



Rocky Flats Citizens Advisory Board Recommendation 2003-1

Comments and Recommendations on Proposed Modifications and Additions to Attachments to the Rocky Flats Cleanup Agreement

Approved January 23, 2003

Introduction:

During the past year, members of the Rocky Flats Citizens Advisory Board (RFCAB) have been learning about and discussing the end-state for Rocky Flats. Much of that discussion has centered on proposals presented by the Department of Energy (DOE), the Environmental Protection Agency (EPA), and the Colorado Department of Public Health and Environment (CDPHE) – collectively referred to as the RFCA parties – to modify the current Rocky Flats Cleanup Agreement (RFCA). The most significant modifications call for the adoption of revised soil cleanup levels and changes to the regulatory framework for evaluating surface water quality exceedances.

Much of the Board's discussion this past year took place before the official document, "Proposed Modifications and Additions to Attachments to the Rocky Flats Cleanup Agreement," was released. In the comments and recommendations below, the Board offers a summary of its discussions held before the document was released, as well as providing more specific comments and recommendations that refer to the document and the remediation strategy contained therein.

Recommendation 2003-1 is divided into several parts. Part 1 provides a context for the Board's recommendations and reflects much of the Board's discussions before the RFCA parties' document was released. The comments and recommendations in Part 2 focus specifically on the document. Part 3 addresses the Board's concerns on long-term stewardship. The final section is an appendix that contains comments and questions related to the RFCA parties' document.

Note: In the following comments and recommendations, the word "stakeholder" is used in a collective sense to refer to all members of the community.

Part 1: A Context for the Board's Recommendations on the Proposed RFCA Changes

A. General Comments on the Tradeoff Proposal, Risk and the Cleanup Budget

In its discussions with the RFCA parties, the Board has been asked whether it supports a tradeoff proposal for remediation at Rocky Flats, giving more emphasis to surface soil remediation at the expense of subsurface soil cleanup. We understand this proposal is based on DOE's need and desire to address areas of greater risk within the confines of a limited budget available for site cleanup.

To begin addressing this proposal, the Board offers its reflections on two questions. First, do we support the notion that surface soil contamination represents a greater risk than subsurface contamination at the present time? Second, in a conceptual exercise where the site is facing limited cleanup resources, does the Board support greater risk reduction in the near term by removing more surface contamination at the expense of less subsurface soil cleanup? The answer to both questions is yes as long as we clarify the importance of using the words “at the present time” and “near term,” and as long as we stress our response to the second question is based on a conceptual exercise only.

To elaborate further on our answer to the first question, the Board does not deny that the exposure pathways for surface soil contamination do represent a greater risk than do those for subsurface contamination **at the present time**. Subsurface contamination, however, does not lose its potential for someday becoming a risk concern. For that reason, long-term stewardship controls will be necessary for any areas where residual contamination above background levels is left behind. Although no exposure pathways may currently exist, given the long life of the contaminants and the inevitable likelihood that controls will ultimately fail, there is certainty that risk pathways will someday exist for any residual contamination left behind at the site.

With respect to the second question, there are numerous qualifications we need to make. First, there is the issue of a limited site budget for cleanup. We recognize that DOE and the regulators believe the site will get only the resources for cleanup outlined in Kaiser-Hill’s baseline proposal presented to Congress in the late 1990s. Our major concern with the site’s cleanup budget is that it was developed with minimal stakeholder input. At the time the baseline was developed, we were not asked our views on such important issues as old process waste line removal, 903 Pad remediation, and other major cleanup projects. Given the fact that specific proposals for addressing these areas of contamination were only developed recently, our confidence that the site was able to develop adequate budget projections that incorporate stakeholder concerns for these projects is low.

The Board also notes the current closure baseline assumes a surface soil cleanup for plutonium of 651 pCi/g, a level already under DOE-sponsored review at the time the baseline was developed. In response to community concerns raised at the time regarding the possibility that lower cleanup levels might someday be approved, DOE asserted that additional funding would be sought to comply with its regulatory obligations. The Board believes DOE has an obligation to seek additional cleanup funds given these circumstances.

Another concern the Board raises in addressing the second question is the notion of tradeoffs. In the near term, such a tradeoff emphasizing surface soil remediation over subsurface might make sense as DOE seeks to address the areas of greatest risk. The Board believes just as importantly, however, that tradeoffs must be considered in a much longer timeframe. As explained in more detail later, the Board believes DOE must quantify the life-cycle costs required for long-term stewardship and compare those to the costs of a complete cleanup at the site. By focusing on near-term cost savings, the site may be leaving a legacy of a much larger bill for future taxpayers.

An additional concern is the lack of sufficient cost information to evaluate the tradeoff proposal. DOE stresses its proposal is revenue-neutral. Without specific dollar information showing what money might be saved by doing less work in one area, compared with what additional cost might be required to do

more work in another, the Board does not have sufficient information to determine whether the proposal is indeed revenue-neutral.

Based on the budget concerns raised above, the Board offers these recommendations.

- ***Recommendation 1:*** *The Board proposes the following budgeting and spending steps for the site with respect to environmental restoration work.*

Ø *As a first step, the Board recommends DOE develop a cost baseline to clean the site to a 10^{-6} risk level for both the surface and subsurface. Having this information will give stakeholders a better understanding of cost options for the various cleanup projects, including whether it makes sense to seek additional funding.*

Ø *DOE recently announced that Rocky Flats might close early with a total cost savings of more than \$200 million. The Board recommends as a second step that DOE's entire share of any cost savings that may be realized by 2006 be applied toward further environmental restoration work. We anticipate that most if not all our recommendations can readily be fulfilled with this additional funding.*

Ø *As a third step, the Board recommends DOE spend no less than the full baseline amount currently budgeted for environmental restoration work at the site. Any projected cost savings from the proposed approach should be applied toward achieving a 10^{-6} risk level.*

- ***Recommendation 2:*** *The Board recommends DOE provide cost estimates of its end-state tradeoff proposal as part of any response it may have to any of our recommendations they are unable to implement.*

B. RFCAB's View of a Framework for Remediation Decision-Making

The Board offers the following framework establishing its preferences for cleanup decision-making at Rocky Flats. RFCAB acknowledges the current RFCA modifications proposal document, as well as our response to that document, mainly focuses on Radionuclide Soil Action Levels (RSALs). However, RFCAB believes the same attention should be afforded to the remediation of non-radionuclide contaminants of concern (COCs) as they pertain to groundwater, soil, ingestion by animals, and ingestion by the human population. We look forward to assisting DOE with the future recommendation process for the remediation of non-radionuclides at the Rocky Flats Environmental Technology Site.

- ***Recommendation 3:*** *As it has stated on numerous occasions, the Board believes cleanup to background should be the ultimate goal for the site. Current technological and budget constraints may prevent reaching this goal now, but the possibility may exist in the future. Achieving this goal will eliminate the need for continued funding to provide*

controls and will help reduce the risks to future generations due to the likelihood that any controls will ultimately fail. The Board therefore urges DOE and the regulators to assess each individual cleanup project to see if cleanup to background can be achieved. We believe there is value in reducing the footprint of contaminated areas and future stewardship obligations.

- ***Recommendation 4:*** *In keeping with the Radionuclide Soil Action Level Recommendation the Board made in October 2001, the next level of cleanup analysis should assess the feasibility of cleanup to a 10^{-6} level. In the event this level is not recognized as obtainable, a documented justification should be provided.*

Part 2: Comments and Recommendations Specific to the Proposed Modifications and Additions to Attachments to the Rocky Flats Cleanup Agreement

As described in Part 1, members of the Rocky Flats Citizens Advisory Board have reservations with the overall strategy of pursuing greater surface soil remediation at the expense of subsurface remediation due to concerns about long-term impacts of leaving subsurface contamination in place. Despite the reservations expressed by the Board, should the RFCA parties proceed in adopting the strategy as outlined in the document, "Proposed Modifications and Additions to Attachments to the Rocky Flats Cleanup Agreement," the Board believes that, as a minimum, the following changes must be made.

A. Surface Soil Remediation

The following recommendations relate to the RFCA parties' proposed surface soil remediation strategy.

- ***Recommendation 5:*** *If during surface remediation it is found that contamination continues below six inches, DOE should remove all contamination in excess of 50 pCi/g in the top six feet of soil from the present grade, unless a different cleanup level is established for the three-to-six-foot layer below grade in formal consultation with the regulators and stakeholders. DOE should apply the ALARA principle and a risk analysis to areas where the contamination below six feet exceeds 50 pCi/g. This depth is based on the possibility that near-surface contamination may be exposed due to erosion, or contamination may be excavated at some point in the future, either by humans or by burrowing animals. As an example, it should be noted that environmental restoration work at Building 663 unexpectedly resulted in excavating a hot spot down to a depth of five feet.*
- ***Recommendation 6:*** *RFCAB feels all radionuclide soil contamination in excess of the action levels, including uranium, should be excavated down to a depth of at least six feet.*
- ***Recommendation 7:*** *RFCAB recommends DOE carefully examine and apply technologies other than soil excavation (for example, soil vacuuming) for areas where*

the plutonium contamination is less than 50 pCi/g. We further request that tests of these technologies be open to outside observers and that DOE provide quarterly updates to the Board on the progress of these tests.

- ***Recommendation 8:*** *Institutional and engineered controls must be implemented for any areas of residual contamination exceeding a 10^{-6} risk level for a future residential user, consistent with the state environmental covenants law.*
- ***Recommendation 9:*** *DOE and the regulators should develop a publicly acceptable soil sampling protocol to be used for final status survey of surface soils. This survey should be based on recognized sampling and analysis practices and should utilize conservative statistical methods. The survey should be independently peer reviewed for the purpose of validation and verification.*
- ***Recommendation 10:*** *RFCAB recommends that all disturbed soil that is contaminated in excess of the action levels, and even such soil approaching the action level, be disposed of as waste rather than replaced into the environment.*

B. Subsurface Soil Remediation

These comments are directed toward the subsurface soil remediation approach.

- ***Recommendation 11:*** *RFCAB finds the proposed subsurface cleanup levels are far too high and cleanup depth is too shallow. DOE should work with the regulators and stakeholders to establish a limit on subsurface contamination that would apply regardless of depth or size of the contaminated area.*

Note: RFCAB understands the site has stated that a risk analysis would likely conclude there is no current pathway by which users of the site could become exposed to plutonium and americium at this depth. RFCAB has yet to have the components of the risk analysis identified. We also know circumstances may change in the future. The agencies' approach to subsurface contamination does not adequately address these uncertainties. That is why RFCAB is requesting a ceiling on subsurface contamination that would apply regardless of depth.

- ***Recommendation 12:*** *DOE should thoroughly characterize the subsurface and place special emphasis on the areas around all process waste lines and valve vaults.*
- ***Recommendation 13:*** *All old process waste lines should be removed. If this cannot be done, all lines associated with the plutonium buildings, as well as lines with known or suspected leaks, should be removed, regardless of depth. Valve vaults and sumps should also be removed. If a line is not removed, justification should be provided and the line needs to be thoroughly characterized, sealed, and fully documented.*
- ***Recommendation 14:*** *All pipes, whether old or new, and regardless of purpose,*

should be removed from areas subject to landslides or erosion.

- ***Recommendation 15:*** *All remediation decisions dependent on depth of contamination should be based on present grade. Utilizing the present grade will eliminate the possibility that re-contouring of the industrial area might result in grade change and thus in lesser remediation.*
- ***Recommendation 16:*** *As a matter of principle, when DOE is making remedial decisions, source removal should be the preferred remedial action. Not only does source removal accomplish permanent risk reduction, but it may also be more cost effective in the long run. In the case of organic solvents, source removal of discrete spills would reduce continued reliance on passive treatment systems. In the case of radionuclide contamination, any anomalously high water samples (such as at GS10) should be assumed to originate from a discrete source, which should be aggressively sought out. The Board believes that in many cases source removal is cost effective since it would present savings during stewardship.*

C. Surface Water Regulatory Changes

Points of compliance (POCs) are the five locations where surface water monitoring is conducted to determine whether DOE is in compliance with applicable water quality standards. Under the RFCA parties' end-state proposal, the POCs would remain where they currently are, at the outfalls of the three terminal ponds (A-4, B-5 and C-2) and at the points where Walnut Creek and Woman Creek cross the site boundary at Indiana Street. For radionuclide contaminants in **surface water onsite** (as measured at the outfalls of the terminal ponds), the proposal would change the method for demonstrating compliance from a 30-day average to a 12-month averaging period. **Water leaving the site** will still be held to the more restrictive 30-day averaging period.

RFCAB has the following concerns and comments regarding the end-state proposal for surface water:

Compliance Method

RFCAB supports the decision to retain a 30-day averaging period for water leaving the site to meet the regulatory standard for all contaminants of concern. However, RFCAB is concerned that the switch to annual averaging onsite may reduce DOE's incentive to be vigilant regarding evaluations which should trigger actions to ensure the standard of 0.15 pCi/L is maintained for plutonium and americium and the standards are met for all other contaminants of concern.

- ***Recommendation 17:*** *In order to alleviate this concern regarding onsite water, RFCAB recommends the following measures be taken to promote early identification of impacts to water quality from a source area remaining onsite:*

Ø *DOE should conduct a timely evaluation whenever the standard is exceeded over a 30-day average and notify the regulators and local governments monitoring surface water.*

- Ø *If the standard is violated for two consecutive 30-day periods, a field investigation should be triggered.*
- Ø *Elevated concentrations in excess of four times the standard in any 30-day period should be investigated, no matter how short the duration.*
- Ø *Following a major storm event, it is expected that DOE will conduct a physical inspection to check for significant erosion from areas with residual contamination. DOE should work with stakeholders to define what constitutes a major storm.*
- Ø *The proposed RFCA changes should recognize that new POCs might need to be added between now and closure. An example of this is at the present landfill pond, the removal of which would cause leachate from the landfill to be released directly into No Name Gulch. In that event and all similar events, RFCAB recommends DOE work with the regulators and stakeholders to determine the location of the new POC, as well as an appropriate sampling design based on the data quality objectives process.*

Data Collection and Reporting

- ***Recommendation 18:*** *Should DOE adopt annual averaging as the compliance method for POCs onsite, RFCAB recommends:*

- Ø *Sampling method and frequency remain unchanged.*
- Ø *Data from all surface water monitoring should be readily available to stakeholders and local governments within a timely manner consistent with the Quarterly Data Exchange meetings, and should also include an online database.*
- Ø *Reports of data from all surface water monitoring should flag all short-term spikes in excess of the standard.*
- Ø *Data for onsite water should still be reported in terms of a 30-day average so that stakeholders are kept informed of short-term fluctuations in water quality.*
- Ø *DOE should also work with stakeholders to develop a mechanism to depict trends in water quality.*
- Ø *DOE should provide predicted life-cycles of COCs, based on modeling, to determine when concentrations of contaminants will start to*

diminish and are expected to no longer pose an impact to water quality.

∅ *DOE should identify a point person to be available to stakeholders for post-closure exchange regarding data reporting, trending, and source evaluations.*

∅ *DOE should develop a Contingency Plan in the event the water quality standard is exceeded.*

Points of Evaluation (POEs)

The proposed RFCA language states that the need for POEs will be determined later in the Corrective Action Decision / Record of Decision (CAD/ROD). In contrast to performance monitoring locations, which are project-specific and geared toward assessing the effectiveness of water treatment systems, POEs would be sampled for a broader suite of contaminants and located upstream of the POCs to provide an early detection system to identify potential impacts to water quality.

- ***Recommendation 19:*** *RFCAB anticipates POEs and performance monitoring will be needed post-closure and understands the need to defer specifics of the program to the CAD/ROD. It is imperative to have POEs post-closure to be used as a tool to evaluate surface water quality onsite and prevent degradation of surface water quality offsite.*
- ***Recommendation 20:*** *RFCAB expects DOE to involve stakeholders in clearly defining the data quality objectives of the POE monitoring program, as well as the actions required of DOE if POE sampling were to reveal a deterioration of water quality.*

The hydrology and topography of the site will change post-closure and the consequences for contaminant migration are not known. For instance, the Site Wide Water Balance study predicted the groundwater table will rise as a result of increased infiltration in the industrial area, a situation with the potential to mobilize contaminants.

- ***Recommendation 21:*** *DOE should work with stakeholders to develop a surface water sampling plan (based on data quality objectives) that would include identification of possible new POEs for the purpose of periodic sampling of a broader suite of analytes that have a potential to be mobilized in the surface water.*

Contaminants of Concern

Where Attachment 5, Section 2.3 Numeric [Surface Water] Levels After Active Remediation, pp. 5-10 and 5-11, refers to specific COCs, only plutonium and americium are mentioned.

- ***Recommendation 22:*** *Due to their solubility and known contamination within groundwater, both uranium and nitrates should be identified as COCs. Tritium should*

also be identified as a potential COC to ensure water quality is maintained.

- ***Recommendation 23:*** *In the event CDPHE no longer performs monitoring for volatile organic compounds, metals and other analytes, sampling for these additional analytes would need to be performed by DOE.*

Only a limited number of contaminants are sampled for at the POCs.

- ***Recommendation 24:*** *Data quality objectives for POEs and performance monitoring should include a mechanism to trigger analysis of additional analytes at the POCs to ensure water quality is maintained.*

Future Considerations

The proposed language of Attachment 5, Section 2.2 Numeric [Surface Water] Levels During Active Remediation, p. 5-9, seems to indicate that the surface water standards (at least for uranium and certain other contaminants) are subject to change.

- ***Recommendation 25:*** *RFCAB believes the current surface water standards should not be relaxed in the future.*

Part 3: Long-Term Stewardship Considerations

For any areas where residual contamination above background levels of contamination will be left behind, members of the Rocky Flats Citizens Advisory Board believe a comprehensive and legally enforceable long-term stewardship program is necessary. Rocky Flats is the model site for DOE's accelerated closure program. The Board believes Rocky Flats should also become the model site for an effective and comprehensive long-term stewardship program. The following recommendations address the minimum criteria for a model stewardship program.

Note: Long-term stewardship subjects marked with an asterisk (*) should be subject to legally enforceable mechanisms. Please see recommendation 31 for a full range of stewardship activities that should be legally enforceable.

A. Funding Issues

Funding Assurance

Long-term stewardship at Rocky Flats will be necessary far into the future. Given the current federal budget process, long-term funding for stewardship is uncertain. When DOE and Kaiser-Hill developed their accelerated closure plan for the site, they were successful in persuading Congress to provide funding assurance beyond the normal bounds of the two-year federal budget process. It is just as important to develop and promote a long-term stewardship program. Congress needs to be made aware of the legacy that will remain post-closure and the federal government's commitment and

responsibility far into the future.

- ***Recommendation 26(*):*** DOE, as part of the federal government, must explore possibilities for and implement a program to provide assured, stable funding for long-term stewardship needs at the site. In doing so, DOE must pursue the same level of education and persuasion it used in Congress to promote the accelerated closure plan to advance the need for a similar commitment to long-term stewardship needs.

The Board understands DOE will soon develop a five-year budget planning process that will include near-term stewardship program needs.

- ***Recommendation 27:*** The Board requests DOE open its budget process to allow stakeholder input into the development of the new five-year budget planning process so we may better understand and comment on the stewardship funding proposals.

Funding for Contingencies

- ***Recommendation 28(*):*** After closure, institutional, physical and engineered controls may fail, assumptions regarding contaminant migration may prove false, and new pathways to contaminant exposure may be shown to exist. In such cases, compensatory measures will be necessary. As part of its budget projections, DOE must include a funding mechanism (such as a reserve fund or trust fund) to cover such contingencies.

Development of Life-Cycle Cost Estimates for Long-Term Stewardship

Given the long-lived nature of the contaminants at Rocky Flats, implementation of a long-term stewardship program at the site will require substantial resources far into the future.

The Board understands that as the site evaluates remediation options, cost comparisons are made. These cost comparisons may strongly influence the choice of options. Life-cycle stewardship costs for options that do not result in complete cleanup may be significant. An important consideration should be at what point do life-cycle stewardship costs for options involving partial remediation exceed the costs of a complete cleanup.

- ***Recommendation 29:*** The Board recommends the site develop life-cycle cost estimates, which include long-term stewardship needs, for each remediation option it may develop for a particular project. These cost estimates should be an important consideration in determining the most suitable option. This analysis should be included in any draft decision document and made available for public review and comment before a remediation decision is made.

DOE and the regulators have presented a remediation scheme for the site to reduce the highest risk by calling for greater surface soil remediation than previously planned and less remediation for the

subsurface. The Board is concerned that the site has not presented cost information that shows whether such a tradeoff is revenue-neutral based on current project costs. The Board believes that life-cycle costs for long-term stewardship must be factored into this overall discussion of tradeoffs. Leaving greater amounts of subsurface soil contamination is committing DOE and the federal government to a larger financial burden in the long term by trying to save resources in the near term.

- ***Recommendation 30:*** *The Board recommends the site also develop life-cycle cost estimates associated with its tradeoff proposal so that a better interpretation can be made regarding whether near-term cost savings and risk reduction are justified when comparing them to longer-term costs and future risks.*

B. Stewardship Enforceability

Legally Enforceable Mechanisms for All Stewardship Program Elements

With the need for stewardship measures post-closure to provide long-term protection to human health and the environment, combined with the need to provide greater funding incentives, legally enforceable mechanisms requiring stewardship are necessary. These mechanisms must include the full range of stewardship program needs.

- ***Recommendation 31(*):*** *The Board recommends the RFCA parties develop legally enforceable mechanisms for long-term stewardship as an integral part of RFCA. These enforcement mechanisms must be comprehensive to address all the stewardship components outlined below. (Further details concerning these program components can be found in “The Rocky Flats Stewardship Toolbox: Tools for Long-Term Planning,” prepared by the Rocky Flats Stewardship Working Group.)*

- Ø *Physical and engineered controls*
- Ø *Institutional controls*
- Ø *Information management systems*
- Ø *Methods to inform and educate*
- Ø *Environmental monitoring of all media (air, groundwater, surface water, and soil)*
- Ø *Surveillance and maintenance of controls*
- Ø *Periodic performance review and assessment of all program activities and features*

- Ø *Delegation of authority to responsible parties to make sure the program is maintained*

- Ø *Continued scientific research into better cleanup technologies and the effects of contamination on human health and the environment*

- Ø *Continued public participation and oversight*

- Ø *Program funding*

Institutional Controls Related to Groundwater

Attachment 5, Section 1.3, p. 5-4 lists examples of institutional controls that may be appropriate for use at Rocky Flats post-closure; among them: *“prohibition on drilling wells for water use into contaminated groundwater and/or pumping groundwater that could adversely affect the remedy.”*

- ***Recommendation 32(*)***: *RF CAB recommends that the RFCA parties implement a site wide ban on groundwater use and/or drilling. This would reduce the possibility of accidental use and/or drilling into contaminated groundwater.*

State Environmental Covenants

The state of Colorado requires environmental covenants for properties where residual contamination will remain after active remediation. DOE, as part of the federal government, has questioned the applicability of this requirement for federal facilities, as alluded to in the following language from Attachment 5, Section 1.2, p. 5-4: *“Section 25-15-320, C.R.S., requires an environmental covenant under certain conditions. As of October 2002, the Parties have not reached an agreement on the applicability of this statute to the federal government.”*

- ***Recommendation 33(*)***: *The Board believes the state-required covenants provide another layer of meaningful and enforceable institutional control that will provide greater protection of human health and the environment into the future. The Board urges DOE to argue strongly for the acceptance of the environmental covenants provision in its discussions with other federal government entities as a valuable and necessary control mechanism to protect human health and the environment for future generations. The Board further urges the state of Colorado to hold steadfast in its position that such a requirement on the federal government is indeed appropriate and necessary for those same reasons.*

C. Other Considerations

Continued Research

The Board believes that important continued research programs should be included as enforceable

provisions in regulatory agreements that are developed for the stewardship program. Recommendations 34 through 37 identify specific research programs that are recommended by the Board.

- ***Recommendation 34(*):*** *The Board recommends DOE include continued research into ecologically sensitive cleanup technologies as a necessary part of the long-term stewardship program and commit to employing new technologies should they prove effective in moving toward the ultimate goal of cleanup to background.*

History has shown that our knowledge of the risks posed by environmental contaminants changes over time, particularly for radionuclides.

- ***Recommendation 35(*):*** *The Board recommends a research program be established at the site post-closure to monitor the body burdens of the wildlife onsite to determine to what extent they are exposed to contaminants of concern at Rocky Flats and to assess the risk to their health. Particular attention should be given to long-term genetic effects of exposures.*
- ***Recommendation 36(*):*** *The Board recommends DOE work closely with stakeholders to establish a well-publicized program of screening the health of people who live near or visit the Rocky Flats site by screening for possible adverse effects from exposure to contaminants left in the Rocky Flats environment, with such screening made available to any who seek it on a strictly voluntary basis. Data from the screening program should be made available to stakeholders on a regular basis.*

RFCAB understands an “institutional control zone” (RFCA Attachment 5, figure 1) – anticipated to be approximately 1,000 acres within which there will be institutional, physical, and engineered controls – will be established at the site.

- ***Recommendation 37(*):*** *RFCAB recognizes that the Rocky Flats site is a distinctly valuable site for research on how to remediate a plutonium-contaminated site. Lessons learned at Rocky Flats could be beneficial for cleanup of plutonium-contaminated sites elsewhere. With the understanding that wildlife and workers with the U.S. Fish and Wildlife Service will have access to the “institutional control zone” at Rocky Flats, RFCAB believes this area should remain in the primary jurisdiction of DOE and should serve as a test bed for research on future promising remediation technologies.*

Characterization

It is imperative that future stewards at the site and the public know as precisely as possible the extent of contamination above background levels left behind after closure.

- ***Recommendation 38(*):*** *The Board recommends DOE develop a detailed map of and information about residual contamination above background levels at the site post-*

closure.

Public Involvement and Oversight

Public involvement in the development of a long-term stewardship program for the site is necessary for its successful implementation. An important part of this program is environmental monitoring. Long-term stewardship is a major part of the Board's work plan for 2003.

- **Recommendation 39:** *The Board recommends DOE and the other RFCA parties continue to engage RFCAB and the other stakeholders in development of a long-term stewardship program for the site.*
- **Recommendation 40(*):** *The Board recommends DOE work with the community on developing a comprehensive post closure environmental monitoring program for all media, including air, surface water, groundwater, and soil.*

Continued public involvement in the implementation and monitoring of the long-term stewardship program post-closure will also be necessary for its success.

- **Recommendation 41(*):** *The Board recommends that as part of the Rocky Flats long-term stewardship plan, DOE establish a community oversight group under the Federal Advisory Committee Act with assured funding for continued public oversight of long-term stewardship activities at Rocky Flats.*

Appendix

The following are questions and requests for information that relate specifically to the document, "Proposed Modifications and Additions to Attachments to the Rocky Flats Cleanup Agreement.

1. Attachment 5, Put-Back Levels, Section 1.1, p. 5-2, last paragraph: "*DOE may, with LRA [Lead Regulatory Agency] approval after appropriate consultation, replace excavated soils with contaminant concentrations greater than the put-back levels.*"

a. Identify the procedure for determining whether contaminated soil that has been excavated will be put back as fill material. Please provide a scenario under which excavated soils will be replaced with soils containing contaminant concentrations greater than the put-back levels.

b. How will this excavated material be characterized? Will it be the same procedure currently used on the 903 Pad to characterize material in the containerized roll-offs?

2. Attachment 5, Assessing additive risks from radionuclides and non-radionuclides, Section 1.1, p. 5-3, first paragraph: "*The cumulative radiological and non-radiological effects will be assessed on a project-specific basis if the concentrations are near their respective action levels.*"

How near the action levels do these contaminants have to be to trigger cumulative assessment of risk from radionuclides and non-radionuclides? Even if there were only two contaminants, each present at levels of one-half the action level, i.e., 5×10^{-6} , the cumulative risk would be 1×10^{-5} .

3. Attachment 5, Best management practices, Section 1.3, pp. 5-4 and 5-5: *“Actions will be developed in an integrated manner with other actions being taken and will be consistent with best management practices.”*

Please clarify what is meant by the term, “best management practices.” If this is a regulatory term, please provide the regulatory citation.

4. Attachment 5, Surface Water Numeric Levels After Active Remediation, Section 2.3, pp. 5-10 and 5-11:

The only contaminants of concern (COC) mentioned from the standpoint of water quality compliance are plutonium and americium. Does this mean the RFCA parties do not envision sampling for other contaminants at POCs post-closure?

5. Attachment 5, Non-radionuclide contaminated soils – Action Determinations, Section 4.2, pp. 5-17 and 5-18, and Soils Contaminated with Radioactive Materials – Action Determinations, Section 5.3 B., p. 5-21:

The agencies have committed to removal of non-radionuclide and uranium contamination above the action level to a depth of six inches, as opposed to three feet for plutonium and americium. Please provide an explanation for this inconsistency.

6. Attachment 5, Non-Radionuclide Contaminated Soils – Isolated Data Points, Section 4.4 A and B, p. 5-19, (also Soils Contaminated with Radioactive Materials – Isolated Data Points, Section 5.3 I. 1 and 2, p. 5-23): *“Single geographically isolated data points of contamination greater than action levels will be evaluated using the data aggregation methodology outlined in the IA SAP and the BZ SAP, and action will be taken as warranted. These single data points will not trigger a source removal, remedial, or management action, in the absence of the source evaluation.”*

a. Please clarify what source evaluation means in this context and whether this section is referring to the hot spot methodology.

b. The BZ SAP data aggregation methodology was not approved along with the rest of the document. Does this language mean EPA is now approving it?

7. Attachment 5, Soils Contaminated with Radioactive Materials – Action Determinations.

Please clarify the approach for plutonium and americium at depths greater than six feet.

8. Attachment 5, Soils Contaminated with Radioactive Materials – Action Determinations, Section 5.3 C, p. 5-21: *“Where plutonium and/or americium soil contamination greater than the action level is present at a depth of less than 3 feet, but did not originate at the surface, soil contamination will be removed unless, after consultation with the Lead Regulatory Agency, it is decided that the concentration and aerial extent is such that removal is not warranted.”*

RFCAB was given to understand all plutonium and americium above the action level would be removed within three feet of the surface, as is stated in the Technical Basis document, pp. 18 and 19. According to the language above, this is not necessarily the case. Please clarify.

9. Attachment 5, Soils Contaminated with Radioactive Materials – Action Determinations, Section 5.3 D.1, pp. 5-21 and 5-22: *“If during characterization of soils between three and six feet total plutonium/ americium contamination is found at an activity concentration of greater than 3 nCi/g, “step out” sampling will be performed to determine the areal extent of contamination.”*

How does “step out” sampling relate to the sampling methodology in the existing Industrial Area/ Buffer Zone Sampling and Analysis Plans? If step out sampling is used for characterization other than for OPWLs, will these documents have to be modified?

10. Attachment 5, Soils Contaminated with Radioactive Materials – Action Determinations, Section 5.3 D.3, p. 5-22: *“Application of ALARA will be most appropriate when the extent of contamination is defined by a sharp concentration gradient; areas of diffuse contamination may not benefit from ALARA principals. If extensive contamination is detected from 1 nCi/g – 3 nCi/g, then the RFCA Parties and the communities will use the consultative process to evaluate human health and environmental risks and implement actions as appropriate.”*

Please clarify how sharp a gradient would be needed to trigger remediation.

11. Attachment 5, Figure 3: Soil Risk Screen, Screen 2: *“Is there a potential for subsurface soil to become surface soil (landslides & erosion areas identified on Fig. 1)?”*

a. Define how landslide and erosion areas were identified and provide the criteria.

b. Please identify the time frame for this erosion analysis. Is it 50, 100, 1000 years? Does the modeling take into account the life expectancy of the contaminant and the associated risk?

c. Please provide a detailed map showing erosion areas with an overlay of the OPWLs.

12. Attachment 5, Figure 3: Soil Risk Screen, Screen 4: *“Is there (or will there be) a groundwater treatment system intercepting groundwater to treat COCs originating from this IHSS, AOC, or OU?”*

The locations of any additional groundwater treatment systems have yet to be determined. Absent that information, please clarify how this screen would be applied prior to identification of location of the treatment units and their capacity to treat contaminants.

13. Attachment 5, Figure 3: Soil Risk Screen, Screen 6: *“Is there a potential to exceed Surface Water Standards at a POC?”*

What is the basis for making this determination? If modeling is used, how will OPWLs be modeled in the evaluation?

14. The text on p. 15 of the Technical Basis Document refers to Table 3 of Attachment 5. This table lists 16 contaminants of concern (COCs) and 143 potential COCs. The text on p. 15 says the COCs *“are the hazardous substances that are wide-spread contaminants at the site and are found or suspected to be at concentrations that pose a greater than 1×10^{-5} risk to a wildlife refuge worker.”*

Will analysis for each of these 159 contaminants be done at each individual hazardous substance site (IHSS)? How are the IHSSs chosen? What can be missed?

15. Attachment 10, Section III, last sentence, page 4: *“CDPHE and DOE agree that the OPWL system was abandoned and not used after November 19, 1980 and therefore is not subject to interim status closure requirements.”*

Some site documents indicate parts of the OPWL were still in use until 1982. Please clarify the basis for this determination.

16. Attachment 14, Section I. G, page 4: *“Once an OPWL or associated valve vault is opened, and where safe and practical, the pipe will be grouted or foamed to minimize the possibility of mobilizing contamination inside the OPWL.”*

- a. What are the requirements for foaming and grouting? Is the procedure applied only to the end of the line, such as was done at the Solar Ponds area?
- b. Most valve vaults extend beyond the six-foot depth. Please provide us with the number of valve vaults, depth of each, and the plans to seal or excavate each vault.

The Rocky Flats Citizens Advisory Board is a community advisory group that reviews and provides recommendations on cleanup plans for Rocky Flats, a former nuclear weapons plant outside of Denver, Colorado.

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