State of New Mexico
ENVIRONMENT DEPARTMENT
Hazardous & Radioactive Materials Bureau
2044 Galisteo Street
P.O. Box 26110
Santa Fe, New Mexico 87502
(505) 827-1557
Fax (505) 827-1544

GARY E. JOHNSON
GOVERNOR

PETER MAGGIORE
SECRETARY

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

March 16, 1999

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

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

RE: Request for Supplemental Information
16-021(c) RFI Report and CMS Plan
Los Alamos National Laboratory
NM0890010515

Dear Mr. Taylor and Mr. Browne:

The RCRA Permits Management Program (RPMP) of the New Mexico Environment Department's Hazardous and Radioactive Materials has reviewed the RFI Report (LAUR-98-4101) and CMS Plan (LAUR-98-3918) for 16-021(c) both dated September 1998 and referenced by EM/ER:98-393 and 98-392, respectively, and requests supplemental information as detailed in the Attachments A (RFI Report) and B (CMS Plan).

The comments in Attachments A and B are subdivided into a minimum of three (3) distinct response categories: immediate response required, incorporate into subsequent relevant submittal, and no response required. All comments in the immediate response category must be responded to within thirty (30) calendar days of the receipt of this letter. Those comments in the "incorporate into subsequent relevant submittal" category only require a response within thirty (30) calendar days of the receipt of this letter if LANL disagrees with incorporating the comment into the subsequent relevant submittal.

Attachment A contains one additional category of comments: incorporate into the site-specific risk assessment. Many portions of the screening-level risk assessment were

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based on a separate screening methodology document. This document is currently under revision and anticipated for submittal to the Administrative Authority prior to June 1999. If LANL does not respond contrary to the comments provided in this section, LANL must incorporate these comments into the up-coming site-specific risk assessment.

Many of the 16-021(c) issues identified during the review of the RFI Report and the CMS Plan (and discussed in a meeting in early December) dealt with the scope of the RFI and CMS. More specifically, it was discussed whether the following watersheds and other discreet areas should be included within the upcoming investigations performed as part of the 16-021(c) and 16-003(k) RFI and CMS/CMI efforts: MDAs P & R; K-site; Building 340; alluvial systems in Fish Ladder Seep Canyon, Martin Spring Canyon, Cañon de Valle west of the Pajarito Fault, etc.; geomorphology of the entire RFI/CMS study area (including Water Canyon and the entirety of Cañon de Valle, etc.)

As a result of these discussions, RPMP requests that LANL provide a comprehensive schedule for the corrective action activities (including the geologic mapping and fracture logging activities previously scheduled for inclusion in this report) and other related investigations for all PRSs, reaches, and canyons within the RFI/CMS study area as shown in Figure 3.1-1 of the CMS Plan. This schedule should be included in LANL's response to the attached request for supplemental information.

Should you have any questions regarding this letter, please contact me at 827-1558 x1039 or Mr. John Kieling, RPMP's LANL Facility Manager, at (505) 827-1558 x1012.

Sincerely,

Robert S. ("Stu") Dinwiddie, PhD, Manager
RCRA Permits Management Program
Hazardous and Radioactive Materials Bureau

RSD:kth

attachment

cc w/ attachment:

J. Canepa, LANL EM/ER, MS M992
J. Davis, NMED SWQB
B. Garcia, NMED HRMB
K. Hill, NMED HRMB
M. Johansen, DOE LAAO, MS A316
J. Kieling, NMED HRMB
M. Kirsch, LANL EM/ER, MS M992
S. Kruse, NMED HRMB
M. Leavitt, NMED GWQB
H. LeDoux, DOE LAAO, MS A316
D. McInroy, LANL EM/ER, MS M992
D. Neleigh, EPA 6PD-N
J. Parker, NMED DOE OB
J. Vozella, DOE LAAO, MS A316
S. Yanicak, NMED DOE OB, MS J993
File: HSWA LANL 3/1082/16/16-021(c) & 16-003(k)
Track: LANL, doc date, NA, DOE/LANL, NMED HRMB/Dinwiddie, RE, file

ATTACHMENT A

Immediate Response Required:

1. LANL should revise all "Results..." tables in Sections 2 through 4 and Table 6.1-1 to include those COPCs prematurely eliminated from inclusion in the screening process, to address identified discrepancies, to ensure consistent handling of water quality parameters, to include a missing Table of results, to provide further useful clarification, and to ensure consistency with Appendix D. The following are a few examples:
   a. Premature elimination of COPCs:
      i. *3.4.2.1.2 Evaluation of Radionuclides, page 3-39, first paragraph:* "Although bismuth-214, lead-212, lead-214, and thallium-208 were all detected, they are also naturally occurring and not carried forward as COPCs. Cadmium-109, potassium-40, protactinium-231, and protactinium-234M are not considered to be COPCs because they are analyzed for quality control purposes. Because they are not reliably measured by gamma spectroscopy, actinium-228, lanthanum-140, neptunium-237, radium-224, and radium-226 are also not carried forward as COPCs."
      ii. *3.4.3.1 COPCs, page 3-113, first bullet:* Some detected radionuclides have been prematurely eliminated as COPCs.
      iii. *6.3.1.6 Potential Persistent Bioaccumulators and Biomagnifiers, page 6-18, third paragraph in section:* "...mercury was detected as a total concentration and not in its methylated state...thus, mercury is not considered a concern..."Although methylated mercury was not identified (or, probably analyzed for), it is still bioavailable and can become methylated in the environment. Based on the above statement, LANL should not prematurely exclude mercury from the screening assessment.
      iv. *6.3.1.6 Potential Persistent Bioaccumulators and Biomagnifiers, pages 6-18 and -19:* "Cesium-137 was reported from channel sediments...In surface waters of Cañon de Valle, detected radiological PPBs included uranium-234 and -238..." LANL does not provide adequate rationale for excluding these radionuclides from the ecological screening assessment.
      v. *6.3.2 Screening Assessment, page 6-24, second paragraph:* "Iron, as well as calcium, magnesium, nitrogen (nitrate), phosphorous (phosphate), and sodium are considered naturally occurring nutrients for aquatic systems and not retained as COPECs." Nitrates were part of the Laboratory operations at the 260 outfall area. Nitrates should be retained until evaluated in the screening assessment.
      vi. *6.3.2 Screening Assessment, page 6-24, second paragraph:* "Aluminum occurs in naturally high concentrations...Concentrations of aluminum in alluvial water, groundwater and spring water are not likely to have been influenced by Laboratory operations, and are, therefore considered to be naturally occurring. Thus, aluminum is not retained as a COPEC for alluvial water." Logic is faulty; speculation precedes the screening assessment.
   b. Discrepancies:
      i. *2.4.3.1.1 Inorganic Chemical Comparison with Background, page 2-28, second paragraph:* "DLs were above BVs for antimony, cadmium, total cyanide, and thallium in some samples." According to Table 2.4-2, the DL for selenium was also above BV in 32 samples. Please explain the omission or revise the statement/table.
      ii. *Table 2.4-10, Results of Organic Chemical Data Review for Surface and Near-surface Drainage Samples, page 2-54:* Dichlorobenzene[1,2-] is represented twice in this table; once as a volatile and once as a semi-volatile.

iii. *2.4.3.2.1 Inorganic Chemical Comparison with Background, page 2-56, third paragraph:* "DLs were above BVs for antimony, selenium, silver and total cyanide." According to Table 2.4-11, the DLs for mercury and thallium were also above BVs in some samples.

iv. *3.4.3.1 COPCs, page 3-113, third bullet:* Nitrobenzene is not indicated as a COPC for surface water. See Table 3.4-35.

v. *3.4.3.1 COPCs, page 3-113, third bullet:* "Nitrotoluene (3-)" is not found in Section 3.4 or Table 3.4-35. Perhaps this is a typographical error and should be corrected to read "nitrotoluene(2-)"

vi. *Table 4.4-19, Results of Inorganic Data Review for Springs - Major Constituents, page 4-73:* The following constituents enumerated as "major constituents" on page 4-37 and identified in Table 4.4-18 are missing from the table: lithium, chlorine, fluorine, bromine, carbonate and TDS.

vii. *Table 4.4-20, Results of Inorganic Data Review Springs - Minor Constituents, page 4-76:* The following constituents enumerated as "minor constituents" on page 4-37 and identified in Table 4.4-18 are missing from the table: silver, arsenic, cadmium, cobalt, chromium, copper, mercury, nickel, lead, antimony, selenium, uranium and zinc.

viii. *Table 6.1-1, Summary of Constituents Retained as COPCs for Further Screening, page 6-1:* Nitrotoluene[2-], which was retained as a COPC for surface water samples in Table 3.4-35, is missing from this table; and Trichloroethane[1,1,1-] is not identified as a COPC in any of the preceding tables.

c. Inconsistent use and handling of water quality parameters:

LOOKING FOR CONSISTENCY

i. *Table 3.4-42, Results of Water Quality Inorganic Chemicals Data Review for Alluvial Water Samples in Cañon de Valle - Major Constituents, page 3-107:* TDS, a water quality parameter, is retained as a RCRA COPC.

ii. *3.4.3.1 COPCs, page 3-113, last bullet:* TDS is not included as a COPC although many other water quality parameters are.

iii. *Table 4.4-20, Results of Inorganic Data Review Springs - Minor Constituents, page 4-76:* Bicarbonate is retained as a RCRA COPCs.

d. Missing table:

i. *3.4.2.1.2 Evaluation of Radionuclides, pages 3-39 and 3-40:* A table indicating the "Results of Radionuclide Data Review for Cañon de Valle Surface Sediments" has been omitted.

e. Information required for clarification purposes:

- 'UTR' IS NOT DESCRIPTIVE ENOUGH
- CONSISTENT USE ALL RH WTR, SPL, ETC

i. LANL should define and consistently distinguish between the various types of water (surface water, alluvial water, spring water and borehole water), sediments, and soils encountered at the site in both text and tables.

ii. LANL should enhance all "Results..." tables by including more detailed information such as that found in Table 2.4-4 on page 2-42.

iii. LANL should organize the constituents in Table 6.1-1 by media and provide the descriptor of "carcinogenic" or "non-carcinogenic" in Table 6.1-1 to make a smooth transition to the next phase of the evaluation (Section 6.2).

f. Consistency with Appendix D:

i. Tables D-2.3-1 through D-2.3-28 indicate that the the following constituents should be retained as COPCs; however, the tables in the main body of the report do not include them:

dichloroethane (may be a typographical error - dichloromethane?)
isopropyltoluene[4-]
dinitro-2-methylpheno[4,6-]
phenanthrene, and
lead

2. LANL should include in the report a master table indicating which types of analyses (radionuclide, VOC, SVOC, metals, water quality parameters, etc.) were conducted on each of the source, alluvial, and subsurface media.
3. *3.4.2.3.1 Evaluation of Inorganic Chemicals, page 3-85, second paragraph:* "The data set is not complete enough to compare concentrations of barium over time because surface water was not sampled from each location during each sampling event." The lack of comparable data sets is a setback for the ER Project as a whole. LANL should obtain periodic analytical "snapshots" of both the surface water and groundwater systems and should handle the sampling methodology and types of analyses for each medium consistently. That is, LANL should use the same types of pumps to obtain all groundwater samples; analyze all groundwater samples for the same analytes, etc.
4. In order to ensure consistency between treatment of media samples and to provide a complete "picture" of the contamination present, RPMP recommends the following additional analyses be conducted:
   a. Radionuclides in all water samples
   b. Nitroglycerin
5. *2.3.1 Summary, page 2-7, last paragraph of section:* "Although above-background levels of uranium were reported in some Phase I samples, no uranium analyses were required by the Phase II sampling and analysis plan for the source area." LANL should explain where the elevated uranium concentrations were identified (source area, etc.) and provide a more technically valid reason for not conducting analyses for uranium other than it was not required by the Phase II SAP.
6. *Figures 2.4-9 though -24, pages 2-79 through 2-95:* LANL should clarify how to interpret the following:
   - the symbol ">" is used to mean both "Dtech RDX>5 ppm" and "Dtech TNT>5 ppm"
   - the series of "x"s (magnitude of concentration?)
7. *Appendix B*: A location map of all the cited springs should be included.

Incorporate into the Site-specific Risk Assessment:

1. *5.3 Contaminant Persistence and Chemistry, page 5-8, first paragraph in section:* "The principal COPCs for the 260 outfall include..." LANL should clarify what is meant by "principal COPCs".
2. *5.3 Contaminant Persistence and Chemistry, page 5-8, last paragraph:* "At this time, some microbial decay may be occurring at TA-16." LANL should provide the basis for this statement or remove it.
3. *5.3 Contaminant Persistence and Chemistry, pages 5-8 through 5-11:* This section fails to evaluate the persistence and chemistry of TCE degradation products as well as LNAPLs and DNAPLs.
4. *5.3 Contaminant Persistence and Chemistry, page 5-11, top paragraph:* "...the residence time of organics at TA-16 should generally be less than metals." LANL should provide justification for this statement.
5. *5.4 Implications of Conceptual Model for the Human Health Pathways Exposure Model, page 5-11:* "Exposure to subsurface soils and groundwater are not considered viable pathways at TA-16, as will be more fully discussed in following sections." [emphasis added]
   a. Section 5.4 does not provide any further discussion on this subject.
   b. LANL should provide rationale for not considering the subsurface soils and groundwater as viable pathways. These pathways may have offsite implications that have not been appropriately considered.
6. *5.4 Implications of Conceptual Model for the Ecological Pathways Exposure Model (EPCEM), page 5-14:* "LANL should more clearly delineate how downstream habitat will be evaluated.

7. *Figure 5.4-1, Human Health Pathways Conceptual Exposure Model, page 5-13:* The Worker Trail User human receptor should include incidental ingestion of both surface water and sediment.
8. *6.1 Summary, page 6-1, first paragraph:* "Table 6.1-1 provides a concise list of all chemicals that have been retained for such an analysis from these three sections." This table is incomplete; the elimination of COPCs must be accompanied by appropriate rationale.
9. *6.2.1 Scoping, page 6-6, first paragraph:* "Toxicity information...was taken from Region 9 Preliminary Remediation Goals..." LANL should obtain its toxicity information from primary sources not from secondary sources such as the Region 9 Preliminary Remediation Goals.
10. *6.3 Ecological Screening Assessment, page6-14, fourth paragraph:* "The uncertainty analysis can result in the addition or removal of chemical constituents from the list of COPECs." LANL should provide the basis upon which the removal or addition of chemical constituents will be added or removed.
11. *6.3 Ecological Screening Assessment, page6-14, last paragraph:* "...corrective action or BMP..." BMPs are one form of Stabilization Measure/Interim Action (SM/IA). LANL should use the terms SM/IA instead of BMP when making generalized statements.
12. *6.3.1.2 Suspected Contamination Effects on Biotic Media, page 6-15, last paragraph:* "However, the condition of the surface of PRS 16-021(c) makes it difficult to distinguish the effects of physical disturbance from the effects of biotic inhibition due to contamination at the site." The observed fact is that there is a loss of biota. Attribution of the loss of biota is the focus of this investigation. LANL appears to speculate that the loss is attributable to physical disturbance of the site. LANL should avoid speculation by listing the possible contributors to the loss and set about proving or disproving each possibility.
13. *6.3.1.2 Suspected Contamination Effects on Biotic Media, page 6-16, second paragraph:* "It is highly unlikely that any sensitive populations of organisms have been affected by operations or contamination from PRS 16-021(c), as there is no history of sensitive populations being confined to the 260 outfall site or Cañon de Valle." This is reverse logic and speculation. LANL should remove this statement and present only facts and their interpretations.
14. *6.3.1.4 COPC Identification, page 6-17, first paragraph:* "The data gathered...adequately identify COPCs for the purpose of an ecological screening assessment." LANL should clarify how the data were determined to be adequate and indicate that there were exceptions to each data set.
15. *6.3.1.5 Ecological Pathways Conceptual Exposure Model, page 6-17, last paragraph:* "The contaminated media considered were surface soil (including sediment) of the 260 outfall, surface water and channel sediments of Cañon de Valle, alluvial water...and emergent groundwater...Deep groundwater and deep (alluvial and borehole) sediment and tuff media are not considered to possess the same magnitude of ecological relevance for the area as the aforementioned media. Therefore these media were not considered relevant to the EPCEM..."
    a. LANL should explain how "surface soil (including sediment)" will be used in the ecological screening.
    b. LANL should define what is meant by "deep alluvial" and "deep alluvial sediment."
    c. LANL should provide the rationale upon which it basis the statement that these media do not possess "...the same magnitude of ecological relevance..."
    d. LANL should define what is meant by " magnitude of ecological relevance." Contaminated media are either ecologically relevant or irrelevant.
    e. LANL should provide justification for considering these media ecologically irrelevant and for eliminating them.
16. *6.3.2 Screening Assessment, page 6-19, third paragraph:* "The purpose of the HQ/HI is to identify COPECs, not to calculate ecological risk...An HQ can be thought of as the ratio of the measured exposure dose received by a receptor (contaminant levels at a site...to a dose that has been determined to be acceptable based on toxicity studies (the ecological screening level [ESL]...Thus,

HQs and HIs are toxicologically based scores intended to indicate the potential for receptor-specific risk...An HQ or HI greater than 1 is considered an indicator of potential adverse impacts to ecological receptors." [emphasis added]

a. LANL should revise this statement since the HQ/HI ratio is a risk calculation.
b. LANL should replace "measured exposure dose" with "estimated exposure dose" since dose to ecological receptors cannot be measured.
c. LANL should not equate dose with contaminant levels.
d. LANL should provide a definition of "ecological screening level"
e. LANL should explain what is meant by "toxicologically based."
f. LANL should clarify the "or" in "...An HQ or HI greater than 1..."

17. *6.3.2 Screening Assessment, page 6-19, fourth paragraph:* "Measured effects for any constituent may be reproductivity, morbidity, or mortality based." A toxicity endpoint and its relevance to ecological receptors must be clearly identified; therefore, developmental effects (such as growth, weight gain, etc.) should be used instead of morbidity.
18. *6.3.2 Screening Assessment, page 6-19, last paragraph:* "ESLs for wildlife are determined...on the basis of toxicological studies to determine the maximum dietary exposure to a contaminant that confers no observed adverse effect..." [emphasis added]
    a. LANL should replace "exposure" with "dose."
    b. ESLs should be based on the lowest observed adverse effect level (LOAEL) not the no observed adverse effect level (NOAEL).
19. *6.3.2 Screening Assessment, page 6-20, third paragraph:* "Since Cañon de Valle is not a fishery, and since both water and sediment data have been independently collected, only filtered (dissolved) concentrations of chemical constituents are considered for water data in the ecological screening process." [emphasis added]
    a. LANL should explain what is meant by "independently collected."
    b. LANL should not exclude the unfiltered concentrations of chemical constituents since wildlife is exposed to both water fractions.
20. *6.3.2 Screening Assessment, page 6-21, second paragraph:* This section is inconsistent with Appendices B and D and should be consistent with the revised methodology.
21. *6.3.2 Screening Assessment, page 6-23, second paragraph:* "The only radiological constituent found greater than background..." The term "background" should not be used in reference to radiological constituents; LANL should use the term "fallout" or "fallout/background."
22. *6.3.2 Screening Assessment, page 6-23, last paragraph:* "Calcium, magnesium, potassium, and sodium are highly soluble and considered essential nutrients in aquatic systems..." If LANL wishes to utilize the concept of essential nutrients, it should define levels at which each element is considered nutritional.
23. *6.3.3 Uncertainty Analysis, Uncertainty in the Screening Assessment, page 6-25:* "Maximum reported values of COPCs were used from isolated spots from across the aggregate." It is speculated that the maximum values were obtained from "isolated spots" unless horizontal and vertical extent of these "spots" have been defined. This uncertainty analysis should be used to identify gaps in the available data (such as the lack of extent determination) and prioritize them for future data gathering efforts.
24. *6.3.3 Uncertainty Analysis, Uncertainty in the Screening Assessment, page 6-25:* "Toxicological data are typically based on the most toxic and bioavailable chemical species, which is not likely found in the environment." [emphasis added] LANL should provide support for or remove this statement.

Incorporate into Subsequent Relevant Submittal:

1. *General:* The following are considerations to take into account for the next RFI-related deliverable:
   a. Include the water data from BH 16-2712 (*2.3.4.3 BHs 16-2736 and 16-2712, page 2-23, last paragraph in section*)
   b. Follow the geologic nomenclature of Broxton and Reneau, 1995 which has been accepted by the AA within the Canyons Investigation Core Document (The use of Qbt_5 does not follow this nomenclature.)
   c. Evaluate the data obtained from R-25 and its influence on the site's conceptual model
   d. Evaluate the effect of the radius of influence from nearby pumping wells on groundwater flow
   e. Evaluate the effect of increased pumping on groundwater flow
   f. Avoid using small data sets to draw conclusions
   g. Include or obtain HE analytical data for well SHB-3
2. *1.2 Adjacent Land Use, page 1-8, top paragraph:* "On-site workers (individuals who work on or near the site) and construction workers (individuals who would be exposed to near-surface and subsurface soils through various activities, including excavation) are considered to be the most likely humans to be exposed to potential contaminants. Therefore, they are used in the exposure scenarios evaluated in the human health screening assessment (Section 6)." LANL should indicate that it has requested and received approval to deviate from HRMB's requirement to evaluate the residential land use scenario.
3. *1.4 Conceptual Understanding and Approach, page 1-11, last paragraph of section:* "Details about the transition of this site from the CMS team to the Canyons Focus Area team are still evolving." LANL should mention that a guidance document is being prepared and when that document is anticipated for submittal to the AA.
4. *Table 2.3-1, Summary of Phase I and Phase II Samples Collected for Fixed Laboratory Analysis at the TA-16-260 Outfall Source Area, page 2-9:* The last five (5) columns in the table fail to clearly identify the information found in those columns. LANL should state that these columns provide the request numbers for the indicated analyses.
5. *3.4.2.3 Surface Water, page 3-56 (et sequitur)*: At present, the background data sets for both surface water and springs have not been agreed to by the AA. The AA has identified issues with both data sets that require resolution. In the near term, LANL should continue to pursue the resolution of these issues with the AA.
6. *Figure 5.2-1, Conceptual hydrologic model for the TA-16-260 outfall area, page 5-5:* This figure does not address horizontal fracture flow.
7. *5.5 Implications of Conceptual Model for Ecological Pathways Conceptual Exposure Model (EPCEM), page 5-12:* The effects of contaminants on ecological receptors transported via the groundwater pathway are not fully evaluated.
8. *Appendix A, Acronyms and Glossary:* LANL should provide citations for those definitions obtained from guidance or reference documents.
9. *Appendix B-4.0, Hydrology*: Many sections of this appendix are outdated and contain inappropriate assessments of the environmental setting.
10. *Appendix B, Figure B-3.0-1, page B-7:* This figure provides a dramatic illustration of the potential influence of the Water Canyon Fault Zone on the 260 Outfall site conceptual model. However, the main body of the text does not directly address this important structural feature.
11. *Appendix B-4.1.2*: This portion of Appendix B should be rewritten to more accurately reflect the current conceptual model.

No Response Required:

1. *Executive Summary, page ES-4, top paragraph:* "The assessment reveals that barium and bis(2-ethylhexyl)phthalate are the primary chemicals of potential concern (COPCs)." The term COPCs is used incorrectly. If COPCs are retained after the screening assessment they become COCs.
2. *1.1 Purpose and Regulatory Context, page 1-1, second paragraph:* "The RCRA Corrective Action Program is usually conducted in the following phases: Preliminary Assessment and Site Inspection..." "Preliminary Assessments" and "Site Inspections" are CERCLA activities. RCRA equivalents would be the RFA and RFI.
3. *2.4.3.1.1 Inorganic Chemical Comparison with Background, page 2-30, top paragraph:* "Moreover, the drainage sediments are now dry and immobile..." This section does not provide the reader with any indication why the sediments have apparently become "dry and immobile." LANL should explain the change in drainage sediment condition.
4. *3.3.2 Alluvial BH Sediment and Bandelier Tuff Sampling, page 3-6, second paragraph in section:* This paragraph provides a very thorough written description of the approximate locations of the boreholes; however, it would be extremely useful to reference a figure to aid the reader.
5. *4.3.1 Deviations, page 4-6, third paragraph:* "Also, due to contractual issues, geotechnical parameter analyses of the deep borehole samples are still pending." It is unclear what parameters are included in the pending geotechnical analyses and what types of contractual issues are causing the delay.
6. *4.4.3.2 Springs, page 4-31, last paragraph on page:* The entire last paragraph is repeated on page 4-37.
7. *5.1 Summary, page 5-1, first paragraph:* "TA-16 is one of the most complex sites at the Laboratory in terms of hydrologic behavior and contaminant fate and transport." This statement only currently holds true because the majority of the high-risk sites at the laboratory remain un-investigated to date.
8. *5.1 Summary, page 5-4, fifth bullet:* "However, the effect of springs is to dilute contamination in the alluvial aquifer." This statement is not necessarily true; the springs may under certain conditions (see Appendix G which discusses barium speciation) contribute significant contamination to the alluvial system.
9. *Appendix I, pages I-12 through I-13:* Cross-referencing this table with those in the main body would have made a nice "bridge" between analytical data and text.

ATTACHMENT B

Immediate Response Required:

1. Institutional Controls have not been adequately addressed/evaluated as part of the remedy selection process.
2. *1.3 Conceptual Understanding and Approach, page 7, last paragraph:* "...potential impacts to groundwater and/or surface water quality will continue to be evaluated during the CMS process and in a site-specific risk assessment (SSRA)." Please provide an anticipated schedule date for the submittal of this SSRA.
3. *3.4.3 Points of Compliance, page 32, top paragraph:* "EPA has established that the POC for soils (and by extension, alluvium) is limited to near-surface souls because subsurface soils have limited likelihood of exposure to receptors." Please provide a reference for this statement.
4. *3.4.3.1 through 3.4.3, [Multiple headings], page 32:* "...the preliminary POC for [alluvium, surface water, groundwater]...will be defined as...within areas of contamination defined in Chapter 2..." Chapter 2 does not adequately define what is meant by "areas of contamination." Please clarify.
5. *Table 6.3-1, Summary of Sampling and Analysis for the Connectivity Investigation at the TA-16-260 Outfall Source Area, page 63:* LANL should analyze for HE in the source area to determine the concentrations remaining in the source area.
6. *6.3.4 Alluvial Water Dynamics, page 72, second paragraph:* "At its eastern end, the surface water system terminates near the point where the canyon floor intersects the stratigraphic contact between units Qbt_3 and Qbt_2 of the Tshirege Member of the Bandelier Tuff." Please clarify if this contact is related to the Water Canyon fault system and describe any potential impacts that this fault zone might have on contaminant transport.
7. *6.3.4.1 Investigation Design, page 74, first paragraph:* "Field measurements for all samples will include pH, temperature, conductance, and RDX." Please explain why RDX, in particular, was chosen as a field measurement.
8. *6.3.4.2 Sampling Activities, page 75, last paragraph:* "The locations [of the piezometers] in the perennial reach portion of the canyon will be determined after the geomorphic survey." Please explain how the geomorphic survey will be used to site the piezometers.
9. *Table 6.3-4, Summary of Annual Sampling and Analysis for the Investigation of Alluvial Water Dynamics, page 78:* Please indicate which samples and analytes will be analyzed in the field or in the laboratory.
10. *6.3.5.2 Investigation Design, page 79, first paragraph:* "Geomorphic units will be mapped in Cañon de Valle and Martin Spring Canyon. In Cañon de Valle, this mapping will be conducted from the head of Peter Seep to below the barium anomaly at the bottom of MDA P..." Geomorphic mapping should be conducted for the entire study area as defined in Figure 3.1-1.
11. *6.4.1.2 Field Screening, page 81, top paragraph:* "These two methods [Spectrace 900 and ion-specific electrodes] will be compared, and the more effective will be implemented." Please provide a description of how these methods will be compared to determine which is more effective.
12. *6.4.2 Field Analytical Procedures, page 82:* "Above is a table of the analytical protocols for field screening analyses." No table is presented.
13. *6.4.3 Sample Handling and Tracking, page 82:* "Archived samples for potential stable isotope analysis will be stored in a glass vial with a polyseal cap and refrigerated." Please indicate if there is a standard operating procedure which governs the handling of stable isotope analysis and state at what temperature these samples must be maintained.
14. *6.4.3 Sample Handling and Tracking, page 82:* "An investigation-specific archiving procedure will be developed and presented in the field implementation plan for the Phase III investigation." Please indicate when the FIP is anticipated for submittal to the AA.

Incorporate into Subsequent Relevant Submittal:

1. *General*:
   a. In many instances, the terms "components" and "compartments" are used for the different systems (source, alluvial, and subsurface) by which this site, and consequently the format of the report, has been divided. Please refrain from using the term "compartment" for clarification.
   b. The site-specific risk assessment (SSRA) should include all the COCs retained in the RFI Report.
2. *1.2.2 PRS Description, page 5, second paragraph:* "...and the HEs RDX, TNT, and HMX..." These acronyms should be spelled out in their first use and should be consistent with the terminology used in the September 1998 RFI Report.
3. *1.2.2 PRS Description, page 5, second paragraph:* "Contaminants known to be present before RFI investigations...and identified additional constituents...include...." Discrepancies occur when comparing this listing of COCs to Tables 6.2-6 and 6.3-1 of the September 1998 RFI Report.
4. *1.2.2 PRS Description, page 5, third paragraph:* "HE, barium, and low levels of other constituents have been observed in...intermittent perched water observed during drilling..." It would be instructive to discuss the nature (depth, etc.) of the perched waters.
5. *1.2.2 PRS Description, page 7, top paragraph:* "...BMPs...minimize...runoff from the PRS..." Please discuss the effect of BMPs on runon.
6. *1.3 Conceptual Understanding and Approach, page 9, top paragraph:* "On-site workers (individuals who work on or near the site) and construction workers (individuals who would be exposed to near-surface and subsurface soils through various activities, including excavation) are considered to be the most likely humans to be exposed to potential contaminants. They are therefore used in the exposure scenarios that will be evaluated in the human-health screening assessment and the SSRA." LANL should indicate that it has requested and received approval to deviate from HRMB's requirement to evaluate the residential land use scenario.
7. *2.1 Source Area, page 13, last paragraph:* "...the key stratigraphic features noted...are the soil/tuff interface, ..." This paragraph provides a fairly comprehensive discussion of the horizontal stratigraphic features influencing contaminant transport, but fails to identify and discuss the uncertainty that the vertical flow features introduce into the model.
8. *Table 3.4.3-1, Target MCSs for COPCs Based on Human Health Risk Screening, page 30:* Discrepancies are noted when comparing this table to Section 6.2.4 (page 6-13) of the September 1998 RFI Report.
9. *3.4.3.3 Groundwater, page 32, number 1 (et sequitur):* The term, "...main aquifer...," is an inappropriately used, antiquated term which should be replaced by "regional aquifer."
10. *3.4.3.3 Groundwater, page 33, second paragraph:* "The ecological screening assessment for surface and alluvial waters in the Phase II RFI suggests that these biological systems are not seriously disturbed by contaminants (LANL 1998, in preparation)." The Phase II RFI is unable to adequately determine the effect of 16-021(c) on the biological systems of Cañon de Valle. It is inaccurate to state that these systems have not been "seriously disturbed" since that type of investigation was outside of the scope of the Phase II RFI. Furthermore, please clarify what is meant by the phrase "seriously disturbed."
11. *3.4.5 Applicable Regulation and Requirement Evaluation, page 34:* Neither RCRA nor the Federal Threatened and Endangered Species Act are directly addressed in this section.
12. *3.4.5 Applicable Regulation and Requirement Evaluation, page 34, Land Disposal Restrictions:* "However, any ex-situ CMS treatment (soil or water) that generates a waste will comply with LDR

requirements, pending approval of these requirements by NMED." This statement requires clarification; NMED does not have LDR requirement approval authority.

13. *3.4.5 Applicable Regulation and Requirement Evaluation, page 34, first paragraph:* "This section presents an overview of laws and regulations that may apply..." Many of the bolded subheadings are not "laws" or "regulations." Please rephrase the statement.
14. *5.3.4 Timing of Potential Remedy, page 54:* "For hazardous waste treatment, permits will be required prior to construction." Permits may not be required if hazardous waste is treated on site or in-situ. Please rephrase.
15. *6.1 Objectives and Scope, page 55, first paragraph:* "The investigations that are associated with the first and last of the components [connectivity and alluvial sediment dynamics] will be one-time events." Please clarify how the activities associated with these two components will be "one-time events." It seems that the tracer study, which is a significant portion of the connectivity component, will be on-going throughout Phase III of the RFI.

No Response Required:

1. *1.2.2 PRS Description, page 5, third paragraph:* "RDX is observed most frequently and presents the most significant potential risk to human health." Please quantify "most frequently" and provide the basis for stating that RDX poses the "most significant potential risk." In addition, this type of statement does not appear to consider the risk to ecological receptors.
2. *3.4.3 Points of Compliance*, Page 31: The concept of a "Point of Compliance" applies only to RCRA-regulated units not Hazardous and Solid Waste Corrective Action SWMUs or AOCs.