



August 7, 2001

Dear Stakeholder:

The Rocky Flats Cleanup Agreement (RFCA) Stakeholder Focus Group will meet at the Broomfield Municipal Center at One DesCombes Drive on August 8, 2001 from 3:30 to 6:30 p.m.

The agenda for the August 8, 2001 meeting is enclosed (Attachment A). We will discuss the following topics:

- RSALs: Task 3 - Parameter Discussion and Modeling Results
- Review of Peer Review Process for Task 3, Including Wind Tunnel Peer Review
- Clean-up Alternatives Matrix - Distribution of Draft Working Group Results

The meeting minutes for the July 11, 2001 meeting are enclosed as Attachment B.

The RSALs Working Group met July 12, July 22, and August 2, 2001. The action items and notes resulting from the meetings are enclosed as Attachment C.

Also attached is a paper by Victor Holm entitled "Model Assumptions" (Attachment D).

If you need additional information to prepare you for the Focus Group discussion on August 8, 2001, please contact Christine Bennett of AlphaTRAC, Inc. at 303 428-5670 (cbennett@alphatrac.com). Christine will help to find the appropriate resource for you.

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

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CLASSIFICATION OFFICE

ADMIN RECORD

SW-A-004396

**RFCA Stakeholder Focus Group  
Attachment A**

Title: Agenda for August 8, 2001 Focus Group Meeting

Date: August 7, 2001

Author: C. Reed Hodgins  
AlphaTRAC, Inc.

Phone Number: (303) 428-5670

Email Address: [cbennett@alphatrac.com](mailto:cbennett@alphatrac.com)

## RFCA Stakeholder Focus Group Meeting Agenda

**When:** August 8, 2001 3:30 - 6:30 p.m.

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

3:30-3:40 Agenda Review, 6/20, 7/11/01 Meeting Minutes Review,  
Objectives for this Meeting

3:40-4:50 RSALs: Task 3 - Parameter Discussion and Modeling Results

4:50-5:00 Break

5:00-5:50 RSALs: Task 3 - Parameter Discussion and Modeling Results  
(Continued)

5:50-6:10 Review of Peer Review Process for Task 3, Including Wind  
Tunnel Peer Review

6:10-6:20 Clean-up Alternatives Matrix - Distribution of Draft Working  
Group Results

6:20-6:30 Set Future Agendas and Review Meeting

6:30 Adjourn

**RFCA Stakeholder Focus Group  
Attachment B**

**Title:** Meeting Minutes for July 11, 2001 Focus Group Meeting

**Date:** August 15, 2001

**Author:** C. Reed Hodgkin  
AlphaTRAC, Inc.

**Phone Number:** (303) 428-5670

**Email Address:** [cbennett@alphatrac.com](mailto:cbennett@alphatrac.com)

**RFCA Stakeholder Focus Group**  
**July 11, 2001**  
**Meeting Minutes**

**INTRODUCTION AND ADMINISTRATIVE**

A participants list for the July 11, 2001 Rocky Flats Cleanup Agreement (RFCA) Stakeholder Focus Group meeting is included in this report as Appendix A.

Reed Hodgkin of AlphaTRAC, Inc., meeting facilitator, reviewed the purpose of the RFCA Stakeholder Focus Group. He then went over the Meeting Rules. Introductions were made.

Reed reviewed the meeting agenda, which included:

- RSAL Working Group Update
- RSALs: ALARA Discussion
- RFCA Parties Feedback - What Heard, How Used, Decisions / Choices Made
- RSALs: Task 3 - Plan Future Agenda Topics
- RSALs: Task 4 - Discuss Need for Wind Tunnel Peer Review

**RSALS: TASK 3 - PLANNING FOR FUTURE AGENDA TOPICS**

Reed introduced the topic and identified the objective for the discussion:

- Determine the Focus Group's priority for RSALs parameters and modeling discussions at the next several Focus Group meetings.

Reed laid out the future agenda topics as they currently stood, based on Focus Group and Agenda Group discussions:

- July 25: Presentation and discussion of the initial RSALs modeling results,
- August 8: Continuation of the modeling results discussion,
- August 22: Draft report to be completed; Focus Group to develop questions to send to the peer reviewers and questions of clarification to the agencies,
- September 19: Discussion of the peer review results and agency responses.

Reed noted that there would be time on the September 9, 2001 agenda for discussion of specific Task 3 topics - and perhaps time at other meetings as well. The Focus Group felt that key input parameters should be discussed in detail, including how each parameter varies across the land use scenarios. The sensitivity of the end results

(RSALs) to variations of the key parameters was also of interest. The most likely candidates for key parameters were identified as:

- Inhalation Rate
- Soil Ingestion Rate
- Mass Loading
- Dose Conversion Factors (ICRP 30 vs ICRP 72)
- Vegetation Intake.

## RSAL WORKING GROUP UPDATE

Tim Rehder of the U.S. Environmental Protection Agency (EPA) briefed the Focus Group on the June 28, 2001 RSALs Working Group meeting. He stated that there were three topics of discussion:

1. Dose Conversion Factors,
2. Plant Uptake Factor, and
3. Soil Ingestion Rates for Adults.

Tim stated that prior to the meeting, the Working Group was planning on using the same dose conversion factors that the Risk Assessment Corporation (RAC) study had used, based on ICRP 72 methodology. Based on a memorandum submitted by Jim Benetti on June 5, 2001, the RSALs Working Group recommended using a different dose conversion factor for inhalation than the one used by the RAC. Benetti indicated that the Working Group could justify using the S Class, or the small clearing class, for the inhalation dose conversion factor as applied by RAC. However, since there is not a large body of soil data indicating that all the plutonium is indeed in a tetravalent oxide state, it would be more prudent to assume the M class, which predicts roughly a 50 times higher dose per mass inhaled. The group decided to go with that M class for the dosimetry. That will make a fairly significant difference in the calculation.

Tim stated that the Working Group is evaluating the plant uptake factor being used in the calculations. The Working Group, in conjunction with the Rocky Flats Citizens Advisory Board, will ask questions of Ward Wicker and try to get resolution on that issue.

The Working Group is concerned that the soil ingestion parameter for adults that is currently being considered by the group is based on a study involving only 60 adults.

The Working Group has not been able to identify a more robust data source. The Working Group is considering adopting a distribution appropriate to a study with a limited cohort: a uniform distribution with a low point of 30 mg / day and a high point of 100 mg / day.

A member of the Focus Group asked if candidate RSALs would be calculated using both dose conversion factor methodologies (ICRP 30 and ICRP 60/72). Tim answered that both calculations would be performed for comparison.

Tim was asked for further explanation of the change in Inhalation Dose Conversion Factor. He responded:

"There's always been, within the dose conversion factors, the ability to choose dose conversion factor based on how soluble it is. If we were dealing with plutonium nitrates in the soil, we wouldn't use the most soluble form. With this issue, the RAC made the decision. We have pretty good data that says the plutonium at Rocky Flats is primarily an ionized state. Therefore, we should go with the S class, the least soluble class. Benetti put out the argument, although we do have observational data for the groundwater that says it's not very soluble and we also have direct measurements through some of the samples that were taken by the 903 pad and studied in the Los Alamos program and the Stanford Cyclotron that says it's found potentially as an oxide. Given the magnitude of the position, we don't have as many samples as we would want to make that and it would be more prudent to go with the M class."

A member of the Focus Group then asked about chemical changes to plutonium once it is introduced into the body. The topic was deferred for potential future discussion with experts in the area.

## RSALS: ALARA DISCUSSION

Joe Legare of the U.S. Department of Energy (DOE) presented and led a discussion on the application of the As Low as Reasonably Achievable (ALARA) process during cleanup of Rocky Flats (Appendix B).

Joe explained that this would be the first discussion on ALARA. It is an opportunity to present a perspective and some concepts related to processes in place or anticipated processes in future, on how ALARA applies to cleanup and cleanup decisions at Rocky Flats.

Joe described the regulatory definitions of ALARA:

- DOE Order 5400.5,
- 10 CFR 20.1003, and
- 6 CCR 1007-1 RH 1.4.

Joe indicated that an ALARA action could occur under two general conditions - when a cleanup action has been planned for an area, and when cleanup is not otherwise triggered.

ALARA may come into play for a planned cleanup when there may be a benefit to performing a more extensive remediation. For instance, an action is required, but there may be a health benefit for a more extensive action. There may be a benefit of more extensive excavation or other remediation to reduce contaminant concentrations below the action level.

ALARA may also be applied when cleanup is not otherwise indicated. He referred to candidates for such action as "warm spots" - areas where contamination exists, but nowhere in the area are levels high enough to trigger an action under the RSAL(s). He stated that there might be something about the nature or location of such an area where there would be a benefit that justifies the cost of remediation.

Joe listed examples of areas at Rocky Flats where it seems an ALARA process would be appropriate. Joe listed the areas most likely to impact the cleanup as:

- Original Process Waste Lines,
- Trench 7,
- Ash Pits,
- Original landfill,
- 903 Pad,
- IHSSs found to contain diffuse contamination,
- Under building contamination.

Joe next described a vision of how the ALARA process would be applied to each situation. He noted that he views ALARA as essentially a subjective analysis - a case-by-case evaluation of the question, "Does it make sense to go further with cleanup at this location?"

Joe indicated that the list of sites to be considered under the "action has already been triggered" category will be well defined - those sites that trigger the RSALs. The

ALARA process for these sites is then essentially embedded in the CERCLA process - the application of the threshold criteria and modifying criteria that have already been discussed. Joe noted that the RFCA Agencies have identified a potential opportunity in the RSAL matrix being developed as a part of Task 3 in the RSAL Review. The boxes in the matrix will represent a rigorous dose and risk assessment across a number of scenarios and a wide risk range. The values NOT used to establish the RSAL(s) could form a more quantifiable basis (and justification) for ALARA actions beyond the basic cleanup requirements.

Joe then described a way that the ALARA process could be framed for those areas where actions are not triggered by RSALs. He referred the group to a process described in Attachment 6 to the RFCA that could be used or modified to evaluate "warm spots." The process screens out areas where the contamination is so low that a determination of "No Further Action" can be made. He indicated that the candidates for evaluation under this process had largely been identified in the Historical Release Report, and that the method used to develop the report could be applied further as necessary. So far, 367 candidate sites had been identified and approximately 80 sites were going through the process.

A member of the Focus Group asked if the experience in using the RFCA Attachment 6 process could be used to gain an idea of how "ALARA for Warm Spots" had been applied historically (without knowing that it was ALARA). This could serve in a way as a baseline for understanding and defining ALARA now. Joe agreed to conduct such an analysis.

A member of the Focus Group noted the parallels between the ALARA discussion and the discussion on Stewardship. The criteria for performing ALARA exist in the CERCLA criteria. The challenge is in agreeing on how the criteria should be balanced.

A Focus Group member asked how the ALARA process could be applied successfully as part of the remediation under the Environmental Restoration RFCA Standard Operating Protocol (ERRSOP), where characterization and remediation would be occurring at the same time, in the field. Joe responded that the guidance for applying ALARA during these clean-ups (essentially, on-the-spot ALARA decisions) would have to be included in the ERRSOP. He noted that the ERRSOP would need to be strengthened in this area.

The Focus Group then held a discussion concerning a memo issued by Tom Pentecost of CDPHE regarding application of ALARA under the Nuclear Regulatory Commission (NRC) rule. The discussion centered on the NRC concept that ALARA would be applied to establish the "As Low As Reasonably Achievable" remediation to be

conducted if a site could not be remediated to the 25 mrem dose level. Members of the Focus Group expressed concern that the memo seemed to indicate a use of ALARA that is inconsistent with discussions at the Focus Group meetings. The agency representatives emphasized that the State regulation, based on the NRC rule, was an ARAR, and that the primary result was the consideration of a 25 mrem dose level in setting the RSAL. Joe noted that the 25 mrem level may not be relevant in a practical sense - it is possible that the risk associated with 25 mrem will fall outside the CERCLA risk range.

A Focus Group member noted that ALARA could be conducted as purely a numerical cost-benefit analysis and asked if the Agencies were planning on this approach. Joe responded that the quantitative cost-benefit approach would not be used in the Rocky Flats cleanup, and reiterated that a subjective approach, probably aligned with the CERCLA criteria would be employed. He noted that cost was one of the CERCLA criteria and confirmed that cost would be considered as one of the elements in the subjective ALARA decision for sites that triggered the RSAL. He stated that cost would certainly be considered along with benefits to be gained when looking at sites that did not trigger the RSAL.

A member of the Focus group asked if ALARA would focus strictly on source removal. Joe responded that it was simpler to talk in terms of removal for this discussion, but that alternative actions such as engineered controls should also be considered under ALARA.

In response to a question from the Group, Joe assured the Focus Group that a cost-benefit analysis would not be used to establish the RSAL. The RSAL is intended to be a health-based number.

The Agencies responded to a question about a recent Supreme Court decision and its applicability to setting RSALs. They noted that the Supreme Court had forbidden the use of cost-benefit analysis in establishing a standard and stated that the precedent was not applicable to the Rocky Flats cleanup, as no standard was being set.

The group discussed further the possibility that ALARA could be used in the case that it was not practical to achieve full cleanup in an RSAL-triggered area. In this circumstance, ALARA could be used to determine what IS reasonable to accomplish, given that the CERCLA cleanup could not be fully achieved. The Agencies noted that this possible application was being included for completeness - there was no intention or expectation that the situation would develop at Rocky Flats. Members of the Focus Group expressed a strong intent that such a situation should be avoided.

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## RFCA PARTIES FEEDBACK - WHAT HEARD, HOW USED, DECISIONS / CHOICES MADE

Reed introduced the topic by saying that the Agenda Group had asked for a briefing by the RFCA agencies on how cleanup decisions are being / will be made. When he took the request to the Agencies, they responded that they felt the process had been thoroughly described at previous meetings and asked for a more specific request to fill in the holes for the Focus Group. Reed stated that his approach to addressing the issue was to prepare a White Paper describing the decision-making process as he understood it. The White Paper could serve as a basis for the continuing dialog between the Focus Group and the Agencies.

Reed then presented a summary briefing on the White Paper to the Focus Group (Appendix C).

The Agency representatives agreed that Reed's understanding of the process was accurate, except where the RFCA Principals get involved. They stated that the RFCA Principals get directly involved in the decision-making process at two points only:

- When a decision document is complete in draft form and ready for formal public comment (in the opinion of the Project Coordinators), the RFCA Principals will review the document and make a final determination if the document is ready for public review and comment, and
- When all public comments have been received, responded to, and revisions made to the decision document, the RFCA Principals will review the public comments, the agency responses, and the associated revisions to the document. The RFCA Principals will then make a decision on whether or not to approve the decision document (and thus make the associated cleanup decision).

Reed then opened up the topic for dialog with the Focus Group.

The first issue discussed was the participation / influence of management above the level of the Principals in DOE and EPA (DOE-Headquarters and EPA-Headquarters). The agencies were asked if the decision-making authority ultimately rested in the Headquarters organizations rather than at the local level.

DOE confirmed that the formal decision-making authority in DOE rests with the DOE Manager. DOE replied that its Headquarters was being kept informed about the

cleanup decision process at Rocky Flats and was very interested. The DOE representatives indicated, however, that it was very important that DOE Headquarters understand the decisions being made and agree with them. They stated that Headquarters probably could insert itself into the process if it thought it needed to, which is why it is important to keep DOE-Headquarters informed and on board with the decisions being made locally.

EPA indicated that only limited discussions are being held with its Headquarters, and that those interactions are mostly technically- rather than policy-related.

A member of the Focus Group expressed concern that the decision-making process may be more involved than is being presented to the Focus Group and that there may be outside influences participating behind the scenes, such as DOE-Headquarters, EPA-Headquarters, and Congress. He stated that there was displeasure among some members of the community regarding where the RFCA Project Coordinators were going with the decision regarding the RSAL Land Use Scenario and stated that it was important for the RFCA Principals to hear opinions directly from the community members.

Reed asked the Agencies for the status and process for making the decision on the anticipated land use scenario for the RSAL review. Joe Legare of DOE stated that the RFCA Project Coordinators were developing a recommendation on the land use scenario to be presented to the RFCA Principals. He said that the recommendation was being developed with the participation of stakeholders, principally through the RFCA Stakeholder Focus Group. He said that all options were still on the table and were being discussed. He emphasized that the RFCA Project Coordinators are taking the input from the Focus Group, the agencies' technical staffs, the agencies' legal staffs, etc. and developing a recommendation considering all inputs. He noted that, while the issue is still open for discussion, the RFCA Project Coordinators are in agreement that, unless some compelling new information develops, the recommended anticipated land use scenario will be the Wildlife Refuge Worker. He stated that the recommendation had not been made officially to the RFCA Principals yet and that it would be made as part of the draft Task 3 report submission to the Principals. The scenario choice would become a formal decision when the RSAL report is finalized after formal public comment.

Tim Rehder of EPA stated that his recommendation to the EPA Principal would be that the Wildlife Refuge Worker was the appropriate anticipated future land use scenario. He indicated that this recommendation had the concurrence of technical and legal staff at EPA.

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A member of the Focus Group expressed concern that a National Research Center report indicated that no DOE sites could be cleaned up to unrestricted use. He asked if that meant that the decisions about Rocky Flats had essentially already been made at a Congressional or DOE-Headquarters level. DOE responded that it had been stated several times that some contamination would be left at Rocky Flats and that engineered and/or institutional controls would be necessary to manage the remaining contamination. They said that the decisions to be made were associated with how much to clean up in what areas and what controls to put in place. They indicated that the dialog with the Focus Group, including the establishment of RSALs, was intended to address these issues.

A Focus Group member explained that the concern of some was whether the members of the community should be talking directly with the RFCA Principals or others within the RFCA Agencies, especially if persons outside the Focus Group discussions are significantly influencing cleanup decisions.

## ADJOURNMENT

Reed noted that meeting time had run out before addressing the Wind Tunnel Peer Review and promised to make time on the next agenda for that topic.

The Focus Group meeting was adjourned at 6:35 pm.

**RFCA Stakeholder Focus Group  
July 11, 2001  
Meeting Minutes**

**Appendix A  
Participants List**

**RFCA Stakeholder Focus Group  
July 11, 2001  
Participants List**

NAME		ORGANIZATION / COMPANY
David	Abelson	RFCLOG
Melissa	Anderson	RFCLOG
Christine	Bennett	AlphaTRAC, Inc.
Kent	Brakken	U.S. DOE - RFFO
Lane	Butler	Kaiser-Hill Company, LLC
John	Corsi	Kaiser-Hill Company, LLC
Carol	Deck	Kaiser-Hill Co, LLC
Rick	DiSalvo	US DOE - RFFO
Sam	Dixon	City of Westminster
Joe	Goldfield	RFSALOP
Aaron	Grider	Jefferson County
Jerry	Henderson	RFCAB
Reed	Hodgin	AlphaTRAC, Inc.
Victor	Holm	RFCAB
Jeremy	Karpatkin	US DOE - RFFO
Ken	Korkia	RFCAB
Joe	Legare	DOE
Joshua	Levin	Decision Research
Ann	Lockhart	CDPHE
Carol	Lyons	City of Arvada
Sandi	MacLeod	U.S. DOE
Tom	Marshall	Rocky Mountain Peace and Justice Center
LeRoy	Moore	RMPJC
Bob	Nininger	Kaiser-Hill Company, LLC
Patricia	Powell	U.S. DOE - RFFO
Carla	Rellergert	Weston
Mark	Sattelberg	US Fish and Wildlife Service
Kathy	Schnoor	City of Broomfield
Joel	Selbin	
Carl	Spreng	CDPHE
Noelle	Stenger	RFCAB

**RFCA Stakeholder Focus Group  
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**Appendix B  
Joe Legare, U. S. Department of Energy:  
Presentation: Application of ALARA Process During Cleanup  
of Rocky Flats**

**APPLICATION OF ALARA PROCESS  
DURING CLEANUP OF ROCKY FLATS**

July 11, 2001

## ALARA - Regulatory Definitions

**DOE O 5400.5** - As Low As Reasonably Achievable (ALARA) is a phrase (acronym) used to describe an approach to radiation protection to control or manage exposures (both individual and collective to the work force and the general public) and releases of radioactive material to the environment as low as social, technical, economic, practical, and public policy considerations permit. ALARA is not a dose limit, but rather it is a process that has as its objective the attainment of dose levels as far below the applicable limits of the Order as practicable.

**10 CFR 20.1003** - *ALARA* (acronym for “as low as reasonably achievable”) means making every reasonable effort to maintain exposures to radiation as far below the dose limits in this part as is practical consistent with the purpose for which the license activity is undertaken, taking into account the state of the technology, the economics of improvements in relation to state of technology, the economics of improvements in relation to benefits to the public health and safety, and other societal and socioeconomic considerations, and in relation to utilization of nuclear energy and licensed materials in the public interest.

**6 CCR 1007-1 RH 1.4** – “As low as is reasonably achievable” (ALARA) means making every reasonable effort to maintain exposures to radiation as far below the dose limits in these regulations as is practical, consistent with the purpose for which the licensed or registered activity is undertaken, taking into account the state of technology, the economics of improvements in relation to state of technology, the economics of improvements in relation to benefits to the public health and safety, and other societal and socioeconomic considerations, and in relation to utilization of nuclear energy and licensed or registered sources of radiation in the public interest.

# Summary of Considerations When Performing an ALARA Analysis

Social  
Technical  
Economic  
Practical  
Public policy  
Public health and safety

## When is a discussion of ALARA relevant?

- Action is not triggered but there may be a benefit to performing remediation that is otherwise not contemplated (not required by regulation)
- Action is triggered and there may be a benefit to performing more extensive remediation than is otherwise not contemplated (not required by regulation)

## Examples of Where an ALARA Analysis May Be Applied

- An area of concern does not contain contamination above an action level or PPRG, but due to the nature or location of the AOC, there may be a benefit that justifies the cost of remediation.
- An action is required, but there may be a health benefit for a more extensive action. The Lip Area and Americium Zone contain a concentration gradient radiating from the 903 Pad. The action level may fall somewhere between the lowest and highest associated isopleths. There may be a benefit of more extensive excavation or other remediation to contaminant concentrations below the action level.

# Where is ALARA most likely to impact the cleanup of Rocky Flats?

- Original Process Waste Lines
- Trench 7
- Ash Pits
- Original Land Fill
- 903 Pad
- IHSS's thought to contain discrete contamination but found to contain diffuse contamination
- UBC

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# ALARA - Process

- Quantitative cost-benefit analysis (e.g., optimization) could be performed
  - Parameters needed to evaluate the cost-benefit analyses are difficult to quantify
  - Evaluations themselves can be expensive
  - Evaluations include many additional assumptions, judgment, and limitations that are often difficult to reflect as uncertainties in the analyses

# ALARA – Process

- Qualitative analyses are justified, in most instances, for ALARA judgments, especially where potential doses are well below the dose limit
  - Basis for such judgments should be documented
  - More detailed analysis should be considered if the decisions might result in doses that approach the limit or the limit can't be feasibly met.
- For residual radioactivity in soil at sites that will have unrestricted release, generic analyses show that shipping soil to a low-level waste disposal facility is unlikely to be cost effective for unrestricted release, largely because of the high costs of waste disposal. Therefore shipping soil to a low-level waste disposal facility generally does not have to be evaluated for unrestricted release.

# ALARA - Approach

- Top down review of whether an action should be taken
  - Review of RSALs and PPRGs
  - HRR
  - AOC, PAC, UBC, IHSS
  - New Characterization Data
- Bottom up analysis
  - No Action
  - No Further Action
  - No Further Remedial Action

# ALARA Process – Top Down Approach

## When an action is triggered

### *CERCLA ALTERNATIVES ANALYSIS*

#### **Threshold Criteria:**

Compliance with ARARs - Addresses whether a remedy will meet the applicable and relevant and appropriate Federal and state standards or whether a waiver is justified.

Overall protection of human health and the Environment - Addresses whether a remedy provides adequate protection of human health and the environment and discusses how risks are eliminated, reduced or controlled through treatment, engineered controls or institutional controls.

# ALARA Process – Top Down Approach

## When an action is triggered

### CERCLA ALTERNATIVES ANALYSIS

*Primary balancing criteria are key factors in ALARA process assessments. Although the Reduction of toxicity, mobility, or volume criterion is not addressed in detail, processes or techniques such as these that can reduce migration and possibly dose should be considered and addressed in the selection of alternatives.*

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

# ALARA Process – Top Down Approach

## When an action is triggered

### *CERCLA ALTERNATIVES ANALYSIS*

#### **Modifying Criteria:**

State acceptance - Indicates whether the state concurs with or opposes or has no comment on the preferred alternative.

Community acceptance - Summarizes the public's response to the alternatives.

# ALARA Process – Top Down Approach

## When an action is triggered

### *CERCLA ALTERNATIVES ANALYSIS*

- Balancing criteria are predominantly subjective
- Therefore, use the Risk/Dose RSAL table for radiological contamination to provide an additional indicator of benefit relative to costs (and other factors).

# ALARA Process – Bottoms up approach

## When an action is not triggered

### RFCA Attachment 6 – No Action/No Further Action/No Further Remedial Action Decision Criteria

- Source Evaluation
- Background Comparisons
- CDPHE Conservative Screen
- Risk-Based Screening of Chemicals
- CERCLA Baseline Risk Assessment

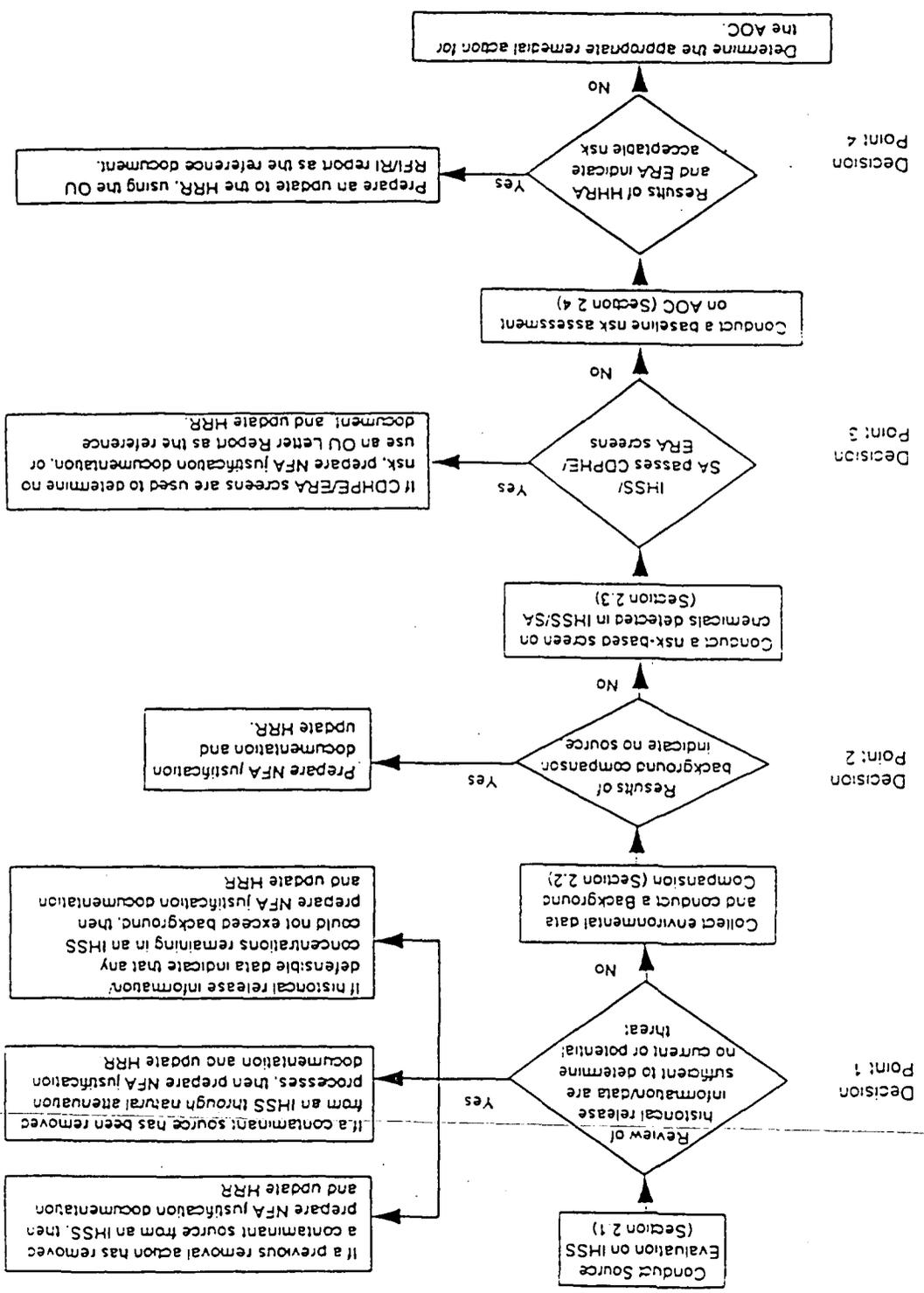


Figure 2. Decision Points for NFA Recommendations

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# Summary

The ALARA process will be applied to determine if:

- additional cleanup beyond a regulatory threshold meets ALARA
- an action is warranted even though a regulatory trigger was not reached

The principles of ALARA as described in DOE and NRC orders and guidance are embedded in the RFCA/CERCLA/RFCA regulatory approach for selecting and implementing remedial and corrective actions

What is reasonably achievable beyond what is required is a subjective standard and is (or should be) contained in the alternatives analysis. However, the RSAL table can assist in providing a quantitative measure to the benefit of further remediation.

The ALARA process is invoked both at a high level as integrated risk management decisions are made in consideration of social, technical, economic, practical, public policy, and public health and safety factors, and case-by-case for each IHSS and AOC.

## *Next Steps*

- *Obtain agreement on the applicability of ALARA goals*
- *Identify where ALARA will be applied on site*
- *Clarify how ALARA will be explicitly addressed in decision documents*
- *Discuss stakeholder involvement in the NFA process*

**RFCA Stakeholder Focus Group  
July 11, 2001  
Meeting Minutes**

**Appendix C  
Reed Hodgin: AlphaTRAC, Inc.  
Cleanup Decision-Making at Rocky Flats Under the RFCA  
A Facilitator's View**

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## Cleanup Decision-Making at Rocky Flats Under the Rocky Flats Cleanup Agreement (RFCA) - a Facilitator's View

C. Reed Hodgkin  
Facilitator, RFCA Stakeholder Focus Group

The following is my understanding of the decision-making process being applied to cleanup decisions at the Rocky Flats Environmental Technology Site (RFETS), and how the RFCA Stakeholder Focus Group fits into the process.

### WHAT GOVERNS CLEANUP DECISIONS?

RFCA is the regulatory foundation for cleanup at RFETS and represents a formal agreement among the cleanup parties - the U. S. Department of Energy (DOE), the U. S. Environmental Protection Agency (EPA), and the Colorado Department of Public Health and Environment (CDPHE). The RFCA integrates the complex regulatory requirements for Rocky Flats, overseen by multiple regulatory agencies, into a single regulatory agreement.

Activities under this agreement are regulated by the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), the Resource Conservation and Recovery Act (RCRA), the National Oil and Hazardous Substances Pollution Contingency Plan, the Colorado Hazardous Waste Act (CHWA), and their implementing regulations, and other applicable State environmental laws. DOE is responsible for satisfying the requirements of the agreement even if the work is ultimately performed by another agent, such as the Rocky Flats integrating management contractor. All cleanup decisions are made within the RFCA framework.

### WHO ARE THE DECISION-MAKERS?

The ultimate decision-makers in the RFCA process are the Agency "Principals."  
The designated Principals are:

- CDPHE: Director, Office of Environment
- EPA: Deputy Region VIII Administrator
- DOE: Manager, Rocky Flats Field Office.

## Cleanup Decision-Making At RFETS - A Facilitator's View

However, it is important to remember that decision-making under RFCA is a PROCESS, rather than personal decisions by the Principals. The process involves investigation and alternatives evaluation at the staff level in one or more of the agencies, joint evaluation of alternatives, and development of a recommended decision. The Principals are kept up-to-date on the decision development process but are not usually directly involved. They get involved when a joint recommendation is agreed upon at the working level and ready for their review or when agreement can not be reached among the agencies and the disagreement can not be resolved at lower levels.

The Principals reserve the right to make decisions that disagree with staff recommendations, but in practice are highly likely to concur in proposed decisions that have the joint support of their staffs. It is a safe working assumption that extraordinary circumstances (such as key new information not known to the staffs) would have to exist for the Principals to discard a recommendation jointly agreed to by the agency staffs.

Because of this, the most important agency representatives in the decision-making process are the RFCA Coordinators. Each agency Principal has designated a RFCA Coordinator to act as the lead for the agency's participation in the RFCA process and to interact with their counterparts at the other agencies in developing recommendations. The RFCA Coordinators lead and coordinate the day-to-day investigations and evaluations by the agency staffs; review and concur with working-level findings, choices, and recommendations; and lead the development of recommended decisions for submittal to the Principals. Because of the RFCA Coordinators' designated responsibilities and intimate familiarity with the issues, the Principals rely heavily on the advice of the RFCA Coordinators and trust them to bring forward sound, jointly supported recommendations.

It should be noted that, under its contract, Kaiser-Hill is directly involved in the staff level investigations and evaluations conducted in support of cleanup decision-making. However, Kaiser-Hill is NOT a party to RFCA - it advises and acts as technical support to one of the parties (DOE). Kaiser-Hill may propose recommendations and strategies to DOE, but DOE is solely responsible for any findings or recommendations it takes to the other RFCA parties.

## WHAT IS THE MECHANISM FOR DECISION-MAKING?

The key cleanup decisions under the RFCA will be made through the development, review, and approval of decision documents. Examples of such decision documents are: Draft Permit Modifications/Proposed Plans, RFCA Standard Operating Protocols (RSOPs), Proposed Action Memorandums (PAMs), Interim Measure/Interim Remedial Actions (IM/IRAs), Closure Plans, the RFCA Integrating Decision Document (RIDD), and the Radioactive Soil Action Level (RSAL) Review.

Under RFCA, the documents are submitted to and approved by the "Lead Regulatory Agency." RFCA designates the EPA as the Lead Regulatory Agency on remedial activities in the Buffer Zone or offsite areas and the State for the industrial area and any issues surrounding siting of a waste facility. The RIDD and RSAL Review are jointly authored by the three agencies.

## HOW IS THE COMMUNITY INVOLVED IN CLEANUP DECISION-MAKING?

The RFCA agencies have been expanding the traditional regulatory formal comment process to include informal interaction with and input from the community. Forums such as the D&D Pizza Group and the RFCA Stakeholder Focus Group are examples of this trend.

The community is directly involved in formulating cleanup decisions for Rocky Flats in four formal and informal ways:

### *Formal Public Comment on Draft Decision-Documents*

The RFCA specifies that public review and comment will be provided for key decision documents such as those listed above. This is the traditional regulatory public comment process and is consistent with requirements under CERCLA. A formal comment period will be announced and comments collected. The authoring agency will review and, where appropriate, incorporate comments received. The Lead Regulatory Agency will determine if public comments have been properly addressed and either accept the revised draft document or return it to the authoring agency for further revision.

## Cleanup Decision-Making At RFETS - A Facilitator's View

### *Rocky Flats Citizens Advisory Board*

The Rocky Citizens Advisory Board (RFCAB) is tracking and reviewing cleanup decisions at RFETS. The RFCAB is intended to represent the diverse views existing in the broad community at and surrounding RFETS. The RFCAB develops recommendations and submits its recommendations jointly to DOE, CDPHE and EPA. Members of the public may apply for positions on the Board or participate directly in subcommittee deliberations.

### *Rocky Flats Coalition of Local Governments*

The Rocky Flats Coalition of Local Governments (RFCLOG) is tracking and reviewing cleanup decisions at RFETS. The RFCLOG is intended to represent the views of the local governments surrounding RFETS. The RFCLOG develops recommendations for submittal to agencies and governments. Local governments appoint representatives to the Coalition.

### *RFCA Stakeholder Focus Group*

The RFCA Stakeholder Focus Group was created to provide direct interaction between interested members of the community and the RFCA Project Coordinators and associated agency staffs. The intention is for the community to bring issues of concern as well as community values and interests to the RFCA parties early in the process of decision formulation. In this way the agency staffs and Project Coordinators can consider community concerns DURING the development of recommended decisions. The draft decision documents will thus already incorporate much (hopefully "most") of the community's needs and values when they are issued for formal public review. To the extent that the decisions and documents have the support of key members of the community, the decisions and commitments will be stronger and more likely to succeed.

The RFCA Stakeholder Focus Group does not replace any of the other community involvement processes. In a sense, it directly involves key community members in preparing for success in the public comment process - and strengthens the prospects for overall success in the cleanup of Rocky Flats.

## DECISION-MAKING FOR THE RSAL REVIEW

A specific decision-making process has been established for decisions related to the RSAL review:

- Agency technical staff prepare a draft decision-support report.
- The RFCA Project Coordinators review the draft report.
- When the RFCA Project Coordinators agree on the content of the draft report, they submit the report to the RFCA Stakeholder Focus Group for review and comment (and where needed, peer review).
- The Focus Group discusses the draft report and provides comments and input to the RFCA Project Coordinators and technical staff.
- The RFCA Project Coordinators work with the technical staff and the Focus Group to resolve the Focus Group comments.
- The RFCA Project Coordinators submit the draft report, along with any unresolved Focus Group comments, to the RFCA Principals. The RFCA Principals make no decision at this time.
- The RFCA Principals issue the composite RSAL Review report for formal public comment.
- The RFCA Project Coordinators and technical staff resolve public comments.
- The RFCA Project Coordinators submit public comments, responses, and any unresolved issues to the RFCA Principals.
- The RFCA Principals evaluate the public comments, responses, and any unresolved issues and make a final joint decision on the RSAL.

**RFCA Stakeholder Focus Group  
Attachment C**

Title: RSALs Working Group Notes for July 12, July 26,  
and August 2, 2001

Date: August 7, 2001

Phone Number: (303) 428-5670

Email Address: [cbennett@alphatrac.com](mailto:cbennett@alphatrac.com)

**NOTES FROM RSALs WORKING GROUP MEETING ON 7/12/01**

**ITEMS COVERED ON 7/12:**

1. RESRAD runs for 3 scenarios (rural resident adult, rural resident child, and wildlife refuge worker) for the purpose of QA/QC of the input parameters.
2. Adult soil ingestion rate parameter.
3. Plant uptake factor.
4. Task 3 report outline and responsibilities.

**ACTIONS**

<b>Action Item</b>	<b>Who</b>	<b>When</b>	<b>Notes</b>
Provide RESRAD runs to Jim Benetti.	Tom Pentecost	ASAP	
QA/QC input parameters used in 3 RESRAD runs by Tom Pentecost (distributed at 7/12/01 working group meeting).	All	7/19/01	Be prepared to discuss any issues from QA/QC of input parameters. Please have proposals for changes if you disagree with any of the inputs.
QA/QC dose conversion factors (e-mailed on 7/10/01).	All	7/19/01	Be prepared to discuss any issues from QA/QC of dose conversion factors. Please have proposals for changes if you disagree with any of the factors.
Talk to Ward Whicker (& submit in writing) to get his recommendation on which plant uptake factor to use.	Carl Spreng	7/19/01	Working group decided to accept and use Ward Whicker's recommendation.
Add new assignees to Task 3 report outline and provide to Sandi.	Tricia Powell	7/18/01	Sandi will distribute to working group. Group members should review outline prior to 7/19 meeting and be prepared to complete the assignments.
Tom Pentecost will prepare a spreadsheet of current input parameter values for each scenario. Susan Griffin will use the spreadsheet to propose values for office worker & open space scenarios.	Tom Pentecost & Susan Griffin	7/19/01	

### DECISIONS

1. The working group will accept and use Ward Whicker's recommendation on plant uptake factor.
2. For the adult soil ingestion rate parameter, the working group will use the point estimate value in the Exposure Factors Handbook. For the office worker scenario this is 50 mg/day and for all other scenarios it is 100 mg/day. The information from Syracuse Research Corporation on this parameter, which helped lead the working group to this conclusion, will be included in the written justification for this parameter value.

NEXT MEETING: THURSDAY, 7/19, 8:30 a.m. at the EPA CONFERENCE CENTER

### Agenda Items:

1. Present plant uptake factor results.
2. Discuss results/comments of the working group's QA/QC of the RESRAD input parameters.
3. Discuss results/comments of the working group's QA/QC of the dose conversion factors.
4. Finish assigning responsibility for writing each section of the Task 3 report.
5. Discuss proposed open space and office worker scenario parameter values.

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## Notes from RSAL's Working Group Meeting on 7/26/01

### Items covered on 7/26:

Plant uptake factors - proved acceptable to Ward Whicker

QA/QC of dose conversion factors

Occupancy factors

QA/QC of RESRAD input parameters

### Actions:

Action Item	Who	When	Notes
Get confirmation of plant uptake factors from Ward Wicker	Carl Spreng	8/2	
Write up justification for dose conversion factors	Jim Benetti	7/27	
Run Resrad using ICRP 72	Tom Pentecost	8/2	
Complete RAGS runs	Phil Goodrum	8/2	
Revise parameter value spreadsheet per discussion in working group mtg	Tom Pentecost	8/2	
Look into variance for the requirement to running ICRP 30	Joe Legare	8/2	
Participate in discussion concerning veg. consumption and breathing rates for office worker and open space scenario	Carl Spreng Phil Goodrum Jim Benetti	7/31	Send results of discussion on to working group
Gather materials for packet to be distributed to Focus Group	Patricia Powell	8/2	Workgroup members send directly to Patricia or Jean

### Decisions:

Tom Pentecost will only run RESRAD using ICRP 72. If a variance is not obtained, ICRP 30 will also need to be used.

The following plant uptake factors will be used - Pu:  $6.7 \times 10^{-5}$ , Am:  $1.3 \times 10^{-3}$ .

*Next Meeting: Thursday, August 2, 2001, 8:30 am at the EPA Conference Center*

**Agenda Items:**

1. **Discuss results of Resrad Runs and RAGS runs**
2. **Comments on Jim's proposal for simplifying the indoor/outdoor time fractions for RESRAD**
3. **Resolution of dose conversion factor**
4. **Complete assignments for writing each section of the Task 3 report**
5. **Discuss proposed open space and office worker scenario parameter values**
6. **Discuss details for presentation at 8/8 Focus Group meeting**

**Notes from RSAL's Working Group Meeting on 8/2/01**

**Items covered on 8/2:**

1. Results of Resrad Runs
2. Indoor/outdoor time fraction values for RESRAD
3. Open space and office worker scenario parameter values
4. Presentation for 8/8 Focus Group meeting

**Actions:**

Action Item	Who	When	Notes
Get confirmation of plant uptake factors from Ward Wicker	Carl Spreng	8/9	Postponed from 8/2
Run Resrad using ICRP 72 for Wildlife Refuge Worker and Rural Resident Scenarios at 90, 95, & 97.5 percentiles	Tom Pentecost	8/3	
Complete RAGS runs	Phil Goodrum	8/8	

**Decisions:**

Agreed to go with a distributed indoor/outdoor time fraction which will be consistent with RAGS inputs.

**Next Meeting: Thursday, August 9, 2001, 8:30 am at the EPA Conference Center**

**Agenda Items for 8/9/01 Meeting:**

1. Feedback/discussion from Focus-Group Mtg
2. DCF Discussion
3. Use of RAC RESRAD run parameters for running Resident Rancher Scenario
4. Task 3 Report assignments

**RFCA Stakeholder Focus Group  
Attachment D**

Title: Modeling Assumptions memorandum

Author: Victor Holm

Date: August 6, 2001

Phone Number: (303) 989-9086

Email Address: vholm@aol.com

There are a number of very conservative assumptions built into the RSAL process. These assumptions are intrinsic to the models being used and are separate from choosing conservative scenarios and parameters. No one is suggesting that these assumptions should be changed; in fact, most can not be adjusted like parameters; they are part of the model. It is nevertheless important to realize that they exist and have a profound effect on the health risk.

**Depth of contaminated soil:**

Most of the contamination in the buffer zone at Rocky Flats originated as either wind blown dust from the 903 pad or from the 1957 fire. At first it was a thin layer on the soil. With time it moved into the top 20 cm of the soil. A number of mechanisms were responsible for this movement. The most important was probably cracking of the soil after being wetted and then drying out. Animals (earthworms) and plants also probably contributed. Even after thirty years the result is not a uniform distribution. In the RAC study (Task 6, p.19-21) RAC reports that 50% of the Pu, Am is in the top 3 cm and 90 % is in the top 9 cm. The samples we have showing the level of contamination were all taken in this top 3 cm, most in the top 1 cm. The RSAL working group assigned 15 cm as the depth of contamination and further assumed that the surface concentration of Pu, Am is the same as the entire 15 cm. This was done to accurately account for the inhalation pathway which is controlled by the surface concentration. For the other pathways this is a very conservative assumption. For instance, for the plant ingestion pathway the entire root system is assumed to be in the top 15 cm of the soil and the Pu, Am concentration of the 15 cm is assumed to same as the surface. Any soil disturbance will tend to mix this surface layer into the underlying soil. If the top 15 cm were mixed, typical of a garden, then the contamination would be reduces to approximately a tenth of it's surface concentration. The external exposure pathway is assuming that gamma rays are coming from the entire 15 cm instead of just the top 1-2 cm. Much of the soil ingestion is from working in the soil not just contact with the surface. The result is that the external exposure and plant ingestion pathway are overestimating the risk by as much ten times. The soil ingestion pathway is overestimating the risk by three times.

**Time on the contaminated area:**

The wildlife refuge worker will work on the entire 6400 acres of the refuge. Only about 300 acres are contaminated above 10 pCi/g and much of this will be cleaned up. The working group correctly assumed that the worker would spend the entire year on the most contaminated portion of this 300 acres. There was some discussion of using a probability distribution to account for the worker moving over the entire refuge. In the end the working group decided even though it is highly unlikely, placing the worker on the contaminated portion for the entire year is the most prudent assumption. The working group realizes that this single assumption will probably overestimate the risk by more than ten times for this scenario.

**Buildings:**

Both the residential and wildlife scenario assume that the building in which they live or work will be on contaminated soil. It would be virtually impossible to construct a building without disturbing the top 1-2 cm of soil. This assumption overestimates external exposure by 85 % for the resident and 50% for the wildlife worker.

**The soil ingestion and inhalation risks are not in the same place:**

The risk equations and Resrad both put the receptor on the downwind edge of the contaminated area. This assumption minimizes the dilution effect from dust that originated up wind of the contaminated area. The receptor for soil ingestion and external exposure is assumed to be on the most contaminated part of the area. If the contaminated area was uniform this assumption would

not result in overestimating the risk. Since the contamination at Rocky Flats was wind deposited it decreases to the east or downwind. This decrease is dramatic, near the 903 pad the values are in the hundreds of pCi/g. One thousand feet to the east the values are about 10 pCi/g. At the east fence line they are less than 1 pCi/g. The result is, at the point where the receptor is inhaling the most contaminated dust, the soil contamination has dropped to less than 10 pCi/g overestimating risk from the external and soil ingestion pathways by a factor of ten. If the receptor is placed on the most contaminated portion of the area, the 903 pad, the contaminated dust concentration is almost zero. In effect the receptor has his mouth at the 903 pad and his nose 1000 ft. to the east. This is not as bad as what RAC did where the receptor's mouth and nose were separated by 6000 ft.

There are several other assumptions that have less effect on the outcome but all result in a more conservative scenario. The net result of these assumptions is that the actual exposure for a worker or resident will be less than a tenth of what the risk assessment estimates. This is very appropriate since we all want the maximum protection for the future user.

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From: Mary Harlow  
To: Victor Holm  
Date: 8/7/01

Thanks for the update Victor. I would like to point out some inconsistencies in your statements regarding the soil ingest and inhalation risks are not in the same place. You state that one thousand feet to east of the 903 pad the plutonium values are about 10 pCi/g and at the east fence line they are less than 1 pCi/g.

I refer you to the Plutonium 239/240 Distribution in Surface Soil (1999 Kriging Analysis) which shows that along the East fence line the contamination levels for plutonium for much of the soil along Indiana the levels is greater than 1.0 and less 5.0 which amounts to 945.7 acres(onsite). This contamination level does not stop at Indiana but also continues across the road to offsite property to the East.

The contamination coming off the 903 pad at Indiana (east Gate Area) is shown to be great than 5.0 and less than 10 picocuries per gram. This level of contamination amounts to 184.8 acres (not all contiguous to Indiana but close by). The MEI (Maximally Exposed Individual) for offsite contamination was shown to be located at Mower Reservoir in 1999. I haven't seen where that individual would be located in 2000.

I would like to have information from the working group members as to whether they have considered:

1. That the Wildlife Refuge Worker may be caught in high winds while doing his job and therefore be exposed to higher levels of dust.
2. Cumulative effects from other contaminants such as VOC's in the soil. There may be some areas where putting a building may not be prudent. Fumes do come up from the soil and could enter buildings.
3. Radon that could enter buildings from natural occurring uranium at the site should also be factored in.
4. That plant litter as well as soil will contain plutonium contamination. The contamination comes from wind blown plutonium being deposited on plants. Rain, snow, die-back, more wind will result in the contamination being washed to the ground/litter that is in the area. You will have some concentrating effects with Rills (cracks in the soil).