5-Sep-01  
PROJECT MGR: R. FELLMAN  
CAM: R. FELLMAN  
PREPARED BY: M. KOPP  
FISCAL YEAR: FY01 - FY09

ESTIMATE SUPPORT WORKSHEET  
FOR ACTIVITY BASED ESTIMATING  
(1 FTE EQUALS 1747 HOURS)

PBS: PBS07  
WBS: 1.1.H.C  
CTRL ACCT: HSWR  
CHARGE NO: HSWRC  
COMMENT#: F07-022

Yr Total Cost: 8,000 0 0 0 0 0 0 0 0 0  
Cum Total Cost: 8,000 8,000 8,000 8,000 8,000 8,000 8,000 8,000 8,000

Resource: ODCTRVL TRAVEL RESOURCE EOC: ODC  
Res Dept: 943 Overtime: Class:

	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Sep 01	628.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Units:	628.0	0.0	628.0	628.0	628.0	628.0	628.0	628.0	628.0	628.0
Cum Units:	628	628	628	628	628	628	628	628	628	628
Yr Total Cost:	628	628	628	628	628	628	628	628	628	628
Cum Total Cost:	628	628	628	628	628	628	628	628	628	628

Resource: WSTENG WASTE ENGINEER EOC: LABOR  
Res Dept: 943 Overtime: Class: SAL

	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Sep 01	250.0	122.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Hours:	250.0	372.6	372.6	372.6	372.6	372.6	372.6	372.6	372.6	372.6
Cum Hours:	250.0	625.2	1007.8	1380.4	1753.0	2125.6	2498.2	2870.8	3243.4	3616.0
Yr Total Cost:	12,758	6,586	0	0	0	0	0	0	0	0
Cum Total Cost:	12,758	19,344	19,344	19,344	19,344	19,344	19,344	19,344	19,344	19,344

GRAND TOTALS:

	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Sep 01	300.0	122.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Hours:	300.0	422.6	422.6	422.6	422.6	422.6	422.6	422.6	422.6	422.6
Cum Hours:	300.0	725.2	1147.8	1570.4	1993.0	2415.6	2838.2	3260.8	3683.4	4106.0
Yr Total Cost:	24,396	6,586	0	0	0	0	0	0	0	0
Cum Total Cost:	24,396	30,982	30,982	30,982	30,982	30,982	30,982	30,982	30,982	30,982

*Robert Fellman*

*M. Kopp*

CONTROL TEAM

**HWR1A**

**AWR TRANSITION (DUE DILIGENCE) – FLUOR  
FERNALD**



# Fluor Fernald, Inc.

DATE: 5-Sep-01  
PROJECT MGR: R. FELLMAN  
CAM: R. FELLMAN  
PREPARED BY: M. KOPP  
FISCAL YEAR: FY01 - FY09

ESTIMATE SUPPORT WORKSHEET  
FOR ACTIVITY BASED ESTIMATING  
**[REDACTED]**  
(1 FTE EQUALS 1747 HOURS)

PBS: PBS07  
WBS: 1.1.H.C  
CTRL ACCT: HWRT  
CHARGE NO: HWR1A  
COMMENT#: F07-022

Resource:	Res Dept:	CNSNG	943	CONSTRUCTION ENG		EOC:		LABOR										
				Overtime:	Class:	SAL	SAL	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-		
Yr Hours:				59.8		349.4		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:				59.8		409.2		758.6	758.6	758.6	758.6	758.6	758.6	758.6	758.6	758.6	758.6	758.6
Yr Total Cost:				3,259		20,044		21,230	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:				3,259		23,303		44,533	44,533	44,533	44,533	44,533	44,533	44,533	44,533	44,533	44,533	44,533

Resource:	Res Dept:	CNSMGR	943	CONSTRUCTION MGR		EOC:		LABOR										
				Overtime:	Class:	SAL	SAL	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-		
Yr Hours:				383.8		124.2		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:				383.8		508.0		508.0	508.0	508.0	508.0	508.0	508.0	508.0	508.0	508.0	508.0	508.0
Yr Total Cost:				23,797		8,109		0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:				23,797		31,906		31,906	31,906	31,906	31,906	31,906	31,906	31,906	31,906	31,906	31,906	31,906

Resource:	Res Dept:	DEPADM	943	DEPT ADMINISTRATOR		EOC:		LABOR										
				Overtime:	Class:	SAL	SAL	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-		
Yr Hours:				383.8		124.2		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:				383.8		508.0		508.0	508.0	508.0	508.0	508.0	508.0	508.0	508.0	508.0	508.0	508.0
Yr Total Cost:				12,169		4,147		0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:				12,169		16,316		16,316	16,316	16,316	16,316	16,316	16,316	16,316	16,316	16,316	16,316	16,316

Resource:	Res Dept:	ENGINR	943	ENGINEER		EOC:		LABOR										
				Overtime:	Class:	SAL	SAL	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-		
Yr Hours:				919.7		708.0		349.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:				919.7		1,627.7		1,977.1	1,977.1	1,977.1	1,977.1	1,977.1	1,977.1	1,977.1	1,977.1	1,977.1	1,977.1	1,977.1







**HWR1B**

**AWR TRANSITION (DUE DILIGENCE) - JACOBS**



# Fluor Fernald, Inc.

DATE: 5-Sep-01  
PROJECT MGR: R. FELLMAN  
CAM: R. FELLMAN  
PREPARED BY: M. KOPP  
FISCAL YEAR: FY01 - FY09

ESTIMATE SUPPORT WORKSHEET  
FOR ACTIVITY BASED ESTIMATING  
(1 FTE EQUALS 1747 HOURS)

PBS: PBS07  
WBS: 1.1.H.C  
CTRL ACCT: HWR1  
CHARGE NO: HWR1B DUE DILIGENCE - JACOBS  
COMMENT#: F07-022, F07-062

Resource:	SERVSUB	SUBS	JEG	Class:	EOC:		SUBCONTRACTORS			
					OverTime:	SUB	Sub 1	Sub 2		
Yr Units:	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Cum Units:	503,715.6	270,286.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:	503,715.6	774,002.0	774,002.0	774,002.0	774,002.0	774,002.0	774,002.0	774,002.0	774,002.0	774,002.0
Cum Total Cost:	503,716	277,584	0	0	0	0	0	0	0	0
	503,716	781,300	781,300	781,300	781,300	781,300	781,300	781,300	781,300	781,300

### GRAND TOTALS:

Yr Total Cost:	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Cum Total Cost:	503,716	277,584	0	0	0	0	0	0	0	0
	503,716	781,300	781,300	781,300	781,300	781,300	781,300	781,300	781,300	781,300

*Robert Fellman*

*Stephen Bulek*

CONTROL TEAM



**HWR1C**

**RCS CONSTRUCTION**



# Fluor Fernald, Inc.

ESTIMATE SUPPORT WORKSHEET  
FOR ACTIVITY BASED ESTIMATING  
(1 FTE EQUALS 1747 HOURS)

DATE: 5-Sep-01  
PROJECT MGR: R. FELLMAN  
CAM: R. FELLMAN  
PREPARED BY: M. KOPP  
FISCAL YEAR: FY01 - FY09

PBS: PBS07  
WBS: 1.1.H.C  
CTRL ACCT: HWRI  
CHARGE NO: HWRIC RCS CONSTRUCTION  
COMMENT#: F07-022, F07-035, F07-062

Resource:	FIELD SUB	FIELD SUBS	EOC:	SUBCONTRACTORS						
				Class:	SUB					
Res Dept:	943	Overtime:								
Yr Units:	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Cum Units:	1,674,458.2	6,099,811.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:	1,674,458.2	7,774,270.0	7,774,270.0	7,774,270.0	7,774,270.0	7,774,270.0	7,774,270.0	7,774,270.0	7,774,270.0	7,774,270.0
Cum Total Cost:	1,674,458	6,264,507	7,938,965	7,938,965	7,938,965	7,938,965	7,938,965	7,938,965	7,938,965	7,938,965

GRAND TOTALS:

Yr Total Cost:	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Cum Total Cost:	1,674,458	6,264,507	7,938,965	7,938,965	7,938,965	7,938,965	7,938,965	7,938,965	7,938,965	7,938,965

*Robert Fellman*

*Robert Fellman*

CAM: [REDACTED]

CONTROL TEAM: [REDACTED]



---

**Memorandum**

---

To:	Doris Edwards, MS-20	Date:	Aug 08, 2001
Location:	Fernald 	Reference:	N/A
From:	Ken Kepler, MS80-3	Fernald #:	M:OOTP:(PC/EST)2001-0113
Location:	Springdale	Client:	DOE DE-AC24-01OH20115
Extension:	648-6761	Subject:	RCS Building Estimate

cc: File Record Subject ESTIMATE C4-01-08-01  
Mike Kuntz MS 52-4  
Mike Connors MS-52-4

Attached are two (2) copies of the estimate for the RCS Building Estimate.

To request any additional copies of this estimate or for any questions, please contact Roger Johnson on extension 6797.

KGK:RJ:hmp  
Attachment





# ESTIMATE REVIEW FORM

PROJECT: Radon Control System  
ESTIMATE NO. C4.01.08.01  
CLIENT: DOE  
WBS NO.: 1.1.H.C

## FLUOR FERNALD

DATE: 13-Aug-01  
ESTIMATOR: Johnson  
LOCATION: Fernald  
TASK NO.: HWR1A

OTHER REVIEWS:

*ADJUSTED CONT. SUPER. TO 40% - JJK 8/13*  
*added 4 mos to DURATION for completion work -*

REQUESTER \_\_\_\_\_

DATE \_\_\_\_\_

CAM if > \$100,000 \_\_\_\_\_

DATE \_\_\_\_\_

PROJ.MGR. if > \$ 1M \_\_\_\_\_

DATE \_\_\_\_\_

ESTIMATING SERVICES  
TEAM COACH *JJK* \_\_\_\_\_

DATE 8/13/01

**FLUOR FERNALD  
PROJECTS CONTROLS  
ESTIMATING SERVICES**

August 14, 2001

**PROJECT DESCRIPTION: Radon Control System**

**WBS:1.1.H.C**

**PROJECT ENGINEER: Doris Edwards**

**ESTIMATOR: R Johnson**

**ESTIMATE NUMBER: C4.01.08.01**

**BASIS OF ESTIMATE**

**SUPPORTING DOCUMENTATION:**

Verbal Scope	<input checked="" type="checkbox"/>	P & ID's	<input checked="" type="checkbox"/>	Work Plan	<input type="checkbox"/>
Drawings	<input checked="" type="checkbox"/>	Equipment List	<input checked="" type="checkbox"/>	Site Walk	<input type="checkbox"/>
Sketches	<input type="checkbox"/>	Specifications	<input checked="" type="checkbox"/>	Eng. Mtg.	<input type="checkbox"/>
Flow Diagrams	<input checked="" type="checkbox"/>	Written Scope	<input checked="" type="checkbox"/>	Prev. Estimates	<input type="checkbox"/>

**TYPE OF ESTIMATE:**

Change Order	<input type="checkbox"/>	Government	<input type="checkbox"/>
Plan/Feasibility	<input type="checkbox"/>	Conceptual	<input type="checkbox"/>
Construction	<input checked="" type="checkbox"/>	Title I Design	<input type="checkbox"/>
Budget	<input type="checkbox"/>	Independent	<input type="checkbox"/>

**BASIS OF ESTIMATE:**

The purpose of estimate C4.01.08.01 is to provide a cost for the construction of a Radon Treatment Facility, an Electrical Equipment building and approximately 300 feet of the pipe rack. The Radon Facility consists of three entities. These are the Carbon Bed Building, the Air Handling Building and an equipment pad. The Carbon bed building is a single story concrete building and will house the 4 carbon beds and also will have 4 pre-cast concrete box culverts. The Air Handling building is a 2-story building. The first story will be a concrete structure. The second story is a pre-engineered steel structure. Heating for the Air handling building will be by electric duct heaters. There are two ventilation systems The Carbon Bed building has its air-handling unit located on the roof of the building. The Air Handling building ventilation will be supplied through a filter and a supply fan that rests on the equipment pad. Drying and filtering of the radon gas will be done in this facility All systems will exhaust to the stack that is located on the equipment pad. Monitoring of the stack will be housed in a small pre-engineered structure that is located on the equipment pad. This structure will have its own small air-handling unit. The Electrical Equipment Building will be a pre-engineered steel structure .An electrical duct bank that runs to the emergency generator pad is constructed in this estimate. It was assumed that there are enough construction trailers on site and none will be added for this

**FLUOR FERNALD  
PROJECTS CONTROLS  
ESTIMATING SERVICES**

August 14, 2001

**PROJECT DESCRIPTION: Radon Control System**

**WBS:1.1.H.C**

**PROJECT ENGINEER: Doris Edwards**

**ESTIMATOR: R Johnson**

**ESTIMATE NUMBER: C4.01.08.01**

job. The estimate is broken into three subcontracts These subcontracts are Civil, Structural and Architectural, Mechanical (equipment, HVAC and piping) and Electrical (electrical and instruments). Direct costs have also been included in the estimate for Construction Acceptance Testing (CAT) The instrument list contains, in addition to just instruments, some valves from the valve list and some equipment from the equipment list. The estimator made every effort not to duplicate the valves and equipment that appear on more than one list. The cost of the instrumentation appears as lot costs. These lot costs were supplied by Jacobs Engineering out of Oak Ridge The estimator cannot determine what each individual instrument costs. Where PO's existed, for the equipment, then the actual equipment costs were used in the estimate. The HVAC ducting is constructed of 10 ga and 16 ga carbon steel. The radon control piping is 10 ga carbon steel. The line list , that was supplied for the estimate shows no insulation on the HVAC ducting. The P&ID's, that were also supplied for the estimate, show insulation on some of the ducting. Where a conflict exists, the P&ID's are taken as the governing document. The quantities taken off for this estimate came from certified for construction drawings (CFC). The scope of work for this estimate was to assume no construction activities had taken place. Any reduction in costs for work done by a previous contractor will be agreed upon between Fluor Fernald and that contractor. The schedule for this construction shows a 12 month time frame.

**FLUOR FERNALD  
PROJECTS CONTROLS  
ESTIMATING SERVICES**

August 14, 2001

**PROJECT DESCRIPTION: Radon Control System**

**WBS:1.1.H.C**

**PROJECT ENGINEER: Doris Edwards**

**ESTIMATOR: R Johnson**

**ESTIMATE NUMBER: C4.01.08.01**

**ESTIMATE ASSUMPTIONS**

**EXECUTION:**

- This project is to be performed on a 50-hour week, 10 hours a day (per contract agreement).
- This project is to be performed on a 40-hour week, 10 hours a day.
- Premium time allowed in addition to contractual 50-hour weeks.

**WAGE RATES:**

- Wage rates within this estimate are based on Project Labor Agreement rates, effective October 1999 and are considered FY01 dollars for estimating.
- Wage rates within this estimate are based on FF Support Contractor FSC 599 wage rates, effective October 1999 and are considered FY01 dollars for estimating.
- Wage rates and fringes within this estimate are per actual contract agreement. Wage rates for this contractor have been adjusted to include overtime costs resulting from the scheduled 50-hour week.

**ENGINEERING:**

- N/A
- Engineering dollars provided by the Project Engineer.
- Engineering dollars have been factored in at the standard 12% of the total direct and indirect field costs as per request of Project Engineer.

**CONSTRUCTION MANAGEMENT:**

- N/A
- Construction Management dollars provided by the Project Engineer.
- Construction Management dollars have been factored in at the standard 30% of the total direct and indirect field costs as per request of Project Engineer.

**PROJECT MANAGEMENT:**

- N/A
- Project Management dollars provided by the Project Engineer.
- Project Management dollars have been factored in at the standard 30% of the total direct and indirect field costs as per request of Project Engineer.

**WASTE PROGRAM MANAGEMENT:**

- Waste Program costs for all material disposal are now part of their budget and are not part of this estimate.
- Waste Program Management dollars provided by the Project Engineer.

**FLUOR FERNALD  
PROJECTS CONTROLS  
ESTIMATING SERVICES**

August 14, 2001

**PROJECT DESCRIPTION: Radon Control System**

**WBS:1.1.H.C**

**PROJECT ENGINEER: Doris Edwards**

**ESTIMATOR: R Johnson**

**ESTIMATE NUMBER: C4.01.08.01**

**PRODUCTIVITY:**

See appendix "B" for productivity factors

**ESCALATION:**

Escalation costs are excluded from the target estimate. The escalation costs are calculated within the Micro-Frame computer system according to the plan for rebaselining.

**UNIT RATES:**

Labor rates are the crew rates based on the current site labor rates.

**G & A (HO EXPENSE):**

This expense is now a part of the over all project expense and is excluded from this estimate.

**HEALTH PHYSICS:**

See attached APPENDIX "C".

**RISK BUDGET:**

Risk budget will now be based on a project level and will be done after the rebaselining is complete. No risk analysis will done for this estimate.

**CONTINGENCY:**

N/A.

**ESTIMATE INCLUSIONS & EXCLUSIONS**

**FLUOR FERNALD  
PROJECTS CONTROLS  
ESTIMATING SERVICES**

August 14, 2001

**PROJECT DESCRIPTION: Radon Control System**  
**WBS:1.1.H.C**  
**PROJECT ENGINEER: Doris Edwards**  
**ESTIMATOR: R Johnson**  
**ESTIMATE NUMBER: C4.01.08.01**

**INCLUSIONS:**

- The supplied drawings were the primary source for the material take-off.
- Material pricing was from Mean's, Richardson's and / or other publishes sources
- Unit man-hours were from Mean's, Richardson's or previous estimates.
- The equipment list was provided by the project.
- The valve list was provided by the project
- The instrument list was provided by the project.
- Project provided the cost for some of the equipment as the equipment had already been purchased.
- Jacobs Engineering supplied the cost for the PLC and PLC drops
- Jacobs Engineering supplied the cost for the instruments
- Utilities to this facility will be from near by sources.
- The piping and ducting line list was provided the project
- The P&ID's were supplied by the project.
- Origionally detailed the staff out, but was directed to change to the default percent of 40% by the project

**FLUOR FERNALD  
PROJECTS CONTROLS  
ESTIMATING SERVICES**

August 14, 2001

**PROJECT DESCRIPTION: Radon Control System**

**WBS:1.1.H.C**

**PROJECT ENGINEER: Doris Edwards**

**ESTIMATOR: R Johnson**

**ESTIMATE NUMBER: C4.01.08.01**

**EXCLUSIONS:**

- Permits and fees.
- FD G & A (Home Office Expense)
- Construction Management Costs
- Waste disposal costs including shipping and burial fees.
- Project Management Costs.
- A/E Costs
- Any costs associated with schedule extension, including construction equipment, staff costs, facility costs and other indirect costs.
- D & D costs for the new construction
- Start-up costs.
- Any costs to decontaminate any portion of the silo or new construction prior to the operation phase.
- Any testing costs other than normal construction testing.
- Any and all fire suppression costs

**ESTIMATE SUMMARY SHEET**

PROJECT: Radon Control System  
 ESTIMATE #: C4.01.08.01  
 CLIENT: DOE  
 WBS #: 1.1.H.C

**FLUOR FERNALD**

DATE: 14-Aug-01  
 ESTIMATOR: Johnson  
 LOCATION: Fernald  
 TASK NO.: HWR1A

ITEM DESCRIPTION	M/H	RATE	LABOR \$	S/C \$	MAT'L \$	EQUIP. \$	TOTAL \$
Mobilization and Demobilization	1,500		\$62,800				\$62,800
Civil, Structural and Architectural	10,471		\$238,800		\$730,200		\$969,000
Mechanical Contractor							
HVAC	10,293		\$271,000		\$243,300		\$514,300
Equipment	2,455		\$58,000			\$1,519,700	\$1,577,700
Piping	2,413		\$63,700		\$143,600		\$207,300
Electrical Contractor							
Electrical	8,780		\$199,100		\$307,800	\$281,900	\$788,800
Instrumentation	5,604		\$127,300		\$349,100		\$476,400
<b>DIRECT FIELD COSTS TOTAL</b>	<b>41,516</b>	<b>\$24.59</b>	<b>\$1,020,700</b>		<b>\$1,774,000</b>	<b>\$1,801,600</b>	<b>\$4,596,300</b>
CONTRACTOR PROJECT STAFFING	16,606		\$408,300				\$408,300
SMALL TOOLS & CONSUMABLES	-	-	-		\$61,200		\$61,200
MISC. EQUIP. RENTAL	-	-	-			\$249,100	\$249,100
TEMPORARY FACILITIES	1,245		\$30,600		\$30,600		\$61,200
TEMPORARY UTILITY HOOK-UP	810		\$19,900		\$10,700		\$30,600
JOB CLEAN-UP	1,868		\$45,900		\$15,300		\$61,200
PER DIEM / SUBSISTANCE	-	-	-				
HEALTH PHYSICS S/C	102		\$2,500				\$2,500
GET / SITE WORKER / RAD TRAINING	637		\$17,700				\$17,700
JOB SPECIFIC TRAINING	354		\$8,700				\$8,700
PAYROLL BURDENS & BENEFITS	-	-	\$886,000				\$886,000
OVERHEAD & PROFIT	-	-	-	\$1,276,600			\$1,276,600
BOND	-	-	-	\$99,600			\$99,600
SALES TAX	-	-	-		\$113,500	\$123,000	\$236,500
<b>INDIRECT FIELD COSTS TOTAL</b>	<b>21,622</b>		<b>\$1,419,600</b>	<b>\$1,376,200</b>	<b>\$231,300</b>	<b>\$372,100</b>	<b>\$3,399,200</b>
<b>DIRECT &amp; INDIRECT FIELD COSTS TOTAL</b>	<b>63,138</b>	<b>\$38.65</b>	<b>\$2,440,300</b>	<b>\$1,376,200</b>	<b>\$2,005,300</b>	<b>\$2,173,700</b>	<b>\$7,995,500</b>

**TARGET ESTIMATE (FY 01 DOLLARS) \$7,995,500**

ESTIMATE PERFORMED BY ESTIMATING SERVICES







DETAIL ESTIMATE WORKSHEETS

# FLUOR FERNALD

PROJECT: Radon Control System  
 ESTIMATE NO.: C4.01.08.01  
 CLIENT: DOE  
 WBS NO.: 1.1.H.C

DATE: 14-Aug-01  
 ESTIMATOR: Johnson  
 LOCATION: Fernald  
 TASK NO.: HWR1A

ITEM NO.	SUMMARY	QTY	UNIT	MAN-HOURS		Rate	Labor	COST / UNIT			LABOR	SIC	MAT'L	EQUIP	TOTAL
				Unit	Total			SIC	Mat'l	Equip					
	Mobilization and Demobilization				1,500		\$62,800								\$62,800
	Civil, Structural and Architectural				10,471		\$238,800					\$730,200			\$969,000
	Mechanical Contractor				10,293		\$271,000					\$243,300			\$514,300
	HVAC				2,455		\$58,000					\$143,600	\$1,519,700		\$1,577,700
	Equipment				2,413		\$63,700					\$307,800	\$281,900		\$207,300
	Piping				8,780		\$199,100					\$349,100			\$788,800
	Electrical Contractor				5,604		\$127,300								\$476,400
	Electrical Instrumentation														
	<b>Subtotal Direct Cost</b>	<b>1</b>	<b>LOT</b>		<b>41,516</b>	<b>\$24.59</b>	<b>\$1,320,700</b>				<b>\$0</b>	<b>\$1,774,000</b>	<b>\$1,901,600</b>		<b>\$4,596,300</b>

DETAIL ESTIMATE WORKSHEETS

**FLUOR FERNALD**

DATE: 13-Aug-01  
 ESTIMATOR: Johnson  
 LOCATION: Fernald  
 TASK NO.: HWR1A

PROJECT: Radon Control System  
 ESTIMATE NO.: C4.01.08.01  
 CLIENT: DOE  
 WBS NO.: 1.1.H.C

ITEM NO.	Mobilization and Demobilization	QTY	UNIT	MAN-HOURS		COST/UNIT			LABOR	S/C	MAT'L	EQUIP	TOTAL
				Unit	Total	Rate	Labor	S/C					
D	Mobilization	120	hr	1	120	21.49			\$2,580				\$2,580
D	Teamsters	60	hr	1	60	24.75			\$1,490				\$1,490
D	Operators	60	hr	1	60	22.69			\$1,360				\$1,360
D	Unload Trucks												
D	Submittals	700	hr	1	700	33.00			\$23,100				\$23,100
	Vendor Representatives	320	hrs	1	320	90.00			\$28,800				\$28,800
	Automobile	2	mo				1,000			\$2,000			\$2,000
	Plane fare-round trip	2	ea				1,000			\$2,000			\$2,000
	Daily pre diem	60	days				115			\$6,900			\$6,900
	Demobilization												
D	Same as mobilization	240		1	240	22.70			\$5,450				\$5,450
									62,800		10,900		73,700

DETAIL E IATE WORKSHEETS

# FLUOR FERNALD

ESTIMATE NO.: C4.01.08.01  
 CLIENT: DOE  
 WBS NO.: 1.1.H.C

DATE: 13-Aug-01  
 ESTIMATOR: Johnson  
 LOCATION: Fernald  
 TASK NO.: HWR1A

ITEM NO.	CIVIL, STRUCTURAL & ARCHITECTURAL	QTY	UNIT	MAN-HOURS		COST/UNIT		LABOR	S/C	MATL	EQUIP	TOTAL
				Unit	Total	Rate	Labor					
D	Electrical Building											
D	Light steel	1.25	ton	25.00	40	23.57		\$950		\$1,560		\$2,510
D	Medium steel	2.25	ton	22.00	64	23.57		\$1,500		\$2,760		\$4,260
D	Siding	2430	sf	0.04	131	22.69		\$2,980		\$2,960		\$5,940
D	Roofing	590	sf	0.020	15	22.43		\$340		\$340		\$680
D	Wall Insulation	1215	sf	0.01	16	22.43		\$350		\$680		\$1,030
D	Roof Insulation	590	sf	0.01	6	22.43		\$140		\$280		\$420
D	Membrane Roofing	590	sf	0.05	37	22.43		\$830		\$1,210		\$2,040
D	Gutters	54	lf	0.07	5	22.43		\$100		\$50		\$150
D	Downspouts	24	lf	0.06	2	22.43		\$40		\$30		\$70
D	3' X 7' HM door	2	ea	8.00	21	22.43		\$460		\$1,010		\$1,470
D	4' X 7" HM door	1	pr	14.00	18	22.43		\$400		\$980		\$1,380
D	3' x 8' Transom	1	ea	3.00	4	22.43		\$90		\$720		\$810
D	Vapor barrier	565	sf	0.01	5	22.43		\$110		\$100		\$210
D	Paint Steel	960	sf	0.01	7	22.43		\$170		\$120		\$290
D	Ladder	16	lf	0.64	13	23.57		\$360		\$850		\$1,160
D	Epoxy coat floor	565	sf	0.02	15	23.33		\$290		\$310		\$650
D	Paint 3x7' door, Prime and 1 finish coat	2	ea	2.67	7	23.33		\$160		\$10		\$170
D	paint 4x7' door, Prime and 1 finish coat	1	pr	7	9	23.33		\$210		\$10		\$220
D	RCS Facility											
D	Light steel RCS bldg	11	ton	25	354	23.57		\$8,340		\$0		\$8,340
D	Medium Steel RCS bldg	15	ton	22	425	23.57		\$10,010		\$0		\$10,010
D	Heavy steel RCS bldg	5	ton	19	122	23.57		\$2,880		\$0		\$2,880
D	Light steel Pipe bridge	21	ton	25.00	676	23.57		\$15,920		\$0		\$15,920
D	Medium steel Pipe bridge	10	ton	22.00	283	23.57		\$6,670		\$0		\$6,670
D	3" steel Plate	2574	sf	0.16	530	23.57		\$12,490		\$252,050		\$264,540
D	1" steel plate	1336	sf	0.09	155	23.57		\$3,650		\$43,610		\$47,260
D	Ladder	50	lf	0.64	41	23.57		\$970		\$2,800		\$3,770
D	Grating	2600	sf	0.07	234	23.57		\$5,520		\$15,990		\$21,510
D	Metal decking	2100	sf	0.01	24	23.57		\$570		\$2,210		\$2,780
D	Wire mesh	2245	sf	0.006	17	23.57		\$410		\$390		\$800
D	Mark, drill and install expansion anchors	150	ea	0.60	116	23.57		\$2,730		\$540		\$3,270
D	3x7' HM doors	6	ea	8.00	62	23.57		\$1,460		\$3,020		\$4,480
D	Paint 3x7' door, Prime and 1 finish coat	6	ea	2.67	21	23.57		\$490		\$20		\$510
D	Paint Steel	8800	sf	0.015	170	23.57		\$4,000		\$1,060		\$5,060
D	Handrail	200	lf	0.234	60	23.57		\$1,420		\$2,820		\$4,240
D	Kickplate	200	lf	0.08	19	23.57		\$450		\$570		\$1,020
D	Gutters	150	lf	0.07	13	22.43		\$290		\$140		\$430
D	downspouts	180	lf	0.06	14	22.43		\$320		\$250		\$570
D	Wall Insulation	6668	sf	0.01	86	22.43		\$1,930		\$3,730		\$5,660
D	Roof Insulation	3235	sf	0.01	33	22.43		\$750		\$1,550		\$2,300
D	Membrane roofing	3235	sf	0.05	204	22.43		\$4,580		\$6,630		\$11,210
D	Siding	13336	sf	0.04	721	22.69		\$16,360		\$16,270		\$32,630

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DETAIL E IATE WORKSHEETS

# FLUOR FERNALD

CT: Radon Control System  
 ESTIMATE NO.: C4.01.08.01  
 CLIENT: DOE  
 WBS NO.: 1.1.H.C

DATE: 13-Aug-01  
 ESTIMATOR: Johnson  
 LOCATION: Fernald  
 TASK NO.: HWR1A

ITEM NO.	CIVIL, STRUCTURAL & ARCHITECTURAL	QTY	UNIT	MAN-HOURS		COST/UNIT		LABOR	S/C	MAT'L	EQUIP	TOTAL
				Unit	Total	Labor	S/C					
D	Roofing	3235	sf	0.020	83	22.43	0.57	\$1,870		\$1,840		\$3,710
D	vapor Barrier	2813	sf	0.01	25	22.43	0.18	\$570		\$510		\$1,080
D	Electrical Building											
D	Excavation	88	cy	0.11	12	21.49		\$270				\$270
D	Backfill	52	cy	0.15	10	21.49		\$220				\$220
D	Haul and Dump	49	cy	0.08	5	21.49		\$110				\$110
D	Slab on grade	43	cy	0.65	36	22.43	68.50	\$810		\$2,950		\$3,760
D	rebar	1299	lb	0.007	12	22.43	0.26	\$260		\$340		\$600
D	formwork	317	sf	0.091	37	22.43	0.83	\$830		\$260		\$1,090
D	Unload & Store, Accessories	43	cy	0.40	22	22.43	4.50	\$500		\$190		\$690
D	RCS Building											
D	Excavation	777	cy	0.11	110	21.49		\$2,360				\$2,360
D	Backfill	308	cy	0.15	59	21.49		\$1,280				\$1,280
D	Haul and Dump	585	cy	0.08	60	21.49		\$1,290				\$1,290
D	Slab on grade	510	lf	0.65	427	22.43	68.50	\$9,570		\$34,940		\$44,510
D	Formwork	1510	lf	0.09	177	22.43	0.83	\$3,970		\$1,250		\$5,220
D	rebar	21602	lf	0.01	195	22.43	0.26	\$4,370		\$5,620		\$9,990
D	Unload & Store, Accessories	510	cy	0.40	263	22.43	4.50	\$5,890		\$2,300		\$8,190
D	Elevated Slab (cast-in-place)	120	cy	0.75	116	22.43	68.50	\$2,600		\$8,220		\$10,820
D	Formwork	3379	sf	0.10	444	22.43	2.61	\$9,950		\$8,820		\$18,770
D	rebar	3771	lbs	0.01	32	22.43	0.26	\$710		\$980		\$1,690
D	Unload & Store, Accessories	120	cy	0.40	62	22.43	6.00	\$1,390		\$720		\$2,110
D	Concrete Walls	396	ea	0.8	408	22.43	68.50	\$9,150		\$27,130		\$36,280
D	Formwork	8589	ea	0.171	1890	22.43	3.76	\$42,400		\$32,290		\$74,690
D	rebar	21780	lbs	0.01	149	22.43	0.26	\$3,330		\$5,660		\$8,990
D	Unload & Store, Accessories	381	cy	0.40	196	22.43	6.00	\$4,400		\$2,290		\$6,690
D	Mud Mat	75	cy	0.45	43	22.43	52.00	\$970		\$3,900		\$4,870
D	Formwork	174	sf	0.07	16	22.43	0.83	\$350		\$140		\$490
D	Precast Culvert	4	ea	50	257	22.43	50446	\$5,770		\$201,780		\$207,550
D	Tank Footing	3	cy	0.70	3	22.43	68.50	\$60		\$210		\$270
D	Formwork	69	sf	0.09	8	22.43	2.40	\$170		\$170		\$340
D	rebar	338	lb	0.01	3	22.43	0.26	\$70		\$90		\$160
D	Unload & Store, Accessories	3	cy	0.40	2	22.43	4.50	\$30		\$10		\$40
D	Precast concrete walls	26	cy	2.000	67	22.43	269.00	\$1,500		\$6,990		\$8,490
D	Elevated slab on metal deck	40	cy	0.75	39	22.43	68.50	\$870		\$2,740		\$3,610
D	Formwork	108	sf	0.10	14	22.43	0.83	\$320		\$90		\$410
D	Unload & Store, Accessories	40	cy	0.40	21	22.43	6.00	\$460		\$240		\$700
D	lean Concrete	2	cy	1.50	4	22.43	62.00	\$90		\$120		\$210
D	Nelson Studs	198	ea	0.016	4	22.43	0.23	\$90		\$50		\$140
D	Angle Iron 2"x 2"x 1/4"	196	lf	0.05	13	22.43	1.56	\$280		\$310		\$590
D	Grout	74	cf	0.55	52	22.43	48.00	\$1,180		\$3,550		\$4,730

DETAIL E / DATE WORKSHEETS

# FLUOR FERNALD

PROJECT: Radon Control System  
 ESTIMATE NO.: C4.01.08.01  
 CLIENT: DOE  
 WBS NO.: 1.1.H.C

DATE: 13-Aug-01  
 ESTIMATOR: Johnson  
 LOCATION: Fernald  
 TASK NO.: HWR1A

ITEM NO.	CIVIL, STRUCTURAL & ARCHITECTURAL	QTY	UNIT	MAN-HOURS		COST/UNIT			LABOR	S/C	MAT'L	EQUIP	TOTAL
				Unit	Total	Rate	Labor	S/C					
D	Pipe Rack Foundations	29	cy	0.87	33	22.43			\$730		\$1,990		\$2,720
D	Formwork	966	sf	0.085	106	22.43		\$2,370		\$2,320			\$4,690
D	rebar	1995	lb	0.0076	20	22.43		\$440		\$520			\$960
D	Unload & Store, Accessories	29	cy	0.40	15	22.43		\$330		\$130			\$460
D	Continuous Monitor Building 94J	100	sf	0.40	51	22.43		\$1,150		\$950			\$2,100
D	Punch list items	1	lot	60.00	77	22.43		\$1,730		\$0			\$1,730
									\$258,800	\$0	\$730,200	\$0	\$969,000
Total Civil Structural & Architectural													

DETAIL ESTIMATE WORKSHEETS

**FLUOR FERNALD**

PROJECT: Radon Control System  
 ESTIMATE NO.: C4.01.08.01  
 CLIENT: DOE  
 WBS NO.: 1.1.H.C

DATE: 13-Aug-01  
 ESTIMATOR: Johnson  
 LOCATION: Fernald  
 TASK NO.: HWR1A

ITEM NO.	HVAC	QTY	UNIT	MAN-HOURS		COST/UNIT		LABOR	S/C	MAT'L	EQUIP	TOTAL
				Unit	Total	Rate	Labor					
D	Supports	116	ea	2.50	373	26.40		\$9,850		\$10,167	\$0	\$20,017
D	6" insulation	41	lf	0.145	8	23.33	87.65	\$180		\$175	\$0	\$355
D	8" insulation	71	lf	0.178	16	23.33	4.26	\$380		\$380		\$760
D	10" insulation	40	lf	0.200	10	23.33	5.35	\$240		\$268		\$508
D	12" insulation	126	lf	0.21	35	23.33	6.70	\$810		\$920		\$1,730
D	16" insulation	18	lf	0.25	6	23.33	7.30	\$130		\$171		\$301
D	20" insulation	95	lf	0.29	36	23.33	9.50	\$830		\$1,240		\$2,070
D	22" insulation	7	lf	0.32	3	23.33	13.05	\$70		\$99		\$169
D	26" insulation	17	lf	0.34	7	23.33	14.15	\$170		\$261		\$431
D	28" insulation	27	lf	0.376	13	23.33	15.35	\$300		\$450		\$750
D	30" insulation	37	lf	0.41	20	23.33	16.65	\$460		\$670		\$1,130
D	34" insulation	144	lf	0.43	80	23.33	18.10	\$1,860		\$3,070		\$4,930
D	3" dampers lug	6	ea	2	15	26.40	21.32	\$410		\$1,098		\$1,508
D	4" dampers lug	5	ea	3.20	21	26.40	206.00	\$540		\$1,030		\$1,570
D	6" dampers lug	49	ea	4.800	303	26.40	264.00	\$7,990		\$12,936		\$20,926
D	8" dampers lug	12	ea	5	82	26.40	370.00	\$2,160		\$4,440		\$6,600
D	10" dampers lug	20	ea	6.00	154	26.40	475.00	\$4,080		\$9,500		\$13,580
D	6" dampers flanged	4	ea	2.70	14	26.40	238.00	\$370		\$952		\$1,322
D	8" dampers flanged	4	ea	3.00	15	26.40	332.00	\$410		\$1,328		\$1,738
D	14" dampers flanged	1	ea	6.20	8	26.40	940.00	\$210		\$940		\$1,150
D	20" dampers flanged	1	ea	14.60	19	26.40	1345.00	\$500		\$1,345		\$1,845
D	30" dampers flanged	3	ea	18.20	70	26.40	3710.00	\$1,850		\$11,130		\$12,980
D	34" dampers flanged	11	ea	23.40	331	26.40	5040.00	\$8,740		\$55,440		\$64,180
D	Exhaust air register 10"x 10"	9	ea	0.42	5	26.40	28.50	\$130		\$257		\$387
D	Exhaust air register 24"x 20"	2	ea	0.667	2	26.40	76.00	\$50		\$152		\$202
D	Exhaust air register 18"x 18"	4	ea	0.47	2	26.40	60.50	\$60		\$242		\$302
D	Exhaust air register 16"x 16"	3	ea	0.47	2	26.40	44.00	\$50		\$132		\$182
D	Supply air diffusers 14"	6	ea	0.4	3	26.40	39.50	\$90		\$237		\$327
D	Supply air diffusers 8"	4	ea	0.33	2	26.40	23.00	\$50		\$92		\$142
D	Supply air diffusers 12"	3	ea	0.44	2	26.40	34.00	\$50		\$102		\$152
D	Bolts and gaskets	1	lot	473.0	609	26.40	6549.00	\$16,070		\$6,549		\$22,619
D	Test and balance HVAC System	1	lot	1160.0	1493	26.40		\$39,410				\$39,410
D	Backdraft Damper BDK-20-001, 10"x 10"	1	ea	2.0	3	26.40	136.00	\$70		\$136		\$206
D	Backdraft Damper BDK-77-001, 32"x 32"	1	ea	4.0	5	26.40	331.00	\$140		\$331		\$471
D	Opposed Blade Dampers .6" x 12"	4	ea	2.0	10	26.40	84.00	\$270		\$336		\$606
D	Pipe sleeves, carbon bed area 12"	8	ea	1.5	15	26.40	100.00	\$410		\$800		\$1,210
D	Pipe sleeves, carbon bed area 14"	16	ea	1.6	33	26.40	120.00	\$870		\$1,920		\$2,790

DETAIL ESTIMATE WORKSHEETS

# FLUOR FERNALD

DATE: 13-Aug-01  
 ESTIMATOR: Johnson  
 LOCATION: Fernald  
 TASK NO.: HWR1A

PROJECT: Radon Control System  
 ESTIMATE NO.: C4.01.08.01  
 CLIENT: DOE  
 WBS NO.: 1.1.HC

ITEM NO.	HVAC	QTY	UNIT	MAN-HOURS			COST/UNIT			LABOR	S/C	MAT'L	EQUIP	TOTAL
				Unit	Total	Rate	Labor	S/C	Mat'l					
D	Opposed Blade Dampers , 6" x 12"	14	ea	2	36	26.40			\$950		\$980		\$1,930	
D	Opposed Blade Dampers , 12" x 12"	2	ea	2	6	26.40			\$150		\$196		\$346	
D	Sandblast Duct	7041	sf			22.69					\$4,788		\$4,788	
D	Prime Duct	7041	sf			22.69					\$2,253		\$2,253	
D	Shop welds 6"	52	ea			22.69					\$3,328		\$3,328	
D	Shop welds 8"	53	ea			22.69					\$3,763		\$3,763	
D	Shop welds 10"	34	ea			22.69					\$2,720		\$2,720	
D	Shop welds 12"	10	ea			22.69					\$870		\$870	
D	Shop welds 14"	13	ea			22.69					\$1,222		\$1,222	
D	Shop welds 16"	2	ea			22.69					\$202		\$202	
D	Shop welds 20"	8	ea			22.69					\$920		\$920	
D	Shop welds 26"	1	ea			22.69					\$146		\$146	
D	Shop welds 28"	4	ea			22.69					\$632		\$632	
D	Shop welds 30"	3	ea			22.69					\$507		\$507	
D	Shop welds 34"	12	ea			22.69					\$2,292		\$2,292	
D	Expansion Joint EXP-77-001 , 34"	1	ea	14	18	26.40			\$480		\$1,275		\$1,755	
D	Expansion Joint EXP-77-002 , 34"	1	ea	14	18	26.40			\$480		\$1,275		\$1,755	
D	Expansion Joint EXP-77-003 , 34"	1	ea	14	18	26.40			\$480		\$1,275		\$1,755	
D	Expansion Joint EXP-77-004 , 34"	1	ea	14	18	26.40			\$480		\$1,275		\$1,755	
D	Expansion Joint EXP-77-007 , 30"	1	ea	13	17	26.40			\$440		\$1,175		\$1,615	
D	Expansion Joint EXP-77-008 , 34"	1	ea	14	18	26.40			\$480		\$1,275		\$1,755	
D	Flanges 6"	106	ea	2.5	341	26.40			\$9,000		\$3,021		\$12,021	
D	Flanges 8"	32	ea	3	132	26.40			\$3,480		\$1,391		\$4,871	
D	Flanges 10"	40	ea	4	206	26.40			\$5,440		\$2,998		\$8,438	
D	Flanges 14"	2	ea	6	14	26.40			\$380		\$346		\$726	
D	Flanges 20"	2	ea	7	19	26.40			\$500		\$662		\$1,162	
D	Flanges 30"	6	ea	10	74	26.40			\$1,960		\$3,567		\$5,527	
D	Flanges 34"	22	ea	11	306	26.40			\$8,070		\$18,563		\$26,633	
D	Flanges 3"	12	ea	1	20	26.40			\$530		\$217		\$747	
D	Flanges 4"	10	ea	1.7	22	26.40			\$580		\$234		\$814	
D	90 deg elbow 6"	17	ea			22.69					\$574		\$574	
D	90 deg elbow 8"	19	ea			22.69					\$1,188		\$1,188	
D	90 deg elbow 10"	15	ea			22.69					\$1,716		\$1,716	
D	90 deg elbow 12"	2	ea			22.69					\$327		\$327	
D	90 deg elbow 14"	1	ea			22.69					\$209		\$209	
D	90 deg elbow 20"	1	ea			22.69					\$492		\$492	
D	90 deg elbow 34"	4	ea			22.69					\$3,638		\$3,638	
D	45 deg elbow 6"	14	ea			22.69					\$315		\$315	
D	45 deg elbow 8"	21	ea			22.69					\$838		\$838	

DETAIL ESTIMATE WORKSHEETS

# FLUOR FERNALD

DATE: 10-01  
 ESTIMATOR: Johnson  
 LOCATION: Fernald  
 TASK NO.: HWR1A

CT: Radon Control System  
 DATE NO.: C4.01.08.01  
 CLIENT: DOE  
 WBS NO.: 1.1.H.C

ITEM NO.	HVAC	QTY	UNIT	MAN-HOURS		COST/UNIT		LABOR	S/C	MATT'L	EQUIP	TOTAL
				Unit	Total	Rate	Labor					
D	45 deg elbow 10"	4	ea			22.69				\$260		\$260
D	45 deg elbow 12"	1	ea			22.69				\$96		\$96
D	45 deg elbow 14"	8	ea			22.69				\$1,034		\$1,034
D	45 deg elbow 16"	3	ea			22.69				\$545		\$545
D	45 deg elbow 20"	1	ea			22.69				\$278		\$278
D	Tee 6"	1	ea			22.69				\$46		\$46
D	Tee 10"	1	ea			22.69				\$147		\$147
D	Tee 34"	4	ea			22.69				\$6,644		\$6,644
D	Reducer 34"x30"	2	ea			22.69				\$1,183		\$1,183
D	Reducer 30"x26"	1	ea			22.69				\$522		\$522
D	Reducer 26"x22"	1	ea			22.69				\$442		\$442
D	Reducer 26"x20"	1	ea			22.69				\$402		\$402
D	Reducer 28"x26"	1	ea			22.69				\$485		\$485
D	Reducer 16"x12"	2	ea			22.69				\$192		\$192
D	Reducer 12"x8"	2	ea			22.69				\$128		\$128
D	Reducer 14"x12	1	ea			22.69				\$84		\$84
D	Reducer 8"x6"	2	ea			22.69				\$52		\$52
D	Reducer 10 x 8"	4	ea			22.69				\$175		\$175
D	Reducer 12 x 10	1	ea			22.69				\$60		\$60
D	Reducer 30 x 28"	1	ea			22.69				\$552		\$552
D	Reducer 20 x 16"	1	ea			22.69				\$274		\$274
D	Reducer 34 x 24"	4	ea			22.69				\$1,670		\$1,670
D	Reducer 10 x 14"	1	ea			22.69				\$50		\$50
D	Reducer 10 x 4"	1	ea			22.69				\$66		\$66
D	Ducting 4"	100	lf	0.25	32	26.40		\$850		\$313		\$1,163
D	Ducting 6"	628	lf	0.35	283	26.40		\$7,470		\$2,958		\$10,428
D	Ducting 8"	641	lf	0.43	355	26.40		\$9,360		\$3,942		\$13,302
D	Ducting 10"	410	lf	0.52	273	26.40		\$7,210		\$3,219		\$10,429
D	Ducting 12"	126	lf	0.63	102	26.40		\$2,680		\$1,419		\$4,099
D	Ducting 14"	160	lf	0.66	136	26.40		\$3,590		\$2,101		\$5,691
D	Ducting 16"	24	lf	0.71	22	26.40		\$580		\$344		\$924
D	Ducting 20"	95	lf	0.92	113	26.40		\$2,980		\$1,492		\$4,472
D	Ducting 22"	7	lf	0.95	9	26.40		\$230		\$131		\$361
D	Ducting 26"	17	lf	1.14	25	26.40		\$660		\$415		\$1,075
D	Ducting 28"	27	lf	1.24	43	26.40		\$1,140		\$709		\$1,849
D	Ducting 30"	43	lf	1.35	75	26.40		\$1,970		\$1,210		\$3,180
D	Ducting 34"	154	lf	1.61	318	26.40		\$8,400		\$4,623		\$13,023
D	Field welds 4"	4	ea	4.6	24	26.40		\$630				\$630
D	Field welds 6"	31	ea	6.3	251	26.40		\$6,630				\$6,630
D	Field welds 8"	33	ea	7.1	302	26.40		\$7,960				\$7,960
D	Field welds 10"	23	ea	8.4	249	26.40		\$6,560				\$6,560
D	Field welds 12"	7	ea	9.8	88	26.40		\$2,330				\$2,330

DETAIL ESTIMATE WORKSHEETS

# FLUOR FERNALD

PROJECT: Radon Control System  
 ESTIMATE NO.: C4.01.08.01  
 CLIENT: DOE  
 WBS NO.: 1.1.H.C

DATE: 13-Aug-01  
 ESTIMATOR: Johnson  
 LOCATION: Fernald  
 TASK NO.: HWR1A

ITEM NO.	HVAC	QTY	UNIT	MAN-HOURS		COST/UNIT			LABOR	S/C	MATT'L	EQUIP	TOTAL
				Unit	Total	Rate	Labor	S/C					
D	Field welds 14"	8	ea	9.6	99	26.40			\$2,610				\$2,610
D	Field welds 16"	2	ea	12.2	31	26.40			\$830				\$830
D	Field welds 20"	4	3a	16.5	85	26.40			\$2,240				\$2,240
D	Field welds 22"	2	ea	17.6	45	26.40			\$1,200				\$1,200
D	Field welds 26"	2	ea	22.0	57	26.40			\$1,490				\$1,490
D	Field welds 28"	2	ea	25.8	66	26.40			\$1,750				\$1,750
D	Field welds 30"	4	ea	31.7	163	26.40			\$4,310				\$4,310
D	Field welds 34"	9	ea	45.2	524	26.40			\$13,820				\$13,820
D	Insulation in 12" sleeve	8	ea	3.6	37	26.40		50.00	\$980		\$400		\$1,380
D	Insulation in 14" sleeve	16	ea	4.3	89	26.40		55.00	\$2,340		\$880		\$3,220
D	Paint Stack	1555	sf	0.0	32	26.40		0.12	\$850		\$187		\$1,037
D	Unload and store @ 5% of manhours	1	lot	450.0	579	26.40			\$15,290				\$15,290
D	CAT Testing	1	lot	250.0	322	26.40			\$8,490		\$1,570		\$8,490
D	NDE shop welds	1	lot	198	255	26.40			\$6,740				\$6,740
D	NDE Field welds @ 10% of welding hours	1	lot	80.0	103	26.40			\$2,720				\$2,720
D	Punch list items	1	lot										
Total HVAC									\$0	\$0	\$0	\$0	\$0
Total									\$27,000	\$0	\$249,300	\$0	\$514,300

DETAIL MATE WORKSHEETS

# FLUOR FERNALD

ECT: Radon Control System  
 L1 MATE NO.: C4.01.08.01  
 CLIENT: DOE  
 WBS NO.: 1.1.H.C

DATE: 13-Aug-01  
 ESTIMATOR: Johnson  
 LOCATION: Fernald  
 TASK NO.: HWR1A

ITEM NO.	EQUIPMENT	QTY	UNIT	MAN-HOURS		COST/UNIT			LABOR	S/C	MAT'L	EQUIP	TOTAL
				Unit	Total	Rate	Labor	S/C					
D	Chiller Unit CHR-20-001A/B	2	ea	75	193	\$23.60			\$4,560			\$214,450	\$219,010
D	Exhaust Stack STK-20-001	1	ea	120	154	\$23.60			\$3,650			\$45,000	\$48,650
D	RCS Building Filter FLT-77-001	1	ea	8	10	\$23.60			\$240			\$11,500	\$11,740
D	Fan FAN-77-003	1	ea	16	21	\$23.60			\$490			\$4,000	\$4,490
D	Desiccant Drying System DDS-20-001A/B	2	ea	90	232	\$23.60			\$5,470			\$142,960	\$148,430
D	Roughing Filter FLT-20-001A/B	2	ea	12	31	\$23.60			\$730			\$19,000	\$19,730
D	Transfer Pump PMP-20-001A/B	2	ea	24	62	\$23.60			\$1,460			\$3,400	\$4,860
D	Hold Up Tank TNK-20-002A/B	2	ea	14	36	\$23.60			\$850			\$14,200	\$15,050
D	Carbon Bed CBD-20-001A/B/C/D	4	ea	225	1158	\$23.60			\$27,340			\$989,330	\$1,016,670
D	Duct Heater HTR-77-012A/B	2	ea	6	15	\$23.60			\$360			\$4,400	\$4,760
D	HEPA Filter FLT-77-002A/B	2	ea	24	62	\$23.60			\$1,460			\$44,000	\$45,460
D	Building Vent Fan FAN-77-001A/B	2	ea	20	51	\$23.60			\$1,220			\$5,000	\$6,220
D	Air Handling Unit AHU-77-001	1	ea	22	28	\$23.60			\$670			\$2,000	\$2,670
D	Filter FLT-20-004	1	ea	6	8	\$23.60			\$180			\$2,000	\$2,180
D	Fan FAN-20-001A/B	2	ea	20	51	\$23.60			\$1,220			\$4,800	\$6,020
D	Filter FLT-20-002A/B	2	ea	6	15	\$23.60			\$360			\$4,000	\$4,360
D	Fan FAN-20-003	1	ea	16	21	\$23.60			\$490			\$900	\$1,390
D	RSC Bldg Sump Pump PMP-20-003	1	ea	24	31	\$23.60			\$730			\$2,700	\$3,430
D	Duct Heater DHT-20-001	1	ea	6.0	8	\$23.60			\$180			\$2,200	\$2,380
D	Electric Building Heater	1	ea	4.0	5	\$23.60			\$120			\$670	\$790
D	Air Handling Unit AHU-77-002	1	ea	4.0	5	\$23.60			\$120			\$430	\$550
D	CAT Testing	1	lot	90	116	\$23.60			\$2,730			\$0	\$2,730
D	Unload and store @ 5% of nhs	1	lot	110	141	\$23.60			\$3,340			\$0	\$3,340
									\$0	\$0	\$0	\$0	\$0
<b>Total Equipment</b>									<b>58,000</b>	<b>0</b>	<b>0</b>	<b>1,197,000</b>	<b>\$1,857,700</b>

DETAIL MATE WORKSHEETS

DATE: 13-Aug-01  
 ESTIMATOR: Johnson  
 LOCATION: Fernald  
 TASK NO.: HWR1A

FLUOR FERNALD

JECT: Radon Control System  
 ESTIMATE NO.: C4.01.08.01  
 CLIENT: DOE  
 WBS NO.: 1.1.H.C

ITEM NO.	PIPING	QTY	UNIT	MAN-HOURS		COST/UNIT		LABOR	S/C	MAT'L	EQUIP	TOTAL
				Unit	Total	Rate	Equip					
D	3/4" Screwed Control Valve HOV	4	ea	1.90	10	26.40	3130	\$260		\$12,520		\$12,780
D	1/2" Flanged Control Valve HOV	8	ea	1.90	20	26.40	2870	\$520		\$21,360		\$21,880
D	2" Flanged Copontrol Valve HOV	3	ea	2.75	11	26.40	5180	\$280		\$15,540		\$15,820
D	1/2" Screwed Control Valve HOV	2	ea	1.90	5	26.40	3140	\$130		\$6,280		\$6,410
D	1" Flanged Control Valve HOV	2	ea	2.75	7	26.40	4840	\$190		\$9,680		\$9,870
D	1-1/2" Socketwelded Control Valve HOV	2	ea	2.60	7	26.40	2880	\$180		\$5,360		\$5,540
D	3" Flanged Control Valve MOV	2	ea	3.80	10	26.40	6910	\$260		\$13,820		\$14,080
D	1" Flanged Control Valve MOV	4	ea	2.75	14	26.40	3960	\$370		\$15,840		\$16,210
D	2" Flanged Pressure Relief Valve	4	ea	1.80	9	26.40	1830	\$240		\$7,320		\$7,560
D	6" Flanged Pressure Relief Valve	2	ea	3.90	10	26.40	6890	\$260		\$13,380		\$13,640
D	1" Screwed Control Valve SOV	1	ea	2.75	4	26.40	4680	\$90		\$4,680		\$4,770
D	2" Wafer Check Valve	2	ea	0.89	2	26.40	670	\$60		\$1,340		\$1,400
D	1" Flanged Check Valve	4	ea	0.57	3	26.40	370	\$80		\$1,480		\$1,560
D	Bolts and Gaskets for aobve Valves	1	lot	42.00	54	26.40	224	\$1,430		\$220		\$1,650
D	4"sch 40 cs pipe	5	lf	0.25	2	26.40	530	\$40		\$30		\$70
D	3"sch 40 cs pipe	465	lf	0.20	120	26.40	370	\$3,160		\$1,720		\$4,880
D	2"sch 40 cs pipe	690	lf	0.17	147	26.40	180	\$3,890		\$1,240		\$5,130
D	1-1/2"sch 40 cs pipe	250	lf	0.15	48	26.40	200	\$1,260		\$500		\$1,760
D	1"sch 40 cs pipe	300	lf	0.13	49	26.40	130	\$1,280		\$390		\$1,670
D	3/4"sch 40 cs pipe	20	lf	0.13	3	26.40	106	\$90		\$20		\$110
D	1/2" sch 40 pipe	200	lf	0.13	32	26.40	090	\$860		\$180		\$1,040
D	Flanges 1/2"	16	ea	0.50	10	26.40	1300	\$270		\$210		\$480
D	Flanges 2"	18	ea	0.70	16	26.40	1300	\$430		\$230		\$660
D	Flanges 1"	14	ea	0.50	9	26.40	1300	\$240		\$180		\$420
D	Flanges 3"	4	ea	0.80	4	26.40	1733	\$110		\$70		\$180
D	Flanges 6"	4	ea	1.30	7	26.40	3621	\$180		\$140		\$320
D	90 deg elbow 3"	23	ea	2.800	83	26.40	1046	\$2,190		\$240		\$2,430
D	90 deg elbow 2"	35	ea	2.000	90	26.40	586	\$2,380		\$210		\$2,590
D	90 deg elbow 1-1/2"	12	ea	0.9	14	26.40	2470	\$370		\$300		\$670
D	90 deg elbow 1"	15	ea	0.8	15	26.40	950	\$410		\$140		\$550
D	90 deg elbow 3/4"	2	ea	0.70	2	26.40	760	\$50		\$20		\$70
D	Feld shop weld 4"	10	ea	1.9	24	26.40		\$650				\$650
D	Feld shop weld 3"	124	ea	1.4	223	26.40		\$5,900				\$5,900
D	Feld shop weld 2"	73	ea	1.0	94	26.40		\$2,480				\$2,480
D	Feld shop weld 1"	66	ea	1.0	85	26.40		\$2,240				\$2,240
D	Inplace welds 3"	12	ea	3.6	56	26.40		\$1,470				\$1,470
D	Inplace welds 2"	19	ea	2.9	71	26.40		\$1,870				\$1,870
D	Inplace welds 1"	26	ea	2.4	80	26.40		\$2,120				\$2,120
D	8"sch 40 cs pipe In piperack	310	ea	0.2	69	26.40		\$1,810				\$1,810
D	Inplace welds 8"	8	ea	7.8	80	26.40	1290	\$2,120		\$4,000		\$6,120

DETAIL ESTIMATE WORKSHEETS

**FLUOR FERNALD**

PROJECT: Radon Control System  
 ESTIMATE NO.: C4.01.08.01  
 CLIENT: DOE  
 WBS NO.: 1.1.H.C

DATE: 13-Aug-01  
 ESTIMATOR: Johnson  
 LOCATION: Fernald  
 TASK NO.: HWR1A

ITEM NO.	PIPING	QTY	UNIT	MAN-HOURS		COST/UNIT			LABOR	S/C	MAT'L	EQUIP	TOTAL
				Unit	Total	Rate	Labor	S/C					
D	Tees 3"	4	ea	1.7	8	26.40			\$220		\$90		\$310
D	Tees 2"	14	ea	1.5	27	26.40			\$710		\$230		\$940
D	Tees 1-1/2"	5	ea	1.4	9	26.40			\$230		\$170		\$400
D	Tees 1"	8	ea	1.2	12	26.40			\$330		\$130		\$460
D	Tees 3/4"	1	ea	1.1	1	26.40			\$40		\$10		\$50
D	supports	45	allow	0.8	43	26.40			\$1,150		\$1,130		\$2,280
D	Paint Pipe	1030	sf	0.016	21	26.40			\$560		\$180		\$740
D	2" flanged gate valve	4	ea	1.1	6	26.40			\$150		\$1,640		\$1,790
D	1/2" gate valves	11	ea	1.2	17	26.40			\$450		\$290		\$740
D	3/4" gate valves	4	ea	1.3	7	26.40			\$180		\$120		\$300
D	Signal connection to HOV's 50' of 1/4" tubing pe	1050	lf	0.1	108	26.40			\$2,850		\$1,010		\$3,860
D	Hydro testing @ 7% of manhours	1	lot	130.0	167	26.40			\$4,420				\$4,420
D	Unload and store @ 5% of manhours	1	lot	90.0	116	26.40			\$3,060				\$3,060
D	CAT testing	1	lot	75.0	97	26.40			\$2,550				\$2,550
D	NDE testing @ 10% of welding hours	1	lot	76.0	98	26.40			\$2,580				\$2,580
D	Punch list items	1	lot	60.0	77	26.40			\$2,040				\$2,040
										\$0	\$0	\$0	\$0
<b>Total Piping</b>										<b>\$53,700</b>	<b>\$43,800</b>	<b>\$0</b>	<b>\$207,300</b>

DETAIL ESTIMATE WORKSHEETS

# FLUOR FERNALD

PROJECT: Radon Control System  
 ESTIMATE NO.: C4.01.08.01  
 CLIENT: DOE  
 WBS NO.: 1.1.H.C

DATE: 13-Aug-01  
 ESTIMATOR: Johnson  
 LOCATION: Fernald  
 TASK NO.: HWR1A

ITEM NO.	Electrical	QTY	UNIT	MAN-HOURS		COST/UNIT		LABOR	S/C	MAT'L	EQUIP	TOTAL
				Unit	Total	Rate	Mat'l					
D	UPS Distribution Panel UDP-33-001	1	ea	120	154	22.66		\$3,500			\$35,000	\$38,500
D	UPS Battery Rack UBR-33-001	1	ea	18	23	22.66		\$530			\$1,090	\$1,620
D	UPS/Inverter UPS-33-001	1	ea	11	14	22.66		\$310			\$690	\$1,000
D	UPS-Bypass Transformer XFR-33-001	1	ea	12	15	22.66		\$350			\$2,270	\$2,620
D	Heat Trace Panel HTP-39-001	1	ea	24	31	22.66		\$700			\$4,130	\$4,830
D	Mini Power Zone MPZ-31-001	1	ea	12	15	22.66		\$350			\$1,680	\$2,030
D	Automatic Transfer Switch ATS-32-001	1	ea	23	30	22.66		\$670			\$38,450	\$39,120
D	Motor Control Center MCC-31-002	1	ea	125	161	22.66		\$3,650			\$72,500	\$76,150
D	Diesel Generator Control Panel DGP-32-001	1	ea	10	13	22.66		\$290			\$1,450	\$1,740
D	Panel PNL-RCS-012	1	ea	12.0	15	22.66		\$350			\$1,660	\$2,010
D	Motor Control Center MCC-31-003	1	ea	125.0	161	22.66		\$3,650			\$72,500	\$76,150
D	Panel PNL-RCS-010	1	ea	12.0	15	22.66		\$350			\$2,050	\$2,400
D	Panel PNL-MCC-002	1	ea	14.0	18	22.66		\$410			\$2,150	\$2,560
D	Transformer XFR-31-011	1	ea	10.0	13	22.66		\$290			\$1,900	\$2,190
D	Panel PWP-31-002	1	ea	10.0	13	22.66		\$290			\$1,770	\$1,770
D	Lighting Panel	1	ea	28.0	36	22.66		\$820			\$1,800	\$2,620
D	2" Spare Conduit 2'-9" long	3	ea	0.50	2	22.66	14.71	\$40		\$40		\$80
D	2" Conduit Caps	3	ea	0.25	1	22.66	8.78	\$20		\$30		\$50
D	Duct bank to generator building											
D	Excavation	24	cy	0.110	3	22.66		\$80				\$80
D	Concrete	4	cy	1.400	7	22.66		\$160				\$500
D	Backfill	23	cy	0.150	4	22.66	85.00	\$100		\$340		\$100
D	4" RSG conduit	180	lf	0.4	93	22.66	16.50	\$2,100		\$2,970		\$5,070
D	4" couplings	4	ea	0.30	2	22.66	14.10	\$40		\$60		\$100
D	4" 90 deg elbows	8	ea	2.0	21	22.66	70.50	\$470		\$560		\$1,030
D	4" bushings	4	ea	0.9	5	22.66	6.90	\$110		\$30		\$140
D	#4/0 bare Cu wire	80	lf	0.0	3	22.66	0.62	\$60		\$50		\$110
D	1" RSG conduit	90	lf	0.1	14	22.66	2.51	\$320		\$230		\$550
D	1" couplings	2	ea	0.2	1	22.66	1.66	\$10		\$0		\$10
D	1" 90 deg elbows	4	ea	0.2	1	22.66	0.47	\$20		\$0		\$20
D	1" bushing	2	ea	0.3	1	22.66	0.47	\$20		\$0		\$20
D	Plyform	110	sf	0.1	15	22.66	1.69	\$340		\$190		\$530
D	Unload and Store, Accessories	4	cy	0.4	2	22.66	4.50	\$50		\$20		\$70

DETAIL ESTIMATE WORKSHEETS

**FLUOR FERNALD**

PROJECT: Radon Control System  
 ESTIMATE NO.: C4.01.08.01  
 CLIENT: DOE  
 WBS NO.: 1.1.H.C

DATE: 13-Aug-01  
 ESTIMATOR: Johnson  
 LOCATION: Fernald  
 TASK NO.: HWR1A

ITEM NO.	Electrical	Unit	MAN-HOURS		COST/UNIT			LABOR	SIC	MATL	EQUIP	TOTAL
			Total	Rate	Labor	SIC	Mat'l					
D	Concrete accessories	4	cy	1	22.66					\$30		\$60
	Grounding											
D	4/0 Grounding Cable, RCS building	800	lf	29	22.66		\$650			\$1,540		\$2,190
D	Cu ground wire #2	400	lf	8	22.66		\$190			\$240		\$430
D	Cadweld	120	ea	177	22.66		\$4,000			\$810		\$4,810
	Lightning Protection											
D	Install air term W/base 3/8" x 10" f mld	8	ea	12	22.66		\$280			\$200		\$480
D	Install #2/0 str Cu wire	100	lf	4	22.66		\$90			\$90		\$180
D	Install #2/0-#4/0 exothermic weld	2	ea	3	22.66		\$70			\$10		\$80
	Radiation Monitor PNL-RCS-013										\$3,250	\$3,660
D	Filter Area Pnael PNL-RCS-009	1	ea	14	22.66		\$410				\$3,250	\$3,660
D	RAC-RCS-020	1	ea	14	22.66		\$320				\$2,550	\$2,870
D	RAC-RCS-025	1	ea	11	22.66		\$320				\$2,550	\$2,870
D	RAC-RCS-021	1	ea	14	22.66		\$320				\$2,550	\$2,870
D	RAC-RCS-026	1	ea	14	22.66		\$320				\$2,550	\$2,870
D	Panel PNL-RCS-008	1	ea	14	22.66		\$410				\$3,250	\$3,660
D	RAC-RCS-016	1	ea	14	22.66		\$320				\$2,550	\$2,870
D	RAC-RCS-018	1	ea	14	22.66		\$320				\$2,550	\$2,870
D	RAC-RCS-017	1	ea	14	22.66		\$320				\$2,550	\$2,870
D	RAC-RCS-019	1	ea	14	22.66		\$320				\$2,550	\$2,870
D	Carbon Bed Panel PNL-RCS-007	1	ea	14	22.66		\$410				\$3,250	\$3,660
D	RAC-RCS-015	1	ea	14	22.66		\$320				\$2,550	\$2,870
D	RAC-RCS-023	1	ea	14	22.66		\$320				\$2,550	\$2,870
D	RAC-RCS-024	1	ea	14	22.66		\$320				\$2,550	\$2,870
D	Welding Receptacle	1	ea	14	22.66		\$320				\$2,550	\$2,870
D	Cable tray	994	lf	3	22.66		\$60			\$170		\$230
D	Cable tray elbows	45	ea	633	22.66		\$14,350			\$17,380		\$31,730
D	Cable Tray Divider	1128	ea	87	22.66		\$1,970			\$3,270		\$5,240
D	Cable tray Cover	600	lf	388	22.66		\$8,790			\$24,250		\$33,040
D	#4/0 Ground wire	1200	lf	116	22.66		\$2,630			\$6,410		\$9,040
D	Tray hangers	60	ea	54	22.66		\$1,230			\$2,360		\$3,590
D	3/4" RSG conduit	2568	lf	331	22.66		\$1,230			\$1,650		\$2,880
D	3/4" ells	150	ea	29	22.66		\$7,490			\$2,930		\$10,420
D	3/4" coupling	480	ea	105	22.66		\$660			\$330		\$990
							\$2,380			\$320		\$2,700

DETAIL L LATE WORKSHEETS

# FLUOR FERNALD

PROJECT: Radon Control System  
 ESTIMATE NO.: C4.01.08.01  
 CLIENT: DOE  
 WBS NO.: 1.1.H.C

DATE: 13-Aug-01  
 ESTIMATOR: Johnson  
 LOCATION: Fernald  
 TASK NO.: HWR1A

ITEM NO.	Electrical	QTY	UNIT	COST/UNIT		O&M	EQUIP	TOTAL
				Month	Total			
D	3/4" Conduit	25	ea	0.45	14	22.66		\$330
D	1" RSG conduit	2480	lf	0.10	319	22.66		\$7,230
D	1" ells	250	ea	0.20	64	22.66		\$1,460
D	1" coupling	660	ea	0.22	187	22.66		\$4,240
D	1" Conduit	20	ea	0.55	14	22.66		\$320
D	1-1/4" RSG conduit	100	lf	0.11	14	22.66		\$320
D	1-1/4" ells	2	ea	0.20	1	22.66		\$10
D	1-1/4" coupling	12	ea	0.25	4	22.66		\$90
D	1-1/4" Conduit	2	ea	0.60	2	22.66		\$40
D	1-1/2" RSG conduit	1050	lf	0.125	169	22.66		\$3,830
D	1-1/2" ells	60	ea	0.25	19	22.66		\$440
D	1-1/2" coupling	200	ea	0.30	77	22.66		\$1,750
D	1-1/2" Conduit	15	ea	0.65	13	22.66		\$280
D	2" RSG conduit	1820	lf	0.15	351	22.66		\$7,960
D	2" ells	60	ea	0.25	19	22.66		\$440
D	2" coupling	250	ea	0.34	109	22.66		\$2,480
D	2" Conduit	20	ea	0.70	18	22.66		\$410
D	3" RSG conduit	1080	lf	0.185	257	22.66		\$5,830
D	3" ells	120	ea	0.45	69	22.66		\$1,580
D	3" coupling	320	ea	0.43	177	22.66		\$4,010
D	3" Conduit	15	ea	1.00	19	22.66		\$440
D	4" RSG conduit	280	lf	0.225	81	22.66		\$1,840
D	4" ells	25	ea	0.55	18	22.66		\$400
D	4" coupling	70	ea	0.50	45	22.66		\$1,020
D	4" Conduit	5	ea	1.25	8	22.66		\$180
D	5" RSG conduit	570	lf	0.275	202	22.66		\$4,570
D	5" ells	35	ea	0.750	34	22.66		\$770
D	5" coupling	120	ea	0.600	93	22.66		\$2,100
D	5" Conduit	10	ea	1.5	19	22.66		\$440
D	Supports	200	ea	0.75	193	22.66		\$4,380
D	4/c 500 MCM cable	2720	lf	0.20	700	22.66		\$15,870
D	3/c #2 cable	2310	lf	0.05	149	22.66		\$3,370
D	3/c #1/0 grd	1925	lf	0.06	149	22.66		\$3,370
D	3/c#3 om Cm	330	lf	0.026	11	22.66		\$250
D	4/c #4/o	50	lf	0.0575	4	22.66		\$80
D	3/c #6	385	lf	0.018	9	22.66		\$200
D	3/c #8	770	lf	0.01	13	22.66		\$290
D	3/c #10	1925	lf	0.012	28	22.66		\$650
D	3/c #4/o	375	lf	0.05	22	22.66		\$500
D	3/c #2/0	770	lf	0.043	43	22.66		\$970
D	3/c #4	50	lf	0.0215	1	22.66		\$30
D	4/c #4/0	385	lf	0.058	28	22.66		\$650
D	4/c #750 MCM	2440	lf	0.140	440	22.66		\$9,960
								\$63,070

**DETAIL ESTIMATE WORKSHEETS**  
**FLUOR FERNALD**

**PROJECT:** Radon Control System  
**ESTIMATE NO.:** C4.01.08.01  
**CLIENT:** DOE  
**WBS NO.:** 1.1.H.C

**DATE:** 13-Aug-01  
**ESTIMATOR:** Johnson  
**LOCATION:** Fernald  
**TASK NO.:** HWR1A

ITEM NO.	Electrical	QTY	UNIT	COST/UNIT		O&M	Equip	TOTAL	
				Month	Total				
D	2/c #1/0	50	lf	0.024	22.66	\$40		\$130	
D	a/c 500 MCM terminations	6	ea	1.5	22.66	\$260		\$430	
D	3/c #2 terminations	10	ea	0.9	22.66	\$260		\$280	
D	3/c #1/0 terminations	8	ea	0.2	22.66	\$60		\$70	
D	3/c#3 om terminations	4	ea	0.4	22.66	\$40		\$50	
D	4/c #4/o terminations	2	ea	0.9	22.66	\$50		\$90	
D	3/c #6 terminations	6	ea	0.3	22.66	\$50		\$60	
D	3/c #8 terminations	6	ea	0.3	22.66	\$50		\$60	
D	3/c #10 terminations	8	ea	0.2	22.66	\$60		\$70	
D	3/c #4/o terminations	4	ea	0.7	22.66	\$80		\$130	
D	3/c #2/0 terminations	6	ea	0.5	22.66	\$90		\$140	
D	3/c #4 terminations	2	ea	0.4	22.66	\$20		\$30	
D	4/c #4/0 terminations	6	ea	0.9	22.66	\$160		\$270	
D	4/c #750 MCM terminations	8	ea	1.9	22.66	\$440		\$960	
D	2/c #1/0 tweminations	2	ea	0.3	22.66	\$20		\$30	
D	6/c 14 Cu	1859	lf	0.015	36	\$810		\$1,290	
D	1 Pr 16 Shld Plenum	4975	lf	0.007	45	\$1,020		\$1,670	
D	6/c 14 terminations	1	ea	1.0	22.66	\$700		\$1,210	
D	1 Pr 16 terminations	60	ea	0.3	22.66	\$530		\$1,230	
D	1 X 4 Strip Fixture	12	ea	0.9	22.66	\$320		\$1,530	
D	2 HEAPnLight Fixture	6	ea	1.1	22.66	\$190		\$1,600	
D	Wall Mount Fixture	10	ea	2.0	22.66	\$580		\$2,680	
D	Exit light	6	ea	1.0	22.66	\$180		\$360	
D	High Bay Lights	18	ea	4.0	22.66	\$2,100		\$5,790	
D	#12 THHN/THWN Cable	4508	lf	0.0073	42	\$960		\$1,240	
D	20 Amp GFCI receptacle 125V	2	ea	0.7	22.66	\$40		\$130	
D	20 Amp Receptacle 125V	6	ea	0.6	22.66	\$90		\$340	
D	Lighting Contactor	2	ea	2.2	22.66	\$230		\$460	
D	Wall Mounted Area Lights	10	ea	2.0	22.66	\$330		\$1,500	
D	Fire Alarm Pull Station	10	ea	1.1	22.66	\$920		\$1,000	
D	Fire Alarm Horn	5	ea	1.2	22.66	\$680		\$370	
D	Speakers	5	ea	1.0	22.66	\$190		\$550	
D	Smoke Detector	2	ea	1.3	22.66	\$400		\$230	
D	Heat Detector	16	ea	1.0	22.66	\$150		\$980	
D	Evac cable 12 pr #16	900	lf	0.029	34	\$470		\$1,890	
D	Fire Alaqrm Cable 24 pr #16	900	lf	0.046	53	\$760		\$2,960	
D	Terminations, 12 pr #16	10	ea	1.9	22.66	\$550		\$910	
D	Terminations, 24 pr #16	10	ea	3.7	22.66	\$1,080		\$1,680	
D	Miscellaneous Labor & material @ 2.5%	1	lot	182	22.66	\$5,320		\$12,830	
D	Unload and store @ 4% of labor hrs	1	lot	330	22.66	\$9,630		\$9,630	
D	Punch list items	1	lot	80.0	22.66	\$2,330		\$2,330	
<b>Total Electrical</b>				<b>5,780</b>	<b>\$22,68</b>	<b>\$9,100</b>	<b>\$0</b>	<b>\$0</b>	<b>\$785,800</b>

DETAIL MATE WORKSHEETS

FLUOR FERNALD

PROJECT: Radon Control System  
 ESTIMATE NO.: C4.01.08.01  
 CLIENT: DOE  
 WBS NO.: 1.1.H.C

DATE: 13-Aug-01  
 ESTIMATOR: Johnson  
 LOCATION: Fernald  
 TASK NO.: HWR1A

ITEM NO.	INSTRUMENTATION	QTY	UNIT	MAN-HOURS		COST/UNIT			LABOR	S/C	MATT	EQUIP	TOTAL
				Unit	Total	Rate	Labor	S/C					
D	FIT-SILO-20-001	1	ea	16.0	21	\$22.66			\$470				\$470
D	FIT-SILO-20-002	1	ea	16.0	21	\$22.66			\$470				\$470
D	ZS-DMP-20-029 A/B	2	ea	4.0	10	\$22.66			\$230				\$230
D	HOA-DMP-20-054	1	ea	4.0	5	\$22.66			\$120				\$120
D	HOA-DMP-20-058	1	ea	4.0	5	\$22.66			\$120				\$120
D	HOA-DMP-20-084	1	ea	4.0	5	\$22.66			\$120				\$120
D	LSHH-CND-20-003	1	ea	8.0	10	\$22.66			\$230				\$230
D	LSHH-CND-20-004	1	ea	8.0	10	\$22.66			\$230				\$230
D	ZS-DMP-20-030 A/B	2	ea	4.0	10	\$22.66			\$230				\$230
D	PDIT--SILO-20-001A	1	ea	16.0	21	\$22.66			\$470				\$470
D	PDIT--SILO-20-001B	1	ea	16.0	21	\$22.66			\$470				\$470
D	ZS-DMP-20-054A/B	2	ea	4.0	10	\$22.66			\$230				\$230
D	ZS-DMP-20-058A/B	2	ea	4.0	10	\$22.66			\$230				\$230
D	ZS-DMP-20-084A/B	2	ea	4.0	10	\$22.66			\$230				\$230
D	FE-FLT-20-005	1	ea	8.0	10	\$22.66			\$230				\$230
D	FIT-FLT-20-005	1	ea	16.0	21	\$22.66			\$470				\$470
D	HOA-DMP-20-070	1	ea	4.0	5	\$22.66			\$120				\$120
D	HOA-DMP-20-094	1	ea	4.0	5	\$22.66			\$120				\$120
D	HOA-DMP-20-095	1	ea	4.0	5	\$22.66			\$120				\$120
D	HOA-DMP-20-096	1	ea	4.0	5	\$22.66			\$120				\$120
D	HOA-DMP-20-097	1	ea	4.0	5	\$22.66			\$120				\$120
D	HOA-DMP-20-029	1	ea	4.0	5	\$22.66			\$120				\$120
D	HOA-DMP-20-030	1	ea	4.0	5	\$22.66			\$120				\$120
D	PDI-FLT-20-005A	1	ea	4.0	5	\$22.66			\$120				\$120
D	PDI-FLT-20-005B	1	ea	4.0	5	\$22.66			\$120				\$120
D	PDIT-FLT-20-005	1	ea	16.0	21	\$22.66			\$470				\$470
D	ZS-DMP-20-070 A/B	2	ea	4.0	10	\$22.66			\$230				\$230
D	ZS-DMP-20-094 A/B	2	ea	4.0	10	\$22.66			\$230				\$230
D	ZS-DMP-20-095 A/B	2	ea	4.0	10	\$22.66			\$230				\$230
D	ZS-DMP-20-096 A/B	2	ea	4.0	10	\$22.66			\$230				\$230
D	ZS-DMP-20-097 A/B	2	ea	4.0	10	\$22.66			\$230				\$230
D	FE-CBD-20-001A	1	ea	10.0	13	\$22.66			\$290				\$290
D	FE-CBD-20-001B	1	ea	10.0	13	\$22.66			\$290				\$290
D	FE-CBD-20-002A	1	ea	10.0	13	\$22.66			\$290				\$290
D	FE-CBD-20-002B	1	ea	10.0	13	\$22.66			\$290				\$290
D	FIT-DHT-20-001	1	ea	16.0	21	\$22.66			\$470				\$470
D	HOA-DMP-20-006	1	ea	4.0	5	\$22.66			\$120				\$120
D	HOA-DMP-20-008	1	ea	4.0	5	\$22.66			\$120				\$120
D	HOA-DMP-20-010	1	ea	4.0	5	\$22.66			\$120				\$120
D	HOA-DMP-20-012	1	ea	4.0	5	\$22.66			\$120				\$120
D	HOA-DMP-20-045	1	ea	4.0	5	\$22.66			\$120				\$120
D	IZ-DHT-20-001	1	ea	3.0	4	\$22.66			\$90				\$90
D	ME-CBD-20-001	1	ea	10.0	13	\$22.66			\$290				\$290

DETAIL MATE WORKSHEETS

# FLUOR FERNALD

ECT: Radon Control System  
 MATE NO.: C4.01.08.01  
 CLIENT: DOE  
 WBS NO.: 1.1.H.C

DATE: 13-Aug-01  
 ESTIMATOR: Johnson  
 LOCATION: Fernald  
 TASK NO.: HWR1A

ITEM NO.	INSTRUMENTATION	QTY	UNIT	MAN-HOURS		COST/UNIT		LABOR	S/C	MAT'L	EQUIP	TOTAL
				Unit	Total	Rate	Labor					
D	ME-CBD-20-002	1	ea	10.0	13	\$22.66		\$290				\$290
D	MT-CBD-20-001	1	ea	16.0	21	\$22.66		\$470				\$470
D	MT-CBD-20-002	1	ea	16.0	21	\$22.66		\$470				\$470
D	PDIT-CBD-20-001A	1	ea	16.0	21	\$22.66		\$470				\$470
D	PDIT-CBD-20-001B	1	ea	16.0	21	\$22.66		\$470				\$470
D	PDIT-CBD-20-002A	1	ea	16.0	21	\$22.66		\$470				\$470
D	PDIT-CBD-20-002B	1	ea	16.0	21	\$22.66		\$470				\$470
D	RQIT-CBD-20-001A	1	ea	16.0	21	\$22.66		\$470				\$470
D	RQIT-CBD-20-001B	1	ea	16.0	21	\$22.66		\$470				\$470
D	RQIT-CBD-20-002A	1	ea	16.0	21	\$22.66		\$470				\$470
D	RQIT-CBD-20-002B	1	ea	16.0	21	\$22.66		\$470				\$470
D	TT-CBD-20-001	1	ea	16.0	21	\$22.66		\$470				\$470
D	TT-CBD-20-002	1	ea	16.0	21	\$22.66		\$470				\$470
D	TT-DFN-20-001	1	ea	16.0	21	\$22.66		\$470				\$470
D	TT-DHT-20-001	1	ea	16.0	21	\$22.66		\$470				\$470
D	TW/TE-CBD-20-001	1	ea	3.0	4	\$22.66		\$90				\$90
D	TW/Re-DFN-20-001	1	ea	3.0	4	\$22.66		\$90				\$90
D	TW/TE-DHT-20-001	1	ea	3.0	4	\$22.66		\$90				\$90
D	ZS-DMP-20-006A/B	2	ea	4.0	10	\$22.66		\$230				\$230
D	ZS-DMP-20-008A/B	2	ea	4.0	10	\$22.66		\$230				\$230
D	ZS-DMP-20-010A/B	2	ea	4.0	10	\$22.66		\$230				\$230
D	ZS-DMP-20-012A/B	2	ea	4.0	10	\$22.66		\$230				\$230
D	ZS-DMP-20-045A/B	2	ea	4.0	10	\$22.66		\$230				\$230
D	FCV-AWT-23-001	1	ea	4.0	5	\$22.66		\$120				\$120
D	FE-AWT-20-001	1	ea	4.0	8	\$22.66		\$180				\$180
D	FIT-AWT-20-001	1	ea	16.0	21	\$22.66		\$470				\$470
D	HOA-MOV-20-032	1	ea	6.0	8	\$22.66		\$180				\$180
D	Instrumentation Cost as per e-mail	1	lot		8	\$22.66		\$180				\$180
D	PLC and PLC drops	1	lot	175.0	225	\$22.66	153000	\$5,100		\$153,000		\$153,000
D	HOA-MOV-20-033	1	ea	6.0	8	\$22.66	154364	\$180		\$154,360		\$154,360
D	HOV-MOV-20-001	1	ea	6.0	8	\$22.66		\$180				\$180
D	HOV-MOV-20-002	1	ea	6.0	8	\$22.66		\$180				\$180
D	HOA-MOV-20-003/6	1	ea	6.0	8	\$22.66		\$180				\$180
D	HOA-MOV-20-004/5	1	ea	6.0	8	\$22.66		\$180				\$180
D	HOA-PMP-20-001A	1	ea	6.0	8	\$22.66		\$180				\$180
D	HOA-PMP-20-001B	1	ea	6.0	8	\$22.66		\$180				\$180
D	HOA-PMP-20-003	1	ea	6.0	8	\$22.66		\$180				\$180
D	LE-SMP-20-001	1	ea	8.0	10	\$22.66		\$230				\$230
D	LE-TNK-20-002A	1	ea	8.0	10	\$22.66		\$230				\$230
D	LE-TNK-20-002B	1	ea	8.0	10	\$22.66		\$230				\$230
D	LIT-TNK-20-002A	1	ea	16.0	21	\$22.66		\$470				\$470
D	LIT-TNK-20-002B	1	ea	16.0	21	\$22.66		\$470				\$470
D	LSHH-TNK-20-002A	1	ea	8.0	10	\$22.66		\$230				\$230

# DETAIL I / DATE WORKSHEETS

# FLUOR FERNALD

ECT: Radon Control System  
 Estimate NO.: C4.01.08.01  
 CLIENT: DOE  
 WBS NO.: 1.1.H.C

DATE: 13-Aug-01  
 ESTIMATOR: Johnson  
 LOCATION: Fernald  
 TASK NO.: HWR1A

ITEM NO.	INSTRUMENTATION	QTY	UNIT	MAN-HOURS		COST/UNIT			LABOR	S/C	MAT'L	EQUIP	TOTAL
				Unit	Total	Labor	S/C	Mat'l					
D	LSHH-TNK-20-002B	1	ea	8.0	10	\$22.66			\$230				\$230
D	LSH-SMP-20-001	1	ea	6.0	8	\$22.66			\$180				\$180
D	LSLL-TNK-20-002A	1	ea	8.0	10	\$22.66			\$230				\$230
D	LSLL-TNK-20-002B	1	ea	8.0	10	\$22.66			\$230				\$230
D	Supports for Instruments	50	ea	2.0	129	\$22.66			\$2,920		\$6,250		\$9,170
D	PDIT-TNK-20-002A	1	ea	16.0	21	\$22.66		125.00	\$470				\$470
D	PDIT-TNK-20-002B	1	ea	16.0	21	\$22.66			\$470				\$470
D	PIT-PMP-20-001A	1	ea	16.0	21	\$22.66			\$470				\$470
D	PIT-PMP-20-001B	1	ea	16.0	21	\$22.66			\$470				\$470
D	RCIT-RCS-20-001	1	ea	16.0	21	\$22.66			\$470				\$470
D	ZS-DMP-20-032A/B	2	ea	4.0	10	\$22.66			\$230				\$230
D	ZS-DMP-20-033A/B	2	ea	4.0	10	\$22.66			\$230				\$230
D	ZS-MOV-20-012A/B	2	ea	4.0	10	\$22.66			\$230				\$230
D	ZS-MOV-20-001A/B	2	ea	4.0	10	\$22.66			\$230				\$230
D	ZS-MOV-20-002A/B	2	ea	4.0	10	\$22.66			\$230				\$230
D	ZS-MOV-20-003A/B	2	ea	4.0	10	\$22.66			\$230				\$230
D	ZS-MOV-20-004A/B	2	ea	4.0	10	\$22.66			\$230				\$230
D	ZS-MOV-20-005A/B	2	ea	4.0	10	\$22.66			\$230				\$230
D	ZS-MOV-20-006A/B	2	ea	4.0	10	\$22.66			\$230				\$230
D	HOA-DMP-20-001	1	ea	4.0	5	\$22.66			\$120				\$120
D	HOA-DMP-20-002	1	ea	4.0	5	\$22.66			\$120				\$120
D	HOA-DMP-20-003	1	ea	4.0	5	\$22.66			\$120				\$120
D	HOA-DMP-20-004	1	ea	4.0	5	\$22.66			\$120				\$120
D	LSH-CND-20-002	1	ea	6.0	8	\$22.66			\$180				\$180
D	LSHH-CND-20-001	1	ea	8.0	10	\$22.66			\$230				\$230
D	LSHH-DDS-20-001A	1	ea	8.0	10	\$22.66			\$230				\$230
D	LSHH-DDS-20-001B	1	ea	8.0	10	\$22.66			\$230				\$230
D	ME-TOT-20-001	1	ea	6.0	8	\$22.66			\$180				\$180
D	MT-TOT-20-001	1	ea	6.0	8	\$22.66			\$180				\$180
D	PDIT-DDS-20-001A	1	ea	16.0	21	\$22.66			\$470				\$470
D	PDIT-DDS-20-001B	1	ea	16.0	21	\$22.66			\$470				\$470
D	PDIT-DDS-20-002	1	ea	16.0	21	\$22.66			\$470				\$470
D	PDIT-FLT-20-001A	1	ea	16.0	21	\$22.66			\$470				\$470
D	PDIT-FLT-20-001B	1	ea	16.0	21	\$22.66			\$470				\$470
D	PDIT-SILO-20-003	1	ea	16.0	21	\$22.66			\$470				\$470
D	RCIT-SILO-20-001	1	ea	16.0	21	\$22.66			\$470				\$470
D	TT-TOT-20-001	1	ea	3.0	4	\$22.66			\$90				\$90
D	TW/TE-TOT-20-001	2	ea	4.0	10	\$22.66			\$230				\$230
D	ZS-DMP-20-001A/B	2	ea	4.0	10	\$22.66			\$230				\$230
D	ZS-DMP-20-002A/B	2	ea	4.0	10	\$22.66			\$230				\$230
D	ZS-DMP-20-003A/B	2	ea	4.0	10	\$22.66			\$230				\$230
D	ZS-DMP-20-004A/B	2	ea	4.0	10	\$22.66			\$230				\$230
D	Tubing for transmitters	50	ea	16.0	1030	\$22.66		248.00	\$23,340		\$12,400		\$35,740
D	FE-FAN-20-001A/B	2	ea	8	21	\$22.66			\$470				\$470
D	FE-FAN-20-001R	1	ea	8.0	10	\$22.66			\$230				\$230

DETAIL MATE WORKSHEETS

# FLUOR FERNALD

JECT: Radon Control System  
 ESTIMATE NO.: C4.01.08.01  
 CLIENT: DOE  
 WBS NO.: 1.1.H.C

DATE: 13-Aug-01  
 ESTIMATOR: Johnson  
 LOCATION: Fernald  
 TASK NO.: HWR1A

ITEM NO.	INSTRUMENTATION	QTY	UNIT	MAN-HOURS		Rate	COST/UNIT		LABOR	S/C	MATT'L	EQUIP	TOTAL
				Unit	Total		Labor	Mat'l					
D	FIT-FLT-20-004	1	ea	16.0	21	\$22.66			\$470				\$470
D	HOA-DMP-20-017	1	ea	4.0	5	\$22.66			\$120				\$120
D	HOA-DMP-20-021	1	ea	4.0	5	\$22.66			\$120				\$120
D	HOA-DMP-20-074	1	ea	4.0	5	\$22.66			\$120				\$120
D	HOA-DMP-20-101	1	ea	4.0	5	\$22.66			\$120				\$120
D	HOA-FAN-20-001A	1	ea	4.0	5	\$22.66			\$120				\$120
D	HOA-FAN-20-001B	1	ea	4.0	5	\$22.66			\$120				\$120
D	LSH-STK-20-001	1	ea	6.0	8	\$22.66			\$180				\$180
D	PDI-FLT-20-002A/A	1	ea	3.0	4	\$22.66			\$90				\$90
D	PDI-FLT-20-002A/B	1	ea	3.0	4	\$22.66			\$90				\$90
D	PDI-FLT-20-002B/A	1	ea	3.0	4	\$22.66			\$90				\$90
D	PDI-FLT-20-002B/B	1	ea	3.0	4	\$22.66			\$90				\$90
D	PDI-FLT-20-004A	1	ea	3.0	4	\$22.66			\$90				\$90
D	PDI-FLT-20-004B	1	ea	3.0	4	\$22.66			\$90				\$90
D	PDIT-FAN-20-001A/B	2	ea	16.0	41	\$22.66			\$930				\$930
D	PDIT-FLT-20-002A	1	ea	16.0	21	\$22.66			\$470				\$470
D	PDIT-FLT-20-002B	1	ea	16.0	21	\$22.66			\$470				\$470
D	PDIT-FLT-20-004	1	ea	16.0	21	\$22.66			\$470				\$470
D	RQIT-RCS-20-002	1	ea	16.0	21	\$22.66			\$470				\$470
D	VS-FAN-20-001A	1	ea	4.0	5	\$22.66			\$120				\$120
D	VS-FAN-20-001B	1	ea	4.0	5	\$22.66			\$120				\$120
D	ZS-DMP-20-017A/B	2	ea	4.0	10	\$22.66			\$230				\$230
D	ZS-DMP-20-021A/B	2	ea	4.0	10	\$22.66			\$230				\$230
D	ZS-DMP-20-074A/B	2	ea	4.0	10	\$22.66			\$230				\$230
D	IS-STK-20-001	1	ea	8.0	10	\$22.66			\$230				\$230
D	RQIT-STK-20-001	1	ea	16.0	60	\$22.66			\$1,360				\$1,360
D	HOA-DMP-77-002	1	ea	4.0	5	\$22.66			\$120				\$120
D	HOA-FAN-77-003	1	ea	4.0	5	\$22.66			\$120				\$120
D	PDI-FLT-77-001A	1	ea	3.0	4	\$22.66			\$90				\$90
D	PDI-FLT-77-001B	1	ea	3	4	\$22.66			\$90				\$90
D	PDIT-FLT-77-001	1	ea	16.0	21	\$22.66			\$470				\$470
D	PDIT-RCS-77-001	1	ea	16.0	21	\$22.66			\$470				\$470
D	PDIT-RCS-77-003	1	ea	16.0	21	\$22.66			\$470				\$470
D	PDIT-RCS-77-004	1	ea	16.0	21	\$22.66			\$470				\$470
D	PDIT-RCS-77-005	1	ea	16.0	21	\$22.66			\$470				\$470
D	PDIT-RCS-77-006	1	ea	16.0	21	\$22.66			\$470				\$470
D	PDIT-RCS-77-007	1	ea	16.0	21	\$22.66			\$470				\$470
D	TT-CBD-77-001	1	ea	16.0	21	\$22.66			\$470				\$470
D	TWTE-CBD-77-001	1	ea	3.0	4	\$22.66			\$90				\$90
D	ZS-DMP-77-002A/B	2	ea	4.0	10	\$22.66			\$230				\$230
D	FE-FAN-77-001A/B	2	ea	8.0	21	\$22.66			\$470				\$470
D	FIT-FAN-77-001A/B	2	ea	16.0	41	\$22.66			\$930				\$930
D	HOA-DMP-77-019	1	ea	4.0	5	\$22.66			\$120				\$120











**EFFICIENCY FACTORS**

PROJECT: Radon Control System  
 ESTIMATE NO. C4.01.08.01  
 CLIENT: DOE  
 WBS NO.: 1.1.H.C

DATE: 13-Aug-01  
 ESTIMATOR: Johnson  
 LOCATION: Fernald  
 TASK NO.: HWR1A



**EXAMPLE:**

STANDARD CHART MANHOURS =	NET	100
<b>EFFICIENCY FACTORS:</b>		
* SITE SPECIFIC ( SEE APPENDIX A )	17%	17.0
S/T = BASE UNIT MANHOURS		117
OVERTIME PRODUCTIVITY FACTOR (SEE DETAIL WORKSHEET BACK-UP)	0.00%	0
		117
* TASK SPECIFIC ( confined space, high elevation, congestion, etc.)	0.0%	0
		117
* PPE SPECIFIC (Based on current data and estimating knowledge)		

	PPE LEVEL									
	D		Mod.'D'		Mod. "C"		C		C+	
PRODUCTIVITY HOURS	MH's	MULTIPLIER	MH's	MULTIPLIER	MH's	MULTIPLIER	MH's	MULTIPLIER	MH's	
( AS A % ) / ADD MH's	10.00%	12	28.00%	33	66.00%	77	74.00%	87	96.00%	112
( AS A MULTIPLIER )/TOTAL HR's	1.04	128.7	1.28	149.8	1.66	194.2	1.74	203.6	1.96	229.3
<b>TOTAL MULTIPLIER w/SITE PROD.</b>	<b>1.287</b>		<b>1.4976</b>		<b>1.9422</b>		<b>2.0358</b>		<b>2.2932</b>	

NOTE : Use the Default Productivity Factor of 'mC' for working in a contaminated area if the Safety Level cannot be determined.

(SEE FD FERNALD ESTIMATING SERVICES REFERENCE MANUAL IM-6006 8.10)

Total hours worked in a specific PPE level divided by 10 hour working days = (PPE) ManDays to determine material cost of PPE's.  
 (SEE APPENDIX C - HEALTH PHYSICS)

13.0	Man Days	15.0	Man Days	19.0	Man Days	20.0	Man Days	23.0	Man Days
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THESE EFFICIENCY FACTORS WERE APPLIED INDIVIDUALLY THROUGHOUT THE ESTIMATE AT A TASK SPECIFIC LEVEL, TO OBTAIN A MORE ACCURATE ACCOUNT OF OVERALL EFFICIENCY IMPACT DUE TO PPE REQUIREMENTS IN HANDLING CONTAMINATED AND HAZARDOUS WASTE.

EFFICIENCY FACTORS

PROJECT: Radon Control System  
 ESTIMATE NO. C4.01.08.01  
 CLIENT: DOE  
 WBS NO.: 1.1.H.C

**FLUOR FERNALD**

DATE: 13-Aug-01  
 ESTIMATOR: Johnson  
 LOCATION: Fernald  
 TASK NO.: HWR1A

PPE MULTIPLIER DEVELOPEMENT

		D	mD	mC	C	C+
CREW SIZE & MAKE-UP	STANDARD	7	7	7	7	7
	WORKER-BUDDY	0	0	0	0	0
	SUPPORT TEAM	0	0	0	0	0
	TOTAL CREW	7	7	7	7	7
CREW SIZE RATIO		1.00	1.00	1.00	1.00	1.00
AVAILABLE WORK TIME FACTOR		0.96	0.78	0.7	0.7	0.68
PPE LABOR PRODUCTIVITY FACTOR		1	1	0.86	0.82	0.75
NET PRODUCTIVITY RATIO		0.96	0.78	0.602	0.574	0.51
NET PRODUCTIVITY MULTIPLIER		1.04	1.28	1.66	1.74	1.96

These factors were based on Tables 6.1 and 6.2, Moderate Work Efforts, 66F to 85F temperature of 'Hazardous Waste Cost Control' by R.A.Selg. Modifications were made to reflect a 10 hour work day and no buddy system or support team for levels D, mC and C. The worker-buddy and support team members, if required, may be covered under Construction Mgmt. (Rad Techs).

AVAILABLE WORK TIME FACTOR		D	mD	mC	C	C+
TOTAL WORK MINUTES per [ 4 - 10's		600	600	600	600	600
ADDITN'L.SITE SAFETY MEETINGS NOT INCLD. IN BAS	QUANTITY	1	1	1	1	1
	MINUTES	25	25	25	25	25
TOTAL		25	25	25	25	25
PPE DON & DOFFING (ADJUST LEVEL D per WORK PLAN)	QUANTITY	0	0	3	3	3
	MINUTES	0	0	15	15	20
TOTAL		0	0	45	45	60
WORK BREAKS (ADJUST LEVEL D per WORK PLAN)	QUANTITY	N/A	2	2	2	2
	MINUTES	N/A	15	15	15	15
TOTAL		0	30	30	30	30
MOBILIZATION - ROUND TRIPS (ADJUST LEVEL D per WORK PLAN)	QUANTITY	N/A	4	4	4	4
	MINUTES	N/A	15	15	15	15
TOTAL		0	60	60	60	60
COOLDOWNS PER DAY ** ( 4 OUT OF 12 MONTHS) 33.33%	QUANTITY	N/A	4	4	4	4
	MINUTES	N/A	15	15	15	15
TOTAL			20	20	20	20
AIR TANK REPLACEMENT	QUANTITY	N/A	N/A	N/A	N/A	N/A
	MINUTES	N/A	N/A	N/A	N/A	N/A
TOTAL						
AVAILABLE WORK TIME		575	465	420	420	405
AVAILABLE WORK TIME FACTOR		0.96	0.78	0.7	0.7	0.68

NOTE: Adjust 'Work Minutes per Day' basis to: 5 - 8's, or leave as 4 - 10's. Any other circumstances, over-ride the minutes per day.

\*\* Assumption based on work performed in May, June, July & August, pro-rating cost over one year. Adjust % to individual circumstances.

# HEALTH PHYSICS

PROJECT: Radon Control System  
 ESTIMATE NO.: C4.01.08.01  
 CLIENT: DOE  
 WBS NO.: 1.1.H.C

## FLUOR FERNALD

DATE: 14-Aug-01  
 ESTIMATOR: Johnson  
 LOCATION: Fernald  
 TASK NO.: HWR1A

### PPE's - PERSONAL PROTECTIVE EQUIPMENT

DESCRIPTION	UNIT	UNIT COST	* NO. OF CHANGE OUTS PER WORKER PER DAY	Man Days (TOTAL HOURS worked in PPE's Div. by WORK HOURS / DAY)			
				MAN DAYS	MAT'L.\$'s	PPE LEVEL	
<b>PPE LEVEL C / C+ / B : F/HF MASK w/RESP.&amp;CART.</b>				*			
TYVEK COVER-ALL w/HOOD & BOOTIES - DISPOSABLE	EA	\$4.46	3	0	\$0	C / C+	(DOUBLE PPE)
TYVEK COVER-ALL w/HOOD & BOOTIES - DISPOSABLE	EA	\$4.46	3	0	\$0	C / C+	
GLOVE LINER - DISPOSABLE	PR	\$0.24	3	0	\$0	C / C+	
GLOVE, LASTEX - DISPOSABLE	PR	\$0.26	3	0	\$0	C / C+	
GLOVE, WORK - DISPOSABLE	PR	\$1.02	3	0	\$0	C / C+	
APR CARTRIDGES - DISPOSABLE	PR	\$6.98	3	0	\$0	C / C+	
<b>SUB-TOTAL</b>		<b>\$17.42</b>	<b>3</b>		<b>\$0</b>		
				<b>\$/MD = \$0.00</b>			

<b>PPE LEVEL mC : FULL DRESS w/ FACE SHIELD</b>				MAN DAYS	MAT'L.\$'s	PPE LEVEL	
LT.WT. DISPOSABLE COVERALLS W/HOOD & BOOTIES	PR	\$4.46	3	0	\$0	mC	
GLOVE LINER - DISPOSABLE	PR	\$0.24	3	0	\$0	mC	
GLOVE, LASTEX - DISPOSABLE	PR	\$0.26	3	0	\$0	mC	
GLOVE, WORK - DISPOSABLE	PR	\$1.02	3	0	\$0	mC	
<b>SUB-TOTAL</b>		<b>\$5.98</b>	<b>3</b>		<b>\$0</b>		
				<b>\$/MD = \$0.00</b>			

SUBCONTRACTOR REQUIRED PURCHASES			QTY. PER WKR.	NO. OF WORKERS	MAT'L.\$'s	PPE LEVEL
RUBBER BOOT COVERS-(1)PR.PER WORKER	PR	\$12.70	6	0	\$0	D/C/B
APR w/HALF FACE MASK - (1) PER WORKER	EA	\$22.30	6	0	\$0	C
APR w/FULL FACE MASK - (1) PER WORKER	EA	\$174.00	6	0	\$0	C
SCBA	EA	\$1,894.00	2	0	\$0	B
COOL VESTS	EA	\$137.50	6	0	\$0	C/B
THERMO STRIPS	EA	\$50.00	6	0	\$0	C/B
<b>SUB-TOTAL</b>					<b>\$0</b>	

TOTAL PPE's = MAT'L.\$'s  
\$0  
 (FORWARD TO PAGE 2 OF 2)

OTHER PPE's SUCH AS HARD HAT, SAFETY GLASSES/GOGGLES, STEEL TOED SAFETY SHOES, HEARING PROTECTION, ARE CONSIDERED THE SUBCONTRACTORS RESPONSIBILITY AND ARE COVERED IN HIS OVERHEAD EXPENSE. COSTS OF FD FERNALD SUPPLIED PPE's, SUCH AS COTTON COVERALLS, EXCHANGE OF RUBBER BOOT COVERS AND RESPIRATORS FOR CHANGEOUTS AND CLEANING OF SAME IS INCURRED BY FD FERNALD AND COSTS ARE NOT INCLUDED AS PART OF PROJECT COSTS AT THIS TIME.

# HEALTH PHYSICS

PROJECT: Radon Control System  
 ESTIMATE NO.: C4.01.08.01  
 CLIENT: DOE  
 WBS NO.: 1.1.H.C

## Fluor Fernald, Inc.

DATE: 14-Aug-01  
 ESTIMATOR: Johnson  
 LOCATION: Fernald  
 TASK NO.: HWR1A

--MEDICAL MONITORING --

**MEDICAL - PHYSICAL - BASELINE & ANNUALLY - LOST WORKER TIME for RAD II WORKERS ONLY**

DESCRIPTION <i>PHYSICAL (3hrs)</i>	QTY	HRS	WKR <sub>s</sub>	TOTAL HOURS	AVG. LABOR RATE	TOTAL LABOR \$
BASELINE PHYSICALS	1	3	0	0	\$24.59	\$0
ANNUAL PHYSICALS	1	3	0	0	\$24.59	\$0
EXIT (TERMINATION) PHYSICALS	1	3	0	0	\$24.59	\$0
<b>SUB-TOTAL</b>						<b>\$0</b>

**RADIATION IN-VIVO & IN-VITRO SURVEILLANCE - LOST WORKER TIME for RAD I & II WORKERS**

DESCRIPTION	QTY	HRS	WKR <sub>s</sub>	TOTAL HOURS	AVG. LABOR RATE	TOTAL LABOR \$
<b>IN-VIVO:</b>						
BASELINE	1	1	0	0	\$24.59	\$0
ANNUAL	1	1	0	0	\$24.59	\$0
EXIT (TERMINATION)	1	1	0	0	\$24.59	\$0
IN-VITRO - ONCE PER WEEK (See NOTE)	61	1	0	0	\$24.59	\$0
<b>SUB-TOTAL</b>						<b>\$0</b>

NOTE: Assumes working 46 weeks per year average.

**RANDOM DRUG TESTING**

	TESTS	HRS	TOTAL HOURS	AVG. RATE	LABOR \$'s	
	50	2	100	\$24.59	\$2,500	
NO. OF WKRS. TESTED	TESTING DAYS PER YR.	AVG. NO. OF TESTS PER DAY	CHANCE/ DAY FOR TEST	NO. OF WKRS. FOR THIS ESTIMATE	CHANCES /DAY FOR TEST FOR PROJECT	CONSTR WORKING DAYS
1945	208	9	0.00462725	39	0.1805	278

**LABOR \$'s THRU SAFETY**

**LABOR \$'s**

WORK DELAYS CAUSED BY MONITORING	0.0%		\$1,525,400	\$0
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**LABOR \$'s**

WORK DELAYS CAUSED BY RAD CHECKING	0.0%		\$1,525,400	\$0
------------------------------------	------	--	-------------	-----

**TOTAL LABOR**

**TOTAL MAT'L.**

**GRAND TOTAL**

**TOTAL HEALTH PHYSICS**

\$2,500

\$0

\$2,500

(FORWARD TO ESTIMATE SUMMARY SHEET)

# ACTIVITY DURATIONS **FLUOR FERNALD**

**PROJECT:** Radon Control System  
**ESTIMATE NO.:** C4.01.08.01  
**CLIENT:** DOE  
**WBS NO.:** 1.1.H.C

**DATE:** 14-Aug-01  
**ESTIMATOR:** Johnson  
**LOCATION:** Fernald  
**TASK NO.:** HWR1A

ACTIVITY	EST. DATE	START DATE	MID POINT	COMPL. DATE	ACTIVITY	DURATION
CONSTRUCTION:	08-Aug-01	01-Jan-02	02-Jul-02	01-Jan-03		12.0 MONTHS
PLUS 4 MONTHS COMPLETED						4 MONTHS
<b>TOTAL</b>						<b>16.0 MONTHS</b>

DATE of EST. to MID-POINT ACTIVITY DURATION	
a.	10.8 MONTHS
b.	0 MONTHS

ACTIVITY	EST. DATE	START DATE	MID POINT	COMPL. DATE	ACTIVITY	DURATION
OPERATIONS						0 MONTHS

DATE of EST. to MID-POINT ACTIVITY DURATION	
	0 MONTHS

ACTIVITY DURATION IS USED IN DETERMINING NUMBER of WORKERS for CERCLA/SAT TRAINING HOURS and HEALTH PHYSICS COSTS.



# TRAINING

PROJECT: Radon Control System  
 ESTIMATE #: C4.01.08.01  
 CLIENT: DOE  
 #: 1.1.H.C

## Fluor Fernald, Inc.

DATE: 14-Aug-01  
 ESTIMATOR: Johnson  
 LOCATION: Fernald  
 TASK #: HWR1A

### Site Access Training Requirements (RM-0055 Rev. 1 Effective: 09/30/99)

Access Areas		Administrative Support Area	Controlled Area	Contamination Compound	Frequency	LABOR DOLLARS
Training Requirements	HOURS	Non-Hazardous	Occasional Site Worker	General Site Worker		
General Employee Training	6	X	X	X	One Time	
Site Worker Training	12		X	X	One Time	
Construction Rules & Regulations	2	X	X	X	One Time	
Supervised Field Experience	8		X		One Time	
Supervised Field Experience	24			X	One Time	
Rad. Worker I	8		X		One Time	
Rad. Worker II	20			X	One Time	
Respirator Training *	4		X	X	One Time	
Respirator Fit Testing *	1		X	X	One Time	
OSHA Construction Outreach (Contractor Project Staff)	30	X			One Time	
<b>TOTAL HOURS PER WORKER - ONE TIME</b>		8 HOURS	41 HOURS	69 HOURS	AVG. RATE	
ENTER NO. of WORKERS by Type		29 WORKERS	WORKERS	WORKERS		29
<b>TOTAL HOURS of WORKER One Time Training</b>		232 HOURS	HOURS	HOURS	\$24.59	\$5,704
<b>TOTAL HOURS PER Contractor Project Staff GET</b>		6 HOURS	41 HOURS	69 HOURS		
ENTER NO. of Contractor Project Staff		10.0 PROJ.STAFF	PROJ.STAFF	PROJ.STAFF		
<b>TOTAL HOURS of Cont.Proj.Staff One Time GET Training</b>		60 HOURS	HOURS	HOURS	\$28.46	\$1,707
<b>TOTAL HOURS PER Contractor Project MGMT. OSHA</b>		30 HOURS	HOURS	HOURS		
ENTER NO. of Contractor Project Staff		5.0 PROJ.MGMT.	PROJ.MGMT.	PROJ.MGMT.		
<b>TOTAL HOURS of Cont.Proj.Staff One Time OSHA Training</b>		150 HOURS	HOURS	HOURS	\$35.36	\$5,305
<b>DURATION in MONTHS</b>		16.0				
GET Refresher	5	X	X	X	Annually	
Rad. Worker I Retraining	6		X		Biennial	
Rad. Worker I Retraining - Practical	1		X		Biennial	
Rad. Worker II Retraining	6			X	Biennial	
Rad. Worker II Retraining - Practical	2			X	Biennial	
Respirator Fit Testing - non-asbestos	1		X	X	Annually	
<b>TOTAL HOURS PER WORKER - ANNUAL/BIENNIAL</b>		5 HOURS	6 HOURS	6 HOURS	AVG. RATE	
ENTER NO. of WORKERS by Type		29 WORKERS	WORKERS	WORKERS	\$24.59	\$3,565
ENTER NO. of PROJECT STAFF by Type		10 PROJ.STAFF	PROJ.STAFF	PROJ.STAFF	\$28.46	\$1,423
<b>HOURS for ANNUAL/BIENNIAL TRAINING</b>		195 HOURS	HOURS	HOURS		
<b>TOTAL GET/SITE WORKER/RAD TRAINING (Fwd. To Estimate Summary Sheet)</b>				637		\$17,700

# TRAINING

PROJECT: Radon Control System  
 ESTIMATE #: C4.01.08.01  
 CLIENT: DOE  
 1.1.H.C

## Fluor Fernald, Inc.

DATE: 14-Aug-01  
 ESTIMATOR: Johnson  
 LOCATION: Fernald  
 TASK #: HWR1A

Site Access Training Requirements (RM-0055 Rev. 1 Effective: 09/30/99)

Additional Training - Job Specific	HRS	No. of Workers	TOTAL HOURS	LABOR RATE	Frequency	LABOR DOLLARS
Confined Space	8	2	16	\$24.59	One Time	\$393
Fire Watch	1	2	2	\$24.59	One Time	\$49
Lock out / Tag out	8	4	32	\$24.59	One Time	\$787
Rigging	24	6	144	\$24.59	One Time	\$3,540
Scaffold	16	6	96	\$24.59	One Time	\$2,360
Lead Worker	8			\$24.59	One Time	
Asbestos Abatement	32			\$24.59	One Time	
Asbestos Class III, O&M	4			\$24.59	One Time	
Asbestos Class IV	2			\$24.59	One Time	
Asbestos Abatement Practices-Cont.	40			\$24.59	One Time	
K-65 Silo/RTS Access	3			\$24.59	One Time	
NVO 325 Initial	8			\$24.59	One Time	
Additional Training - Job Specific - One Time			290			\$7,130
DURATION in MONTHS		16.0				
Lock out / Tag out Refresher	4	16	64	\$24.59	Annual	\$1,573
Lead Worker	8			\$24.59	Annual	
Asbestos Abatement Refresher	8			\$24.59	Annual	
Asbestos Class III, O&M Refresher	4			\$24.59	Annual	
Asbestos Class IV	2			\$24.59	Annual	
Respirator Fit Testing - lead/cadmium	1			\$24.59	Semi-Annual	
Respirator Fit Testing - asbestos abate,	1			\$24.59	Semi-Annual	
Respirator Fit Testing - Asbestos O&M	1			\$24.59	Semi-Annual	
Asbestos Abatement Practices-Cont.	8			\$24.59	Annual	
NVO 325 Refresher	2			\$24.59	Annual	
Additional Training - Job Specific - Annual/Semi-Annual			64			\$1,573
					HOURS	
<b>TOTAL JOB SPECIFIC TRAINING (Fwd. To Estimate Summary Sheet)</b>					<b>354</b>	<b>\$8,700</b>

**GUIDELINES FOR DETERMINING TRAINING REQUIREMENTS**

- Determine number of craft workers and contractor management/supervision/staff required for each of the three work areas for One Time Training.
- Any annual or biennial training will be generated automatically based on the input above and the number of months duration from Appendix 'D'.
- Determine the number of workers for each 'Additional Training Requirements' for the 'One Time' option.
- Any semi-annual or annual training will be generated automatically based on the above input and the months duration from Appendix 'D'.

\* = All employees classified as General Site Worker must initially take respirator training. The annual requirement for the repeat of training and the fit test frequency requirements are only needed by those employees that are required to wear a respirator.

**HWR1D**

**JACOBS CONSTRUCTION SUPPORT**



# Fluor Fernald, Inc.

ESTIMATE SUPPORT WORKSHEET  
FOR ACTIVITY BASED ESTIMATING  
[REDACTED]  
(1 FTE EQUALS 1747 HOURS)

DATE: 5-Sep-01  
PROJECT MGR: R. FELLMAN  
CAM: R. FELLMAN  
PREPARED BY: M. KOPP  
FISCAL YEAR: FY01 - FY09

PBS: PBS07  
WBS: 1.1.H.C  
CTRL ACCT: HWR1  
CHARGE NO: HWR1D JACOBS CONSTRUCTION SUPPORT  
COMMENT#: F07-022, F07-035, F07-062

Resource: Res Dept:	SERVSUB 943	SUBS Overtime:	JEG	Class:	EOC:		SUBCONTRACTORS							
					SUB	SUB	Sub 1	Sub 2						
Yr Units:					Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Cum Units:					196,618.3	792,815.7	792,815.7	618,396.3	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:					196,618.3	989,434.0	1,782,249.7	2,400,646.0	2,400,646.0	2,400,646.0	2,400,646.0	2,400,646.0	2,400,646.0	2,400,646.0
Cum Total Cost:					196,618	814,222	836,206	670,503	0	0	0	0	0	0
GRAND TOTALS:					196,618	1,010,840	1,847,046	2,517,549	2,517,549	2,517,549	2,517,549	2,517,549	2,517,549	2,517,549

CAM: Robert Fellman

CONTROL TEAM: *[Signature]*



**HWR1E**

**BALANCE OF PLANT CONSTRUCTION**



# Fluor Fernald, Inc.

DATE: 5-Sep-01  
PROJECT MGR: R. FELLMAN  
CAM: R. FELLMAN  
PREPARED BY: M. KOPP  
FISCAL YEAR: FY01 - FY09

ESTIMATE SUPPORT WORKSHEET  
FOR ACTIVITY BASED ESTIMATING  
(1 FTE EQUALS 1747 HOURS)

PBS: PBS07  
WBS: 1.1.H.C  
CTRL ACCT: HWR1  
CHARGE NO: HWR1E BALANCE OF PLANT CONSTRUCTION  
COMMENT#: F07-022, F07-035, F07-062

Resource: Res Dept:	FIELDSUB 943	FIELD SUBS Overtime:	Class:		EOC:		SUBCONTRACTORS										
			Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-						
Yr Units:			372,557.7	11,500,074.4	12,773,808.0	7,255,522.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Units:			372,557.7	11,872,632.1	24,646,440.1	31,901,963.0	31,901,963.0	31,901,963.0	31,901,963.0	31,901,963.0	31,901,963.0	31,901,963.0	31,901,963.0	31,901,963.0	31,901,963.0	31,901,963.0	31,901,963.0
Yr Total Cost:			372,558	11,810,576	13,472,906	7,866,883	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:			372,558	12,183,134	25,656,040	33,522,923	33,522,923	33,522,923	33,522,923	33,522,923	33,522,923	33,522,923	33,522,923	33,522,923	33,522,923	33,522,923	33,522,923
<b>GRAND TOTALS:</b>																	
Yr Total Cost:			372,558	11,810,576	13,472,906	7,866,883	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:			372,558	12,183,134	25,656,040	33,522,923	33,522,923	33,522,923	33,522,923	33,522,923	33,522,923	33,522,923	33,522,923	33,522,923	33,522,923	33,522,923	33,522,923

CAM  
*Robert Fellman*  
CONTROL TEAM *Stephen M. Kopp*







**Fluor Fernald, Inc.**  
**PROJECTS CONTROLS**  
**ESTIMATING SERVICES**

August 8, 2001

**PROJECT DESCRIPTION:** SILOS AWR Balance of Plant - Support

**WBS NUMBER:** 1.1.H.C

**PROJECT ENGINEER:** Michael G. Connors

**ESTIMATOR:** Don Osborne

**ESTIMATE NUMBER:** C4-2001-06-005

**BASIS OF ESTIMATE**

**SUPPORTING DOCUMENTATION:**

Verbal Scope	<input checked="" type="checkbox"/>	P & ID's	<input checked="" type="checkbox"/>	Work Plan	<input type="checkbox"/>
CFC Drawings	<input checked="" type="checkbox"/>	Equipment List	<input checked="" type="checkbox"/>	Site Walk	<input type="checkbox"/>
Sketches	<input type="checkbox"/>	Specifications	<input checked="" type="checkbox"/>	Eng. Mtg.	<input checked="" type="checkbox"/>
Flow Diagrams	<input checked="" type="checkbox"/>	Written Scope	<input type="checkbox"/>	Estimate	<input type="checkbox"/>

**TYPE OF ESTIMATE:**

Change Proposal	<input type="checkbox"/>	Government	<input type="checkbox"/>
Plan/Feasibility	<input type="checkbox"/>	Conceptual	<input type="checkbox"/>
Construction	<input type="checkbox"/>	Title I Design	<input type="checkbox"/>
Budget	<input checked="" type="checkbox"/>	Independent	<input type="checkbox"/>

**BASIS OF ESTIMATE:**

This estimate contains values of purchase orders Fluor Fernald will be issuing for equipment, services, and materials installed by subcontractors, and associated support labor for the Balance of Plant (BOP) scope for the Advanced Waste Retrieval (AWR) plan as designed by Foster Wheeler. BOP consists of the Full Scale Mockup System (FSMS), the Silo Waste Retrieval System (SWRS), and the Transfer Tank System (TTS).

**Fluor Fernald, Inc.**  
**PROJECTS CONTROLS**  
**ESTIMATING SERVICES**

August 8, 2001

**PROJECT DESCRIPTION:** SILOS AWR Balance of Plant - Support

**WBS NUMBER:** 1.1.H.C

**PROJECT ENGINEER:** Michael G. Connors

**ESTIMATOR:** Don Osborne

**ESTIMATE NUMBER:** C4-2001-06-005

**ESTIMATE ASSUMPTIONS**

**EXECUTION:**

- This project is to be performed on a 40-hour week, 10 hours a day.
- This project is to be performed on a 40-hour week, 8 hours a day.
- Premium time allowed.

**WAGE RATES:**

- Wage rates within this estimate are based on Project Labor Agreement rates, effective October 2000 and are considered FY01 dollars for estimating.
- Wage rates within this estimate are based on FF Support Contractor FSC 645 wage rates, effective January 30, 2001 and are considered FY01 dollars for estimating.
- Wage rates within this estimate are based on FF FTE Planning Labor Rates FY01.

**ENGINEERING:**

- N/A
- Engineering dollars provided by the Project Engineer.
- Engineering dollars have been factored in at the standard 12% of the total direct and indirect field costs as per request of Project Engineer.

**CONSTRUCTION MANAGEMENT:**

- N/A
- Construction Management dollars provided by the Project Engineer.
- Construction Management dollars have been factored in at the standard 30% of the total direct and indirect field costs as per request of Project Engineer.

**PROJECT MANAGEMENT:**

- N/A
- Project Management dollars provided by the Project Engineer.
- Project Management dollars have been factored in at the standard 30% of the total direct and indirect field costs as per request of Project Engineer.

**WASTE PROGRAM MANAGEMENT:**

- N/A
- Waste Program Management dollars provided by the Project Engineer.

**Fluor Fernald, Inc.**  
**PROJECTS CONTROLS**  
**ESTIMATING SERVICES**

August 8, 2001

**PROJECT DESCRIPTION:** SILOS AWR Balance of Plant - Support

**WBS NUMBER:** 1.1.H.C

**PROJECT ENGINEER:** Michael G. Connors

**ESTIMATOR:** Don Usborne

**ESTIMATE NUMBER:** C4-2001-06-005

**PRODUCTIVITY:**

N.A.

**ESCALATION:**

Escalation costs are excluded from the target estimate. The escalation costs are calculated within the Micro-Frame computer system according to the plan for rebaselining. Estimate is expressed in 2001 dollars.

**UNIT RATES:**

Support labor was based on a duration of 12 months as provided by Construction. Rented crane operating costs are based on MEANS.

**G & A (HO EXPENSE):**

G & A are excluded from the target estimate. The G & A cost are calculated within the Micro-Frame computer system according to the plan for rebaselining.

**HEALTH PHYSICS:**

See attached APPENDIX "C".

**RISK BUDGET:**

N/A

**CONTINGENCY:**

N/A

**Fluor Fernald, Inc.**  
**PROJECTS CONTROLS**  
**ESTIMATING SERVICES**

August 8, 2001

**PROJECT DESCRIPTION:** SILOS AWR Balance of Plant - Support

**WBS NUMBER:** 1.1.H.C

**PROJECT ENGINEER:** Michael G. Connors

**ESTIMATOR:** Don Usborne

**ESTIMATE NUMBER:** C4-2001-06-005

**ESTIMATE INCLUSIONS & EXCLUSIONS**

**INCLUSIONS:**

- P.O. items were determined by the equipment list and the project engineer.
- P.O. costs were taken from quotes solicited by Foster Wheeler when available.
- P.O. costs not obtained by Foster Wheeler were estimated from published cost data such as MEANS and Richardson.
- FF rented cranes, 230 T and 60 T, for 19months, which includes mobilization and demobilization.
- Operating costs for rented cranes.
- Support labor for rented cranes. Support labor wages provided by Construction.

**EXCLUSIONS:**

- Installation of P.O. items.
- Radon Control System (RCS) associated costs.
- Bulk materials, such as pipe, valves, wire, conduit, cable tray, concrete, and steel.
- MTO Allowance.
- Crane rigging materials.
- Permits and fees.
- FF G & A (Home Office Expense).
- Construction Management.
- Any second tier subcontract costs.
- Project Management dollars.

## SUPPORT CONTRACTOR ESTIMATE SUMMARY SHEET

ACT: SILOS AWR Balance of Plant Support  
 ESTIMATE NO.: C4-01-06-05  
 CLIENT: DOE  
 WBS NO.: 2.1.2.E.M (1.1.H.C)

DATE: 08-Aug-01  
 ESTIMATOR: D.Usborne  
 LOCATION: FERNALD  
 TASK NO: HWR1E

# Fluor Fernald, Inc.

	DESCRIPTION	M/H	AVG. RATE	SPT.CONT. LABOR \$	FERNALD			
					S/C /OTHER	MAT'L \$	EQUIP \$	TOTAL \$
	PURCHASE ORDERS by FF				\$831,900	\$14,763,800	\$527,500	\$16,123,200
	SUPPORT LABOR	13,376		\$642,000				
<b>SUPPORT CONT. / FF D. F. COST TOTAL</b>		<b>13,376</b>	<b>\$48.00</b>	<b>\$642,000</b>	<b>\$831,900</b>	<b>\$14,763,800</b>	<b>\$527,500</b>	<b>\$16,123,200</b>
<b>SUPERVISION</b>								
	ALL TOOLS & CONSUMABLES					\$70,600		\$70,600
	CONC. EQUIP. RENTAL							
	JOB CLEAN-UP	602		\$28,900		\$9,600		\$9,600
	SAFETY	260		\$12,500		\$6,700		\$6,700
	HEALTH PHYSICS S/C	413		\$19,800		\$2,600		\$2,600
	JOB SPECIFIC TRAINING							
<b>SUPPORT CONT. INDIRECT FIELD COST TOTAL</b>		<b>1,275</b>		<b>\$61,200</b>				
<b>SUPPORT CONT. TOTAL BILLABLE COSTS</b>		<b>14,651</b>	<b>\$48.00</b>	<b>\$703,200</b>				
<b>TEMPORARY FACILITIES</b>								
	TEMPORARY UTILITY HOOK-UP							
	FD FERNALD SALES TAX					\$891,200	\$31,700	\$922,900
<b>FF INDIRECT FIELD COSTS TOTAL</b>						<b>\$980,700</b>	<b>\$31,700</b>	<b>\$1,012,400</b>
<b>FF DIRECT &amp; INDIRECT FIELD COSTS TOTAL</b>					<b>\$831,900</b>	<b>\$15,744,500</b>	<b>\$559,200</b>	<b>\$17,135,600</b>
<b>FF and SPT.CONT. DIRECT &amp; INDIRECT FIELD COST TOTAL</b>				<b>\$703,200</b>	<b>\$831,900</b>	<b>\$15,744,500</b>	<b>\$559,200</b>	<b>\$17,838,800</b>
<b>SUB-TOTAL (BASE ESTIMATE)</b>								<b>\$17,838,800</b>
<b>TARGET ESTIMATE (FY 01 DOLLARS)</b>								<b>\$17,838,800</b>
ESTIMATE PERFORMED E								

## SUPPORT CONTRACTOR ESTIMATE SUMMARY SHEET

PROJECT: SILOS AWR Balance of Plant Support

DATE: 08-Aug-01

ESTIMATE NO.: C4-01-06-05

### FACTORS

ESTIMATOR: D.Usborne

CLIENT: DOE

LOCATION: FERNALD

WBS NO.: 2.1.2.E.M (1.1.H.C)

TASK NO.: HWR1E

	SUPT.CONT	FD FERNALD					PROJECT
	LABOR \$	LABOR \$	S/C \$	MAT'L \$	EQUIP. \$	PPE \$	TOTAL \$
DFC DOLLARS	\$642,000		\$831,900	\$14,763,800	\$527,500	\$2,600	\$16,767,800
IFC COST FACTOR	1.0953	1.0000	1	1.0059	1.0000	--	
SALES TAX COST FACTOR	--	--	--	1.0600	1.0600	1.0600	
BOND + OVERHEAD & PROFIT COST FACTOR	N/A	N/A	N/A	N/A	N/A	N/A	
<b>DIRECT FIELD COST FACTOR =</b>	<b>1.0953</b>	<b>1.0000</b>	<b>1.0000</b>	<b>1.0662</b>	<b>1.0600</b>	<b>1.0600</b>	
<b>DIRECT BASE ESTIMATE \$'s</b>	<b>\$703,200</b>		<b>\$831,900</b>	<b>\$15,741,742</b>	<b>\$559,150</b>	<b>\$2,756</b>	<b>\$17,838,748</b>
<b>RISK BUDGET FACTOR</b>	<b>1.0000</b>	<b>1.0000</b>	<b>1.0000</b>	<b>1.0000</b>	<b>1.0000</b>	<b>1.0000</b>	
<b>DIRECT TARGET ESTIMATE FACTOR</b>	<b>1.0953</b>	<b>1.0000</b>	<b>1</b>	<b>1.0662</b>	<b>1.0600</b>	<b>1.0600</b>	
<b>DIRECT TARGET ESTIMATE (FY00 DOLLARS)</b>	<b>\$703,200</b>		<b>\$831,900</b>	<b>\$15,741,742</b>	<b>\$559,150</b>	<b>\$2,756</b>	<b>\$17,838,748</b>

**NOTE:**

1.) If there are no equipment rental costs in the "Directs" ( 0 \$'s in I20) and the default allowance of \$3.50 per MH has been used in the "indirects", input the indirect Equip. \$'s in H62 and put a dash in H63. This will treat the Equip. \$'s as direct cost and apply the sales tax factor. On page 3 below, insert the equipment \$'s in any pay items that apply.

# SUPPORT CONTRACTOR ESTIMATE SUMMARY SHEET

PROJECT: SILOS AWR Balance of Plant Support

DATE: 08-Aug-01

ESTIMATE NO.: C4-01-06-05

Direct Field Cost

ESTIMATOR: D.Usborne

AGENT: DOE

**w / FACTORS**

LOCATION: FERNALD

JOB NO.: 2.1.2.E.M (1.1.H.C)

SUPPORT

TASK NO.: HWR1E

PAY ITEM NO.	DESCRIPTION	SUPPORT		FF				PROJECT	
		CONT.	FF	LABOR \$	S/C \$	MAT'L \$	EQUIP. \$	PPE \$	TOTAL \$
	PPE							2600	
								\$2,760	\$2,760
	PURCHASE ORDERS by FF				831900	14,763,800	527,500		
					\$831,900	\$15,741,740	\$559,150		\$17,132,790
	SUPPORT LABOR	642000							
		\$703,200							\$703,200
<b>SUB-TOTAL - SUPPORT CONTRACTOR</b>		\$703,200							\$703,200
<b>SUB-TOTAL - FF</b>					\$831,900	\$15,741,740	\$559,150	\$2,760	\$17,135,550
<b>TOTAL DIRECT FIELD COSTS w/FACTORS</b>									\$17,838,750

NOTE: The above costs exclude any FD Fernald support costs that may appear on page 1 & 2, such as Waste Disposition, Engineering, Project Management, or Construction Management.



PROJECT: SILOS AWR Balance of Plant Support Costs  
 ESTIMATE NO.: C4-01-06-05  
 CLIENT: DOE  
 WBS NO.: 2.1.2.E.M (1.1.H.C)

# Fluor Fernald, Inc.

DATE: 08-Aug-01  
 ESTIMATOR: D.Usborne  
 LOCATION: FERNALD  
 TASK NO.: HWRIE

DIRECT COST SUMMARY	QTY	UNIT	MAN-HOURS		Rate	COST / UNIT			LABOR	SIC	MAT'L	EQUIP	TOTAL
			Unit	Total		Labor	SIC	Mat'l					
PURCHASE ORDERS by FF									\$831,900	\$14,763,800	\$527,500	\$16,123,200	
SUPPORT LABOR			13,376					\$642,000				\$642,000	
<b>DIRECT COST SUMMARY</b>	<b>1</b>	<b>LOT</b>		<b>13,376</b>	<b>\$48.00</b>			<b>\$642,000</b>	<b>\$831,900</b>	<b>\$14,763,800</b>	<b>\$527,500</b>	<b>\$16,765,200</b>	

PROJECT: SILOS AWR Balance of Plant Support Costs  
 ESTIMATE NO.: C4-01-06-05  
 CLIENT: DOE  
 WBS NO.: 2.1.2.E.M (1.1.H.C)

DATE: 08-Aug-01  
 ESTIMATOR: D.Usborne  
 LOCATION: FERNALD  
 TASK NO.: HWRIE

# Fluor Fernald, Inc.

PPE LEVEL	PURCHASE ORDERS by FF		QTY	UNIT	MAN-HOURS			COST/UNIT			LABOR	SIC	MAT'L	EQUIP	TOTAL
	Rate	Total			Unit	Rate	Labour	S/C	Mat'l	Equip					
<b>CRANE RENTAL</b>															
	Move 60T & 250T Cranes On & Off		1	Lot										\$24,000	\$24,000
	Crane Rental, 230T		19	mo										\$332,500	\$332,500
	Crane Rental, 60T truck mid		19	mo										\$171,000	\$171,000
	Operating & maintenance of rented cranes														
	60T, working hours / day	70%	19	mo				4,682						\$88,950	\$88,950
	230T, working hours / day	70%	19	mo				11,088						\$210,670	\$210,670
<b>INSTRUMENTATION</b>															
<b>BOP / RCS Phase 2 (per P. Bowman of Jacobs)</b>															
	Field instruments		1	Lot								274,547		\$274,550	\$274,550
	PLC and PLC drops		1	Lot								140,755		\$140,760	\$140,760
	PLC Programming by CCA		1	Lot								120,000		\$120,000	\$120,000
<b>VENDOR EQUIPMENT</b>															
	American Tank & Vessel - Transfer T		1	Lot					Erect TT			466,000		\$466,000	\$466,000
	American Tank & Vessel - 3 tanks		1	Lot					Mech S/C			1,392,400		\$1,392,400	\$1,392,400
	Battelle		1	Lot					Mech S/C			2,053,246		\$2,053,250	\$2,053,250
	Grey Pilgrim		1	Lot					Mech S/C			4,636,000		\$4,636,000	\$4,636,000
	Providence Group		1	Lot					Mech S/C			4,150,922		\$4,150,920	\$4,150,920
	Barnebey & Sutcliffe		1	Lot					Mech S/C			9,755		\$9,760	\$9,760
	FLT-12-003		1	ea					Mech S/C			1,068		\$1,070	\$1,070
	FLT-11-001		1	ea					Mech S/C			1,068		\$1,070	\$1,070
	FLT-11-003		1	ea					Mech S/C			1,068		\$1,070	\$1,070
	FLT-11-005		1	ea					Mech S/C			1,068		\$1,070	\$1,070
	FLT-12-001		1	ea					Mech S/C			1,068		\$1,070	\$1,070
	FLT-12-002		1	ea					Mech S/C			1,068		\$1,070	\$1,070
	FLT-14-001		1	ea					Mech S/C			3,000		\$3,000	\$3,000
	Tracability fo heat nos.		1	Lot					Mech S/C					\$3,000	\$3,000
	Eberline Instruments		2	ea					Elec S/C			41,975		\$83,950	\$83,950
	Personnel Contamination Monitors		1	ea					Elec S/C			13,351		\$13,350	\$13,350
	ValTech - Heat Trace Power Control		1	Lot					Civil S/C			6,889		\$6,890	\$6,890
	AeroGo Load Moving Equip - Bridge		1	Lot					Civil S/C			200,000		\$200,000	\$200,000
	Air Bearings		1	Lot					Elec S/C			2,532		\$2,530	\$2,530
	Ludlum Measurements		1	Lot					Mech S/C			448		\$450	\$450
	Grainger - Sump pump		1	ea										\$12,400	\$12,400
	Pro-Coat		1	ea										\$11,200	\$11,200
	Coating, Filter Process Tank, TNK-12-0		1	ea										\$11,700	\$11,700
	Coating, Filtrate Storage Tank, TNK-12		1	ea										\$11,700	\$11,700
	Coating, Water Make-Up Tank, TNK-51		1	ea										\$11,700	\$11,700
	Control Corporation of America		1	ea					Elec S/C			72,762		\$72,760	\$72,760

PROJECT: SILOS AWR Balance of Plant Support Costs  
 ESTIMATE NO.: C4-01-06-05  
 CLIENT: DOE  
 WBS NO.: 2.1.2.E.M (1.1.H.C)

DATE: 08-Aug-01  
 ESTIMATOR: D.Usborne  
 LOCATION: FERNALD  
 TASK NO.: HWR1E

# Fluor Fernald, Inc.

PPE LEVEL	PURCHASE ORDERS by FF	QTY	UNIT	MAN-HOURS		COST / UNIT			LABOR	SIC	MAT'L	EQUIP	TOTAL
				Unit	Total	Rate	Labor	SIC					
	VENDORS OTHER												
	DUPLEX AIR COMPRESSOR	1	ea	Mech S/C			26,425			\$26,420		\$26,420	
	AIR DRYER SKID	1	ea	Mech S/C			10,191			\$10,190		\$10,190	
	DUPLEX BAG FILTER HOUSING	1	ea	Mech S/C			5,575			\$5,580		\$5,580	
	EMERG. DIESEL GENERATOR & FU	1	ea	Mech S/C			149,867			\$149,870		\$149,870	
	FILTER PROCESS AGITATOR	1	ea	Mech S/C			11,000			\$11,000		\$11,000	
	1" ORFICE PLATE, FILTRATE SYS	1	ea	Mech S/C			81			\$80		\$80	
	1 1/2"ORIFICE PLT, DOMESTIC WA	1	ea	Mech S/C			81			\$80		\$80	
	1 1/2"ORIFICE PLT, DOMESTIC WA	1	ea	Mech S/C			81			\$80		\$80	
	FSMS FAN SKID	1	ea	Mech S/C			9,184			\$9,180		\$9,180	
	SURROGATE TANK	1	ea	Mech S/C			90,800			\$90,800		\$90,800	
	SURROGATE SETTLING TANK	1	ea	Mech S/C			18,600			\$18,600		\$18,600	
	ULTRAFILTRATION UNIT	1	ea	Mech S/C			300,000			\$300,000		\$300,000	
	UPS POWER PANEL 120/240V, 100	1	ea	Elec S/C			1,000			\$1,000		\$1,000	
	XFMR, LTG/POWER RECEPTACLE	1	ea	Elec S/C			4,000			\$4,000		\$4,000	
	225 kVA 480/208Y-120, 3 PH	2	ea	Elec S/C			750			\$1,500		\$1,500	
	XFMR, LTG/POWER RECEPTACLE	1	ea	Elec S/C			750			\$750		\$750	
	50 kVA 480/120-240, 1 PH	3	ea	Elec S/C			1,000			\$3,000		\$3,000	
	XFMR, LTG/POWER RECEPTACLE	3	ea	Elec S/C			2,500			\$7,500		\$7,500	
	30 kVA 480/208Y-120, 3 PH												
	XFMR, LTG/POWER RECEPTACLE												
	45 kVA 480/208Y-120, 3 PH												
	POLE MTD DISTRIBUTION XFMR												
	13.2 kV-120/240V, 167kVA												
	Butler pre-engineered bldg.												
	Building	22,500	SF	Civil S/C			15.00			\$337,500		\$337,500	
	Roof insulation	25,000	SF	Civil S/C			0.48			\$12,000		\$12,000	
	Wall insulation	24,000	SF	Civil S/C			0.56			\$13,440		\$13,440	
	Standing seam roof	25,000	SF	Civil S/C			2.50			\$62,500		\$62,500	
	Gutters	300	LF	Civil S/C			3.20			\$960		\$960	
	Downspouts	90	LF	Civil S/C			3.20			\$290		\$290	
	3'x7' personnel doors	2	Ea	Civil S/C			450			\$900		\$900	
	16' overhead door	1	Ea	Civil S/C			4,000			\$4,000		\$4,000	
	Roof Vent (continuous ridge)	150	LF	Civil S/C			25.00			\$3,750		\$3,750	
	Liner (12' high)	7,200	SF	Civil S/C			2.18			\$15,700		\$15,700	
	Flashings	760	LF	Civil S/C			2.45			\$1,860		\$1,860	
	Paint steel	1	LS	Civil S/C			3,000			\$3,000		\$3,000	

PROJECT: SILOS AWR Balance of Plant Support Costs  
 ESTIMATE NO.: C4-01-06-05  
 CLIENT: DOE  
 WBS NO.: 2.1.2.E.M (1.1.H.C)

DATE: 08-Aug-01  
 ESTIMATOR: D.Usborne  
 LOCATION: FERNALD  
 TASK NO.: HWRTE

# Fluor Fernald, Inc.

PPE LEVEL	PURCHASE ORDERS by FF		QTY	UNIT	MAN-HOURS			COST / UNIT			LABOR	SIC	MAT'L	EQUIP	TOTAL
	FF	men			Unit	Total	Rate	Labor	SIC	Mat'l					
	Allowance for Vendor Reps	1	6 mo		176	1,056		90.00							\$95,040
	Providence	1	6 mo		176	1,056		90.00							\$95,040
	Battelle	1	6 mo		176	1,056		90.00							\$95,040
	Grey Pilgrim	1	6 mo		176	1,056		90.00							\$95,040
	Controls	1	6 mo		176	1,056		90.00							\$95,040
	Air Bearings	1	1 mo		176	176		90.00							\$15,840
	Room & Expenses @ \$115/day		25 mo					3450.00							\$86,250
	Car rental		25 mo					1000							\$25,000
	Airfare		25 RTs					1000							\$25,000
	<b>PURCHASE ORDERS by FF</b>														
															\$831,870
															\$14,763,820
															\$527,500
															\$16,123,190

PROJECT: SILOS AWR Balance of Plant Support Costs  
 ESTIMATE NO.: C4-01-06-05  
 CLIENT: DOE  
 WBS NO.: 2.1.2.E.M(1.1.H.C)

DATE: 08-Aug-01  
 ESTIMATOR: D.Usborne  
 LOCATION: FERNALD  
 TASK NO.: HWRTE

# Fluor Fernald, Inc.

PPE LEVEL	SUPPORT LABOR	QTY	UNIT	MAN HOURS			COST / UNIT			LABOR	SIC	MAT'L	EQUIP	TOTAL
				Unit	Total	Rate	Labor	SIC	Mat'l					
D	<u>SUPPORT LABOR (by WISI)</u> Crane Operators	19	mo	176	3344	48.00								\$160,510
D	Rigger	19	mo	176	3344	48.00								\$160,510
D	Operator, GF (250T)	19	mo	176	3344	48.00								\$160,510
D	Oiler	19	mo	176	3344	48.00								\$160,510
D	Operator, GF (60T)	19	mo	176	3344	48.00								\$160,510
	Oiler	N.A.												
<b>SUPPORT LABOR</b>				<b>1</b>	<b>LOT</b>	<b>13376</b>	<b>\$48.00</b>							<b>\$642,000</b>



# HEALTH PHYSICS

PROJECT: SILOS AWR Balance of Plant Support Costs  
 ESTIMATE NO C4-01-06-05  
 CLIENT: DOE  
 WBS NO.: 2.1.2.E.M (1.1.H.C)

DATE: 08-Aug-01  
 ESTIMATOR: D.Usborne  
 LOCATION: FERNALD  
 TASK NO.: HWR1E

## Fluor Fernald, Inc.

### PPE's - PERSONAL PROTECTIVE EQUIPMENT

DESCRIPTION	UNIT	UNIT COST	* NO. OF CHANGE OUTS PER WORKER PER DAY			
			Man Days (TOTAL HOURS worked in PPE's Div. by WORK HOURS/DAY)			
PPE LEVEL C / C+		\$'s	*	MAN DAYS	MAT'L.\$'s	LEVEL
LAUNDRY COST per CHANGE	SET	1.96	1	0	\$0	C/B
TYVEK COVER-ALL w/HOOD & BOOTIES - DIS	EA	4.46	3	0	\$0	C/B
TYVEK COVER-ALL w/HOOD & BOOTIES - DIS	EA	4.46	3	0	\$0	C/B
GLOVE LINER - DISPOSABLE	PR	0.24	3	0	\$0	C/B
GLOVE, LASTEX - DISPOSABLE	PR	0.26	3	0	\$0	C/B
GLOVE, WORK - DISPOSABLE	PR	1.02	3	0	\$0	C/B
APR CARTRIDGES - DISPOSABLE, CLEANING	PR	9.38	3	0	\$0	C/B
SUB-TOTAL				0	\$0	
				\$/MD = #DIV/0!		

PPE LEVEL mC						
DESCRIPTION	UNIT	\$'s		MAN DAYS	MAT'L.\$'s	LEVEL
RESS w/ FACE SHIELD						
LAUNDRY COST per CHANGE	SET	1.96	1	0	\$0	mC
LT.WT. DISPOSABLE COVERALLS W/HOOD &	PR	4.46	3	0	\$0	mC
GLOVE LINER - DISPOSABLE	PR	0.24	3	0	\$0	mC
GLOVE, LASTEX - DISPOSABLE	PR	0.26	3	0	\$0	mC
GLOVE, WORK - DISPOSABLE	PR	1.02	3	0	\$0	mC
SUB-TOTAL				0	\$0	mC
				\$/MD = #DIV/0!		

PPE LEVEL D						
DESCRIPTION	UNIT	\$'s		MAN DAYS	MAT'L.\$'s	LEVEL
LAUNDRY COST per CHANGE	SET	1.96	1	1338	\$2,622	D

SUBCONTRACTOR REQUIRED PURCHASES	UNIT	QTY. PER WKR.	NO. OF WORKERS	MAT'L. \$'s	LEVEL
RUBBER BOOT COVERS-(1)PR.PER WORKER	PR	12.70	6	\$0	D/C/B
APR w/HALF FACE MASK - (1) PER WORKER	EA	22.30	6	\$0	C
APR w/FULL FACE MASK - (1) PER WORKER	EA	174.00	6	\$0	C
SCBA	EA	1894.00	2	\$0	B
COOL VESTS	EA	137.50	6	\$0	C/B
THERMO STRIPS	EA	50.00	6	\$0	C/B
SUB-TOTAL				\$0	C/B

Total PPE Matl \$ and Laundry \$ \$2,600

(FORWARD TO PAGE 2 OF 2)

OTHER PPE's SUCH AS HARD HAT, SAFETY GLASSES/GOGGLES, STEEL TOED SAFETY SHOES, HEARING PROTECTION, ARE CONSIDERED THE SUBCONTRACTORS RESPONSIBILITY AND ARE COVERED IN HIS OVERHEAD EXPENSE. FD FERNALD SUPPLIED PPE's, SUCH AS COTTON COVERALLS, EXCHANGE OF RUBBER BOOT COVERS AND RESPIRATORS FOR CHANGEOUTS AND CLEANING OF SAME IS INCLUDED.

# HEALTH PHYSICS

PROJECT: SILOS AWR Balance of Plant Support Costs  
 ESTIMATE NO C4-01-06-05  
 CLIENT: DOE  
 WBS NO.: 2.1.2.E.M (1.1.H.C)

DATE: 08-Aug-01  
 ESTIMATOR: D.Usborne  
 LOCATION: FERNALD  
 TASK NO.: HWR1E

--MEDICAL MONITORING --

**MEDICAL - PHYSICAL and IN-VIVO MONITORING - LOST WORKER TIME for RAD II WORKERS ONLY**

DESC.	QTY	HRS	WKR	TOTAL HOURS	AVG. LABOR RATE	TOTAL LABOR \$
PHYSICAL (3hrs), IN-VIVO (1hr)						
BASELINE PHYSICALS	1	4	5	20	\$48.00	\$960
ANNUAL PHYSICALS	2	4	5	40	\$48.00	\$1,920
EXIT (TERMINATION) PHYSICALS (IN-VIVO)	1	1	5	5	\$48.00	\$240
<b>SUB-TOTAL</b>						<b>\$3,120</b>

**RADIATION IN-VITRO SURVEILLANCE - LOST WORKER TIME for RAD II WORKERS ONLY**

DESC.	QTY	HRS	WKR	TOTAL HOURS	AVG. LABOR RATE	TOTAL LABOR \$
BI-MONTHLY BIOASSAY	9	1	5	47	\$48.00	\$2,270
<b>SUB-TOTAL</b>						<b>\$2,270</b>

**RANDOM DRUG TESTING**

	TESTS	HRS	TOTAL HRS	AVG. RATE	LABOR \$'s	
	8	2	16	\$48.00	\$800	
NO. OF WKRS. TESTED	TESTING DAYS PER YR.	AVG. NO. OF TESTS PER DAY	CHANCE/ DAY FOR TEST	NO. OF WKRS. FOR THIS ESTIMATE	CHANCES /DAY FOR TEST for this PROJECT	CONSTR WORKING DAYS
2500	226	11	0.0044	5	0.022	358

<b>WORK DELAYS CAUSED BY MONITORING</b>	1.0%			<b>\$683,400</b>	<b>\$6,800</b>	
					<b>LABOR \$'s</b>	
<b>WORK DELAYS CAUSED BY RAD CHECKING</b>	1.0%			<b>\$683,400</b>	<b>\$6,800</b>	
				<b>TOTAL LABOR</b>	<b>TOTAL MAT'L.</b>	<b>GRAND TOTAL</b>
<b>TOTAL HEALTH PHYSICS - FORWARD TO ESTIMATE SUMMARY SHEET</b>				<b>\$19,800</b>	<b>\$2,600</b>	<b>\$22,400</b>

## ACTIVITY DURATIONS

PROJECT: SILOS AWR Balance of Plant Support Cont  
 ESTIMATE N C4-01-06-05  
 CLIENT: DOE  
 WBS NO.: 2.1.2.E.M (1.1.H.C)

# Fluor Fernald, Inc.

DATE: 08-Aug-01  
 ESTIMATOR: D.Usborne  
 LOCATION: FERNALD  
 TASK NO.: HWRIE

ACTIVITY	EST. DATE	START DATE	MID POINT	COMPL. DATE	ACTIVITY	DURATION
CONSTRUCTION:	06-Aug-01	01-Oct-01	16-Jul-02	30-Apr-03	18.9	MONTHS
					0	MONTHS
<b>TOTAL</b>					<b>18.9</b>	<b>MONTHS</b>

DATE of EST. to MID-POINT	
ACTIVITY DURATION	
a.	11.3 MONTHS
b.	0 MONTHS

ACTIVITY	EST. DATE	START DATE	MID POINT	COMPL. DATE	ACTIVITY	DURATION
OPERATIONS					0	MONTHS

DATE of EST. to MID-POINT	
ACTIVITY DURATION	
	0 MONTHS

ACTIVITY DURATION IS USED IN DETERMINING NUMBER of WORKERS for CERCLA/SAT TRAINING HOURS and HEALTH PHYSICS COSTS.



**HWR1F**

**CONSTRUCTION MANAGEMENT**







# Fluor Fernald, Inc.

ESTIMATE SUPPORT WORKSHEET  
FOR ACTIVITY BASED ESTIMATING  
(1 FTE EQUALS 1747 HOURS)

PBS: PBS07  
WBS: 1.1.H.C  
CTRL ACCT: HWR1  
CHARGE NO: HWR1F  
COMMENT#: F07-022, F07-035

DATE: 5-Sep-01

PROJECT MGR: R. FELLMAN  
CAM: R. FELLMAN  
PREPARED BY: M. KOPP  
FISCAL YEAR: FY01 - FY09

	QA MANAGER		QA MANAGER		LABOR									
	Yr	Total Cost	Yr	Total Cost	Yr	Total Cost	Yr	Total Cost	Yr	Total Cost	Yr	Total Cost	Yr	Total Cost
Yr Hours:	22,106	22,106	22,106	22,106	22,106	22,106	22,106	22,106	22,106	22,106	22,106	22,106	22,106	22,106
Cum Hours:	481.0	481.0	1,921.7	1,921.7	1,917.0	1,917.0	6,241.3	6,241.3	6,241.3	6,241.3	6,241.3	6,241.3	6,241.3	6,241.3
Yr Total Cost:	22,106	22,106	98,469	98,469	104,017	104,017	317,557	317,557	317,557	317,557	317,557	317,557	317,557	317,557
Cum Total Cost:	481.0	481.0	4,324.4	4,324.4	6,241.3	6,241.3	6,241.3	6,241.3	6,241.3	6,241.3	6,241.3	6,241.3	6,241.3	6,241.3

Resource:	Res Dept:	QACMGR	943	EOC:		LABOR		LABOR		LABOR		LABOR		LABOR	
				Yr	Total Cost	Yr	Total Cost	Yr	Total Cost	Yr	Total Cost	Yr	Total Cost	Yr	Total Cost
Yr Hours:				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:				0.0	0.0	960.7	960.7	1,919.3	1,919.3	1,919.3	1,919.3	1,919.3	1,919.3	1,919.3	1,919.3
Yr Total Cost:				0	0	57,648	57,648	60,910	60,910	0	0	0	0	0	0
Cum Total Cost:				0	0	57,648	57,648	118,558	118,558	118,558	118,558	118,558	118,558	118,558	118,558

Resource:	Res Dept:	RADENG	943	EOC:		LABOR									
				Yr	Total Cost	Yr	Total Cost	Yr	Total Cost	Yr	Total Cost	Yr	Total Cost	Yr	Total Cost
Yr Hours:				240.5	240.5	2,354.4	2,354.4	3,312.8	3,312.8	3,312.8	3,312.8	3,312.8	3,312.8	3,312.8	3,312.8
Cum Hours:				240.5	240.5	50,563	50,563	53,412	53,412	0	0	0	0	0	0
Yr Total Cost:				11,351	11,351	119,198	119,198	172,610	172,610	172,610	172,610	172,610	172,610	172,610	172,610
Cum Total Cost:				11,351	11,351	119,198	119,198	172,610	172,610	172,610	172,610	172,610	172,610	172,610	172,610

Resource:	Res Dept:	RADMGR	943	EOC:		LABOR									
				Yr	Total Cost	Yr	Total Cost	Yr	Total Cost	Yr	Total Cost	Yr	Total Cost	Yr	Total Cost
Yr Hours:				481.0	481.0	1,441.8	1,441.8	1,441.8	1,441.8	1,441.8	1,441.8	1,441.8	1,441.8	1,441.8	1,441.8
Cum Hours:				481.0	481.0	60,490	60,490	89,257	89,257	89,257	89,257	89,257	89,257	89,257	89,257
Yr Total Cost:				28,767	28,767	89,257	89,257	89,257	89,257	89,257	89,257	89,257	89,257	89,257	89,257
Cum Total Cost:				28,767	28,767	89,257	89,257	89,257	89,257	89,257	89,257	89,257	89,257	89,257	89,257

Resource:	Res Dept:	RADTEC	943	EOC:		LABOR									
				Yr	Total Cost										
Yr Hours:				1,442.9	1,442.9	4,325.5	4,325.5	4,325.5	4,325.5	4,325.5	4,325.5	4,325.5	4,325.5	4,325.5	4,325.5
Cum Hours:				1,442.9	1,442.9	2,882.6	2,882.6	2,882.6	2,882.6	2,882.6	2,882.6	2,882.6	2,882.6	2,882.6	2,882.6
Yr Total Cost:				49,175	49,175	152,578	152,578	152,578	152,578	152,578	152,578	152,578	152,578	152,578	152,578
Cum Total Cost:				49,175	49,175	152,578	152,578	152,578	152,578	152,578	152,578	152,578	152,578	152,578	152,578

# Fluor Fernald, Inc.

DATE: 5-Sep-01  
PROJECT MGR: R. FELLMAN  
CAM: R. FELLMAN  
PREPARED BY: M. KOPP  
FISCAL YEAR: FY01 - FY09

ESTIMATE SUPPORT WORKSHEET  
FOR ACTIVITY BASED ESTIMATING  
(1 FTE EQUALS 1747 HOURS)

PBS: PBS07  
WBS: 1.1.H.C  
CTRL ACCT: HWR1  
CHARGE NO: HWR1F  
COMMENT#: F07-022, F07-035

Resource:	S&HEER	SAFETY ENGINEER	Class:	EOC:		LABOR	
				SAL	SAL	EOC:	SAL
Res Dept:	943	Overtime:					
Yr Hours:	481.0	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06
Cum Hours:	481.0	481.0	1,729.5	1,537.4	1,533.6	5,281.4	5,281.4
Yr Total Cost:	23,909	23,909	2,210.5	3,747.9	5,281.4	90,004	5,281.4
Cum Total Cost:	23,909	23,909	114,405	199,607	289,611	289,611	289,611

Resource:	S&HTEC	SAFETY TECH	Class:	EOC:		LABOR	
				SAL	SAL	EOC:	SAL
Res Dept:	943	Overtime:					
Yr Hours:	481.0	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06
Cum Hours:	481.0	481.0	1,921.7	4,324.4	6,241.3	6,241.3	6,241.3
Yr Total Cost:	13,905	13,905	58,478	61,939	65,430	0	0
Cum Total Cost:	13,905	13,905	72,382	134,322	199,751	199,751	199,751

GRAND TOTALS:							
Yr Hours:	8,898.0	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06
Cum Hours:	8,898.0	8,898.0	36,608.4	30,939.3	27,604.4	0.0	0.0
Yr Total Cost:	415,397	415,397	1,846,447	1,706,773	1,622,488	0	0
Cum Total Cost:	415,397	415,397	2,261,844	3,968,617	5,591,105	5,591,105	5,591,105

CAM: *Robert Fellman*

CONTROL TEAM: *Stephan Black*

**HWR1G**

**ENGINEERING SUPPORT**



# Fluor Fernald, Inc.

ESTIMATE SUPPORT WORKSHEET  
FOR ACTIVITY BASED ESTIMATING

DATE: 5-Sep-01  
PROJECT MGR: R. FELLMAN  
CAM: R. FELLMAN  
PREPARED BY: M. KOPP  
FISCAL YEAR: FY01 - FY09

PBS: PBS07  
WBS: 1.1.H.C  
CTRL ACCT: HWR1  
CHARGE NO: HWR1G  
COMMENT#: F07-022, F07-035  
(1 FTE EQUALS 1747 HOURS)

Resource:	CLERKS	EOC:	LABOR																			
			Class:		SAL																	
Res Dept:	943		Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Yr Hours:	437.3		Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10	Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10
Cum Hours:	437.3		437.3	1,048.2	698.8	698.8	148.8	3,730.7	0.0	0.0	0.0	0.0	3,730.7	3,730.7	3,730.7	3,730.7	3,730.7	3,730.7	3,730.7	3,730.7	3,730.7	3,730.7
Yr Total Cost:	10,446		10,446	26,358	18,612	19,710	4,750	100,754	0	0	0	0	100,754	100,754	100,754	100,754	100,754	100,754	100,754	100,754	100,754	100,754
Cum Total Cost:	10,446		10,446	36,804	55,416	75,126	96,004	100,754	100,754	100,754	100,754	100,754	100,754	100,754	100,754	100,754	100,754	100,754	100,754	100,754	100,754	100,754

Resource:	ENGINEER CIVIL	EOC:	LABOR																			
			Class:		SAL																	
Res Dept:	943		Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Yr Hours:	131.2		Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10	Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10
Cum Hours:	131.2		131.2	524.1	524.1	524.1	524.1	0.0	0.0	0.0	0.0	0.0	524.1	524.1	524.1	524.1	524.1	524.1	524.1	524.1	524.1	524.1
Yr Total Cost:	7,133		7,133	29,999	31,775	33,649	35,643	0	0	0	0	0	138,199	138,199	138,199	138,199	138,199	138,199	138,199	138,199	138,199	138,199
Cum Total Cost:	7,133		7,133	37,132	68,907	102,556	138,199	138,199	138,199	138,199	138,199	138,199	138,199	138,199	138,199	138,199	138,199	138,199	138,199	138,199	138,199	138,199

Resource:	ENGINEER	EOC:	LABOR																			
			Class:		SAL																	
Res Dept:	943		Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Yr Hours:	437.3		Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10	Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10
Cum Hours:	437.3		437.3	2,096.4	2,096.4	2,096.4	2,096.4	372.0	0.0	0.0	0.0	0.0	2,096.4	2,096.4	2,096.4	2,096.4	2,096.4	2,096.4	2,096.4	2,096.4	2,096.4	2,096.4
Yr Total Cost:	30,065		30,065	151,728	160,710	170,186	180,274	34,177	0	0	0	0	727,140	727,140	727,140	727,140	727,140	727,140	727,140	727,140	727,140	727,140
Cum Total Cost:	30,065		30,065	181,793	342,503	512,689	692,963	727,140	727,140	727,140	727,140	727,140	727,140	727,140	727,140	727,140	727,140	727,140	727,140	727,140	727,140	727,140

Resource:	ENGPRC	EOC:	LABOR																			
			Class:		SAL																	
Res Dept:	943		Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Yr Hours:	87.5		Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10	Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10
Cum Hours:	87.5		87.5	174.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	174.7	174.7	174.7	174.7	174.7	174.7	174.7	174.7	174.7	174.7
Yr Total Cost:	262.2		262.2	262.2	262.2	262.2	262.2	262.2	262.2	262.2	262.2	262.2	262.2	262.2	262.2	262.2	262.2	262.2	262.2	262.2	262.2	262.2
Cum Total Cost:	262.2		262.2	524.4	786.6	1048.8	1311.0	1573.2	1835.4	2097.6	2359.8	2622.0	2622.0	2622.0	2622.0	2622.0	2622.0	2622.0	2622.0	2622.0	2622.0	2622.0

# Fluor Fernald, Inc.

DATE: 5-Sep-01  
PROJECT MGR: R. FELLMAN  
CAM: R. FELLMAN  
PREPARED BY: M. KOPP  
FISCAL YEAR: FY01 - FY09

ESTIMATE SUPPORT WORKSHEET  
FOR ACTIVITY BASED ESTIMATING  
(1 FTE EQUALS 1747 HOURS)

PBS: PBS07  
WBS: 1.1.H.C  
CTRL ACCT: HWR1  
CHARGE NO: HWR1G  
COMMENT#: F07-022, F07-035

	Yr Total Cost:		10,294		0		0		0		0		0		0		0		0		0	
	4,895	15,189	0	15,189	0	15,189	0	15,189	0	15,189	0	15,189	0	15,189	0	15,189	0	15,189	0	15,189	0	
Cum Total Cost:	4,895	15,189	15,189	15,189	15,189	15,189	15,189	15,189	15,189	15,189	15,189	15,189	15,189	15,189	15,189	15,189	15,189	15,189	15,189	15,189	15,189	
<b>GRAND TOTALS:</b>																						
Yr Hours:	1,093.1	3,843.4	3,319.3	3,319.3	3,319.3	3,319.3	3,319.3	3,319.3	3,319.3	3,319.3	3,319.3	3,319.3	3,319.3	3,319.3	3,319.3	3,319.3	3,319.3	3,319.3	3,319.3	3,319.3	3,319.3	
Cum Hours:	1,093.1	4,936.5	8,255.8	11,575.1	14,894.4	18,213.7	21,533.0	24,852.3	28,171.6	31,490.9	34,810.2	38,129.5	41,448.8	44,768.1	48,087.4	51,406.7	54,726.0	58,045.3	61,364.6	64,683.9	68,003.2	
Yr Total Cost:	52,540	218,379	211,098	223,544	236,796	250,048	263,300	276,552	289,804	303,056	316,308	329,560	342,812	356,064	369,316	382,568	395,820	409,072	422,324	435,576	448,828	
Cum Total Cost:	52,540	270,919	482,016	705,560	942,356	1,183,152	1,423,948	1,664,744	1,905,540	2,146,336	2,387,132	2,627,928	2,868,724	3,109,520	3,350,316	3,591,112	3,831,908	4,072,704	4,313,500	4,554,296	4,795,092	

*Robert Fellman*

*M. Kopp*

CAM

CONTROL TEAM

**HWR1H**

**JACOBS EXECUTION ENGINEERING**



# Fluor Fernald, Inc.

DATE: 5-Sep-01  
 PROJECT MGR: R. FELLMAN  
 CAM: R. FELLMAN  
 PREPARED BY: M. KOPP  
 FISCAL YEAR: FY01 - FY09

PBS: PBS07  
 WBS: 1.1.H.C  
 CTRL ACCT: HWR1  
 CHARGE NO: HWR1H  
 COMMENT#: F07-022, F07-035, F07-062

ESTIMATE SUPPORT WORKSHEET  
 FOR ACTIVITY BASED ESTIMATING

(1 FTE EQUALS 1747 HOURS)

Resource: SERVSUB  
 Res Dept: 943

OverTime: JEG

Class: SUB

EOC: SUB

SUBS

SUBCONTRACTORS

	Oct 00-		Oct 01-		Oct 02-		Oct 03-		Oct 04-		Oct 05-		Oct 06-		Oct 07-		Oct 08-		Oct 09-	
	Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10	Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10
Yr Units:	302,416.8	453,937.3	208,377.2	166,701.7	254,975.7	55,970.3	0.0	0.0	0.0	0.0	1,442,379.0	1,442,379.0	1,442,379.0	1,442,379.0	1,442,379.0	1,442,379.0	1,442,379.0	1,442,379.0	1,442,379.0	1,442,379.0
Cum Units:	302,417	756,354.1	964,731.3	1,131,433.0	1,386,408.7	1,442,379.0	1,442,379.0	1,442,379.0	1,442,379.0	1,442,379.0	1,442,379.0	1,442,379.0	1,442,379.0	1,442,379.0	1,442,379.0	1,442,379.0	1,442,379.0	1,442,379.0	1,442,379.0	1,442,379.0
Yr Total Cost:	302,417	466,194	219,781	180,748	284,201	64,195	0	0	0	0	1,517,536	1,517,536	1,517,536	1,517,536	1,517,536	1,517,536	1,517,536	1,517,536	1,517,536	1,517,536
Cum Total Cost:	302,417	768,610	988,392	1,169,140	1,453,341	1,517,536	1,517,536	1,517,536	1,517,536	1,517,536	1,517,536	1,517,536	1,517,536	1,517,536	1,517,536	1,517,536	1,517,536	1,517,536	1,517,536	1,517,536

GRAND TOTALS:

	Oct 00-		Oct 01-		Oct 02-		Oct 03-		Oct 04-		Oct 05-		Oct 06-		Oct 07-		Oct 08-		Oct 09-	
	Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10	Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10
Yr Total Cost:	302,417	466,194	219,781	180,748	284,201	64,195	0	0	0	0	1,517,536	1,517,536	1,517,536	1,517,536	1,517,536	1,517,536	1,517,536	1,517,536	1,517,536	1,517,536
Cum Total Cost:	302,417	768,610	988,392	1,169,140	1,453,341	1,517,536	1,517,536	1,517,536	1,517,536	1,517,536	1,517,536	1,517,536	1,517,536	1,517,536	1,517,536	1,517,536	1,517,536	1,517,536	1,517,536	1,517,536

*Robert Fellman*

*Robert Fellman*

CONTROL TEAM

CAM



**HWR1J**

**STARTUP AND READINESS**



# Fluor Fernald, Inc.

ESTIMATE SUPPORT WORKSHEET  
FOR ACTIVITY BASED ESTIMATING  
(1 FTE EQUALS 1747 HOURS)

DATE: 5-Sep-01  
PROJECT MGR: R. FELLMAN  
CAM: R. FELLMAN  
PREPARED BY: M. KOPP  
FISCAL YEAR: FY01 - FY09

PBS: PBS07  
WBS: 1.1.H.C  
CTRL ACCT: HWR1  
CHARGE NO: HWR1J  
COMMENT#: F07-022, F07-035, F07-062

Resource:	Res Dept:	CHIMOPR	Overtime:	LABOR											
				Class:	EOC:	HOU	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
	943				Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-	
Yr Hours:					Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10	
Cum Hours:					1,345.5	9,163.5	41,928.0	41,928.0	636.0	0.0	0.0	0.0	0.0	0.0	
Yr Total Cost:					10,509.0	52,437.0	94,365.0	95,001.0	95,001.0	95,001.0	95,001.0	95,001.0	95,001.0	95,001.0	
Cum Total Cost:					41,980	300,934	1,458,451	1,544,441	24,816	0	0	0	0	0	
					41,980	342,914	1,801,364	3,345,806	3,370,622	3,370,622	3,370,622	3,370,622	3,370,622	3,370,622	

Resource:	Res Dept:	CRPNTR	Overtime:	LABOR											
				Class:	EOC:	HOU	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Yr Hours:					Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-	
Cum Hours:					Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10	
Yr Total Cost:					89.7	498.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Cum Total Cost:					2,778	16,263	0	0	0	0	0	0	0	0	
					2,778	19,041	19,041	19,041	19,041	19,041	19,041	19,041	19,041	19,041	

Resource:	Res Dept:	DEPADM	Overtime:	LABOR											
				Class:	EOC:	SAL	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Yr Hours:					Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-	
Cum Hours:					Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10	
Yr Total Cost:					299.0	1,663.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Cum Total Cost:					9,481	55,506	0	0	0	0	0	0	0	0	
					9,481	64,988	64,988	64,988	64,988	64,988	64,988	64,988	64,988	64,988	

Resource:	Res Dept:	ELECTN	Overtime:	LABOR											
				Class:	EOC:	HOU	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Yr Hours:					Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-	
Cum Hours:					Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10	
Yr Total Cost:					598.0	3,326.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Cum Total Cost:					18,741	109,718	0	0	0	0	0	0	0	0	
					18,741	128,459	128,459	128,459	128,459	128,459	128,459	128,459	128,459	128,459	

Resource:	Res Dept:	ENGMEC	Overtime:	LABOR											
				Class:	EOC:	SAL	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Yr Hours:					Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-	
Cum Hours:					Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10	
Yr Total Cost:					149.5	866.5	873.5	873.5	13.3	0.0	0.0	0.0	0.0	0.0	
Cum Total Cost:					149.5	1,016.0	1,889.5	2,763.0	2,776.2	2,776.2	2,776.2	2,776.2	2,776.2	2,776.2	

# Fluor Fernald, Inc.

ESTIMATE SUPPORT WORKSHEET  
FOR ACTIVITY BASED ESTIMATING

DATE: 5-Sep-01  
PROJECT MGR: R. FELLMAN  
CAM: R. FELLMAN  
PREPARED BY: M. KOPP  
FISCAL YEAR: FY01 - FY09

PBS: PBS07  
WBS: 1.1.H.C  
CTRL ACCT: HWR1  
CHARGE NO: HWR1J  
COMMENT#: F07-022, F07-035, F07-062  
(1 FTE EQUALS 1747 HOURS)

Yr Total Cost: 9,296  
Cum Total Cost: 9,296

Resource:	ENGPRC	ENG PROCESS/STARTUP	Class:	EOC:	LABOR	EOC:	LABOR	EOC:	LABOR	EOC:	LABOR	EOC:	LABOR
Res Dept:	943	Overtime:		SAL		HOU		HOU		HOU		HOU	
Yr Hours:	1,405.3	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10	0	0
Cum Hours:	1,405.3	8,096.1	6,988.0	6,988.0	23,477.4	23,583.4	23,583.4	23,583.4	23,583.4	23,583.4	23,583.4	191,718	191,718
Yr Total Cost:	78,669	477,050	436,133	991,852	1,453,699	1,461,120	1,461,120	1,461,120	1,461,120	1,461,120	1,461,120	191,718	191,718
Cum Total Cost:	78,669	555,719	991,852	1,453,699	1,461,120	1,461,120	1,461,120	1,461,120	1,461,120	1,461,120	1,461,120	191,718	191,718

Resource:	HAZWAT	HAZWAT	Class:	EOC:	LABOR	EOC:	LABOR	EOC:	LABOR	EOC:	LABOR	EOC:	LABOR
Res Dept:	943	Overtime:		HOU		HOU		HOU		HOU		HOU	
Yr Hours:	299.0	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10	0	0
Cum Hours:	299.0	1,803.0	3,494.0	3,494.0	9,090.0	9,143.0	9,143.0	9,143.0	9,143.0	9,143.0	9,143.0	296,066	296,066
Yr Total Cost:	8,608	2,102.0	5,596.0	112,150	118,762	1,908	296,066	296,066	296,066	296,066	296,066	296,066	296,066
Cum Total Cost:	8,608	63,246	175,395	294,157	296,066	296,066	296,066	296,066	296,066	296,066	296,066	296,066	296,066

Resource:	HEOOPR	HEAVY EQUIP OPERATOR	Class:	EOC:	LABOR	EOC:	LABOR	EOC:	LABOR	EOC:	LABOR	EOC:	LABOR
Res Dept:	943	Overtime:		HOU		HOU		HOU		HOU		HOU	
Yr Hours:	149.5	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10	0	0
Cum Hours:	149.5	1,181.5	8,735.0	8,735.0	18,801.0	18,933.5	18,933.5	18,933.5	18,933.5	18,933.5	18,933.5	18,933.5	18,933.5
Yr Total Cost:	4,703	39,124	306,376	350,204	674,644	679,857	679,857	679,857	679,857	679,857	679,857	679,857	679,857
Cum Total Cost:	4,703	43,828	350,204	674,644	679,857	679,857	679,857	679,857	679,857	679,857	679,857	679,857	679,857

Resource:	INDHYG	INDUSTRIAL HYGIENIST	Class:	EOC:	LABOR	EOC:	LABOR	EOC:	LABOR	EOC:	LABOR	EOC:	LABOR
Res Dept:	943	Overtime:		SAL		HOU		HOU		HOU		HOU	
Yr Hours:	89.7	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10	0	0
Cum Hours:	89.7	526.9	698.8	1,315.4	2,014.2	2,024.8	2,024.8	2,024.8	2,024.8	2,024.8	2,024.8	2,024.8	2,024.8
Yr Total Cost:	4,164	25,745	36,165	66,074	104,371	104,987	104,987	104,987	104,987	104,987	104,987	104,987	104,987
Cum Total Cost:	4,164	29,909	66,074	104,371	104,987	104,987	104,987	104,987	104,987	104,987	104,987	104,987	104,987

Resource:	INSMEC	INSTRUMENT MECHANIC	Class:	EOC:	LABOR	EOC:	LABOR	EOC:	LABOR	EOC:	LABOR	EOC:	LABOR
Res Dept:	943	Overtime:		HOU		HOU		HOU		HOU		HOU	
Yr Hours:	89.7	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10	0	0
Cum Hours:	89.7	526.9	698.8	1,315.4	2,014.2	2,024.8	2,024.8	2,024.8	2,024.8	2,024.8	2,024.8	2,024.8	2,024.8
Yr Total Cost:	4,164	25,745	36,165	66,074	104,371	104,987	104,987	104,987	104,987	104,987	104,987	104,987	104,987
Cum Total Cost:	4,164	29,909	66,074	104,371	104,987	104,987	104,987	104,987	104,987	104,987	104,987	104,987	104,987

# Fluor Fernald, Inc.

ESTIMATE SUPPORT WORKSHEET  
FOR ACTIVITY BASED ESTIMATING

COMMENT#: F07-022, F07-035, F07-062

(1 FTE EQUALS 1747 HOURS)

DATE: 5-Sep-01  
PROJECT MGR: R. FELLMAN  
CAM: R. FELLMAN  
PREPARED BY: M. KOPP  
FISCAL YEAR: FY01 - FY09

PBS: PBS07  
WBS: 111HC  
CTRL ACCT: HWR1  
CHARGE NO: HWR1J

Yr	Hours:	Cum Hours:	Yr Total Cost:	Cum Total Cost:	LABOR																		
					Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10									
	299.0	1,803.0	3,484.0	9,143.0	189,895	121,421	128,580	9,090.0	9,143.0	53.0	0.0	9,143.0	0.0	0.0	9,143.0	0.0	0.0	9,143.0	0.0	0.0	320,541	320,541	
	9,320	59,154	121,421	128,580	318,475	2,066	0	9,143.0	9,143.0	2,066	0	9,143.0	0	0	9,143.0	0	0	9,143.0	0	0	320,541	320,541	
	9,320	68,474	189,895	318,475	320,541	320,541	320,541	320,541	320,541	320,541	320,541	320,541	320,541	320,541	320,541	320,541	320,541	320,541	320,541	320,541	320,541	320,541	320,541

Resource: MILWRT  
Res Dept: 943  
Class: LABOR  
Overtime: EOC: HOU

Yr	Hours:	Cum Hours:	Yr Total Cost:	Cum Total Cost:	LABOR																	
					Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10								
	299.0	1,803.0	3,494.0	9,143.0	190,382	121,732	128,910	9,090.0	9,143.0	53.0	0.0	9,143.0	0.0	0.0	9,143.0	0.0	0.0	9,143.0	0.0	0.0	321,363	321,363
	9,344	59,306	121,732	128,910	319,292	2,071	0	9,143.0	9,143.0	2,071	0	9,143.0	0	0	9,143.0	0	0	9,143.0	0	0	321,363	321,363
	9,344	68,650	190,382	319,292	321,363	321,363	321,363	321,363	321,363	321,363	321,363	321,363	321,363	321,363	321,363	321,363	321,363	321,363	321,363	321,363	321,363	321,363

Resource: MNTMGR  
Res Dept: 943  
Class: LABOR  
Overtime: EOC: SAL

Yr	Hours:	Cum Hours:	Yr Total Cost:	Cum Total Cost:	LABOR																	
					Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10								
	598.0	3,396.0	1,747.0	7,488.0	272,842	86,829	91,949	7,488.0	7,514.5	26.5	0.0	7,514.5	0.0	0.0	7,514.5	0.0	0.0	7,514.5	0.0	0.0	366,268	366,268
	26,659	159,354	86,829	91,949	364,791	1,477	0	7,488.0	7,514.5	1,477	0	7,514.5	0	0	7,514.5	0	0	7,514.5	0	0	366,268	366,268
	26,659	186,013	272,842	364,791	366,268	366,268	366,268	366,268	366,268	366,268	366,268	366,268	366,268	366,268	366,268	366,268	366,268	366,268	366,268	366,268	366,268	366,268

Resource: MNTREP  
Res Dept: 943  
Class: LABOR  
Overtime: EOC: SAL

Yr	Hours:	Cum Hours:	Yr Total Cost:	Cum Total Cost:	LABOR																	
					Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10								
	299.0	1,698.0	873.5	2,870.5	106,340	33,842	35,837	873.5	3,757.2	13.3	0.0	3,757.2	0.0	0.0	3,757.2	0.0	0.0	3,757.2	0.0	0.0	142,753	142,753
	10,390	62,108	33,842	35,837	142,177	576	0	873.5	3,757.2	576	0	3,757.2	0	0	3,757.2	0	0	3,757.2	0	0	142,753	142,753
	10,390	72,498	106,340	142,177	142,753	142,753	142,753	142,753	142,753	142,753	142,753	142,753	142,753	142,753	142,753	142,753	142,753	142,753	142,753	142,753	142,753	142,753

Resource: INVVOOPR  
Res Dept: 943  
Class: LABOR  
Overtime: EOC: HOU

Yr	Hours:	Cum Hours:	Yr Total Cost:	Cum Total Cost:	LABOR																	
					Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10								
	149.5	901.5	1,747.0	4,545.0	87,911	2,798.0	59,525	1,747.0	4,571.5	26.5	0.0	4,571.5	0.0	0.0	4,571.5	0.0	0.0	4,571.5	0.0	0.0	148,393	148,393
	4,315	27,385	56,211	59,525	147,436	956	0	1,747.0	4,571.5	956	0	4,571.5	0	0	4,571.5	0	0	4,571.5	0	0	148,393	148,393
	4,315	31,700	87,911	147,436	148,393	148,393	148,393	148,393	148,393	148,393	148,393	148,393	148,393	148,393	148,393	148,393	148,393	148,393	148,393	148,393	148,393	148,393

# Fluor Fernald, Inc.

ESTIMATE SUPPORT WORKSHEET  
FOR ACTIVITY BASED ESTIMATING

COMMENT# F07-022, F07-035, F07-062

FISCAL YEAR: FY01 - FY09

DATE: 5-Sep-01

PROJECT MGR: R. FELLMAN  
CAM: R. FELLMAN  
PREPARED BY: M. KOPP

Resource: OILERM  
Res Dept: 943

Class: LABOR

OILER MAINTENANCE																					
Yr	Hours:																				
Oct 00-	29.9	Oct 01-	166.3	Oct 02-	196.2	Oct 03-	196.2	Oct 04-	196.2	Oct 05-	196.2	Oct 06-	196.2	Oct 07-	196.2	Oct 08-	196.2	Oct 09-	196.2	Oct 09-	196.2
Sep 01	29.9	Sep 02	166.3	Sep 03	196.2	Sep 04	196.2	Sep 05	196.2	Sep 06	196.2	Sep 07	196.2	Sep 08	196.2	Sep 09	196.2	Sep 09	196.2	Sep 10	196.2
Yr Total Cost:	794	Yr Total Cost:	4,651	Yr Total Cost:	5,445																
Cum Total Cost:	794	Cum Total Cost:	5,445																		

Resource: OPRMGR  
Res Dept: 943

Class: LABOR

OPERATIONS MGR		OPERATIONS MGR		OPERATIONS MGR		OPERATIONS MGR		OPERATIONS MGR		OPERATIONS MGR		OPERATIONS MGR		OPERATIONS MGR		OPERATIONS MGR		OPERATIONS MGR		OPERATIONS MGR	
Yr	Hours:	Yr	Hours:	Yr	Hours:	Yr	Hours:	Yr	Hours:	Yr	Hours:	Yr	Hours:	Yr	Hours:	Yr	Hours:	Yr	Hours:	Yr	Hours:
Oct 00-	598.0	Oct 01-	3,396.0	Oct 02-	5,741.0	Oct 03-	7,488.0	Oct 04-	7,514.5	Oct 05-	7,514.5	Oct 06-	7,514.5	Oct 07-	7,514.5	Oct 08-	7,514.5	Oct 09-	7,514.5	Oct 09-	7,514.5
Sep 01	598.0	Sep 02	3,396.0	Sep 03	5,741.0	Sep 04	7,488.0	Sep 05	7,514.5	Sep 06	7,514.5	Sep 07	7,514.5	Sep 08	7,514.5	Sep 09	7,514.5	Sep 09	7,514.5	Sep 10	7,514.5
Yr Total Cost:	31,263	Yr Total Cost:	186,878	Yr Total Cost:	101,827	Yr Total Cost:	107,830	Yr Total Cost:	1,733	Yr Total Cost:	0										
Cum Total Cost:	31,263	Cum Total Cost:	218,142	Cum Total Cost:	319,968	Cum Total Cost:	427,799	Cum Total Cost:	429,531												

Resource: PAINTR  
Res Dept: 943

Class: LABOR

PAINTER																					
Yr	Hours:																				
Oct 00-	29.9	Oct 01-	166.3	Oct 02-	196.2	Oct 03-	196.2	Oct 04-	196.2	Oct 05-	196.2	Oct 06-	196.2	Oct 07-	196.2	Oct 08-	196.2	Oct 09-	196.2	Oct 09-	196.2
Sep 01	29.9	Sep 02	166.3	Sep 03	196.2	Sep 04	196.2	Sep 05	196.2	Sep 06	196.2	Sep 07	196.2	Sep 08	196.2	Sep 09	196.2	Sep 09	196.2	Sep 10	196.2
Yr Total Cost:	941	Yr Total Cost:	5,507	Yr Total Cost:	6,448																
Cum Total Cost:	941	Cum Total Cost:	6,448																		

Resource: PIPE FITTER  
Res Dept: 943

Class: LABOR

PIPE FITTER		PIPE FITTER		PIPE FITTER		PIPE FITTER		PIPE FITTER		PIPE FITTER		PIPE FITTER		PIPE FITTER		PIPE FITTER		PIPE FITTER		PIPE FITTER	
Yr	Hours:	Yr	Hours:	Yr	Hours:	Yr	Hours:	Yr	Hours:	Yr	Hours:	Yr	Hours:	Yr	Hours:	Yr	Hours:	Yr	Hours:	Yr	Hours:
Oct 00-	289.0	Oct 01-	1,803.0	Oct 02-	3,494.0	Oct 03-	3,494.0	Oct 04-	53.0	Oct 05-	0.0	Oct 06-	0.0	Oct 07-	0.0	Oct 08-	0.0	Oct 09-	0.0	Oct 09-	0.0
Sep 01	289.0	Sep 02	1,803.0	Sep 03	3,494.0	Sep 04	3,494.0	Sep 05	53.0	Sep 06	0.0	Sep 07	0.0	Sep 08	0.0	Sep 09	0.0	Sep 09	0.0	Sep 10	0.0
Yr Total Cost:	9,338	Yr Total Cost:	59,268	Yr Total Cost:	121,654	Yr Total Cost:	128,827	Yr Total Cost:	2,070	Yr Total Cost:	0										
Cum Total Cost:	9,338	Cum Total Cost:	68,606	Cum Total Cost:	190,261	Cum Total Cost:	319,088	Cum Total Cost:	321,158												

Resource: PJSREP  
Res Dept: 943

Class: LABOR

PROJECT SUPPORT REP		PROJECT SUPPORT REP		PROJECT SUPPORT REP		PROJECT SUPPORT REP		PROJECT SUPPORT REP		PROJECT SUPPORT REP		PROJECT SUPPORT REP		PROJECT SUPPORT REP		PROJECT SUPPORT REP		PROJECT SUPPORT REP		PROJECT SUPPORT REP	
Yr	Hours:	Yr	Hours:	Yr	Hours:	Yr	Hours:	Yr	Hours:	Yr	Hours:	Yr	Hours:	Yr	Hours:	Yr	Hours:	Yr	Hours:	Yr	Hours:
Oct 00-	418.6	Oct 01-	2,377.2	Oct 02-	1,222.9	Oct 03-	1,222.9	Oct 04-	18.6	Oct 05-	0.0	Oct 06-	0.0	Oct 07-	0.0	Oct 08-	0.0	Oct 09-	0.0	Oct 09-	0.0
Sep 01	418.6	Sep 02	2,377.2	Sep 03	1,222.9	Sep 04	1,222.9	Sep 05	18.6	Sep 06	0.0	Sep 07	0.0	Sep 08	0.0	Sep 09	0.0	Sep 09	0.0	Sep 10	0.0
Yr Total Cost:	418.6	Yr Total Cost:	2,795.8	Yr Total Cost:	4,018.7	Yr Total Cost:	5,241.6	Yr Total Cost:	5,260.1												
Cum Total Cost:	418.6	Cum Total Cost:	2,795.8	Cum Total Cost:	4,018.7	Cum Total Cost:	5,241.6	Cum Total Cost:	5,260.1												



# Fluor Fernald, Inc.

PBS: PBS07  
 WBS: 1.1.H.C  
 CTRL ACCT: HWR1  
 CHARGE NO: HWR1J  
 COMMENT#: F07-022, F07-035, F07-062

ESTIMATE SUPPORT WORKSHEET  
 FOR ACTIVITY BASED ESTIMATING  
 (1 FTE EQUALS 1747 HOURS)

DATE: 5-Sep-01  
 PROJECT MGR: R. FELLMAN  
 CAM: R. FELLMAN  
 PREPARED BY: M. KOPP  
 FISCAL YEAR: FY01 - FY09

Resource:	RIGGER	RIGGER	EOC:	LABOR												
Res Dept:	943	Overtime:	HOU	HOU												
Yr Hours:																
Cum Hours:																
Yr Total Cost:																
Cum Total Cost:																

Resource:	S&HENG	S&HENG	EOC:	LABOR												
Res Dept:	943	Overtime:	SAL	SAL												
Yr Hours:																
Cum Hours:																
Yr Total Cost:																
Cum Total Cost:																

Resource:	TPSREP	TPSREP	EOC:	LABOR												
Res Dept:	943	Overtime:	SAL	SAL												
Yr Hours:																
Cum Hours:																
Yr Total Cost:																
Cum Total Cost:																

Resource:	TRNREP	TRNREP	EOC:	LABOR												
Res Dept:	943	Overtime:	SAL	SAL												
Yr Hours:																
Cum Hours:																
Yr Total Cost:																
Cum Total Cost:																

Resource:	TECH/PROG SUPT REP	TECH/PROG SUPT REP	EOC:	LABOR												
Res Dept:	943	Overtime:	SAL	SAL												
Yr Hours:																
Cum Hours:																
Yr Total Cost:																
Cum Total Cost:																

# Fluor Fernald, Inc.

ESTIMATE SUPPORT WORKSHEET  
FOR ACTIVITY BASED ESTIMATING

COMMENT#: F07-022, F07-035, F07-062

DATE: 5-Sep-01  
PROJECT MGR: R. FELLMAN  
CAM: R. FELLMAN  
PREPARED BY: M. KOPP  
FISCAL YEAR: FY01 - FY09

Resource: WELDER WELDER  
Res Dept: 943 Overtime: 943

Yr Hours:	Oct 00-		Oct 01-		Oct 02-		Oct 03-		Oct 04-		Oct 05-		Oct 06-		Oct 07-		Oct 08-		Oct 09-		
	Yr	Total Cost:																			
29.9	29.9	941	166.3	166.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
149.5	149.5	941	866.5	866.5	196.2	196.2	196.2	196.2	196.2	196.2	196.2	196.2	196.2	196.2	196.2	196.2	196.2	196.2	196.2	196.2	196.2
7,629	7,629	941	46,542	46,542	5,507	5,507	6,448	6,448	6,448	6,448	6,448	6,448	6,448	6,448	6,448	6,448	6,448	6,448	6,448	6,448	6,448
7,629	7,629	941	54,171	54,171	103,867	103,867	156,494	156,494	157,339	157,339	157,339	157,339	157,339	157,339	157,339	157,339	157,339	157,339	157,339	157,339	157,339

Resource: WSTENG WASTE ENGINEER  
Res Dept: 943 Overtime: 943

Yr Hours:	Oct 00-		Oct 01-		Oct 02-		Oct 03-		Oct 04-		Oct 05-		Oct 06-		Oct 07-		Oct 08-		Oct 09-	
	Yr	Total Cost:																		
149.5	149.5	943	866.5	866.5	873.5	873.5	873.5	873.5	13.3	13.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
149.5	149.5	943	1,016.0	1,016.0	1,889.5	1,889.5	2,763.0	2,763.0	2,776.2	2,776.2	2,776.2	2,776.2	2,776.2	2,776.2	2,776.2	2,776.2	2,776.2	2,776.2	2,776.2	2,776.2
7,629	7,629	943	46,542	46,542	49,696	49,696	52,626	52,626	846	846	0	0	0	0	0	0	0	0	0	0
7,629	7,629	943	54,171	54,171	103,867	103,867	156,494	156,494	157,339	157,339	157,339	157,339	157,339	157,339	157,339	157,339	157,339	157,339	157,339	157,339

GRAND TOTALS:

Yr Hours:	Oct 00-		Oct 01-		Oct 02-		Oct 03-		Oct 04-		Oct 05-		Oct 06-		Oct 07-		Oct 08-		Oct 09-	
	Yr	Total Cost:	Yr	Total Cost:	Yr	Total Cost:	Yr	Total Cost:	Yr	Total Cost:	Yr	Total Cost:	Yr	Total Cost:	Yr	Total Cost:	Yr	Total Cost:	Yr	Total Cost:
11,750.7	11,750.7	943	69,016.9	69,016.9	91,368.1	91,368.1	91,368.1	91,368.1	1,386.0	1,386.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
11,750.7	11,750.7	943	80,767.6	80,767.6	172,135.7	172,135.7	263,503.8	263,503.8	264,889.7	264,889.7	264,889.7	264,889.7	264,889.7	264,889.7	264,889.7	264,889.7	264,889.7	264,889.7	264,889.7	264,889.7
482,366	482,366	943	2,963,729	2,963,729	3,695,679	3,695,679	3,913,577	3,913,577	62,884	62,884	0	0	0	0	0	0	0	0	0	
482,366	482,366	943	3,446,095	3,446,095	7,141,775	7,141,775	11,055,351	11,055,351	11,118,235	11,118,235	11,118,235	11,118,235	11,118,235	11,118,235	11,118,235	11,118,235	11,118,235	11,118,235	11,118,235	11,118,235

CAM: *Robert Fellman* CONTROL TEAM: *Robert Fellman*



**HWR1K**

**OPERATIONS/MAINTENANCE**



# Fluor Fernald, Inc.

ESTIMATE SUPPORT WORKSHEET  
FOR ACTIVITY BASED ESTIMATING  
(1 FTE EQUALS 1747 HOURS)

DATE: 5-Sep-01  
PROJECT MGR: R. FELLMAN  
CAM: R. FELLMAN  
PREPARED BY: M. KOPP  
FISCAL YEAR: FY01 - FY09

PBS: PBS07  
WBS: 1.1.H.C  
CTRL ACCT: HWRI  
CHARGE NO: HWRIK  
OPERATIONS/MAINTENANCE  
COMMENT#: F07-022, F07-035, F07-062

Resource:	BUYCON	BUYER/CONTRACTS ADMN	Class:		EOC:	LABOR	
Res Dept:	943	Overtime:	Oct 01-	Oct 02-	SAL	Oct 03-	Oct 04-
Yr Hours:	0.0	0.0	33.6	698.8	691.9	688.2	148.8
Cum Hours:	0.0	732.4	1,424.3	2,112.5	2,261.3	2,261.3	2,261.3
Yr Total Cost:	0	32,844	34,227	36,062	8,330	0	0
Cum Total Cost:	0	1,482	34,126	112,746	112,746	112,746	112,746

Resource:	CHMOPR	CHEMICAL OPERATOR	Class:		EOC:	LABOR	
Res Dept:	943	Overtime:	Oct 01-	Oct 02-	HOU	Oct 03-	Oct 04-
Yr Hours:	0.0	0.0	2,178.5	18,646.2	16,855.3	67,174.4	14,745.6
Cum Hours:	0.0	20,824.7	37,680.0	104,854.4	119,600.0	119,600.0	119,600.0
Yr Total Cost:	0	683,133	99,485	782,619	1,403,494	4,024,583	4,639,293
Cum Total Cost:	0	0	99,485	4,639,293	4,639,293	4,639,293	4,639,293

Resource:	CRPNTR	CARPENTER	Class:		EOC:	LABOR	
Res Dept:	943	Overtime:	Oct 01-	Oct 02-	HOU	Oct 03-	Oct 04-
Yr Hours:	0.0	0.0	46.2	1,060.4	1,053.5	1,049.6	230.4
Cum Hours:	0.0	1,106.5	2,160.0	3,209.6	3,440.0	3,440.0	3,440.0
Yr Total Cost:	0	36,613	38,519	40,653	9,534	0	0
Cum Total Cost:	0	1,505	38,118	126,823	126,823	126,823	126,823

Resource:	DEPADM	DEPT ADMINISTRATOR	Class:		EOC:	LABOR	
Res Dept:	943	Overtime:	Oct 01-	Oct 02-	SAL	Oct 03-	Oct 04-
Yr Hours:	0.0	0.0	42.0	873.5	864.9	860.3	186.0
Cum Hours:	0.0	915.5	1,780.4	2,640.6	2,826.6	2,826.6	2,826.6
Yr Total Cost:	0	30,881	32,379	34,115	7,881	0	0
Cum Total Cost:	0	1,402	32,283	106,658	106,658	106,658	106,658

Resource:	ELECTN	ELECTRICIAN	Class:		EOC:	LABOR	
Res Dept:	943	Overtime:	Oct 01-	Oct 02-	HOU	Oct 03-	Oct 04-
Yr Hours:	0.0	0.0	369.2	8,483.1	8,427.7	8,396.8	1,843.2
Cum Hours:	0.0	8,852.3	17,280.0	25,676.8	27,520.0	27,520.0	27,520.0



# Fluor Fernald, Inc.

DATE: 5-Sep-01  
PROJECT MGR: R. FELLMAN  
CAM: R. FELLMAN  
PREPARED BY: M. KOPP  
FISCAL YEAR: FY01 - FY09

ESTIMATE SUPPORT WORKSHEET  
FOR ACTIVITY BASED ESTIMATING  
(1 FTE EQUALS 1747 HOURS)

PBS: PBS07  
WBS: 1.1.H.C  
CTRL ACCT: HWR1  
CHARGE NO: HWR1K OPERATIONS/MAINTENANCE  
COMMENT#: F07-022, F07-035, F07-062

	Oct 00-		Oct 01-		Oct 02-		Oct 03-		Oct 04-		Oct 05-		Oct 06-		Oct 07-		Oct 08-		Oct 09-		
	Yr	Total Cost																			
Yr Hours:	0.0	0.0	33.6	688.2	688.2	148.8	2,261.3	2,261.3	124,908	124,908	124,908	124,908	124,908	124,908	124,908	124,908	124,908	124,908	124,908	124,908	124,908
Cum Hours:	0.0	0.0	33.6	732.4	1,424.3	2,112.5	2,261.3	2,261.3	2,261.3	2,261.3	2,261.3	2,261.3	2,261.3	2,261.3	2,261.3	2,261.3	2,261.3	2,261.3	2,261.3	2,261.3	2,261.3
Yr Total Cost:	0	0	1,642	37,807	37,807	124,908	124,908	124,908	124,908	124,908	124,908	124,908	124,908	124,908	124,908	124,908	124,908	124,908	124,908	124,908	124,908
Cum Total Cost:	0	0	1,642	37,807	37,807	124,908	124,908	124,908	124,908	124,908	124,908	124,908	124,908	124,908	124,908	124,908	124,908	124,908	124,908	124,908	124,908

Resource:	Res Dept:	INSMEC 943	INSTRUMENT MECHANIC Overtime:	Class:	EOC:		LABOR
					HOU	HOU	
Yr Hours:	0.0	0.0	276.9	276.9	6,320.7	6,320.7	6,320.7
Cum Hours:	0.0	0.0	276.9	276.9	12,960.0	12,960.0	12,960.0
Yr Total Cost:	0	0	9,086	221,099	232,604	245,491	245,491
Cum Total Cost:	0	0	9,086	230,184	462,789	708,279	765,853

Resource:	Res Dept:	MAT300 943	MATERIAL OBJCLASS300 Overtime:	Class:	EOC:		MATERIAL
					MAT	MAT	
Yr Units:	0.0	0.0	294,650.2	294,650.2	308,383.8	1,282,765.4	1,282,765.4
Cum Units:	0.0	0.0	294,650.2	294,650.2	603,034.0	1,885,799.4	1,885,799.4
Yr Total Cost:	0	0	310,776	310,776	334,369	1,429,797	322,960
Cum Total Cost:	0	0	310,776	310,776	645,145	2,074,942	2,397,901

Resource:	Res Dept:	MILWRT 943	MILLWRIGHT Overtime:	Class:	EOC:		LABOR
					HOU	HOU	
Yr Hours:	0.0	0.0	276.9	276.9	6,320.7	6,320.7	6,320.7
Cum Hours:	0.0	0.0	276.9	276.9	12,960.0	12,960.0	12,960.0
Yr Total Cost:	0	0	9,109	221,666	233,201	246,121	246,121
Cum Total Cost:	0	0	9,109	230,775	463,976	710,097	767,819

Resource:	Res Dept:	MNTMGR 943	MAINTENANCE MGR Overtime:	Class:	EOC:		LABOR
					SAL	SAL	
Yr Hours:	0.0	0.0	83.1	83.1	1,991.8	1,991.8	1,991.8
Cum Hours:	0.0	0.0	83.1	83.1	3,888.0	3,888.0	3,888.0
Yr Total Cost:	0	0	3,898	94,866	105,332	105,332	105,332
Cum Total Cost:	0	0	3,898	98,764	198,567	303,899	303,899

# Fluor Fernald, Inc.

DATE: 5-Sep-01  
PROJECT MGR: R. FELLMAN  
CAM: R. FELLMAN  
PREPARED BY: M. KOPP  
FISCAL YEAR: FY01 - FY09

ESTIMATE SUPPORT WORKSHEET  
FOR ACTIVITY BASED ESTIMATING  
(1 FTE EQUALS 1747 HOURS)

PBS: PBS07  
WBS: 1.1.H.C  
CTRL ACCT: HWR1  
CHARGE NO: HWR1K OPERATIONS/MAINTENANCE  
COMMENT#: F07-022, F07-035, F07-062

Resource:	Res Dept:	MNTREP	943	Class:	MAINTENANCE REP		EOC:		LABOR									
					Overtime:	SAL	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-		
Yr Hours:					0.0	0.0	1,484.5	1,474.8	1,469.4	322.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:					0.0	0.0	1,549.2	3,024.0	4,493.4	4,816.0	4,816.0	4,816.0	4,816.0	4,816.0	4,816.0	4,816.0	4,816.0	4,816.0
Yr Total Cost:					0	0	57,515	60,508	63,860	14,977	0	0	0	0	0	0	0	0
Cum Total Cost:					0	0	59,878	120,386	184,247	199,223	199,223	199,223	199,223	199,223	199,223	199,223	199,223	199,223

Resource:	Res Dept:	MVOOPR	943	Class:	MOTOR VEHICLE OPER		EOC:		LABOR									
					Overtime:	HOU	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-		
Yr Hours:					0.0	0.0	1,747.0	1,729.8	3,323.2	983.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:					0.0	0.0	1,831.0	3,560.8	6,884.0	7,867.0	7,867.0	7,867.0	7,867.0	7,867.0	7,867.0	7,867.0	7,867.0	7,867.0
Yr Total Cost:					0	0	56,211	58,938	119,944	37,906	0	0	0	0	0	0	0	0
Cum Total Cost:					0	0	58,763	117,701	237,645	275,551	275,551	275,551	275,551	275,551	275,551	275,551	275,551	275,551

Resource:	Res Dept:	ODC700	943	Class:	ODC 700		EOC:		ODC									
					Overtime:	ODC	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-		
Yr Units:					0.0	0.0	0.0	0.0	1,528,019.2	335,418.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Units:					0.0	0.0	0.0	0.0	1,528,019.2	1,863,438.0	1,863,438.0	1,863,438.0	1,863,438.0	1,863,438.0	1,863,438.0	1,863,438.0	1,863,438.0	1,863,438.0
Yr Total Cost:					0	0	0	0	1,703,162	384,707	0	0	0	0	0	0	0	0
Cum Total Cost:					0	0	0	0	1,703,162	2,087,869	2,087,869	2,087,869	2,087,869	2,087,869	2,087,869	2,087,869	2,087,869	2,087,869

Resource:	Res Dept:	OILERM	943	Class:	OILER MAINTENANCE		EOC:		LABOR									
					Overtime:	HOU	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-		
Yr Hours:					0.0	0.0	212.1	210.7	209.9	46.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:					0.0	0.0	221.3	432.0	641.9	688.0	688.0	688.0	688.0	688.0	688.0	688.0	688.0	688.0
Yr Total Cost:					0	0	6,282	6,609	6,975	1,636	0	0	0	0	0	0	0	0
Cum Total Cost:					0	0	6,540	13,150	20,125	21,761	21,761	21,761	21,761	21,761	21,761	21,761	21,761	21,761

Resource:	Res Dept:	OPRMGR	943	Class:	OPERATIONS MGR		EOC:		LABOR									
					Overtime:	SAL	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-		
Yr Hours:					0.0	0.0	7,396.2	6,320.7	10,496.0	2,304.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:					0.0	0.0	8,559.3	14,880.0	25,376.0	27,680.0	27,680.0	27,680.0	27,680.0	27,680.0	27,680.0	27,680.0	27,680.0	27,680.0

# Fluor Fernald, Inc.

DATE: 5-Sep-01  
PROJECT MGR: R. FELLMAN  
CAM: R. FELLMAN  
PREPARED BY: M. KOPP  
FISCAL YEAR: FY01 - FY09

ESTIMATE SUPPORT WORKSHEET  
FOR ACTIVITY BASED ESTIMATING  
(1 FTE EQUALS 1747 HOURS)

PBS: PBS07

WBS: 1.1.H.C

CTRL ACCT: HWRT

CHARGE NO: HWRTK OPERATIONS/MAINTENANCE

COMMENT#: F07-022, F07-035, F07-082

Yr Total Cost: 0  
Cum Total Cost: 0

Resource: PAINTR  
Res Dept: 943

PAINTER  
Overtime:

EOC:  
HOU

LABOR

Class:	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Yr Hours:	9.2	212.1	210.7	209.9	46.1	0.0	0.0	0.0	0.0
Cum Hours:	9.2	221.3	432.0	641.9	688.0	688.0	688.0	688.0	688.0
Yr Total Cost:	306	7,439	7,826	8,259	1,937	0	0	0	0
Cum Total Cost:	306	7,744	15,570	23,829	25,766	25,766	25,766	25,766	25,766

Resource: PIPE FITTER  
Res Dept: 943

PIPE FITTER  
Overtime:

EOC:  
HOU

LABOR

Class:	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Yr Hours:	276.9	6,362.3	6,320.7	6,287.6	1,382.4	0.0	0.0	0.0	0.0
Cum Hours:	276.9	6,639.3	12,960.0	19,257.6	20,640.0	20,640.0	20,640.0	20,640.0	20,640.0
Yr Total Cost:	9,103	221,524	233,052	245,963	57,684	0	0	0	0
Cum Total Cost:	9,103	230,627	463,679	709,643	767,327	767,327	767,327	767,327	767,327

Resource: PJSMGR  
Res Dept: 943

PROJECT SUPPORT MGR  
Overtime:

EOC:  
SAL

LABOR

Class:	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Yr Hours:	92.3	2,120.8	2,106.9	2,069.2	460.8	0.0	0.0	0.0	0.0
Cum Hours:	92.3	2,213.1	4,320.0	6,419.2	6,880.0	6,880.0	6,880.0	6,880.0	6,880.0
Yr Total Cost:	4,442	108,102	113,728	120,028	28,150	0	0	0	0
Cum Total Cost:	4,442	112,544	226,272	346,300	374,450	374,450	374,450	374,450	374,450

Resource: PJREP  
Res Dept: 943

PROJECT SUPPORT REP  
Overtime:

EOC:  
SAL

LABOR

Class:	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Yr Hours:	84.0	1,747.0	1,729.8	1,720.5	372.0	0.0	0.0	0.0	0.0
Cum Hours:	84.0	1,831.0	3,560.8	5,281.3	5,653.3	5,653.3	5,653.3	5,653.3	5,653.3
Yr Total Cost:	3,605	79,408	83,261	87,724	20,265	0	0	0	0
Cum Total Cost:	3,605	83,013	166,274	253,998	274,263	274,263	274,263	274,263	274,263

Resource: PRJMGR  
Res Dept: 943

PROJECT MANAGER  
Overtime:

EOC:  
SAL

LABOR

# Fluor Fernald, Inc.

DATE: 5-Sep-01  
PROJECT MGR: R. FELLMAN  
CAM: R. FELLMAN  
PREPARED BY: M. KOPP  
FISCAL YEAR: FY01 - FY09

ESTIMATE SUPPORT WORKSHEET  
FOR ACTIVITY BASED ESTIMATING  
(1 FTE EQUALS 1747 HOURS)

PBS: PBS07  
WBS: 1.1.H.C  
CTRL-ACCT: HWR1  
CHARGE NO: HWR1K OPERATIONS/MAINTENANCE  
COMMENT#: F07-022, F07-035, F07-062

	Oct 00-		Oct 01-		Oct 02-		Oct 03-		Oct 04-		Oct 05-		Oct 06-		Oct 07-		Oct 08-		Oct 09-	
	Yr Hours	0.0	8.4	174.7	173.0	172.1	37.2	0.0	0.0	565.3	565.3	565.3	565.3	565.3	565.3	565.3	565.3	565.3	565.3	565.3
Cum Hours	0.0	8.4	183.1	356.1	528.1	565.3	565.3	565.3	565.3	565.3	565.3	565.3	565.3	565.3	565.3	565.3	565.3	565.3	565.3	565.3
Yr Total Cost:	0	788	18,154	19,184	4,432	59,979	59,979	59,979	59,979	59,979	59,979	59,979	59,979	59,979	59,979	59,979	59,979	59,979	59,979	59,979
Cum Total Cost:	0	788	18,154	36,363	55,547	59,979	59,979	59,979	59,979	59,979	59,979	59,979	59,979	59,979	59,979	59,979	59,979	59,979	59,979	59,979

Resource: QACENG  
Res Dept: 943  
Class: LABOR

	Oct 00-		Oct 01-		Oct 02-		Oct 03-		Oct 04-		Oct 05-		Oct 06-		Oct 07-		Oct 08-		Oct 09-	
	Yr Hours	0.0	33.6	698.8	691.9	688.2	148.8	0.0	0.0	2,261.3	2,261.3	2,261.3	2,261.3	2,261.3	2,261.3	2,261.3	2,261.3	2,261.3	2,261.3	
Cum Hours	0.0	33.6	732.4	1,424.3	2,112.5	2,261.3	2,261.3	2,261.3	2,261.3	2,261.3	2,261.3	2,261.3	2,261.3	2,261.3	2,261.3	2,261.3	2,261.3	2,261.3	2,261.3	
Yr Total Cost:	0	1,625	35,807	37,544	9,138	123,671	123,671	123,671	123,671	123,671	123,671	123,671	123,671	123,671	123,671	123,671	123,671	123,671	123,671	
Cum Total Cost:	0	1,625	37,432	74,976	114,533	123,671	123,671	123,671	123,671	123,671	123,671	123,671	123,671	123,671	123,671	123,671	123,671	123,671	123,671	

Resource: RADENGINEER  
Res Dept: 943  
Class: LABOR

	Oct 00-		Oct 01-		Oct 02-		Oct 03-		Oct 04-		Oct 05-		Oct 06-		Oct 07-		Oct 08-		Oct 09-	
	Yr Hours	0.0	33.6	698.8	691.9	688.2	148.8	0.0	0.0	2,261.3	2,261.3	2,261.3	2,261.3	2,261.3	2,261.3	2,261.3	2,261.3	2,261.3	2,261.3	
Cum Hours	0.0	33.6	732.4	1,424.3	2,112.5	2,261.3	2,261.3	2,261.3	2,261.3	2,261.3	2,261.3	2,261.3	2,261.3	2,261.3	2,261.3	2,261.3	2,261.3	2,261.3	2,261.3	
Yr Total Cost:	0	1,669	36,773	38,557	40,624	9,384	127,007	127,007	127,007	127,007	127,007	127,007	127,007	127,007	127,007	127,007	127,007	127,007	127,007	
Cum Total Cost:	0	1,669	38,442	76,999	117,623	127,007	127,007	127,007	127,007	127,007	127,007	127,007	127,007	127,007	127,007	127,007	127,007	127,007	127,007	

Resource: RADMGR  
Res Dept: 943  
Class: LABOR

	Oct 00-		Oct 01-		Oct 02-		Oct 03-		Oct 04-		Oct 05-		Oct 06-		Oct 07-		Oct 08-		Oct 09-	
	Yr Hours	0.0	387.7	2,465.4	2,106.9	2,099.2	460.8	0.0	0.0	7,520.0	7,520.0	7,520.0	7,520.0	7,520.0	7,520.0	7,520.0	7,520.0	7,520.0	7,520.0	
Cum Hours	0.0	387.7	4,960.0 <td>4,960.0 </td></td></td></td></td></td></td></td></td></td></td></td></td></td></td></td>	4,960.0 <td>4,960.0 </td></td></td></td></td></td></td></td></td></td></td></td></td></td></td>	4,960.0 <td>4,960.0 </td></td></td></td></td></td></td></td></td></td></td></td></td></td>	4,960.0 <td>4,960.0 </td></td></td></td></td></td></td></td></td></td></td></td></td>	4,960.0 <td>4,960.0 </td></td></td></td></td></td></td></td></td></td></td></td>	4,960.0 <td>4,960.0 </td></td></td></td></td></td></td></td></td></td></td>	4,960.0 <td>4,960.0 </td></td></td></td></td></td></td></td></td></td>	4,960.0 <td>4,960.0 <td>4,960.0 <td>4,960.0 <td>4,960.0 <td>4,960.0 <td>4,960.0 <td>4,960.0 <td>4,960.0 <td>4,960.0 </td></td></td></td></td></td></td></td></td>	4,960.0 <td>4,960.0 <td>4,960.0 <td>4,960.0 <td>4,960.0 <td>4,960.0 <td>4,960.0 <td>4,960.0 <td>4,960.0 </td></td></td></td></td></td></td></td>	4,960.0 <td>4,960.0 <td>4,960.0 <td>4,960.0 <td>4,960.0 <td>4,960.0 <td>4,960.0 <td>4,960.0 </td></td></td></td></td></td></td>	4,960.0 <td>4,960.0 <td>4,960.0 <td>4,960.0 <td>4,960.0 <td>4,960.0 <td>4,960.0 </td></td></td></td></td></td>	4,960.0 <td>4,960.0 <td>4,960.0 <td>4,960.0 <td>4,960.0 <td>4,960.0 </td></td></td></td></td>	4,960.0 <td>4,960.0 <td>4,960.0 <td>4,960.0 <td>4,960.0 </td></td></td></td>	4,960.0 <td>4,960.0 <td>4,960.0 <td>4,960.0 </td></td></td>	4,960.0 <td>4,960.0 <td>4,960.0 </td></td>	4,960.0 <td>4,960.0 </td>	4,960.0	
Yr Total Cost:	0	31,212	172,806	204,018	148,776	157,019	36,825	546,637	546,637	546,637	546,637	546,637	546,637	546,637	546,637	546,637	546,637	546,637	546,637	
Cum Total Cost:	0	31,212	204,018	352,794	509,813	546,637	546,637	546,637	546,637	546,637	546,637	546,637	546,637	546,637	546,637	546,637	546,637	546,637	546,637	

Resource: RADTECH  
Res Dept: 943  
Class: LABOR

	Oct 00-		Oct 01-		Oct 02-		Oct 03-		Oct 04-		Oct 05-		Oct 06-		Oct 07-		Oct 08-		Oct 09-	
	Yr Hours	0.0	3,212.3	27,904.7	25,283.0	25,190.4	5,529.6	0.0	0.0	87,120.0	87,120.0	87,120.0	87,120.0	87,120.0	87,120.0	87,120.0	87,120.0	87,120.0	87,120.0	
Cum Hours	0.0	3,212.3	31,117.0	56,400.0	81,590.4	87,120.0	87,120.0	87,120.0	87,120.0	87,120.0	87,120.0	87,120.0	87,120.0	87,120.0	87,120.0	87,120.0	87,120.0	87,120.0	87,120.0	
Yr Total Cost:	0	160,212	1,115,838	1,017,280	1,073,639	251,795	3,618,763	3,618,763	3,618,763	3,618,763	3,618,763	3,618,763	3,618,763	3,618,763	3,618,763	3,618,763	3,618,763	3,618,763	3,618,763	
Cum Total Cost:	0	160,212	1,276,050	2,293,330	3,366,968	3,618,763	3,618,763	3,618,763	3,618,763	3,618,763	3,618,763	3,618,763	3,618,763	3,618,763	3,618,763	3,618,763	3,618,763	3,618,763	3,618,763	

# Fluor Fernald, Inc.

ESTIMATE SUPPORT WORKSHEET  
FOR ACTIVITY BASED ESTIMATING  
(1 FTE EQUALS 1747 HOURS)

DATE: 5-Sep-01  
PROJECT MGR: R. FELLMAN  
CAM: R. FELLMAN  
PREPARED BY: M. KOPP  
FISCAL YEAR: FY01 - FY09

PBS: PBS07  
WBS: 1.1.H.C  
CTRL ACCT: HWRT  
CHARGE NO: HWRTK OPERATIONS/MAINTENANCE  
COMMENT#: F07-022, F07-035, F07-062

Resource:	RIGGER	EOC:	LABOR								
Res Dept:	943	HOU									
Yr Hours:		Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Cum Hours:		0.0	129.2	2,969.1	2,949.7	2,938.9	645.1	0.0	0.0	0.0	0.0
Yr Total Cost:		0.0	129.2	3,098.3	6,048.0	8,986.9	9,632.0	9,632.0	9,632.0	9,632.0	9,632.0
Cum Total Cost:		0	4,279	104,139	109,559	115,628	27,118	0	0	0	0
			4,279	108,419	217,977	333,606	360,723	360,723	360,723	360,723	360,723

Resource:	S&HENG	EOC:	LABOR								
Res Dept:	943	SAL									
Yr Hours:		Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Cum Hours:		0.0	33.6	698.8	691.9	688.2	148.8	0.0	0.0	0.0	0.0
Yr Total Cost:		0.0	33.6	732.4	1,424.3	2,112.5	2,261.3	2,261.3	2,261.3	2,261.3	2,261.3
Cum Total Cost:		0	1,758	38,728	40,607	42,784	9,883	0	0	0	0
			1,758	40,486	81,094	123,878	133,761	133,761	133,761	133,761	133,761

Resource:	SERVSUB	EOC:	SUBCONTRACTORS								
Res Dept:	943	SUB									
Yr Units:		Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Cum Units:		0.0	0.0	69,627.3	72,872.7	159,578.6	35,029.4	0.0	0.0	0.0	0.0
Yr Total Cost:		0.0	0.0	69,627.3	142,500.0	302,078.6	337,108.0	337,108.0	337,108.0	337,108.0	337,108.0
Cum Total Cost:		0	0	73,438	79,013	177,870	40,177	0	0	0	0
			0	73,438	152,451	330,321	370,497	370,497	370,497	370,497	370,497

Resource:	WELDER	EOC:	LABOR								
Res Dept:	943	HOU									
Yr Hours:		Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Cum Hours:		0.0	18.5	424.2	421.4	419.8	92.2	0.0	0.0	0.0	0.0
Yr Total Cost:		0.0	18.5	442.6	864.0	1,283.8	1,376.0	1,376.0	1,376.0	1,376.0	1,376.0
Cum Total Cost:		0	611	14,877	15,651	16,518	3,874	0	0	0	0
			611	15,488	31,140	47,658	51,532	51,532	51,532	51,532	51,532

Resource:	WSTENG	EOC:	LABOR								
Res Dept:	943	SAL									
Yr Hours:		Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Cum Hours:		0.0	58.8	1,222.9	1,210.8	1,204.4	260.4	0.0	0.0	0.0	0.0
Yr Total Cost:		0.0	58.8	1,281.7	2,492.5	3,696.9	3,957.3	3,957.3	3,957.3	3,957.3	3,957.3
Cum Total Cost:		0	58.8	1,281.7	2,492.5	3,696.9	3,957.3	3,957.3	3,957.3	3,957.3	3,957.3

# Fluor Fernald, Inc.

DATE: 5-Sep-01  
PROJECT MGR: R. FELLMAN  
CAM: R. FELLMAN  
PREPARED BY: M. KOPP  
FISCAL YEAR: FY01 - FY09

ESTIMATE SUPPORT WORKSHEET  
FOR ACTIVITY BASED ESTIMATING  
(1 FTE EQUALS 1747 HOURS)

PBS: PBS07  
WBS: 1.1.H.C  
CTRL ACCT: HWR1  
CHARGE NO: HWR1K OPERATIONS/MAINTENANCE  
COMMENT#: F07-022, F07-035, F07-082

Yr	Total Cost	0	3,158	69,574	72,950	76,860	17,755	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:	0	3,158	72,733	145,683	222,543	240,298	240,298	240,298	240,298	240,298	240,298	240,298	240,298	240,298	240,298	240,298	240,298	240,298
GRAND TOTALS:																		
Yr Hours:																		
Cum Hours:																		
Yr Total Cost:																		
Cum Total Cost:																		

CAM: *Robert Fellman*

CONTROL TEAM: *Robert Fellman*

**HWR1L**

**SAFE SHUTDOWN**



# Fluor Fernald, Inc.

ESTIMATE SUPPORT WORKSHEET  
FOR ACTIVITY BASED ESTIMATING

DATE: 5-Sep-01  
PROJECT MGR: R. FELLMAN  
CAM: R. FELLMAN  
PREPARED BY: M. KOPP  
FISCAL YEAR: FY01 - FY09

PBS07  
WBS: 1.1.HC  
CTRL ACCT: HWR1  
CHARGE NO: HWR1L  
COMMENT#: F07-022, F07-035

(1 FTE EQUALS 1747 HOURS)

Resource:	Res Dept:	CHMOPR Overtime:	LABOR											
			EOC:		HOU		Class:		EOC:		HOU		Class:	
	943		Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-		
			Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10		
Yr Hours			0.0	0.0	0.0	0.0	0.0	3,390.0	0.0	0.0	0.0	0.0		
Cum Hours:			0.0	0.0	0.0	0.0	0.0	3,390.0	3,390.0	3,390.0	3,390.0	3,390.0		
Yr Total Cost:			0	0	0	0	0	141,321	0	0	0	0		
Cum Total Cost:			0	0	0	0	0	141,321	141,321	141,321	141,321	141,321		

Resource:	Res Dept:	CRPNTR Overtime:	LABOR											
			EOC:		HOU		Class:		EOC:		HOU		Class:	
	943		Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-		
			Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10		
Yr Hours			0.0	0.0	0.0	0.0	0.0	339.0	0.0	0.0	0.0	0.0		
Cum Hours:			0.0	0.0	0.0	0.0	0.0	339.0	339.0	339.0	339.0	339.0		
Yr Total Cost:			0	0	0	0	0	14,028	0	0	0	0		
Cum Total Cost:			0	0	0	0	0	14,028	14,028	14,028	14,028	14,028		

Resource:	Res Dept:	ELECTN Overtime:	LABOR											
			EOC:		HOU		Class:		EOC:		HOU		Class:	
	943		Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-		
			Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10		
Yr Hours			0.0	0.0	0.0	0.0	0.0	678.0	0.0	0.0	0.0	0.0		
Cum Hours:			0.0	0.0	0.0	0.0	0.0	678.0	678.0	678.0	678.0	678.0		
Yr Total Cost:			0	0	0	0	0	28,391	0	0	0	0		
Cum Total Cost:			0	0	0	0	0	28,391	28,391	28,391	28,391	28,391		

Resource:	Res Dept:	ENGPRC Overtime:	LABOR											
			EOC:		SAL		Class:		EOC:		SAL		Class:	
	943		Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-		
			Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10		
Yr Hours			0.0	0.0	0.0	0.0	0.0	1,356.0	0.0	0.0	0.0	0.0		
Cum Hours:			0.0	0.0	0.0	0.0	0.0	1,356.0	1,356.0	1,356.0	1,356.0	1,356.0		
Yr Total Cost:			0	0	0	0	0	101,425	0	0	0	0		
Cum Total Cost:			0	0	0	0	0	101,425	101,425	101,425	101,425	101,425		

Resource:	Res Dept:	HAZWAT Overtime:	LABOR											
			EOC:		HOU		Class:		EOC:		HOU		Class:	
	943		Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-		
			Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10		
Yr Hours			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Cum Hours:			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Yr Total Cost:			0	0	0	0	0	0	0	0	0	0		
Cum Total Cost:			0	0	0	0	0	0	0	0	0	0		

# Fluor Fernald, Inc.

ESTIMATE SUPPORT WORKSHEET  
FOR ACTIVITY BASED ESTIMATING

DATE: 5-Sep-01  
PROJECT MGR: R. FELLMAN  
CAM: R. FELLMAN  
PREPARED BY: M. KOPP  
FISCAL YEAR: FY01 - FY09

PBS: PBS07  
WBS: 1.1.H.C  
CTRL ACCT: HWR1  
CHARGE NO: HWR1L  
COMMENT#: F07-022, F07-035  
(1 FTE EQUALS 1747 HOURS)

	Oct 00-		Oct 01-		Oct 02-		Oct 03-		Oct 04-		Oct 05-		Oct 06-		Oct 07-		Oct 08-		Oct 09-	
	Yr	Total Cost																		
Yr Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Resource:	Res Dept:	HECOOPR 943	HEAVY EQUIP OPERATOR Overtime:	Class:	EOC: HOU	LABOR		EOC: HOU
						Yr	Total Cost	
Yr Hours:			0.0			0.0	0.0	0.0
Cum Hours:			0.0			0.0	0.0	0.0
Yr Total Cost:			0			0	0	0
Cum Total Cost:			0			0	0	0

Resource:	Res Dept:	INSMEC 943	INSTRUMENT MECHANIC Overtime:	Class:	EOC: HOU	LABOR		EOC: HOU
						Yr	Total Cost	
Yr Hours:			0.0			0.0	0.0	0.0
Cum Hours:			0.0			0.0	0.0	0.0
Yr Total Cost:			0			0	0	0
Cum Total Cost:			0			0	0	0

Resource:	Res Dept:	MILWRT 943	MILLWRIGHT Overtime:	Class:	EOC: HOU	LABOR		EOC: HOU
						Yr	Total Cost	
Yr Hours:			0.0			0.0	0.0	0.0
Cum Hours:			0.0			0.0	0.0	0.0
Yr Total Cost:			0			0	0	0
Cum Total Cost:			0			0	0	0

Resource:	Res Dept:	MNTREP 943	MAINTENANCE REP Overtime:	Class:	EOC: SAL	LABOR		EOC: SAL
						Yr	Total Cost	
Yr Hours:			0.0			0.0	0.0	0.0
Cum Hours:			0.0			0.0	0.0	0.0
Yr Total Cost:			0			0	0	0
Cum Total Cost:			0			0	0	0

# Fluor Fernald, Inc.

DATE: 5-Sep-01  
PROJECT MGR: R. FELLMAN  
CAM: R. FELLMAN  
PREPARED BY: M. KOPP  
FISCAL YEAR: FY01 - FY09

ESTIMATE SUPPORT WORKSHEET  
FOR ACTIVITY BASED ESTIMATING

(1 FTE EQUALS 1747 HOURS)

PBS: PBS07  
WBS: 1.1.H.C  
CTRL ACCT: HWR1  
CHARGE NO: HWR1L  
COMMENT#: F07-022, F07-035

Resource: MVOOPR MOTOR VEHICLE OPER EOC: LABOR  
Res Dept: 943 Overtime: HOU Class:

	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Yr Hours:	0.0	0.0	0.0	0.0	0.0	678.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	0.0	0.0	678.0	678.0	678.0	678.0	678.0
Yr Total Cost:	0	0	0	0	0	26,144	0	0	0	0
Cum Total Cost:	0	0	0	0	0	26,144	26,144	26,144	26,144	26,144

Resource: OPRMGR OPERATIONS MGR EOC: LABOR  
Res Dept: 943 Overtime: SAL Class:

	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Yr Hours:	0.0	0.0	0.0	0.0	0.0	678.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	0.0	0.0	678.0	678.0	678.0	678.0	678.0
Yr Total Cost:	0	0	0	0	0	47,361	0	0	0	0
Cum Total Cost:	0	0	0	0	0	47,361	47,361	47,361	47,361	47,361

Resource: PIPFTR PIPE FITTER EOC: LABOR  
Res Dept: 943 Overtime: HOU Class:

	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Yr Hours:	0.0	0.0	0.0	0.0	0.0	678.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	0.0	0.0	678.0	678.0	678.0	678.0	678.0
Yr Total Cost:	0	0	0	0	0	28,291	0	0	0	0
Cum Total Cost:	0	0	0	0	0	28,291	28,291	28,291	28,291	28,291

Resource: PJSREP PROJECT SUPPORT REP EOC: LABOR  
Res Dept: 943 Overtime: SAL Class:

	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Yr Hours:	0.0	0.0	0.0	0.0	0.0	67.8	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	0.0	0.0	67.8	67.8	67.8	67.8	67.8
Yr Total Cost:	0	0	0	0	0	3,693	0	0	0	0
Cum Total Cost:	0	0	0	0	0	3,693	3,693	3,693	3,693	3,693

Resource: RADENG RAD ENGINEER EOC: LABOR  
Res Dept: 943 Overtime: SAL Class:

	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Yr Hours:	0.0	0.0	0.0	0.0	0.0	339.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	0.0	0.0	339.0	339.0	339.0	339.0	339.0

# Fluor Fernald, Inc.

ESTIMATE SUPPORT WORKSHEET  
FOR ACTIVITY BASED ESTIMATING

DATE: 5-Sep-01  
PROJECT MGR: R. FELLMAN  
CAM: R. FELLMAN  
PREPARED BY: M. KOPP  
FISCAL YEAR: FY01 - FY09

PBS: PBS07  
WBS: 1.1.H.C  
CTRL ACCT: HWR1  
CHARGE NO: HWR1L  
COMMENT#: F07-022, F07-035  
(1 FTE EQUALS 1747 HOURS)

Yr Total Cost: 0 0 0 0 0 21,379 0 0 21,379 21,379 0 0 21,379 21,379 0 0 21,379  
Cum Total Cost: 0 0 0 0 0 21,379 21,379 21,379 21,379 21,379 21,379 21,379 21,379 21,379 21,379 21,379 21,379

Resource: RADTEC  
Res Dept: 943  
Class: LABOR

EOC: SAL

RAD TECH  
Overtime:

Yr	Hours:	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Cum Hours:		0.0	0.0	0.0	0.0	0.0	1,017.0	0.0	0.0	0.0	0.0
Yr Total Cost:		0	0	0	0	0	1,017.0	0	0	0	1,017.0
Cum Total Cost:		0	0	0	0	0	46,310	0	0	0	46,310

Resource: S&HENG  
Res Dept: 943  
Class: LABOR

EOC: SAL

SAFETY ENGINEER  
Overtime:

Yr	Hours:	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Cum Hours:		0.0	0.0	0.0	0.0	0.0	169.5	0.0	0.0	0.0	0.0
Yr Total Cost:		0	0	0	0	0	169.5	0	0	0	169.5
Cum Total Cost:		0	0	0	0	0	11,258	0	0	0	11,258

Resource: TPSREP  
Res Dept: 943  
Class: LABOR

EOC: SAL

TECH/PROG SUPT REP  
Overtime:

Yr	Hours:	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Cum Hours:		0.0	0.0	0.0	0.0	0.0	339.0	0.0	0.0	0.0	0.0
Yr Total Cost:		0	0	0	0	0	339.0	0	0	0	339.0
Cum Total Cost:		0	0	0	0	0	23,535	0	0	0	23,535

Resource: WSTENG  
Res Dept: 943  
Class: LABOR

EOC: SAL

WASTE ENGINEER  
Overtime:

Yr	Hours:	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Cum Hours:		0.0	0.0	0.0	0.0	0.0	678.0	0.0	0.0	0.0	0.0
Yr Total Cost:		0	0	0	0	0	678.0	0	0	0	678.0
Cum Total Cost:		0	0	0	0	0	46,228	0	0	0	46,228

GRAND TOTALS:

Yr	Hours:	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Cum Hours:		0.0	0.0	0.0	0.0	0.0	14,644.8	0.0	0.0	0.0	0.0
Yr Total Cost:		0	0	0	0	0	14,644.8	0	0	0	0
Cum Total Cost:		0	0	0	0	0	14,644.8	0	0	0	14,644.8





**HWR1M**

**MAINTENANCE FACILITY**



# Fluor Fernald, Inc.

ESTIMATE SUPPORT WORKSHEET  
FOR ACTIVITY BASED ESTIMATING

COMMENT#: F07-022, F07-035

DATE: 5-Sep-01  
PROJECT MGR: R. FELLMAN  
CAM: R. FELLMAN  
PREPARED BY: M. KOPP  
FISCAL YEAR: FY01 - FY09

(1 FTE EQUALS 1747 HOURS)

Resource:	CRPNTR	CARPENTER		Class:		LABOR		EOC:			
Res Dept:	943	Overtime:		Class:		LABOR		HOU			
Yr Hours:		Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Cum Hours:		Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10
Yr Total Cost:		0.0	32.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Total Cost:		0	32.7	32.7	32.7	32.7	32.7	32.7	32.7	32.7	32.7
		0	1,067	0	0	0	0	0	0	0	0
		0	1,067	1,067	1,067	1,067	1,067	1,067	1,067	1,067	1,067

Resource:	ELECTN	ELECTRICIAN		Class:		LABOR		EOC:			
Res Dept:	943	Overtime:		Class:		LABOR		HOU			
Yr Hours:		Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Cum Hours:		Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10
Yr Total Cost:		0.0	981.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Total Cost:		0	981.7	981.7	981.7	981.7	981.7	981.7	981.7	981.7	981.7
		0	32,385	0	0	0	0	0	0	0	0
		0	32,385	32,385	32,385	32,385	32,385	32,385	32,385	32,385	32,385

Resource:	ENGPRC	ENG PROCESS/STARTUP		Class:		LABOR		EOC:			
Res Dept:	943	Overtime:		Class:		LABOR		SAL			
Yr Hours:		Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Cum Hours:		Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10
Yr Total Cost:		0.0	32.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Total Cost:		0	32.7	32.7	32.7	32.7	32.7	32.7	32.7	32.7	32.7
		0	1,928	0	0	0	0	0	0	0	0
		0	1,928	1,928	1,928	1,928	1,928	1,928	1,928	1,928	1,928

Resource:	HEOOPR	HEAVY EQUIP OPERATOR		Class:		LABOR		EOC:			
Res Dept:	943	Overtime:		Class:		LABOR		HOU			
Yr Hours:		Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Cum Hours:		Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10
Yr Total Cost:		0.0	327.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Total Cost:		0	327.2	327.2	327.2	327.2	327.2	327.2	327.2	327.2	327.2
		0	327.2	0	0	0	0	0	0	0	0
		0	327.2	327.2	327.2	327.2	327.2	327.2	327.2	327.2	327.2

# Fluor Fernald, Inc.

DATE: 5-Sep-01  
PROJECT MGR: R. FELLMAN  
CAM: R. FELLMAN  
PREPARED BY: M. KOPP  
FISCAL YEAR: FY01 - FY09

ESTIMATE SUPPORT WORKSHEET  
FOR ACTIVITY BASED ESTIMATING  
(1 FTE EQUALS 1747 HOURS)

PBS: PBS07  
WBS: 1.1.H.C  
CTRL ACCT: HWR1  
CHARGE NO: HWR1M  
COMMENT#: F07-022, F07-035

Yr Total Cost: 0 10,836 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0  
Cum Total Cost: 0 10,836 10,836 10,836 10,836 10,836 10,836 10,836 10,836 10,836 10,836 10,836 10,836 10,836 10,836 10,836 10,836 10,836 10,836 10,836

Resource: INSMEC INSTRUMENT MECHANIC EOC: LABOR  
Res Dept: 943 Overtime: HOU

	Oct 00-		Oct 01-		Oct 02-		Oct 03-		Oct 04-		Oct 05-		Oct 06-		Oct 07-		Oct 08-		Oct 09-	
	Yr	Cum	Yr	Cum	Yr	Cum	Yr	Cum	Yr	Cum	Yr	Cum	Yr	Cum	Yr	Cum	Yr	Cum	Yr	Cum
Hours:	0.0	0.0	65.4	65.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Cost:	0	0	2,147	2,147	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Cost:	0	0	2,147	2,147	2,147	2,147	2,147	2,147	2,147	2,147	2,147	2,147	2,147	2,147	2,147	2,147	2,147	2,147	2,147	2,147

Resource: MAT300 MATERIAL OBJCLASS300 EOC: MATERIAL  
Res Dept: 943 Overtime: MAT

	Oct 00-		Oct 01-		Oct 02-		Oct 03-		Oct 04-		Oct 05-		Oct 06-		Oct 07-		Oct 08-		Oct 09-	
	Yr	Cum	Yr	Cum	Yr	Cum	Yr	Cum	Yr	Cum	Yr	Cum	Yr	Cum	Yr	Cum	Yr	Cum	Yr	Cum
Units:	0.0	0.0	45,740.0	45,740.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Cost:	0	0	46,975	46,975	0	0	45,740.0	45,740.0	0	0	45,740.0	45,740.0	0	0	45,740.0	45,740.0	0	0	45,740.0	45,740.0
Total Cost:	0	0	46,975	46,975	46,975	46,975	46,975	46,975	46,975	46,975	46,975	46,975	46,975	46,975	46,975	46,975	46,975	46,975	46,975	46,975

Resource: MILLWRIGHT MILLWRIGHT EOC: LABOR  
Res Dept: 943 Overtime: HOU

	Oct 00-		Oct 01-		Oct 02-		Oct 03-		Oct 04-		Oct 05-		Oct 06-		Oct 07-		Oct 08-		Oct 09-	
	Yr	Cum	Yr	Cum	Yr	Cum	Yr	Cum	Yr	Cum	Yr	Cum	Yr	Cum	Yr	Cum	Yr	Cum	Yr	Cum
Hours:	0.0	0.0	981.7	981.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Cost:	0	0	32,292	32,292	0	0	981.7	981.7	0	0	981.7	981.7	0	0	981.7	981.7	0	0	981.7	981.7
Total Cost:	0	0	32,292	32,292	32,292	32,292	32,292	32,292	32,292	32,292	32,292	32,292	32,292	32,292	32,292	32,292	32,292	32,292	32,292	32,292

Resource: MNTMGR MAINTENANCE MGR EOC: SAL  
Res Dept: 943 Overtime: SAL

	Oct 00-		Oct 01-		Oct 02-		Oct 03-		Oct 04-		Oct 05-		Oct 06-		Oct 07-		Oct 08-		Oct 09-	
	Yr	Cum	Yr	Cum	Yr	Cum	Yr	Cum	Yr	Cum	Yr	Cum	Yr	Cum	Yr	Cum	Yr	Cum	Yr	Cum
Hours:	0.0	0.0	327.2	327.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Cost:	0	0	15,356	15,356	0	0	327.2	327.2	0	0	327.2	327.2	0	0	327.2	327.2	0	0	327.2	327.2
Total Cost:	0	0	15,356	15,356	15,356	15,356	15,356	15,356	15,356	15,356	15,356	15,356	15,356	15,356	15,356	15,356	15,356	15,356	15,356	15,356

# Fluor Fernald, Inc.

ESTIMATE SUPPORT WORKSHEET  
FOR ACTIVITY BASED ESTIMATING

COMMENT#: F07-022, F07-035

DATE: 5-Sep-01  
PROJECT MGR: R. FELLMAN  
CAM: R. FELLMAN  
PREPARED BY: M. KOPP  
FISCAL YEAR: FY01 - FY09

(1 FTE EQUALS 1747 HOURS)

<b>Resource:</b> MNTREP	<b>MAINTENANCE REP</b>	<b>EOC:</b>	<b>LABOR</b>
<b>Res Dept:</b> 943	<b>Overtime:</b>	<b>SAL</b>	
		<b>Class:</b>	
Yr Hours:	Oct 01- Sep 01	Oct 02- Sep 02	Oct 03- Sep 03
Cum Hours	0.0 0.0	0.0 0.0	0.0 0.0
Yr Total Cost:	32.7 0	32.7 0	32.7 0
Cum Total Cost:	1,197 1,197	1,197 1,197	1,197 1,197

<b>Resource:</b> ODC700	<b>ODC 700</b>	<b>EOC:</b>	<b>ODC</b>
<b>Res Dept:</b> 943	<b>Overtime:</b>	<b>ODC</b>	
		<b>Class:</b>	
Yr Units:	Oct 01- Sep 01	Oct 02- Sep 02	Oct 03- Sep 03
Cum Units:	0.0 0.0	0.0 0.0	0.0 0.0
Yr Total Cost:	4,200.0 0	4,200.0 0	4,200.0 0
Cum Total Cost:	4,313 4,313	4,313 4,313	4,313 4,313

<b>Resource:</b> PIPEFTR	<b>PIPE FITTER</b>	<b>EOC:</b>	<b>LABOR</b>
<b>Res Dept:</b> 943	<b>Overtime:</b>	<b>HOU</b>	
		<b>Class:</b>	
Yr Hours:	Oct 01- Sep 01	Oct 02- Sep 02	Oct 03- Sep 03
Cum Hours	654.5 0.0	0.0 0.0	0.0 0.0
Yr Total Cost:	654.5 0	654.5 0	654.5 0
Cum Total Cost:	21,514 21,514	21,514 21,514	21,514 21,514

<b>Resource:</b> RIGGER	<b>RIGGER</b>	<b>EOC:</b>	<b>LABOR</b>
<b>Res Dept:</b> 943	<b>Overtime:</b>	<b>HOU</b>	
		<b>Class:</b>	
Yr Hours:	Oct 01- Sep 01	Oct 02- Sep 02	Oct 03- Sep 03
Cum Hours	98.2 0.0	0.0 0.0	0.0 0.0
Yr Total Cost:	98.2 0	98.2 0	98.2 0
Cum Total Cost:	3,251 3,251	3,251 3,251	3,251 3,251

<b>Resource:</b> S&HENG	<b>SAFETY ENGINEER</b>	<b>EOC:</b>	<b>LABOR</b>
<b>Res Dept:</b> 943	<b>Overtime:</b>	<b>SAL</b>	
		<b>Class:</b>	
Yr Hours:	Oct 01- Sep 01	Oct 02- Sep 02	Oct 03- Sep 03
Cum Hours	0.0 0.0	0.0 0.0	0.0 0.0
Yr Total Cost:	0 0	0 0	0 0
Cum Total Cost:	0 0	0 0	0 0

# Fluor Fernald, Inc.

ESTIMATE SUPPORT WORKSHEET  
FOR ACTIVITY BASED ESTIMATING

PROJECT MGR: R. FELLMAN  
CAM: R. FELLMAN  
PREPARED BY: M. KOPP  
FISCAL YEAR: FY01 - FY09

PBS 07  
1.1.H.C  
CTRL ACCT: HWR1  
CHARGE NO: HWR1M  
COMMENT#: F07-022, F07-035

Yr Hours:	0.0	327.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	327.2	327.2	327.2	327.2	327.2	327.2	327.2	327.2	327.2	327.2	327.2	327.2	327.2	327.2
Yr Total Cost:	0	17,123	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:	0	17,123	17,123	17,123	17,123	17,123	17,123	17,123	17,123	17,123	17,123	17,123	17,123	17,123	17,123

(1 FTE EQUALS 1747 HOURS)

Resource:	WELDER	WELDER	EOC:	LABOR																				
Res Dept:	943		HOU																					
				Class:	Oct 01-		Oct 02-		Oct 03-		Oct 04-		Oct 05-		Oct 06-		Oct 07-		Oct 08-		Oct 09-			
					Oct 01-	Sep 02	Oct 02-	Sep 03	Oct 03-	Sep 04	Oct 04-	Sep 05	Oct 05-	Sep 06	Oct 06-	Sep 07	Oct 07-	Sep 08	Oct 08-	Sep 09	Oct 09-	Sep 10		
Yr Hours:	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Cum Hours:	0	0	0		0	65.4	0	65.4	0	65.4	0	65.4	0	65.4	0	65.4	0	65.4	0	65.4	0	65.4	0	
Yr Total Cost:	0	0	0		2,167	0	2,167	0	2,167	0	2,167	0	2,167	0	2,167	0	2,167	0	2,167	0	2,167	0	2,167	
Cum Total Cost:	0	0	0		2,167	2,167	2,167	2,167	2,167	2,167	2,167	2,167	2,167	2,167	2,167	2,167	2,167	2,167	2,167	2,167	2,167	2,167	2,167	
<b>GRAND TOTALS:</b>					0	192,552	0	192,552	0	192,552	0	192,552	0	192,552	0	192,552	0	192,552	0	192,552	0	192,552	0	192,552

*Robert Fellman*

CAM

CONTROL TEAM *Arnold P. West*

**HWR1P**

**PROJECT MANAGEMENT**





# Fluor Fernald, Inc.

ESTIMATE SUPPORT WORKSHEET  
FOR ACTIVITY BASED ESTIMATING

DATE: 5-Sep-01  
PROJECT MGR: R. FELLMAN  
CAM: R. FELLMAN  
PREPARED BY: M. KOPP  
FISCAL YEAR: FY01 - FY09

COMMENT# F07-022, F07-035

(1 FTE EQUALS 1747 HOURS)

Yr Total Cost:	205,070	262,324	277,854	294,236	311,678	198,001	0	0	0	0	0	0
Cum Total Cost:	205,070	467,394	745,248	1,039,484	1,351,162	1,549,163	1,549,163	1,549,163	1,549,163	1,549,163	1,549,163	1,549,163

Resource: QACMGR  
Res Dept: 943

QA MANAGER  
Overtime:

EOC:  
SAL

LABOR

Yr Hours:	575.0	698.8	698.8	698.8	698.8	415.5	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	575.0	1,273.8	1,972.6	2,671.4	3,370.2	3,785.7	3,785.7	3,785.7	3,785.7	3,785.7	3,785.7	3,785.7
Yr Total Cost:	30,947	39,587	41,930	44,403	47,035	29,880	0	0	0	0	0	0
Cum Total Cost:	30,947	70,534	112,464	156,867	203,902	233,782	233,782	233,782	233,782	233,782	233,782	233,782

Resource: S&HMGR  
Res Dept: 943

SAFETY & HEALTH MGR  
Overtime:

EOC:  
SAL

LABOR

Yr Hours:	575.0	698.8	698.8	698.8	698.8	415.5	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	575.0	1,273.8	1,972.6	2,671.4	3,370.2	3,785.7	3,785.7	3,785.7	3,785.7	3,785.7	3,785.7	3,785.7
Yr Total Cost:	31,873	40,771	43,185	45,731	48,442	30,774	0	0	0	0	0	0
Cum Total Cost:	31,873	72,644	115,829	161,559	210,001	240,775	240,775	240,775	240,775	240,775	240,775	240,775

Resource: SECRET  
Res Dept: 943

SECRETARIES  
Overtime:

EOC:  
SAL

LABOR

Yr Hours:	1,725.0	2,096.4	2,096.4	2,096.4	2,096.4	1,246.5	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	1,725.0	3,821.4	5,917.8	8,014.2	10,110.6	11,357.2	11,357.2	11,357.2	11,357.2	11,357.2	11,357.2	11,357.2
Yr Total Cost:	38,520	49,274	52,191	55,268	58,545	37,192	0	0	0	0	0	0
Cum Total Cost:	38,520	87,794	139,985	195,253	253,797	290,989	290,989	290,989	290,989	290,989	290,989	290,989

Resource: TPMSMGR  
Res Dept: 943

TECH/PROG SUPT MGR  
Overtime:

EOC:  
SAL

LABOR

# Fluor Fernald, Inc.

DATE: 5-Sep-01  
PROJECT MGR: R. FELLMAN  
CAM: R. FELLMAN  
PREPARED BY: M. KOPP  
FISCAL YEAR: FY01 - FY09

ESTIMATE SUPPORT WORKSHEET  
FOR ACTIVITY BASED ESTIMATING  
(1 FTE EQUALS 1747 HOURS)

PBS: PBS07  
WBS: 1.1.H.C  
CTRL ACCT: HWR1  
CHARGE NO: HWR1P  
COMMENT#: F07-022, F07-035

	TECH/PROG SUPT REP		LABOR		EOC:	
	OverTime:	Class:	SAL			
Yr Hours:	287.5	349.4	349.4	207.8	1,892.9	1,892.9
Cum Hours:	287.5	636.9	986.3	1,892.9	1,892.9	1,892.9
Yr Total Cost:	17,952	22,964	24,323	17,333	0	0
Cum Total Cost:	17,952	40,915	65,238	135,613	135,613	135,613

	UNESCALATED SUBS		SUBCONTRACTORS		EOC:	
	OverTime:	Class:	SUB			
Yr Hours:	1,150.0	1,397.6	1,397.6	831.0	0.0	0.0
Cum Hours:	1,150.0	2,547.6	5,342.8	7,571.4	7,571.4	7,571.4
Yr Total Cost:	59,755	76,438	80,963	90,819	0	0
Cum Total Cost:	59,755	136,192	217,155	393,710	451,405	451,405

	UNESCALATED SUBS		SUBCONTRACTORS		EOC:	
	OverTime:	Class:	SUB			
Yr Units:	27,950.0	0.0	0.0	0.0	0.0	0.0
Cum Units:	27,950.0	27,950.0	27,950.0	27,950.0	27,950.0	27,950.0
Yr Total Cost:	27,950	0	0	0	0	0
Cum Total Cost:	27,950	27,950	27,950	27,950	27,950	27,950

	UNESCALATED SUBS		SUBCONTRACTORS		EOC:	
	OverTime:	Class:	SUB			
Yr Hours:	9,631.3	11,704.9	11,704.9	6,959.8	0.0	0.0
Cum Hours:	9,631.3	21,336.2	44,746.0	63,410.8	63,410.8	63,410.8
Yr Total Cost:	597,686	728,802	771,947	865,920	0	0
Cum Total Cost:	597,686	1,326,487	2,098,434	3,781,815	4,331,912	4,331,912

GRAND TOTALS:

CONTROL TEAM: *Robert Fellman*

*Robert Fellman*

CAM



## **SECTION 3**

### **5.0 RISK PLAN**



# Risk/Opportunity Identification and Analysis Form

Project: AWR Project, F-W		PBS Number: 07		Total Baseline Dollars (Minimum Case):		\$5,326,385					
Evaluator: M. Connors		Date: Aug. 15, 2001		WBS Number: 1.1.H.C							
CAM: R. Fellman		Date: Aug. 15, 2001		Control Account Number: HSWR							
Project Task	Risk and/or Opportunity	Potential Impact	Internal Or External Driver	Impact Cost \$ (Maximum Case)	Risk Level	Risk Impact	Risk Probability %	Risk Probability Level	Probable Cost \$ (Likeliest Case)	Risk Critical Value	Risk Handling Strategy
Contracts	Settlement Agreement with FWENC exceeds contract funded value due to substantive claims by FWENC.	Payment to FWENC exceeds current estimated earned value of \$27 million.	Internal	\$13,512,000	5		50	3	\$6,756,000		10 Accept
			Total:	\$13,512,000				Total:	\$6,756,000		

# Risk/Opportunity Identification and Analysis Form

Project: AWR Project  
 Evaluator: M. Connors  
 CAM: R. Fellman  
 Date: Aug. 15, 2001  
 Date: Aug. 15, 2001  
 Control Account Number: HWR1  
 Risk and/or Opportunity  
 Potential Impact  
 Internal  
 Or  
 External  
 Driver  
 Impact  
 Cost \$  
 (Maximum  
 Case)  
 Risk  
 Impact  
 Level  
 Risk  
 Probability  
 %  
 Risk  
 Probability  
 Level  
 Probable  
 Cost \$  
 (Likeliest  
 Case)  
 Risk  
 Critical  
 Value  
 Risk  
 Handling  
 Strategy  
 Total Baseline Dollars (Minimum Case): \$94,360,701

Contract	Design Due Diligence identifies significant design modifications to safely operate the AWR System. Equipment assigned during Due Diligence is not ready and not available.	Results in schedule delays while DCNs are processed.	Internal	\$3,000,000	3	50	3	\$1,500,000	4	Accept
Contract	Equipment installation and movement over the silos falls onto the silos.	Results in schedule delays while completing equipment fabrication approximately 4 months. RCS Silo dome collapses. RCS becomes ineffective. Radon release to environment, requiring an evacuation. Significant delays.	Internal	\$3,000,000	3	50	3	\$1,500,000	4	Accept
Construction	Delays in equipment deliveries impact construction schedule.	Procurement schedules are aggressive and may require overtime to compensate for delays in equipment	Internal	\$25,454,000	5	20	2	\$5,090,800	8	Accept
Construction	Weather delays impact the construction schedule.	Procurement schedules are aggressive and may require overtime to compensate for weather delays	Internal	\$1,000,000	2	50	3	\$500,000	2	Accept
Construction	Modifications to the Silo 4 bridge are more extensive than designed, based on field conditions.	Construction schedule is aggressive and may require overtime to compensate for weather delays	Internal	\$1,000,000	2	50	3	\$500,000	2	Accept
Operations	K-65 material does not flow as predicted in the design (lower than 10% percent solids).	Additional costs for the design and construction modifications, which would extend the construction schedule 3 months.	Internal	\$300,000	1	40	3	\$120,000	1	AWR Due Diligence Review to develop mitigation plan.
Operations	Transfer tank capacity does not contain all of the silo material.	Shut down waste transfer activities until an additional storage tank is fabricated and installed in a shielded area. Schedule impact is 9 months.	Internal	\$11,574,000	5	70	4	\$8,101,800	11	AWR Due Diligence Review to develop mitigation plan.
Operations	Full-scale mock-up testing reveals significant design, operability, and safety issues with key equipment.	Would result in a longer settling time and maintenance of the pipeline between waste retrieval activities.	Internal	\$12,727,000	5	40	3	\$5,090,800	10	AWR Due Diligence Review to validate risk and develop mitigation plan.
Operations	FAT&LC laborers are not available to support the AWR project schedule.	The impact would be a redesign, procurement and/or modification of long lead time equipment, resulting in a schedule delay of 8 months.	Internal	\$13,388,000	5	40	3	\$6,347,200	10	Accept
Operations		Delays operation of AWR and would be subject to a claim from the Contractor. Assume 4 month delay.	Internal	\$3,988,000	3	30	2	\$1,196,800	3	Accept

# Risk/Opportunity Identification and Analysis Form

Project: AWR Project		PBS Number: 07		Total Baseline Dollars (Minimum Case):		\$94,360,701				
Evaluator: M. Connors		Date: Aug. 15, 2001		WBS Number: 1.1.H.C						
CAM: R. Fellman		Date: Aug. 15, 2001		Control Account Number: HWR1						
Project Task	Risk and/or Opportunity	Internal Or External Driver	Potential Impact	Impact Cost \$ (Maximum Case)	Risk Impact Level	Risk Probability %	Risk Probability Level	Probable Cost \$ (Likeliest Case)	Risk Critical Value	Risk Handling Strategy
Operations	Use of supernatant from TTA tanks to support the slurry process does not meet the water quality requirements.	Internal	This would result in the silo waste retrieval process being a wastewater generator instead of a water user, as designed. This would result in greater wastewater volumes to AWWT and to the High Nitrate Tank. If AWWT could not treat this increased volume, results in delays in operations of 3 months.	\$2,484,000	3	60	4	\$1,490,400	5	AWR Due Diligence Review to develop mitigation plan.
Operations	Lack of key equipment spare parts.	Internal	Results in delays in operations of 3 months.	\$4,525,000	3	40	3	\$1,810,000	4	Accept
Operations	Utilizing EMMA and clean out of pipeline has contamination control issues.	Internal	Results in design modifications and schedule delays while modifications are implemented.	\$5,785,000	3	60	4	\$3,471,000	5	AWR Due Diligence Review to develop mitigation plan.
Operations	Berm soil exceeds the Waste Acceptance Criteria for the OSDF.	Internal	Results in the soil being shipped to Envirocare for disposal.	\$4,484,000	3	20	2	\$896,800	3	Accept
Operations	Design for berm soil erosion control around the silos is not safe.	Internal	Additional erosion control measures through additional design and construction activities. This activity would result in a delay in silo waste retrieval activity of 1 month.	\$1,157,000	3	50	3	\$578,500	4	AWR Due Diligence Review to develop mitigation plan.
Operations	Untimely turnaround of the berm soil sampling analysis.	Internal	Delays in the berm soil sampling analysis impacts the silo waste retrieval activities. Estimated delay of 3 months.	\$4,525,000	3	30	3	\$1,357,500	4	Accept
Operations	Untimely turnaround of the wastewater sampling analysis.	Internal	Delays in the wastewater sampling analysis impacts the silo waste retrieval activities. Estimated delay of 3 months or the use of temporary wastewater tanks until the analysis is complete. Need a skid water	\$4,525,000	3	30	3	\$1,357,500	4	AWR Due Diligence Review to develop mitigation plan.
Operations	Wastewater requires pretreatment prior to meeting the AWWT requirements.	Internal	treatment process to meet the AWWT requirements. Schedule delay of 2 months and/or use of additional wastewater tanks.	\$4,000,000	3	70	4	\$2,800,000	5	AWR Due Diligence Review to develop mitigation plan.
Operations	Surrogate material used during the full-scale mock-up testing is not reusable after transferred to and from the TTA.	Internal	Additional secondary waste cost and cost for the additional surrogate. Delay in procuring the surrogate - 1 month.	\$300,000	1	50	3	\$150,000	1	Accept
Operations	BentogROUT does not completely rehydrate and causes clumping and gelling effects during the silo waste retrieval activities.	Internal	The clumping and gelling would require lower percent solid in transfer or that the BentogROUT would separate from the slurry cause operations to change 3 month delay	\$5,000,000	3	50	3	\$2,500,000	4	AWR Due Diligence Review to develop mitigation plan.

# Risk/Opportunity Identification and Analysis Form

Project: AWR Project		PBS Number: 07		Total Baseline Dollars (Minimum Case):		\$94,360,701	
Evaluator: M. Connors		Date: Aug. 15, 2001		WBS Number: 1.1.H.C		Control Account Number: HWR1	
Date: Aug. 15, 2001		Risk and/or Opportunity		Internal Or External Driver		Impact Cost \$ (Maximum Case)	
Project Task	Potential Impact	Risk Impact Level	Risk Probability %	Risk Probability Level	Probable Cost \$ (Likeliest Case)	Risk Critical Value	Risk Handling Strategy
Operations	Uncontrolled radon release out of the silos/tanks via the pressure relief valve.	Internal	4	30	3	\$2,700,000	7 AWR Due Diligence review to develop mitigation plan.
Operations	Radon release exceeds the fence/line or worker exposure limit due to carbon bed inefficiencies.	Internal	3	30	3	\$1,500,000	4 Accept
Operations	Weather delays impact the silo waste retrieval activities on the Silos 1 and 2 bridge structure.	Internal	2	50	3	\$500,000	2 Accept
Safe shutdown and Demobilization	Subcontractor equipment becomes contaminated and cannot be released from the site.	Internal	2	60	4	\$132,000	3 Accept
Total:		Total:		Total:		\$50,190,100	
Operations	Archive sampling of the K-65 material is required to support the Silos 1 and 2 Project as directed by DOE.	External	3	20	2	\$400,000	3
Operations	Extended readiness and startup for the Radon Control System (RCS) Phase 1 and AWR waste retrieval due to the involvement of outside influences (DNFSB, TFA, etc.) as directed by DOE.	External	3	50	3	\$1,993,000	4