RFCA Stakeholder Focus Group
September 13, 2000
Meeting Minutes

Introduction and Administrative

Reed Hodgin began the meeting explaining that the meeting room would be arranged as an open square table to foster better communication among the participants. Those who wished to join the conversation were asked to sit around the table; those who attended the meeting to answer technical questions or to observe were seated behind and around the square.

A participants list for the September 13, 2000 RFCA Stakeholder Focus Group meeting is attached (Appendix A).

Reed reviewed the Focus Group purpose.

Reed reviewed the agenda for this meeting. The August 30, 2000 RFCA Stakeholder Focus Group meeting minutes were approved following modification: change "point of exceedance" on page 3 to "point of compliance."

The Focus Group Path

Reed presented a discussion regarding where the Focus Group is in its process (see handout, Appendix B).

Reed stated that he had heard concerns regarding where the Focus Group is heading and what effect community comments on these issues have on the agencies' key decisions.

In response, Reed summarized the path of the Focus Group during the summer of 2000. He indicated that the Focus Group so far had identified its goals and had worked to understand Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) criteria in order to evaluate clean up remedies. He stated that the current step in the process was for the Focus Group to help craft a clean up strategy for the 903 Pad at the Rocky Flats Site (Site). Two key issues associated with this strategy are water

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quality protection--strategies to meet the Surface Water Quality Standard and risk reduction--the RSALs. The current issues focus for the group is crafting a strategy for water quality protection. Reed then showed a flowchart indicating seven overall steps in the Focus Group process for crafting the strategy. So far, the Focus Group had defined the problem to be remediated (Plutonium and Americium contamination in the 903 Pad area). They had also worked to understand the implications of the problem (increased health risk from radiation dose and impacts on surface water quality). The Focus Group had also worked with the RFCA agencies to define the objectives of remediation (maintain health risk at acceptable levels and meet the surface water standard onsite and offsite). The Focus Group is currently working with the RFCA agencies to identify alternatives, define strategies, and to evaluate those strategies. Reed also offered a Focus Group goal for the 903 Pad remediation: help the RFCA parties choose the right strategy for cleaning up the 903 Pad--right the first time. Here, "right" means the strategy that best satisfies the CERCLA criteria.

Reed also identified four working assumptions that had been presented by one or more of the RFCA parties during prior discussions:

- At the conclusion of cleanup, the Site will meet the surface water quality standard as prescribed in RFCA
- Excavation by itself may not be sufficiently protective of surface water quality
- Meeting the surface water quality standard most efficiently may require a mix of strategies, and this mix may be different in different parts of the Site
- In some areas of the Site, meeting the water standard may require removal of contamination to levels beyond those required by the RSALs

Reed stated that he had the asked the RFCA agencies to propose a long-term path for the Focus Group. This path would identify key policy questions that the agencies plan to answer in the future with Stakeholder Focus Group input. The policy questions will be tied to a schedule for decision-making by the agencies. The agencies committed to providing this path forward white paper within two Focus Group meetings.

Reed asked the RFCA agencies to provide specific feedback to the Focus Group on a periodic basis concerning how the Focus Group input is directly or indirectly affecting policy decisions concerning clean up at the Site. The RFCA parties committed to provide feedback on a monthly basis.

Clean up Alternatives Presentation

Lane Butler (Kaiser-Hill, LLC) and Joe Legare (U.S. Department of Energy [DOE]) presented example qualitative evaluations of 903 Pad clean up alternatives as a strawman for discussion by the Focus Group. The alternatives were identified and evaluated qualitatively due to the early stage of information gathering about alternatives.

Joe Legare introduced the discussion by identifying four caveats that must be understood in order to discuss the evaluations (Appendix C):

- Scenarios are conceptual
- Scenarios are intended to bound and support the discussion
- Scenarios are based on information we have today, but in many cases technical information is incomplete or inconclusive
- Scenarios are <u>not</u> agency proposals or working draft. They are illustrative.

Lane Butler then presented and explained the example alternative discussion (see handout, Appendix D).

He presented a graphic showing the qualitative relationship between human health and environmental risk and soil excavation removal. The graphic indicated that as more and more removal occurs, long-term risk to the future land user decreases, but short-term risk to workers and from transportation increases. The curve on the graphic indicated that there is some balancing point at which the overall risk (both long-term and short-term) is minimized.

Lane also showed a graphic representing the combined effects of source removal and engineered barriers on surface water quality for different scenarios. The curve indicated that it would not be possible to meet the surface water quality standard with a clean up to Tier 1 alone, but that clean up to Tier 1 in combination with engineered controls probably could meet the surface water quality standard. The curve also indicated qualitatively that maximum source removal may not be able to protect the surface water quality standard alone, but that maximum source removal combined with more modest engineering controls probably could.

Lane then presented a qualitative evaluation of four bounding alternatives for clean up of the 903 Pad:

1. Soil excavation and removal to Tier 1 only,
2. Soil excavation and removal to Tier 1 plus engineered barriers,
3. Soil excavation and removal to 10pCi/g only,
4. Soil excavation and removal to 10pCi/g plus engineered barriers.

He presented a matrix for qualitative evaluation in which the evaluation was indicated by arrows (up equals success in meeting the criteria, down equals failure in meeting the criteria, and horizontal equals unknown whether the criteria will be met).

Lane presented evaluations of the four alternatives against three overarching criteria:

- Protect land user
- Protect water quality
- Overall protection of human health

He also presented evaluations against criteria based on the CERCLA evaluation criteria:

- Threshold Criteria
  - Protect human health and environment
  - Protect local off-site residents

- Protect future on-site land user
- Protect site workers
- Protect transportation worker and public
- Protect disposal site worker
- Comply with ARARs (surface water)

- Balancing Criteria

  Long-term effectiveness
  Reduction of toxicity, volume, mobility
  Short-term effectiveness
  Implementability
  Cost

- Modifying Criteria

  State acceptance
  Community acceptance

Lane indicated that he did not include evaluations against the modifying criteria because those evaluations can only be conducted by the state and the communities.

Lane indicated that the alternatives presented in the matrix were bounding cases only and were intended to become starting points for alternatives development by the agencies and the Focus Group. He indicated that any alternatives must protective human health and environment and must meet ARARs and have been balanced against the other CERCLA criteria. Lane also identified examples of potential improvements that could be made to the alternatives listed:

- Bounding cases become starting points for alternative development
- Alternatives must protect human health and environment and meet ARARs--balanced against the other CERCLA criteria
- Examples of potential improvements to alternatives:
  - Variable cleanup levels based on erosion potential

- Stabilization techniques
- Precision excavation techniques
- Soil screening and waste volume reduction
- Capping and covering

Clean up Alternatives Discussion

The Focus Group then discussed the "Soil Excavation Alternatives for Remediation of the 903 Pad Bounding Cases" matrix. Key discussion points included:

Comment (C): The agencies must consider the long-term risk over 1,000 years and protection of the workers.

C: The term "Tier 1" should be replaced with "RSALs."

Question (Q): It isn't clear how you can be certain about overall health impacts.
Answer (A): Right - it's early.

C: The Focus Group can use boxes of the matrix to identify areas of agreement, areas of disagreement, areas where more information is needed.

Q: Can't the Site address short term risk with more worker protection?
A: Yes, but short term risk also involves accidents onsite and offsite

C: Should also include long-term stewardship needs in the evaluation matrix

C: Should separate the cost evaluation column into two columns for the evaluation matrix: long term and short-term costs

C: We need to know more about short-term risks

C: We need to provide separate columns in the matrix for environmental impacts and human health impacts

C: These are all general concepts. When we get to the details, they will not hold water.

C: The clean up has to work for thousands of years; engineered barriers will not last that long.

C: We must hurt the environment some to do cleanup.

C: We must alert future generations to the danger (long-term communication)

C: Stewardship programs can be effective

C: Engineered structures have been shown to work well

C: If an engineered structure fails, the stewardship plan means you get in and fix it

C: You can't have stewardship that will last 1,000 years

C: Need information on stewardship implications of engineered barriers is the answer.

C: There is a short-term risk associated with excavation: potential for massive erosion if a storm occurs during excavation.

Lane was asked to describe the engineered barriers listed in the matrix in more detail. A group discussion developed.

- Enhanced South Interceptor Ditch (SID)

C: Make sure that Smart Ditch is considered

C: The SID will not protect water quality standard onsite

- Maintain existing ponds and dams

C: Long term stewardship - when will enough Pu / Am gather in SID / Ponds to require removal?

C: What about earthquakes in long term, as whatever you leave will be rearranged

Q: What is the history of earthquakes in the area?

- Recontouring
  - Are there ways to redirect the flow toward the SID?
  - Recontour the Industrial Area to minimize erosion
  - Design drainage without erosion--Some redirecting of flows, Some retention of water

- Revegetation

Q: What will you do to establish native plants?
A: Depending on how much of an area is disturbed, we would revegetate with native plants

C: Native plants are not working.

- New dam at Indiana Street

Q: What will it hold?
A: Water for ponds on northeast side of Site
Q: Have long term impacts from floods and earthquakes been considered, as the danger of earthquakes is posed as a strong possibility at the Site?

The Focus Group then returned to a discussion of alternatives for remediation of the 903 Pad. Key discussion points included:

C: Consider another alternative: Alternatives 2 and 4 without dams at Indiana street

C: Consider lifetimes of engineering barriers

C: We were told the solar ponds could not leak, and the contents did indeed leak out.

C: Idea: Split "comply with ARARs" into 2 categories: onsite and offsite compliance

C: Consider different risk bases and different remedies for RSALS vs surface water quality (10^{-4} vs 10^{-6})

C: Health must be protected to 10^{-6}
The difference between onsite and offsite remedies sounds great theoretically, but not practically.

Q: Why ship all of the contaminated soil? Why not contain some of it on Site? How do you control it when you're moving it down the road?
A: Low community acceptance for permanent disposal onsite. Protection of water quality is a problem if all material is left in place.

Response: That's not what I'm hearing that's on the streets.

C: Another alternative: Combine excavation and monitored retrievable storage (MRS) of waste onsite

C: Downgradient communities want a more permanent solution than MRS

Path Forward

The Focus Group next discussed how to move forward with its evaluation of alternatives for the 903 Pad remediation. It was decided that a blank matrix will be provided to the Focus Group participants. The revised matrix will include the four alternatives provided by DOE at the meeting with the following additions:

- Alternative 2 without a new dam at Indiana
- Alternative 4 without a new dam at Indiana Street
- Soil excavation and monitored retrievable storage of waste onsite

Changes to the criteria columns will include:

- Comply with ARARs should be separated into 2 columns--onsite compliance and offsite compliance
- Cost should be separated into 2 columns--short-term cost and long-term cost

The Focus Group agreed to each individually complete a matrix and bring the results to the next Focus Group meeting for group analysis.

It was suggested that a goal for the agencies and the Focus Group would be to replace the arrows in the boxes with hard numbers. DOE suggested that the focus group and the agencies conduct a qualitative analysis first (arrows), that the numbers and hard costs are probably a year or two away. The arrows can give a good sense of the feeling of the community about alternatives as we go into detailed analysis.

Q: Have the U.S. Fish and Wildlife been invited to this Group?
A: Yes. We will continue to invite them.

Radioactive Soil Action Level Update

Joe Legare updated the group on the RSALs progress.

Joe indicated that the approach to community involvement in the RSAL review implemented early in the summer is not working. The expected informal direct contact

between community members and technical staff is not occurring. DOE is looking at returning to a more structured and formal community involvement process, involving periodic formal meetings (perhaps biweekly or monthly). DOE is examining the appropriate forum for holding these meetings--the RFCA Stakeholder Focus Group or the technical session prior to Focus Group meetings is a candidate. DOE is also considering holding frequent community conference calls for questions and answers between meetings. The RFCA agencies will issue a letter next week regarding their plans for community involvement in the RSAL review.

A member of the Focus Group asked if there was a dispute over ARARs among the RFCA agencies. DOE responded that agency attorneys have been talking and that there are substantial areas of agreement. A member of the Focus Group asked if DOE is currently trying to change the water quality standard. DOE responded that, "no it is not." Joe Legare emphasized that the weakness in the process right now is not the technical effort or the relationship between the RFCA parties, but the communication with stakeholders.

Actions

The following actions were identified by the Focus Group:

- Alternatives template redesigned to include more thorough explanations of the alternatives and criteria, and supply blanks for participants to fill in (DOE / K-H)
- Included in the laboratory quality paper currently in preparation, water reduction methodology for laboratory analysis (DOE / K-H)
- Methodology of treating negative concentration results in 30-day averages included in the laboratory quality paper (DOE / K-H)
- Surface water quality standards at other DOE sites (CDPHE - Carl Spreng)

Adjournment

The meeting was adjourned at 6:30 p.m.

September 20, 2000

Dear Stakeholder:

The Rocky Flats Cleanup Agreement (RFCA) Stakeholder Focus Group will meet at the Broomfield Municipal Center at One DesCombes Drive, on September 27, 2000 from 4:30 to 6:30 p.m. A technical discussion meeting will be held in the Bal Swan room at the Broomfield Municipal Center from 3:00 to 4:15 p.m. The Focus Group meeting will be held in the Bal Swan and Zang's Spur rooms. As agreed to at the September 13, 2000 meeting, we will discuss alternatives for remediation of the 903 Pad. The agenda for the September 27 meeting is enclosed (Attachment A).

Members of the Focus Group will individually complete evaluation matrices and bring them to the meeting. The Focus Group will discuss the individual results, looking for areas of agreement and disagreement.

The Focus Group will identify areas where further information is needed to allow discussion as well as areas to prioritize for further discussion.

The meeting minutes from the September 13, 2000 RFCA Stakeholder Focus Group are enclosed (Attachment B). Also enclosed are the following water quality related background materials requested by the Focus Group at the September 13 meeting or identified by the RFCA agencies:

- Remedial action alternative selection (DOE / K-H, Attachment C)
- Information regarding operation of surface water sampling equipment (DOE / K-H, Attachment D)
- Negative Activities and Concentrations (DOE / K-H, Attachment E)

You are encouraged to attend the technical discussion session for these materials that will occur in the Bal Swan room at the Broomfield Municipal Center from 3:00 to 4:15 p.m. on September 27, 2000. We will have subject matter experts available to answer any questions on the packet information.

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(Over)

Also, DOE would like to discuss the status of the Radioactive Soil Action Levels (RSALs) review process at the technical meeting.

Please complete the enclosed alternative template (Attachment F) with modifications to the alternatives presented at the September 13 meeting, or create your own alternatives, such as monitored retrievable storage, and bring it to the September 27, 2000 meeting to discuss. You should include in your analysis:

- Which comparisons of alternatives to evaluation criteria are most important?
- Which comparisons of alternatives to evaluation criteria require a great deal more technical discussion or backup?
- Are there any alternatives beyond excavation and engineered barriers you believe that the agencies and the Focus Group ought to consider?
- What criteria should be added to the matrix?

If you need additional information to prepare you for the Focus Group discussion on September 27, please contact the subject matter experts listed in the packet, or call Christine Bennett of AlphaTRAC, Inc. at 303 428-5670 (cbennett@alphatrac.com). Christine will help to find the appropriate resource for you.

Please visit the RFETS RFCA Stakeholder Focus Group website at www.rfets.gov and click on **Stakeholder Focus Group** to access background information, meeting minutes, etc. electronically. You may call either Christine or me if you have any questions, comments, or suggestions concerning the RFCA Stakeholder Focus Group or the upcoming meeting.

Sincerely,

C. Reed Hodgin, CCM
Facilitator / Process Manager

RFCA Stakeholder Focus Group
September 13, 2000
Meeting Minutes

Appendix A
Participants List

RFCA Stakeholder Focus Group
September 13, 2000 Meeting
Participants List

Name		Company / Organization
Christine	Bennett	AlphaTRAC, Inc.
Norma	Castaneda	US DOE
John	Corsi	Kaiser-Hill Company, LLC
Robert	Darr	Kaiser-Hill, Ltd
Gerald	DePoorter	
Honorable Samantha	Dixion	City of Westminster
Sonja	Geoghegan	Citizens Concerned about Nuclear Waste Impacts
Joe	Goldfield	RFSALOP
Tom	Greengard	SAIC
Steve	Gunderson	CDPHE
Paul	Hartmann	US DOE - RFFO
Reed	Hodgin	AlphaTRAC, Inc.
Rich	Horstmann	CDPHE
Jeremy	Karpatkin	US DOE - RFFO
Roman	Kohler	Homesteaders
Joe	Legare	DOE
John	Marler	RFCLOG
Robert	Mastro	DOE Comm.
Dan	Miller	Office of Attorney General Ken Salazar
LeRoy	Moore	RMPJC
Amy	Mueller	City of Boulder
Diane	Niedzwiecki	CDPHE
Bob	Nininger	Kaiser-Hill Company, LLC
Steve	Paris	RMRS
John	Rampe	U.S. DOE - RFFO
Erin	Rogers	RFCAB
Kathy	Schnoor	City of Broomfield
Joel	Selbin	
Dave	Shelton	Kaiser-Hill Company, LLC
Steve	Smith	PSCo of CO
Carl	Spreng	CDPHE
Noelle	Stenger	RFCAB
Steve	Tarlton	CDPHE
George	Vancil	City of Arvada
Jyoti	Wind	Citizens Concerned about Nuclear Waste Impacts

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Appendix B
Reed Hodgin Presentation
Where are we in the Process?

RFCA Stakeholder Focus Group
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Appendix C
Joe Legare Presentation
Scenario Discussion

RFCA Stakeholder Focus Group
Attachment C

Title: Remedial Action Alternative Selection

Date: September 20, 2000

Author: Lane Butler
Kaiser-Hill Inc., LLC

Phone Number: (303) 966-5245

Email Address: lane.butler@rfets.gov

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Meet Surface Water Quality Standard Off-site: Similar to the on-site water quality, off-site water quality must meet a standard that is deemed to be protection of the environment and the local off-site resident. It is also considered as a part of meeting the ARARs.

Protection of the Environment: This segment includes protection of other environmental resources such as the tall prairie grasses and habitat of wildlife. Generally, protection of the Prebles Meadow Jumping Mouse would be included. However, for this exercise we have included the Threatened and Endangered Species Act as part of the ARARs as a separate criteria.

Compliance with ARARs is defined in Attachment F.

The balancing criteria are defined in Attachment F. For this exercise, the cost was divided into (1) capital or remediation cost and (2) operation and maintenance or stewardship cost. Capital cost should be considered as the initial cost for implementation of the remedial alternative. Operation and maintenance cost is the long-term stewardship cost to operate and maintain the remedial alternative. This consists of any subsequent actions required including institutional controls.

The modifying criteria are defined in Attachment F.

Stewardship is not a CERCLA criteria, but has been added to this exercise at the request of the focus group. This criteria has reference to long-term stewardship actions that may or may not be required following implementation of a remedial alternative. It is assumed that less follow-up actions required for an alternative are better than more.

Alternative Development Discussion

The four example alternatives presented at the last stakeholder meeting were developed to consider soil excavation for protection of the land user with engineered barriers for protection of surface water. Examples of potential improvements to the alternatives were presented. The following provides additional detail on the potential improvements.

Variable Cleanup Levels Based on Erosion Potential: The example alternatives were presented as "bounding" alternatives and considered removal of source at Tier 1 as a "minimum" excavation case and 10 pCi/g as a "maximum" excavation case. The maximum case assumed removal of all contaminated soil at the 903 Pad above 10 pCi/g regardless of where it was located. This potential improvement would consider cleaning up to some base level, such as Tier 1, and then excavating to a much lower level on the erodable surfaces. In this way, surface water protection is enhanced, while waste generation and the associated handling by the workers and the transportation industry is reduced from the maximum excavation case.

Stabilization Techniques: This concept is based on stabilizing residual plutonium contamination to prevent erosion into surface water. Examples of this may be surface grouting with various agents such as phosphate-based cements, enhanced vegetation, soil fixants, and physical erosion controls such as rip rap.

Precision Excavation Techniques: Generally, industry practices for minimum excavation depth using standard equipment and methods is six inches, due to equipment limitations. In most areas around the 903 Pad, the soil contamination is only in the top inch or two. Identification of innovative excavation methods to minimize the soil removal could significantly reduce waste volumes and the associated handling by the workers and the transportation industry. As a result both long-term risk to land users and short-term risk to workers and public during excavation, transport, and disposal could be substantially reduced.

Soil Screening for Waste Volume Reduction: Surface soil at Rocky Flats consists of sands and clays mixed with significant amount of rock. Plutonium contamination at the 903 Pad has been determined to be bound in the small soil particle fraction rather than the rocks. The small particle fraction is also most susceptible to erosion. Significant waste volume reduction can be achieved by simple screening of the soil to remove the larger rocks from the waste soils. This method could significantly reduce waste volumes and the associated handling by the workers and the transportation industry. As a result both long-term risk to land users and short-term risk to workers and public during excavation, transport, and disposal could be reduced.

Capping and Covering: Capping or covering of residual contamination could be used in conjunction with soil excavation to minimize the waste. Capping is similar to stabilization in that the contaminant residual is not removed, but placed in a more stable configuration to prevent migration off-site.

RFCA Stakeholder Focus Group
Attachment C
Remedial Action Alternative Selection

Introduction

At the last Stakeholder Focus Group Meeting, the discussion focused on selection of remedial alternatives that would meet the RSALs and Surface Water Quality Standards balanced against the nine CERCLA criteria. DOE and Kaiser-Hill provided four example remedial alternatives with preliminary, qualitative evaluations against the nine CERCLA criteria to illustrate the alternative identification, relevant relationships and the selection process. Using the same process, the focus group agreed to provide separate qualitative evaluation against the CERCLA criteria for the four example alternatives and for any additional alternatives of interest. The focus group requested additional definition and information about the CERCLA criteria and potential components of remedial alternatives. More specific and quantitative information was requested regarding long-term and short-term risk.

Technical Summary

Template Criteria Discussion

Definitions of the nine CERCLA criteria were provided in the last meeting and are included on the template for completeness. Additional definition is provided below to supplement those definitions.

Protection of Human Health and the Environment: The definition provided in the handout provides little explanation of the various segments of human health that must be protected. Below the human health and environment segments for the 903 Pad are broken out separately to explain how the evaluation template was used.

Protection of Local Off-site Residents: Risk to off-site residents may be considered a long-term risk based on the residual contamination left at the site. This segment is primarily focused on exposure routes via wind and surface water. For example, if a remediation scenario cannot guarantee that the surface water standard will be met, the long-term the risk to an off-site resident would be inappropriate (i.e., result in a downward arrow). This risk should not be confused with the long-term risk to the actual land-user.

RFCA Stakeholder Focus Group
Attachment C
Remedial Action Alternative Selection

Protection of Future On-site Land User: This segment is focused on exposure to the future land user. Currently under RFCA the land use is specified as open space and industrial use, with pending legislation to make the site a wildlife refuge. The primary exposure routes of exposure for the future land user are soil and surface water.

Protection of Site Workers: This segment consists of the workers who will actually perform the remediation at the site. Protection of the workers is of prime importance to DOE and Kaiser-Hill. An integrated safety management system will be implemented with health and safety plans for remediation projects to provide proven methods to protect the workers. However, all industrial activities carry inherent risks and zero risk can only be achieved with zero activity. Risk includes potential exposure to contaminants, but the primary risk is industrial accidents, such as accidents with heavy equipment. Therefore, it is imperative that appropriate risk reduction in other segments adequately offset these imposed risks.

Protection of Transportation Workers and Public Exposed to Transportation Risks: This segment consists of the drivers and public during transportation of waste generated during remediation. Mitigation and risk reduction of this segment is very challenging. While safety programs include proper training, procedures, inspections, and preventive maintenance, DOE and the contractors have no control of the actions of others on the road.

Protection of Disposal Site Workers: This segment consists of the workers who will unload the waste from the transport vehicles and place the waste in the disposal site. An integrated safety management system will be implemented to provide proven methods to protect the workers. However, all industrial activities carry inherent risks and zero risk can only be achieved with zero activity. The primary risk in this segment is industrial accidents.

Meet Surface Water Quality Standard On-site: On-Site Water Quality is closely linked to protection of the health of the future land user and the environment. It is also considered as part of meeting the ARARs since it will be a requirement under RFCA. If a given remediation scenario, such as remediate to Tier 1 only, cannot guarantee the water standard will be met, that scenario may not be deemed effective. Definition of where and how this standard will be measured on-site has not been resolved.

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Appendix D
Lane Butler Presentation
Soil Excavation Alternatives for Remediation of the 903 Pad
Bounding Cases

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Alternative Remediation Strategy:
Soil Excavation and Removal to 10 pCi / g Plus Engineered Barriers Except No Dam at Indiana St.

	Threshold Criteria										Balancing Criteria						Modifying Criteria		Non-CERCLA Criteria		
	Protect Human Health and Environment	Protect Local Off-site Residents	Protect Future On-site Land User	Protect Site Workers	Protect Transportation Workers and Public	Protect Disposal Site Workers	Meet Surface Water Quality Standard On-site	Meet Surface Water Quality Standard Off-site	Protect Environment	Comply with ARARs (including Endangered Species Act)	Longterm Effectiveness	Reduction of Toxicity, Volume, Mobility	Shortterm Effectiveness	Implementability	Capital Cost (Remediation)	Operation and Maintenance Cost (Stewardship)	State Acceptance	Community Acceptance	Stewardship	Secondary Benefits	Technology Development
DOE																					
CDPHE	∅	□	∅	∅	∅	∅	□	∅	∅	∅	∅	□	□	□	∅	¬	∅	∅	∅	∅	
EPA	□	□∅	□	□	□	□	□∅	□∅	□	□	∅	□	□	□	□	∅					
COMMUNITY																					
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?	0	0	0	0	0	0	0	0	0	0		0		0	0	0	0	0	0		

Legend:					
	□	Alternative probably WILL meet criterion	∅	Not enough information yet to evaluate success	Left Arrow: Short Term Evaluation
	¬	Alternative probably WILL NOT meet criterion	?	Need key information to have discussion	Right Arrow: Long Term Evaluation

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RFCA Stakeholder
Focus Group

PRELIMINARY - FOR DISCUSSION ONLY

REV. 0: 9/27/00

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Soil Excavation Alternatives for Remediation of the 903 Pad	Threshhold Criteria										Balancing Criteria						Modifying Criteria		Non-CERCLA Criteria				
	Protect HH and Env.	Protect Local off-site Residents	Protect FutureOn-site Land User	Protect Site Workers	Protect Transportation Worker & Public	Protect Disposal Site Worker	Meet Surface Water Quality Standard On-site	Meet Surface Water Quality Standard off-site	Protect Environment	**Comply with ARARs (incl. Endangered Species Act)**	**Longterm Effectiveness**	**Reduction of Tox, Vol., Mob**	**Shortterm Effectiveness**	**Implementability**	**Capital Cost (Remediation)**	**Operation & Maint. Cost (Stewardship)**	**State Acceptance**	**Community Acceptance**	**Stewardship**	***Secondary Benefits***			
Soil Excavation and Removal to RSAL only	↓ surface water standard will not be met	↑for air - NESHAP met now & RESREAD model includes air path ↓ for water - standard will not be met	↑ RESRAD model indicates dose is ok	→Scenarios modelled in RSAL did not include site workers	→ Not known	→Not known	→	→	→ Rad risk ok, but habitat protection uncertain	→ May not meet ALARA - level not yet defined	↓ surface water standard will not be met	↑	↑	↑	→ All options are expensive	↑	→ This analysis is part of the decision making process	→ NA	→ Depends on whether or not free-release levels are attained	→ Needs wildlife & recreational assessment			

CDPHE Decision Matrix for September 27, 2000 Stakeholder Focus Group Meeting

Notes:

- Arrows should be read as one reads the text (holding the page in portrait orientation)
- Column for Secondary Benefits added to Non-CERCLA Criteria - for things such as Habitat or Wildlife Observation benefits

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	Threshhold Criteria										Balancing Criteria						Modifying Criteria		Non-CERCLA Criteria				
Soil Excavation Alternatives for Remediation of the 903 Pad	**Protect HH and Env.**	Protect Local off-site Residents	Protect FutureOn-site Land User	Protect Site Workers	Protect Transportation Worker & Public	Protect Disposal Site Worker	Meet Surface Water Quality Standard On-site	Meet Surface Water Quality Standard off-site	Protect Environment	**Comply with ARARs (incl. Endangered Species Act)**	**Longterm Effectiveness**	**Reduction of Tox, Vol., Mob**	**Shortterm Effectiveness**	**Implementability**	**Capital Cost (Remediation)**	**Operation & Maint. Cost (Stewardship)**	**State Acceptance**	**Community Acceptance**	**Stewardship**	***Secondary Benefits***			
Soil Excavation and Removal to RSAL plus Engineered Barriers - Enhanced SID and potential new structures - Maintain existing dams and ponds - Recontour Site - Revegetate Site - New Dam at Indiana	→ uncertain if on-site water standard will be met	↑for air - NESHAP met now & RESREAD model includes air path ↑ for water - standard currently met (ponds)	↑ RESRAD model indicates dose is ok	→Scenarios modeled in RSAL did not include site workers	→ Not known	→Not known	→ don't know effectiveness	↑current ponds effective	→ Rad risk ok, but habitat protection uncertain	→ May not meet ALARA - level not yet defined	→ on-site water standard may not be met	↑	↑	↑	→ All options are expensive	↓ requires more maintenance than just excavation	→ This analysis is part of the decision making process	→ NA	→ Depends on whether or not free-release levels are attained	→ Needs wildlife & recreational assessment			

CDPHE Decision Matrix for September 27, 2000 Stakeholder Focus Group Meeting

Notes:

- Arrows should be read as one reads the text (holding the page in portrait orientation)
- Column for Secondary Benefits added to Non-CERCLA Criteria - for things such as Habitat or Wildlife Observation benefits

	Threshhold Criteria										Balancing Criteria						Modifying Criteria		Non-CERCLA Criteria				
Soil Excavation Alternatives for Remediation of the 903 Pad	**Protect HH and Env.**	Protect Local off-site Residents	Protect FutureOn-site Land User	Protect Site Workers	Protect Transportation Worker & Public	Protect Disposal Site Worker	Meet Surface Water Quality Standard On-site	Meet Surface Water Quality Standard off-site	Protect Environment	**Comply with ARARs (incl. Endangered Species Act)**	**Longterm Effectiveness**	**Reduction of Tox, Vol., Mob**	**Shortterm Effectiveness**	**Implementability**	**Capital Cost (Remediation)**	**Operation & Maint. Cost (Stewardship)**	**State Acceptance**	**Community Acceptance**	**Stewardship**				

CERCLA's 9 Decision Criteria:

1. Overall protection of human health and the environment
2. Compliance with ARARs
3. Long-term effectiveness and permanance
4. Reduction of toxicity, mobility, or volume
5. Short-term effectiveness
6. Implementability
7. Cost
8. State acceptance
9. Community acceptance

	Threshhold Criteria										Balancing Criteria						Modifying Criteria		Non-CERCLA Criteria				
Soil Excavation Alternatives for Remediation of the 903 Pad	**Protect HH and Env.**	Protect Local off-site Residents	Protect FutureOn-site Land User	Protect Site Workers	Protect Transportation Worker & Public	Protect Disposal Site Worker	Meet Surface Water Quality Standard On-site	Meet Surface Water Quality Standard off-site	Protect Environment	**Comply with ARARs (incl. Endangered Species Act)**	**Longterm Effectiveness**	**Reduction of Tox, Vol., Mob**	**Shortterm Effectiveness**	**Implementability**	**Capital Cost (Remediation)**	**Operation & Maint. Cost (Stewardship)**	**State Acceptance**	**Community Acceptance**	**Stewardship**				
Soil Excavation and Removal to RSAL only																							
Soil Excavation and Removal to RSAL plus Engineered Barriers - Enhanced SID and potential new structures - Maintain existing dams and ponds - Recontour Site - Revegetate Site - New Dam at Indiana																							
Soil Excavation and Removal to 10 pCi/g only																							
Soil Excavation and Removal to 10 pCi/g plus Engineered Barriers - Enhanced SID and potential new structures - Maintain existing dams and ponds - Recontour Site - Revegetate Site - New Dam at Indiana																							

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5. Short-term effectiveness
6. Implementability
7. Cost
8. State acceptance
9. Community acceptance

Soil Excavation and Removal to RSAL only

	Threshhold Criteria										Balancing Criteria						Modifying Criteria		Non-CERCLA Criteria				
	Protect HH and Env.	Protect Local off-site Residents	Protect FutureOn-site Land User	Protect Site Workers	Protect Transportation Worker & Public	Protect Disposal Site Worker	Meet Surface Water Quality Standard On-site	Meet Surface Water Quality Standard off-site	Protect Environment	**Comply with ARARs (incl. Endangered Species Act)**	**Longterm Effectiveness**	**Reduction of Tox, Vol., Mob**	**Shortterm Effectiveness**	**Implementability**	**Capital Cost (Remediation)**	**Operation & Maint. Cost (Stewardship)**	**State Acceptance**	**Community Acceptance**	**Stewardship**	**Secondary benefits**			
DOE		↓	↑	↑	↑	↑				↓	↓	NA	↓	↑	↑	↑							
CDPHE	↓	↑	↑	→	→	→	↓	↓	→	→	↓	↑	↑	↑	→	↑	→		→	→			
EPA																							
Community																							

ADMIN RECORD

SW-A-006255

Soil Excavation and Removal to RSAL plus Engineered Barriers

	Threshhold Criteria										Balancing Criteria						Modifying Criteria		Non-CERCLA Criteria				
	Protect HH and Env.	Protect Local off-site Residents	Protect FutureOn-site Land User	Protect Site Workers	Protect Transportation Worker & Public	Protect Disposal Site Worker	Meet Surface Water Quality Standard On-site	Meet Surface Water Quality Standard off-site	Protect Environment	**Comply with ARARs (incl. Endangered Species Act)**	**Longterm Effectiveness**	**Reduction of Tox, Vol., Mob**	**Shortterm Effectiveness**	**Implementability**	**Capital Cost (Remediation)**	**Operation & Maint. Cost (Stewardship)**	**State Acceptance**	**Community Acceptance**	**Stewardship**	**Secondary benefits**			
DOE		↑	↑	↑	↑	↑				↑	→	NA	↑	↑	→	→							
CDPHE	→	↑	↑	→	→	→	→	↑	→	→	→	↑	↑	↑	→	↓	→		→	→			
EPA																							
Community																							

Soil Excavation and Removal to 10 pCi/g plus Engineered Barriers

	Threshhold Criteria										Balancing Criteria						Modifying Criteria		Non-CERCLA Criteria				
	Protect HH and Env.	Protect Local off-site Residents	Protect FutureOn-site Land User	Protect Site Workers	Protect Transportation Worker & Public	Protect Disposal Site Worker	Meet Surface Water Quality Standard On-site	Meet Surface Water Quality Standard off-site	Protect Environment	**Comply with ARARs (incl. Endangered Species Act)**	**Longterm Effectiveness**	**Reduction of Tox, Vol., Mob**	**Shortterm Effectiveness**	**Implementability**	**Capital Cost (Remediation)**	**Operation & Maint. Cost (Stewardship)**	**State Acceptance**	**Community Acceptance**	**Stewardship**	**Secondary benefits**			
DOE		↑	↑	↓	↓	↓				↑	↑	NA	↓	↑	↓	↓							
CDPHE	→	↑	↑	→	→	→	↑	→	→	→	→	↑	↑	↑	→	↓	→		→	→			
EPA																							
Community																							

Soil Excavation and Removal to 10 pCi/g only

	Threshhold Criteria										Balancing Criteria						Modifying Criteria		Non-CERCLA Criteria				
	Protect HH and Env.	Protect Local off-site Residents	Protect FutureOn-site Land User	Protect Site Workers	Protect Transportation Worker & Public	Protect Disposal Site Worker	Meet Surface Water Quality Standard On-site	Meet Surface Water Quality Standard off-site	Protect Environment	**Comply with ARARs (incl. Endangered Species Act)**	**Longterm Effectiveness**	**Reduction of Tox, Vol., Mob**	**Shortterm Effectiveness**	**Implementability**	**Capital Cost (Remediation)**	**Operation & Maint. Cost (Stewardship)**	**State Acceptance**	**Community Acceptance**	**Stewardship**	**Secondary benefits**			
DOE		↑	↑	↓	↓	↓				→	→	NA	↓	↑	↓	↓							
CDPHE	↓	↓	↑	→	→	→	↓	↓	→	→	↓	↑	↑	↑	→	↑	→		→	→			
EPA																							
Community																							

Alternative:_____

	Threshhold Criteria										Balancing Criteria						Modifying Criteria		Non-CERCLA Criteria				
	Protect HH and Env.	Protect Local off-site Residents	Protect FutureOn-site Land User	Protect Site Workers	Protect Transportation Worker & Public	Protect Disposal Site Worker	Meet Surface Water Quality Standard On-site	Meet Surface Water Quality Standard off-site	Protect Environment	**Comply with ARARs (incl. Endangered Species Act)**	**Longterm Effectiveness**	**Reduction of Tox, Vol., Mob**	**Shortterm Effectiveness**	**Implementability**	**Capital Cost (Remediation)**	**Operation & Maint. Cost (Stewardship)**	**State Acceptance**	**Community Acceptance**	**Stewardship**	**Secondary benefits**			
DOE																							
CDPHE																							
EPA																							
Community																							

	Threshhold Criteria										Balancing Criteria						Modifying Criteria		Non-CERCLA Criteria				
Soil Excavation Alternatives for Remediation of the 903 Pad	**Protect HH and Env.**	Protect Local off-site Residents	Protect FutureOn-site Land User	Protect Site Workers	Protect Transportation Worker & Public	Protect Disposal Site Worker	Meet Surface Water Quality Standard On-site	Meet Surface Water Quality Standard off-site	Protect Environment	**Comply with ARARs (incl. Endangered Species Act)**	**Longterm Effectiveness**	**Reduction of Tox, Vol., Mob**	**Shortterm Effectiveness**	**Implementability**	**Capital Cost (Remediation)**	**Operation & Maint. Cost (Stewardship)**	**State Acceptance**	**Community Acceptance**	**Stewardship**				
Soil Excavation and Removal to RSAL only																							
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CERCLA's 9 Decision Criteria:

1. Overall protection of human health and the environment
2. Compliance with ARARs
3. Long-term effectiveness and permanance
4. Reduction of toxicity, mobility, or volume
5. Short-term effectiveness
6. Implementability
7. Cost
8. State acceptance
9. Community acceptance

ADMIN RECORD

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	Threshhold Criteria										Balancing Criteria						Modifying Criteria		Non-CERCLA Criteria				
Soil Excavation Alternatives for Remediation of the 903 Pad	**Protect HH and Env.**	Protect Local off-site Residents	Protect FutureOn-site Land User	Protect Site Workers	Protect Transportation Worker & Public	Protect Disposal Site Worker	Meet Surface Water Quality Standard On-site	Meet Surface Water Quality Standard off-site	Protect Environment	**Comply with ARARs (incl. Endangered Species Act)**	**Longterm Effectiveness**	**Reduction of Tox, Vol., Mob**	**Shortterm Effectiveness**	**Implementability**	**Capital Cost (Remediation)**	**Operation & Maint. Cost (Stewardship)**	**State Acceptance**	**Community Acceptance**	**Stewardship**				

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	Threshhold Criteria										Balancing Criteria						Modifying Criteria		Non-CERCLA Criteria				
Soil Excavation Alternatives for Remediation of the 903 Pad	**Protect HH and Env.**	Protect Local off-site Residents	Protect FutureOn-site Land User	Protect Site Workers	Protect Transportation Worker & Public	Protect Disposal Site Worker	Meet Surface Water Quality Standard On-site	Meet Surface Water Quality Standard off-site	Protect Environment	**Comply with ARARs (incl. Endangered Species Act)**	**Longterm Effectiveness**	**Reduction of Tox, Vol., Mob**	**Shortterm Effectiveness**	**Implementability**	**Capital Cost (Remediation)**	**Operation & Maint. Cost (Stewardship)**	**State Acceptance**	**Community Acceptance**	**Stewardship**	***Secondary Benefits***			
Soil Excavation and Removal to RSAL only	↓ surface water standard will not be met	↑for air - NESHAP met now & RESREAD model includes air path ↓ for water - standard will not be met	↑ RESRAD model indicates dose is ok	→Scenarios modelled in RSAL did not include site workers	→ Not known	→Not known	→	→	→ Rad risk ok, but habitat protection uncertain	→ May not meet ALARA - level not yet defined	↓ surface water standard will not be met	←	←	←	→ All options are expensive	←	→ This analysis is part of the decision making process	→ NA	→ Depends on whether or not free-release levels are attained	→ Needs wildlife & recreational assessment			

CDPHE Decision Matrix for September 27, 2000 Stakeholder Focus Group Meeting

Notes:

- Arrows should be read as one reads the text (holding the page in portrait orientation)
- Column for Secondary Benefits added to Non-CERCLA Criteria - for things such as Habitat or Wildlife Observation benefits

	Threshhold Criteria										Balancing Criteria						Modifying Criteria		Non-CERCLA Criteria				
Soil Excavation Alternatives for Remediation of the 903 Pad	**Protect HH and Env.**	Protect Local off-site Residents	Protect FutureOn-site Land User	Protect Site Workers	Protect Transportation Worker & Public	Protect Disposal Site Worker	Meet Surface Water Quality Standard On-site	Meet Surface Water Quality Standard off-site	Protect Environment	**Comply with ARARs (incl. Endangered Species Act)**	**Longterm Effectiveness**	**Reduction of Tox, Vol., Mob**	**Shortterm Effectiveness**	**Implementability**	**Capital Cost (Remediation)**	**Operation & Maint. Cost (Stewardship)**	**State Acceptance**	**Community Acceptance**	**Stewardship**	***Secondary Benefits***			
Soil Excavation and Removal to RSAL plus Engineered Barriers - Enhanced SID and potential new structures - Maintain existing dams and ponds - Recontour Site - Revegetate Site - New Dam at Indiana	→ uncertain if on-site water standard will be met	↑for air - NESHAP met now & RESREAD model includes air path ↑ for water - standard currently met (ponds)	↑ RESRAD model indicates dose is ok	→Scenarios modeled in RSAL did not include site workers	→ Not known	→Not known	→ don't know effectiveness	↑current ponds effective	→ Rad risk ok, but habitat protection uncertain	→ May not meet ALARA - level not yet defined	→ on-site water standard may not be met	↑	↑	↑	→ All options are expensive	↓ requires more maintenance than just excavation	→ This analysis is part of the decision making process	→ NA	→ Depends on whether or not free-release levels are attained	→ Needs wildlife & recreational assessment			

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	Threshhold Criteria										Balancing Criteria						Modifying Criteria		Non-CERCLA Criteria				
Soil Excavation Alternatives for Remediation of the 903 Pad	**Protect HH and Env.**	Protect Local off-site Residents	Protect FutureOn-site Land User	Protect Site Workers	Protect Transportation Worker & Public	Protect Disposal Site Worker	Meet Surface Water Quality Standard On-site	Meet Surface Water Quality Standard off-site	Protect Environment	**Comply with ARARs (incl. Endangered Species Act)**	**Longterm Effectiveness**	**Reduction of Tox, Vol., Mob**	**Shortterm Effectiveness**	**Implementability**	**Capital Cost (Remediation)**	**Operation & Maint. Cost (Stewardship)**	**State Acceptance**	**Community Acceptance**	**Stewardship**	***Secondary Benefits***			
Soil Excavation and Removal to 10 pCi/g only	↓ surface water standard will not be met	↑for air - NESHAP met now & RESREAD model includes air path ↓ for water - standard will not be met	↑ RESRAD model indicates dose is ok	→Scenarios modelled in RSAL did not include site workers	→ Not known	→Not known	→	→	→ Rad risk ok, but habitat protection uncertain	→should meet ALARA , but habitat impacts are larger	↓ surface water standard will not be met	←	←	←	→ All options are expensive	←	→ This analysis is part of the decision making process	→ NA	→ Depends on whether or not free-release levels are attained	→ Needs wildlife & recreational assessment			

CDPHE Decision Matrix for September 27, 2000 Stakeholder Focus Group Meeting

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	Threshhold Criteria										Balancing Criteria						Modifying Criteria		Non-CERCLA Criteria				
Soil Excavation Alternatives for Remediation of the 903 Pad	**Protect HH and Env.**	Protect Local off-site Residents	Protect FutureOn-site Land User	Protect Site Workers	Protect Transportation Worker & Public	Protect Disposal Site Worker	Meet Surface Water Quality Standard On-site	Meet Surface Water Quality Standard off-site	Protect Environment	**Comply with ARARs (incl. Endangered Species Act)**	**Longterm Effectiveness**	**Reduction of Tox, Vol., Mob**	**Shortterm Effectiveness**	**Implementability**	**Capital Cost (Remediation)**	**Operation & Maint. Cost (Stewardship)**	**State Acceptance**	**Community Acceptance**	**Stewardship**	***Secondary Benefits***			
Soil Excavation and Removal to 10 pCi/g plus Engineered Barriers - Enhanced SID and potential new structures - Maintain existing dams and ponds - Recontour Site - Revegetate Site - New Dam at Indiana	→ uncertain if on-site water standard will be met	↑for air - NESHAP met now & RESREAD model includes air path ↑ for water - standard currently met (ponds)	↑ RESRAD model indicates dose is ok	→Scenarios modeled in RSAL did not include site workers	→ Not known	→Not known	→ don't know effectiveness	↑current ponds effective	→ Rad risk ok, but habitat protection uncertain	→ should meet ALARA , but habitat impacts are larger	→ on-site water standard may not be met	↑	↑	↑	→ All options are expensive	↓ requires more maintenance than just excavation	→ This analysis is part of the decision making process	→ NA	→ Depends on whether or not free-release levels are attained	→ Needs wildlife & recreational assessment			

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ADMIN RECORD

Soil Excavation and Removal to 10 pCi/g plus Engineered Barriers

	Threshhold Criteria										Balancing Criteria						Modifying Criteria		Non-CERCLA Criteria				
	Protect HH and Env.	Protect Local off-site Residents	Protect FutureOn-site Land User	Protect Site Workers	Protect Transportation Worker & Public	Protect Disposal Site Worker	Meet Surface Water Quality Standard On-site	Meet Surface Water Quality Standard off-site	Protect Environment	Comply with ARARs (incl. Endangered Species Act)	Longterm Effectiveness	Reduction of Tox, Vol., Mob.	Shortterm Effectiveness	Implementability	Capital Cost (Remediation)	Operation & Maint. Cost (Stewardship)	State Acceptance	Community Acceptance	Stewardship	Secondary benefits			
DOE		↑	↑	↓	↓	↓				↑	↑	NA	↓	↑	↓	↓							
CDPHE	→	↑	↑	→	→	→	↑	→	→	→	→	↑	↑	↑	→	↓	→		→	→			
EPA																							
Community																							

Alternative:_____

	Threshhold Criteria										Balancing Criteria						Modifying Criteria		Non-CERCLA Criteria				
	Protect HH and Env.	Protect Local off-site Residents	Protect FutureOn-site Land User	Protect Site Workers	Protect Transportation Worker & Public	Protect Disposal Site Worker	Meet Surface Water Quality Standard On-site	Meet Surface Water Quality Standard off-site	Protect Environment	**Comply with ARARs (incl. Endangered Species Act)**	**Longterm Effectiveness**	**Reduction of Tox, Vol., Mob**	**Shortterm Effectiveness**	**Implementability**	**Capital Cost (Remediation)**	**Operation & Maint. Cost (Stewardship)**	**State Acceptance**	**Community Acceptance**	**Stewardship**	**Secondary benefits**			
DOE																							
CDPHE																							
EPA																							
Community																							

ADMIN RECORD

	Threshhold Criteria										Balancing Criteria						Modifying Criteria		Non-CERCLA Criteria				
Soil Excavation Alternatives for Remediation of the 903 Pad	**Protect HH and Env.**	Protect Local off-site Residents	Protect FutureOn-site Land User	Protect Site Workers	Protect Transportation Worker & Public	Protect Disposal Site Worker	Meet Surface Water Quality Standard On-site	Meet Surface Water Quality Standard off-site	Protect Environment	**Comply with ARARs (incl. Endangered Species Act)**	**Longterm Effectiveness**	**Reduction of Tox, Vol., Mob**	**Shortterm Effectiveness**	**Implementability**	**Capital Cost (Remediation)**	**Operation & Maint. Cost (Stewardship)**	**State Acceptance**	**Community Acceptance**	**Stewardship**				
Soil Excavation and Removal to RSAL only																							
Soil Excavation and Removal to RSAL plus Engineered Barriers - Enhanced SID and potential new structures - Maintain existing dams and ponds - Recontour Site - Revegetate Site - New Dam at Indiana																							
Soil Excavation and Removal to 10 pCi/g only																							
Soil Excavation and Removal to 10 pCi/g plus Engineered Barriers - Enhanced SID and potential new structures - Maintain existing dams and ponds - Recontour Site - Revegetate Site - New Dam at Indiana																							

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3. Long-term effectiveness and permanance
4. Reduction of toxicity, mobility, or volume
5. Short-term effectiveness
6. Implementability
7. Cost
8. State acceptance
9. Community acceptance

	Threshhold Criteria										Balancing Criteria						Modifying Criteria		Non-CERCLA Criteria				
Soil Excavation Alternatives for Remediation of the 903 Pad	**Protect HH and Env.**	Protect Local off-site Residents	Protect FutureOn-site Land User	Protect Site Workers	Protect Transportation Worker & Public	Protect Disposal Site Worker	Meet Surface Water Quality Standard On-site	Meet Surface Water Quality Standard off-site	Protect Environment	**Comply with ARARs (incl. Endangered Species Act)**	**Longterm Effectiveness**	**Reduction of Tox, Vol., Mob**	**Shortterm Effectiveness**	**Implementability**	**Capital Cost (Remediation)**	**Operation & Maint. Cost (Stewardship)**	**State Acceptance**	**Community Acceptance**	**Stewardship**				

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3. Long-term effectiveness and permanance
4. Reduction of toxicity, mobility, or volume
5. Short-term effectiveness
6. Implementability
7. Cost
8. State acceptance
9. Community acceptance

Soil Excavation and Removal to RSAL only

	Threshhold Criteria										Balancing Criteria						Modifying Criteria		Non-CERCLA Criteria				
	Protect HH and Env.	Protect Local off-site Residents	Protect FutureOn-site Land User	Protect Site Workers	Protect Transportation Worker & Public	Protect Disposal Site Worker	Meet Surface Water Quality Standard On-site	Meet Surface Water Quality Standard off-site	Protect Environment	**Comply with ARARs (incl. Endangered Species Act)**	**Longterm Effectiveness**	**Reduction of Tox, Vol., Mob**	**Shortterm Effectiveness**	**Implementability**	**Capital Cost (Remediation)**	**Operation & Maint. Cost (Stewardship)**	**State Acceptance**	**Community Acceptance**	**Stewardship**	**Secondary benefits**			
DOE		↓	↑	↑	↑	↑				↓	↓	NA	↓	↑	↑	↑							
CDPHE	↓	↑	↑	→	→	→	↓	↓	→	→	↓	↑	↑	↑	→	↑	→		→	→			
EPA																							
Community																							

ADMIN RECORD

SW-A-006229

Soil Excavation and Removal to RSAL plus Engineered Barriers

	Threshhold Criteria										Balancing Criteria						Modifying Criteria		Non-CERCLA Criteria				
	Protect HH and Env.	Protect Local off-site Residents	Protect FutureOn-site Land User	Protect Site Workers	Protect Transportation Worker & Public	Protect Disposal Site Worker	Meet Surface Water Quality Standard On-site	Meet Surface Water Quality Standard off-site	Protect Environment	**Comply with ARARs (incl. Endangered Species Act)**	**Longterm Effectiveness**	**Reduction of Tox, Vol., Mob**	**Shortterm Effectiveness**	**Implementability**	**Capital Cost (Remediation)**	**Operation & Maint. Cost (Stewardship)**	**State Acceptance**	**Community Acceptance**	**Stewardship**	**Secondary benefits**			
DOE		↑	↑	↑	↑	↑				↑	→	NA	↑	↑	→	→							
CDPHE	→	↑	↑	→	→	→	→	↑	→	→	→	↑	↑	↑	→	↓	→		→	→			
EPA																							
Community																							

Soil Excavation and Removal to 10 pCi/g only

	Threshhold Criteria										Balancing Criteria						Modifying Criteria		Non-CERCLA Criteria				
	Protect HH and Env.	Protect Local off-site Residents	Protect FutureOn-site Land User	Protect Site Workers	Protect Transportation Worker & Public	Protect Disposal Site Worker	Meet Surface Water Quality Standard On-site	Meet Surface Water Quality Standard off-site	Protect Environment	**Comply with ARARs (incl. Endangered Species Act)**	**Longterm Effectiveness**	**Reduction of Tox, Vol., Mob**	**Shortterm Effectiveness**	**Implementability**	**Capital Cost (Remediation)**	**Operation & Maint. Cost (Stewardship)**	**State Acceptance**	**Community Acceptance**	**Stewardship**	**Secondary benefits**			
DOE		↑	↑	↓	↓	↓				→	→	NA	↓	↑	↓	↓							
CDPHE	↓	↓	↑	→	→	→	↓	↓	→	→	↓	↑	↑	↑	→	↑	→		→	→			
EPA																							
Community																							

RFCA Stakeholder Focus Group
Attachment D

Title: Information Regarding Operation Of Surface Water Sampling Equipment

Date: September 20, 2000

Provided by: Bob Nininger
Kaiser-Hill, LLC

Phone Number: (303) 966-4663

Email Address: bob.nininger@rfets.gov

RFCA Stakeholder Focus Group
Attachment D
Information Regarding Operation Of Surface Water Sampling Equipment

Excerpted from: Surface Water Task Descriptions Document

...Typical equipment for each station will include an ISCO® flow meter controlling an ISCO® portable automated sampler. **Sampler intakes must be positioned such that representative samples are collected at each station.**[1] A Geomation® remote radio telemetry system will be used to transmit data in real-time from certain stations to Site personnel and other potential users of the transmitted data. Certain locations will also be equipped with dedicated multi-parameter water quality probes capable of transmitting and/or logging data. **Water-quality probes must be positioned to ensure that they collect representative data and remain wet at all times.**[2] Certain locations will also be equipped with dedicated precipitation gages. Precipitation gages must be installed such that nearby structures do not interfere with precipitation collection. Power for the instrumentation will be provided by AC line power, where available, with battery backup. Where AC power is unavailable, solar/DC power systems will be used. **Each station will have a primary flow-control structure. The flow-control structures may be existing culverts or concrete stormwater conveyance structures. However, in most cases, flumes or weirs will be purchased and/or fabricated for installation in natural stream channels and ditches, or fastened to existing concrete or metal stormwater conveyance structures.**

The installation task may require minor hand excavation of channel banks and beds for installation of the flow-control structure in ditches or natural channels. All construction and soil disturbance permit requirements will be fulfilled and permits obtained prior to installation. For fastening of flow-control structures to existing structures, a rotary hammer or carbide-tip steel drill may be used to drill holes in the structures for attachment of the flow-control structure by either lag screws or expansion bolts. Alternatively, temporary flow-control structures may be installed by simply using tarps

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[1] Intakes are positioned to collect only water that flowed through the flow-control structure. The intakes must be secured high enough off the streambed so as not to collect non-representative sediment quantities, but low enough to be submerged during near zero flow rates. Consideration is also given such that intake position minimizes the effects of winter freezing conditions.

[2] Probes must be positioned in the flow path, but in a location such that they will not be damaged by high flows. At locations which are dry during some periods, special flow-through sump systems may be constructed such that the probes remain wet between direct runoff periods.

and sandbags to secure a flume in a channel and ensure that all runoff enters the flume. Each location will require a unique application of flow-control structure and means for securing the structure in place. For excavation applications, an areal impact of no more than 15 square feet is expected per site.

After the flow-control structure is installed, it is instrumented with the monitoring equipment. The equipment is then programmed and performance checked to complete the installation.

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Attachment E

Title: Negative Activities and Concentrations

Date: September 20, 2000

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ADMIN RECORD

RFCA Stakeholder Focus Group
Attachment E
Negative Activities and Concentrations

One typically confusing aspect of reporting environmental radioactivity and concentrations of radionuclides is the reporting of negative results. Physically such environmental concentrations are not possible yet they are reported quite frequently in monitoring data reports from not just Rocky Flats Environmental Technology Site but from other databases with similar types of data. DOE guidelines, in fact, recommend the reporting of negative results (see Environmental Regulatory Guide for Radiological Effluent Monitoring and Environmental Surveillance, DOE/EH-0173T, page 7-5, Appendix A).

The reason such data are acceptable, and in fact preferred over other reporting methods, is easy to understand if one understands the origin of the number and the necessity to keep information in the database that can be related to the uncertainty and overall quality of the observations recorded there.

In most reports of environmental data, many of the results may be near the detection limit of the methods employed to analyze the radioactivity in samples. While longer counting times can provide better confidence in the numbers that are recorded in the instruments used for the analysis, there are other limits to the precision of the analysis. For example, no methodology is available to completely remove natural contributions and variability in the materials used in the collection and preparation of the sample, in the instrumental response and in the background in the laboratory. These can be minimized but not eliminated. In this context, since World War II, we must consider actinides resulting from nuclear experiments and weapons detonation as part of the "natural" contribution from these sources.

When these variables are considered together, they result in two contributions to every analytical result: a non-zero result when no environmental sample is present, called a blank, and an analytical uncertainty in that blank result. We compensate for the blank by subtracting an average blank result from the sample analysis result. However, the uncertain contribution due to blank variability cannot be quantified in the individual environmental samples. The number coming out of this arithmetic correction is the "blank-corrected" analytical result for the sample. Most data residing in the RFETs databases (SWD or AIR) are blank corrected. Only groundwater results are not blank corrected, and accordingly, are actually biased high compared to the actual amounts of actinide in the samples.

All is well and good with this approach when the sample contains an easily detected amount of radioactivity, however one must remember that the sample, whether blank corrected or not, still carries with it that unquantifiable "uncertainty" due to the natural factors discussed earlier. The ideal sample would have a blank value equal to the average blank used for the "blank correction"; all real-world samples have such a blank component only serendipitously. These real-world samples have a blank component that is either a little more or a little less than the average blank value.

What does this mean to the reported values when the sample being analyzed contains only a small amount of environmental radionuclide? It means the analytical result can be less or more than the average blank value. Of interest to this discussion, the reported radionuclide activity can be negative after blank correction when the sample blank and environmental radionuclide contributions together are less than the average blank. The negative number is completely valid procedurally and has significant physical meaning if appropriately interpreted in the context of the reporting methodology.

The following graphic may assist in understanding the discussion given above:

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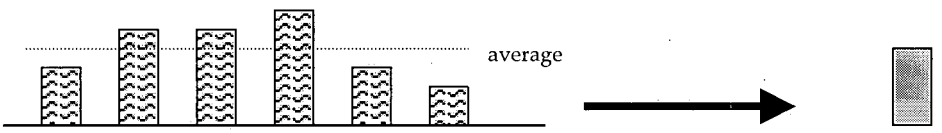
Attachment E
Negative Activities and Concentrations

Definitions:

- **Blank** – instrument output or calculated concentration when no actual environmental sample is present; i.e. result is due to filter or other sampling medium, laboratory medium or instrument variability.
- **Environmental Activity** – actual amount of radioactivity contributed by the environment being sampled.
- **Environmental Sample** – the environmental radionuclide plus the blank contribution.

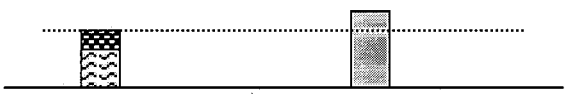
Sample population of **blank** values **Yields** **Average blank** value



Consider a "real-world" **environmental sample** containing:

1) Single blank from total population of blanks 2) Environmental activity

The environmental sample can only be analyzed in the laboratory as these two components together and is then compared with the average blank:



ENVIRONMENTAL SAMPLE AVERAGE BLANK

Since the magnitude of the average blank is larger than the environmental sample, subtracting the average blank from the environmental sample result (blank correcting) will yield a negative number.

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Attachment E

Appendix A
Negative Activities and Concentrations

RFCA Stakeholder Focus Group
Attachment F

Title: Remedial Action Alternative Templates

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RFCA Stakeholder Focus Group
Meeting Agenda

When: **September 27, 2000, 4:30 - 6:30 p.m.**

Where: **Broomfield Municipal Hall, Bal Swan and Zang's Spur Rooms**

4:30 Introductions and Agenda Review

4:40 Presentation and Discussion of Evaluation Matrices for 903 Pad Clean-up

6:10 Topics for Upcoming Meetings

6:20 RSAL Update (DOE, EPA, CDPHE)

6:30 Adjourn