



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VIII

999 18th STREET—SUITE 500

DENVER COLORADO 80202 2405

MAR 01 1988

David C. Shelton Director  
Hazardous Materials and Waste Management Division  
Colorado Department of Health  
4210 East 11th Street  
Denver CO 80220

Re U S D O E Rocky Flats Facility  
903 Pad Mound and East Trenches  
Areas Draft Remedial Investigation

Dear Mr. Shelton

Enclosed are EPA's comments regarding the Rocky Flats draft RI/FS for the 903 Pad Mound and East Trenches Areas submitted for review by DOE on December 31 1988. Also enclosed are the comments of Tetra Tech a contractor retained by the EPA to evaluate the document for completeness. It should be noted that the contractor did not have direct access to previously submitted documents prior to review of this RI. Therefore, the comments concerning inadequate sampling of the B and C series ponds may not be appropriate. However, comments indicating that the surface water run-off control systems are potential migration pathways are appropriate.

It is important that DOE and Rockwell receive comments on this RI report quickly so that further site investigation can be initiated during the present field activities season. If EPA does not receive input from CDH regarding these comments within one week of CDH's receipt of these comments we will forward them directly to DOE and Rockwell International. EPA is not forwarding these comments to DOE and Rockwell today in order to preserve the intent of the Compliance Agreement which identifies CDH as the lead environmental oversight agency.

In general, the information presented in the R does not adequately define the extent and character of the contamination at any of the sites addressed. No attempt is made to quantify or delineate the plume in the vertical and horizontal planes. Contaminant isopleths in the vertical and horizontal planes must be presented in order to understand the extent of contamination and determine the potential for risk to the public and the environment at the facility. The determination of the extent of contamination at the facility is predicated on the ability to ascertain the background concentrations for all constituents present as contaminants. It is the facility's responsibility to determine background concentrations.

The facility has not adequately characterized the source of the contaminant plumes for each site. No samples are taken directly from each site allowing characterization of each source. Composite soil samples are taken which dilute the interpretation of results and allow no specific indication of the extent of contamination for the surface or subsurface soils.

ADMIN RECORD

The purpose of initiating and completing a remedial investigation for a hazardous waste site is to define the extent and character of the contamination specific to the site. This information will then direct evaluations of potential remedial actions which could provide feasible clean up of the existing contamination. Incomplete remedial investigations which do not quantitatively define the extent and character of the contamination preclude the completion of an adequate and complete feasibility study.

The facility must characterize the soils in the vicinity of the SWMUs/operable units with respect to the ability of the soils to attenuate any impact of the contamination. Bench scale leach tests, cation exchange capacity and permeability testing of specific soils at each site would provide information allowing further direction regarding the feasibility and necessity of remediation.

Data presented in DOE's and Rockwell's report should be presented to specifically substantiate statements made in the report. The present level of information gathered at the site should allow the report to identify alluvial and bedrock groundwater flowrates and direction. It is important for this information to be presented within the body of this report in a manner which allows quantitative conclusions to be made in order to effectively evaluate potential options for remediation.

Should you or your staff have any questions or input regarding the enclosed comments, please contact Jim Littlejohn at (303) 293-1527, Nat Mullio at (303) 293-1508 or Martin Hestmark at (303) 293-1506.

Sincerely yours



*for* Robert L. Duprey, Director  
Hazardous Waste Management Division

Enclosures

cc Patricia Corbetta CDH  
Gerald J. Portele Tetra Tech

**903 Pad, Mound and East Trenches Areas Draft Remedial  
Investigation Report Deficiencies**

The following comments are directed towards specific statements and approaches presented in the body of the Remedial Investigation (RI) report

Section 1 0

The tentative conclusion presented on page 1-6 that radionuclide contamination of groundwater does not exist is not supported. The data must support such a statement. Data must be presented which substantiates the premise that the radionuclides present are within background concentrations and/or are unexplained anomalies. Unexplained anomalies do not allow prudent evaluations and cannot be ignored.

The resulting conclusion that surface water is also not contaminated by radionuclides is not supported by any data. Filtered samples should also be taken to verify that the radioactive results are due to suspended particulates.

Delineation of the extent of bedrock groundwater contamination is one of the purposes of completing a remedial investigation. To proceed with a feasibility study without determining the exact extent of contamination is not advisable.

The conclusion presented on page 1-8 stating that neither ground water, surface water, nor air carries contaminants from the 903 Pad, Mound, and East Trenches Areas to the property boundary, and therefore is no immediate health threat, is not substantiated and is actually refuted in the body of the report.

Section 2 0

The quantity of plutonium which is estimated to have leaked from the drums stored on the 903 pad appears to be different from the quantity estimated to have leaked as presented in the CEARP phase I report. The report must present the reason for this new estimate.

The report should list the types of gases which were detoxified at the gas detoxification site and what the detoxification processes involved. This information might prove helpful in understanding the effect this process had on the environment.

Section 3 0

In considering the resources which may be impacted by the sites under investigation, the surface and groundwater must be considered.

During the discussion of plant bedrock geology, it should be noted that the Laramie and Arapahoe formations are considered to be the base of the hydrologic system which could be affected by the SWMUs investigated in this report, not by plant operations in general (page 3-18).

## Section 4 0

The report must present borehole analytical data which will allow cross-referencing to the specific borehole and location of the composite within the borehole. Presently, tables 4-2 and 4 3 do not allow this cross-reference to be done.

The borehole information and the soil gas data should be used to estimate contours depicting the extent of soil contamination. Groundwater well analytical data should be used to depict an estimate of groundwater contamination. This should be done in both the vertical and horizontal planes. The data derived from the remedial investigation must provide this information.

Tables 4-2 and 4-3 present data which is supposed to justify elimination of certain positive hits for VOCs due to laboratory artifact. In reviewing this data many analyses are eliminated when the actual sample concentration is orders of magnitude higher than the blank concentration. There are also some semivolatile samples which are presented as attributable to laboratory artifact which do not show positive blank analyses. It is unacceptable to qualitatively eliminate these analyses due to laboratory artifact. Defensible methodology must be presented to justify this practice.

The laboratory practices, quality assurance and quality control provided for the data may also be questioned if indeed these types and quantities of laboratory errors are actual.

The report must present the location of the one-time sampling done in the west buffer zone used to determine background concentrations of metals and radionuclides in soils. It is unacceptable to assess potential soil contamination based on one sample. It is unacceptable to compare site data resulting from composited depths to supposed background data that was not compiled in the same manner. Comparison of composited borehole samples which may underestimate the concentration of a contaminant at a specific depth to background analyses in which the sample was not treated the same is inappropriate. Strontium background concentration in the soil is not presented. In instances where the error term for radionuclide concentration is larger than the measured value resampling and/or reanalysis is required and no significance can be placed on the number presented in the RI. Defining this type of a number as equal to background is not acceptable.

In lieu of a more conservative method for determining whether an analysis is within background concentrations if the sample's measured value plus the error term is greater than the measured background concentration plus its error term then the sample should be considered above background. It is prudent to err conservatively so that a positive analysis may be incorrect rather than to falsely determine an above background sample is within some qualitative range of background concentrations. The conclusion that uranium contamination does not exist at the sites is unsupported.

It is the responsibility of the facility to ensure that background concentrations are well characterized so that qualitative guesses do not impede the determination of extent of contamination

Qualitative assessments based on poorly characterized background concentrations do not provide acceptable delineation of the extent of contamination. The statement that metal contamination of the soils of the 903 pad, mound and east trenches does not exist is not supported.

Quarterly variation in analytical values may indicate seasonal variation of groundwater table. Varying data during different seasonal quarters should not be used to qualitatively eliminate a possibly contaminated site from further investigation.

#### Section 5 0

The facility must present the methodology used to determine whether the SWMU's upgradient of the proposed background wells are impacting ground water quality with respect to a specific analyte. The subjectiveness of the approach in the RI is not defensible. If an outlier concentration is present in the data for a specific well for a specific analyte, this may represent analytical problems, seasonal variability, or may be an indication that the well is not appropriate for use as an indicator of background concentrations.

If the facility were to propose the same reasoning for uranium 234 and 238 as was proposed for the results of some of the groundwater and soils samples collected which were unexplained or considered anomalies, the background levels for uranium 234 and 238 should be set at zero. The process of selectively eliminating one analysis in preference of another is unacceptable without a method to quantitatively verify the validity of this result. For example, the 5 mg/l potassium concentration should be considered an outlier if the methodology is followed consistently throughout the course of background level determination. It is apparent that no consistent logical method has been utilized by the facility to define the background levels found at the plant.

It is premature to decide that the bedrock wells located west of the plant in the vicinity of the west spray field are not affected by the west spray field. The facility must make this determination and demonstrate that these wells are not affected prior to utilizing them for background determination.

#### Section 6 0

The background concentrations presented for the surface water associated with the plant are not consistent with the methodology utilized for the soils and groundwater background determinations. For instance, the plutonium concentrations presented include error terms greater than the measured value, as does the tritium value. These values are not defined as zero as were some of the soil samples. Are outlier concentrations considered in this determination?

The surface seep contamination due to presumed particulate plutonium must be verified and is presently unsupported

Because the alluvial groundwater in the vicinity of the Woman creek drainage is potentially affecting Woman creek does not preclude the drainage from being impacted by constituents present at the sites being investigated. Alluvial groundwater near Woman creek may be contaminated by any of these sites and in turn may be impacting woman creek water quality

#### Section 7 0

Information presented at past information exchange meetings indicated the anomalous high readings of plutonium in the air were a result of field operations at the 903 pad area. The consistency of and support for any contrary statements must be justified in the RI

If the plant ambient air monitors have an approximate size cutoff in still air of 30 microns and 70% of all plutonium activity is associated with particles greater than 15 microns in size are the monitors collecting accurate or useful information? What percentage of plutonium activity is greater than 30 microns in diameter?

#### Section 8 0

What differences in biological attributes of animals and arthropods of contaminated and non-contaminated areas were or have been recently observed? Are chromosome aberrations occurring in animals living in contaminated areas?

Were the small mammals studied herbivores? If plutonium is mostly associated with the surface of vegetation it is possible that it is being concentrated in the animals reliant on contaminated vegetation. Were pathological studies of the mule deer performed?

Did the aquatic life studies note any physiological aberrations correlatable to the concentration of plutonium in the benthic organisms or the fish living in the contaminated ecosystems at the plant?

#### Section 9 0

Statements indicating that uranium and metal concentrations are not elevated with respect to background are presently not supported by the data

Direct exposure to the public is not precluded by the existence of the plant security area or buffer zone. The employees of the facility must be considered members of the public and external public business people also enter the plant routinely

Long-term exposure to directly resuspended dust and contaminated air can also occur to the public which is employed at the facility

The report should sample the wells located within two miles of the site so as to determine whether there may be any impact at present to the waters being utilized for livestock or drinking purposes. The wells presented in table 9-1 should be cross referenced to the wells which are presented graphically on figure 2-1 of the post closure permit application in appendix A-8.

During past information exchange meetings Rockwell International has attributed high plutonium in air concentrations at the security fence to resuspension of dust due to field activities at the 903 site. The report should address the exposure of the worker population to resuspension of dust and contaminated air.

The report does not address the probability that during times of high flow resuspended sediment contaminated with radionuclides has left the plant, and is potentially a process by which contaminated sediments will leave the plant in the future. Because contaminated water was not found to be leaving the plant during the sampling events of 1986 does not mean that this is not a significant pathway for off-site migration of contamination.