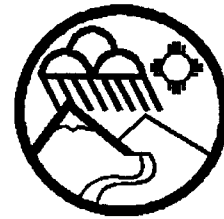




GARY E. JOHNSON
GOVERNOR

State of New Mexico
ENVIRONMENT DEPARTMENT
Hazardous and Radioactive Materials Bureau
2044A Galisteo, P.O. Box 26110
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Telephone (505) 827-1567
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PETER MAGGIORE
SECRETARY

05/11/11/06

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

November 4, 1999

Dr. John Browne, Director
Los Alamos National Laboratory
P. O. Box 1663, Mail Stop A100
Los Alamos, New Mexico 87545

Mr. Theodore Taylor, Project Manager
Los Alamos Area Office
Department of Energy
528 35th Street, Mail Stop A316
Los Alamos, New Mexico 87544

**RE: Supplemental Information Request
RCRA Facility Investigation Report
Eastern and Western Aggregates at Technical Area 6
Los Alamos National Laboratory
NM0890010515**

Dr. Browne and Mr. Taylor:

The RCRA Permits Management Program (RPMP) of the New Mexico Environment Department's Hazardous and Radioactive Materials has reviewed the RCRA Facility Investigation Report (RFI) for Potential Release Sites in the Eastern and Western Aggregates at Technical Area 6 (referenced by LA-UR-98-3710 and EM/ER:98-396) and requests supplemental information as detailed in the attachment.

LANL must respond to the request for supplemental information within thirty (30) days of the receipt of this letter.



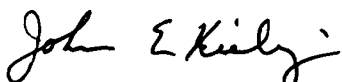
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Dr. Browne and Mr. Taylor
November 4, 1999
Page 2

Should you have any questions regarding this letter or you would like to discuss the comments prior to your response, please contact Roland Rocha at (505) 846-0053 or myself at (505) 827-1558 x1012.

Sincerely,



John E. Kieling, Acting Manager
RCRA Permits Management Program
Hazardous and Radioactive Materials Bureau

JEK:rr

attachment

cc w/ attachment:

- J. Bearzi, NMED HRMB
- J. Canepa, LANL EM/ER, MS M992
- J. Davis, NMED SWQB
- R. Dinwiddie, NMED HRMB
- M. Kirsch, LANL EM/ER, MS M992
- D. McInroy, LANL EM/ER, MS M992
- D. Neleigh, EPA 6PD-N
- J. Parker, NMED DOE OB
- R. Rocha, NMED HRMB
- J. Vozella, DOE LAAO, MS A316
- S. Yanicak, NMED DOE OB, MS J993
- P. Young, NMED HRMB

File: Reading and HSWA LANL HSWA 5/1111/6

ATTACHMENT

The following table includes a complete listing of the potential release sites (PRSs) presented in this document, LANL's (Los Alamos National Laboratory) proposed actions, and the rationale for the Administrative Authority's (AA) concurrence or non-concurrence on each proposed action.

Eastern Aggregate

PRS	LANL'S PROPOSED ACTION	DOES AA CONCUR?	AA RATIONALE
06-002	NFA	No	Extent of release not adequately determined
06-003(c)	NFA	No	Extent of release not adequately determined
C-06-005	NFA	No	Extent of release not adequately determined
C-06-006	NFA	Yes	No known or suspected release of RCRA constituents
C-06-016	NFA	Yes	No known or suspected release of RCRA constituents
C-06-020	NFA	No	Detailed ecological risk assessment necessary

Western Aggregate

PRS	LANL'S PROPOSED ACTION	DOES AA CONCUR?	AA RATIONALE
C-06-003	NFA	Yes	No known or suspected release of RCRA constituents
06-003(g)	NFA	No	Extent of release not adequately determined
C-06-007	NFA	Yes	No known or suspected release of RCRA constituents
C-06-008	NFA	Yes	No known or suspected release of RCRA constituents
C-06-009	NFA	Yes	No known or suspected release of RCRA constituents
C-06-010	NFA	Yes	No known or suspected release of RCRA constituents
C-06-011	NFA	No	Detailed ecological risk assessment necessary

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PRS	LANL'S PROPOSED ACTION	DOES AA CONCUR?	AA RATIONALE
C-06-012	NFA	Yes	No known or suspected release of RCRA constituents
C-06-013	NFA	No	Extent of release not adequately determined
C-06-014	NFA	Yes	No known or suspected release of RCRA constituents
C-06-015	NFA	Yes	No known or suspected release of RCRA constituents
C-06-017	NFA	Yes	No known or suspected release of RCRA constituents
C-06-018	NFA	No	Clarification is needed regarding the depth of Sample ID 0506-97-1306
C-06-021	NFA	No	Detailed ecological risk assessment necessary

The following table includes a complete listing of the SWMUs (Solid Waste Management Unit) or AOCs (Area of Concern) which should be added to the HSWA (Hazardous and Solid Waste Amendments of 1984) module of the RCRA (Resource Conservation and Recovery Act) operating permit.

PRS	Rationale
C-06-005	Inorganic RCRA constituent released at this AOC.
C-06-011	Inorganic RCRA constituent released at this AOC.
C-06-013	Inorganic RCRA constituent released at this AOC.
C-06-018	Inorganic RCRA constituent released at this AOC.
C-06-020	Inorganic RCRA constituent released at this AOC.
C-06-021	Inorganic RCRA constituent released at this AOC.

GENERAL COMMENTS:

1. LANL should supply the AA with the digestion method used in the radiochemical analysis.
2. As it currently exists, comments on the document can only be presented in generalities because no details have been presented in the document which can be reviewed to verify risk calculations. The document references a methodology outlined in Kelly, et al., 1998, however that document does not supply adequate information on factors such as concentration equations, dose equations, bioconcentration factors, biotransfer factors, food chain multipliers, ingestion rates, body weights, toxicity reference values, and receptor diets to evaluate how hazard quotients were calculated in this document. Please present all relevant information necessary to calculate hazard quotients including concentration equations, dose equations, bioconcentration factors, biotransfer factors, food chain multipliers, ingestion rates, body weights, toxicity reference values, and receptor diets.
3. The risk assessment shows that several COPCs (Chemical of Potential Concern) fail the ecological screening assessment based on the toxicity values used. This should bring the risk assessment to the baseline stage. Then uncertainties should be looked at more closely to see if: 1) site specific adjustments can be made to the concentration or dose equation inputs, or 2) a site-specific toxicity reference value can be substituted for the screening value utilized in calculating the hazard quotient. Dropping the site without presenting and documenting how assumptions have been altered should not be used to recommend NFA (No Further Action) decisions. Please propose and document any changes made to the screening assumptions to show that NFA is a viable option.
4. In a screening level risk assessment, maximum media concentrations are either used to directly compare to no-observed adverse effect levels (NOAEL) for community level receptors (e.g, plants, invertebrates, etc.) or used to calculate NOAEL dose levels to upper trophic level receptors (e.g., omnivores, carnivores, etc.). The ecological soil screening levels (ESLs) presented (should be equal to NOAELs) appear to be nearer the lowest observed adverse effect level (LOAEL) in soil for plant and invertebrate species, based on a check of literature values (see references below). This would have a tendency to increase the screening level hazard quotients by an order of magnitude. Please present all toxicity reference values used to calculate hazardous quotients along with full documentation of

references. The following table summarizes toxicity reference values as reviewed by EPA and cited:

Constituent	Duration and Endpoint	Test Organism	LOAEL	Reference
Cadmium	Chronic LOAEL	Spruce seedling growth	2 mg/kg	Burton, et al. (1984)
Lead	Chronic LOAEL	Senna	46 mg/kg	Krishnayya and Bedi (1986)
Zinc	Chronic LOAEL	Spring Barley	9 mg/kg	Davis, Beckett, and Wollan (1978)

Burton, K. W., E. Morgan, and A. Roig. 1984. The influence of Heavy Metals Upon the Growth of Sitka-Spruce in South Wales Forests. II.. Greenhouse Experiment. Plant and Soil. Volume 78. Pages 271-282.

Krishnayya, N.S.R., and S. J. Bedi. 1986. Effect of Automobile Lead Pollution in Cassia tora L. and Cassia Occidentalis L. Environmental Pollution. Volume 40A. Pages 221-226.

Davis, R.D., P.H.T. Beckett, and E. Wollan. 1978. Critical Levels of Twenty Potentially Toxic Elements in Young Spring Barley. Plant and Soil. Volume 49. Pages 395-408.

4. The argument that contaminated "hot spots" are not ecologically relevant for most species because of their large home range is flawed. If food items of larger organisms are weakened by exposure at a site, thereby becoming more vulnerable to predation, they may occupy a larger portion of a predators diet than would be assumed by an adjustment for home range. The "hot spot" might also serve other ecologically relevant functions such as breeding site for some species. Analysis of "hot spots" is past the level generally considered in a screening assessment. If the initial screening assessment is well documented including equations used to calculate the soil screening level, "hot spots" can be dealt with by adjusting the area use

factors and proportion of diet that is contaminated factor in the risk equation as appropriate. Documentation of the adjustments should be presented along with a discussion of what constitutes an ecologically relevant "hot spot". This belongs in the baseline assessment. Another alternative is to conduct "hot spot" removal and confirmatory sampling.

5. Some PRS's from the Eastern and Western Aggregate need to be investigated further to better understand the extent of contamination. These PRS's are listed in the Specific Comments. LANL should produce a comprehensive Sampling and Analysis Plan (SAP) indicating how investigations for these PRS's will proceed.
6. The data tables in the RFI contained valuable information, however the data was difficult to follow because the data was presented in a aggregate specific basis. In future presentations of data LANL should present the data on a site specific basis.

SPECIFIC COMMENTS

1. **§ 2.0 Eastern Aggregate, Figure 2.1-2 Photograph of the Eastern Aggregate with PRSs identified (photo date: November 1, 1946), page 8**

The photo submitted of the Eastern Aggregate is too unclear to make out any features in the aggregate which may have existed in the area. LANL should submit another sharper photograph of the aggregate which better indicates any features which may exist or once existed in the Eastern Aggregate.

2. **§ 2.2.2 Operational History, Eastern Aggregate, TA-6, page 15**

"PRS 06-002 is located toward the western end of the aggregate. The 1000-gal. steel septic tank received process wastewater from two sources: The process wastewater from the PETN recrystallization operation in building TA-6-10 [PRS C-06-003(g) in the Western Aggregate], and sanitary wastewater from the employees resthouse (PRS C-06-020). The discharge from the septic tank is shown in engineering drawings to have been 100 ft to the southeast of the septic tank. The plan does not show an associated leach field. The septic

tank was removed in 1965. The pipelines to and from the tank remain in place and are considered part of the PRS"

Samples 06-8060 and 06-8061 from PRS 06-002 appear to have been taken up gradient from the end of the septic tank discharge line. LANL should positively locate and identify the design of all effluent discharge features associated with PRS 06-002. Once the effluent discharge location(s) and method(s) are identified then LANL should investigate this PRS more thoroughly.

3. § 2.2.2 Operational History, Eastern Aggregate, TA-6, page 15

"PRS 06-003(c) is the location of an inactive firing site. It was not assigned a structure number. It consisted of a 40 ft by 60 ft asphalt pad supporting water recovery shots that used depleted uranium and cobalt tracers. After a shot, metal fragments were washed from the surface of the pad into a 2 ft by 5 ft by 2-ft-deep concrete-lined pit located on the east side of the pad."

Sample data for PRS 06-003(c) indicate inorganic contamination detected throughout the PRS. Sample data also indicate contaminant concentrations increase with depth at many sample locations. LANL should conduct another sampling campaign to better characterize the nature and extent of the release at this PRS. The investigation should include samples taken further from the source of contamination [PRS 06-003(c)] and should include samples taken at a greater depth than the previous sampling campaigns to get a better understanding of the depth of contamination. LANL should also indicate the location of the pit on maps of PRS 06-003(c).

4. § Operational History, Eastern Aggregate, TA-6, page 15

"PRS C-06-005 is the location of former structure TA-6-13, a 16 ft by 16 ft by 9-ft-high wood frame building used as a chemistry laboratory and detonator assembly building. The lab sink in this building discharged to a French drain adjacent to the east side of the building."

The area of the French drain on the east side of PRS C-06-005 has not been sampled. LANL should determine the extent of the french drain and investigate this PRS further.

5. 2.3.4.3 (a) Data Review - Inorganic Chemical Comparisons with Background, Table 2.3-3, page 29

PRS 06-003(g) has inorganic contamination distributed throughout the PRS. Vertical extent appears to have been determined; however, the lateral extent of contamination has not been adequately determined. LANL should conduct another sampling campaign to better characterize the nature and extent of the release at this PRS. The investigation should include samples taken further from the source of contamination [PRS 06-003(g)].

6. 2.3.4.3 (a) Data Review - Inorganic Chemical Comparisons with Background, Table 2.3-3, page 29

PRS C-06-013 has cadmium contamination distributed throughout the PRS. The vertical and lateral extent of contamination has not been adequately determined. LANL should conduct another sampling campaign to better characterize the nature and extent of the release at this PRS. The investigation should include samples taken further from the source of contamination [PRS C-06-013] and should be deeper than the samples taken for the previous characterizing efforts at PRS C-06-013.

7. § Table 2.3-1, Eastern Aggregate-TA-6 Former Building Sites, Summary of Samples Collected for Fixed Laboratory Analysis, page 23

Table 2.3-1 summarizes the samples collected for fixed laboratory analysis in the Eastern Aggregate. Samples associated with sample locations 06-4007 to 06-4012 all appear to be omitted from the table. LANL should include samples from all sample locations in Table 2.3-1.

8. § 2.3.5 Revised Site Conceptual Model, Eastern Aggregate, page 44

"The area was active from 1944 to sometime in 1948, when operations, storage, and utility buildings were built at TA-22 and operations were transferred there. All test firing at TA-6

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ended in 1952 when operations were moved to TA-40 (see Appendix B-1.0). Therefore, 1994 to 1952 is the general timeframe during which HE and detonator development-related activities occurred and during which initial operational releases might have occurred at the Eastern Aggregate."

In future revisions of this RFI Report, please indicate the correct timeframe during which HE and detonator development-related activities occurred.

9. 3.3.4.3(c) Data Review - Evaluation of Organic Chemicals, Table 3.3-10, Page 132

The Sample ID 0506-95-1306 is denoted as being taken from a depth of 3 ft. However, Table 3.3-1 denotes Sample ID 0506-95-1306 as being a surface sample (0 to 6 in). Please clarify the actual depth of Sample ID 0506-95-1306.

10. 3.3.4.3(c) Data Review - Evaluation of Organic Chemicals, Table 3.3-10, Page 133

Organic chemicals including RDX were detected throughout PRS 06-003(g). Additional samples should be taken to determine the depth and the extent of organic contamination.