Response to the Notice of Disapproval, Investigation Report for Bayo Canyon Aggregate Area, Los Alamos National Laboratory EPA ID No: NM0890010515, HWB-LANL-08-006, Dated April 24, 2008

INTRODUCTION

To facilitate review of this response, the New Mexico Environment Department's (NMED's) comments are included verbatim. Los Alamos National Laboratory's (LANL's or the Laboratory's) responses follow each NMED comment. This response contains data on radioactive materials, including source, special nuclear, and byproduct material. Information on radioactive materials and radionuclides, including the results of sampling and analysis of radioactive constituents, is voluntarily provided to NMED in accordance with U.S. Department of Energy (DOE) policy.

SPECIFIC COMMENTS

NMED Comment

1. Executive Summary, page vii:

Permittees Statement: *"Pending DOE and Los Alamos County approval, the following actions are being planned for Consolidated Unit 10-002(a)-99.*

- *Maintain the Central Area under DOE administrative control, implement institutional controls to limit site access and potential strontium-90 mobilization, and negotiate additional actions, if needed, between DOE and the property owner (Los Alamos County).*
- *Remove two isolated areas of elevated strontium-90 activity identified outside of the Central Area within Consolidated Unit 10-002(a)-99 as a good stewardship practice."*

NMED Comment: *See specific comment # 3.*

LANL Response

1. See response to specific comment #3.

NMED Comment

2. Section 4.4, Excavation of Exploratory Test Pits, page 28, paragraph 1:

Permittees' Statement: *"No subsurface debris was encountered and no samples were collected from the test pits excavated at AOC 10-009. Figure 4.3-3 shows the location of the test pits excavated at AOC 10-009. Photographs of the excavation and the debris encountered are presented in Appendix D."*

NMED's Comment: *There are no photographs of the excavation or debris encountered at AOC 10-009 in Appendix D because no debris was encountered in the suspected location of AOC 10-009. The Permittees must remove the last sentence of the above statement or provide the photographs of the excavation.*

LANL Response

2. The last sentence of the above statement has been deleted from the text.

NMED Comment

3. Section 5.3, Cleanup Goals, page 30:

Permittees' Statement: *"As specified in Section VIII.B.1 of the Consent Order, the screening levels will be used as cleanup levels unless determined to be impracticable or unless SSLs do not exist for current and reasonably foreseeable future land use. If appropriate, the cleanup levels to be used in the Bayo Canyon Aggregate Area will be determined during the corrective measures evaluation."*

NMED Comment: *NMED does not require submittal of a Corrective Measures Evaluation (CME) at this time. However, the Report concludes that removal of two isolated areas of elevated strontium-90 south of the radiochemistry laboratory is required. The Permittees must provide a work plan describing the removal activities at the two areas south of the radiochemistry laboratory. The Permittees must provide a schedule for submittal of the work plan with the response to this NOD.*

LANL Response

3. The investigation report does not conclude that removing the two areas with elevated strontium-90 was required but rather recommended removal pending approval by DOE and the County of Los Alamos. Although the elevated strontium-90 activities do not pose an unacceptable dose under current and expected future land use, removal of this contamination, which is on County land, was proposed as a good stewardship practice. LANL proposes removing two isolated areas of elevated strontium-90 south of the radiochemistry laboratory on County land. Currently, there is no schedule for preparing the work plan or completing the work. Both work scope and schedule are subject to discussions between the County of Los Alamos and DOE. When they become available, the schedule and scope of work will be provided to NMED for informational purposes.

NMED Comment

4. Section 6.0, Site Contamination, page 31, paragraph 3:

Permittees' Statement: *"It should be noted that historical data were revalidated to current data-quality standards for this report. Therefore, analytical results and qualifiers for historical data presented in this document are not identical to the analytical results and qualifiers for the historical data used to develop the approved investigation work plan (and HIR). Thus, some data results used in establishing data-quality requirements for the approved Bayo Canyon investigation work plan may now be excluded from the current data set (and will not be presented in plates and figures)."*

NMED Comment: *Exclusion of the data that was utilized in determination of data gaps and subsequent sampling locations in the work plan could have resulted in additional data gaps. The Permittees must provide tables and figures depicting the data that has been excluded because of the data revalidation process. In addition, the Permittees must identify the deficiencies of any data relied upon during this investigation, including that collected during previous work. If such data is considered unreliable, it should not have been cited in the investigation work plan as the basis for proposed activities.*

LANL Response

4. The Bayo Canyon borehole locations were selected and samples were collected based on the data needs identified in the approved Bayo Canyon Aggregate Area investigation work plan. The data needs were identified from data presented in the historical investigation report before revalidation to current standards. All boreholes were drilled and sampled before the 2007 data revalidation; therefore, data revalidation did not affect the selection of drilling or sampling locations. In addition, because of the number and locations of new boreholes, the nature and extent of contamination can largely be evaluated using only 2007 data. The data collected as part of the 2007 investigation along with the valid older data are adequate to determine the nature and extent of contamination and to assess potential risk in the Bayo Canyon Aggregate Area. Revalidation did not result in additional data gaps. Conditions specific to the individual consolidated units, solid waste management units (SWMUs), and areas of concern (AOCs) are given below.

    - Consolidated Unit 10-001(a)-99—All the 2007 surface and shallow subsurface samples were collected at previous sampling locations, and the new 2007 data replaced the historical data. In addition, only a small percentage (less than 3%) of the remaining historical surface/shallow subsurface sampling results were rejected. These were primarily mercury and high explosives results. No high explosives or mercury were detected in any of the valid samples; mercury was retained as a COPC because of nondetections just above the background value (which is the detection limit of 0.1 mg/kg) in six historical samples. Subsurface samples were collected only at SWMU 10-005 within Consolidated Unit 10-001(a)-99. Five boreholes were drilled at SWMU 10-005 during previous investigations, and two new boreholes were drilled in 2007. The results from the new boreholes, along with the results from historical location 10-01283 (for which no results were rejected), 10-01281 (for which several manganese and semivolatile organic compound [SVOC] results were rejected), and 10-01280 (for which many results for just the depth interval 22.5 to 23.5 below ground surface were rejected) are adequate to define nature and extent in the subsurface at this SWMU. Data from location 10-01280, located approximately 25 ft east of location 10-01281, are valid for manganese and SVOCs and three other depth intervals, including one deeper than the 22.5- to 23.5-ft interval.
    - Consolidated Unit 10-002(a)-99—Historical sampling locations within this consolidated unit are surrounded by the 2007 sampling locations. In addition, several 2007 boreholes were drilled and sampled near historical locations to verify previous results. Of the 2007 results, approximately 80 (less than 0.5%) were rejected. Of these results, nearly 60 were undetected volatile organic compound results that were invalidated because surrogate information was missing. The remaining 2007 data and valid historical data are adequate for defining the nature and extent of contamination at Consolidated Unit 10-002(a)-99.
    - SWMU 10-004(a)—All historical sampling locations at SWMU 10-004(a) are surrounded by 2007 sampling locations. Only one 2007 sampling result for 2-butanone was rejected. This organic chemical was not detected in any other sample included in the validated data from SWMU 10-004(a). Therefore, the 2007 data and valid historical data are adequate for defining the nature and extent of contamination at SMWU 10-004(a).
    - AOCs C-10-001 and 10-009—Very little decision-level data existed for these AOCs before the 2007 effort. Confirmation samples for strontium-90 were collected in 1995. Of the data from these samples, two undetected strontium-90 results were rejected because of lack of minimum detectable activity and/or uncertainty documentation. None of the remaining 3709 results for AOCs C-10-001 and 10-009 were invalidated. Twenty-three valid strontium-90 results, including two results from 1995, exist for the small area (approximately 1.5 acres)

that includes these two AOCs. Therefore, the 2007 data and valid 1995 data are adequate for defining the nature and extent of contamination at AOCs C-10-001 and 10-009.

All data presented in the Bayo Canyon report, including data collected during previous investigations, were decision-level data validated to current standards, as outlined in Section IX.C of the Compliance Order on Consent (the Consent Order). The nature and extent of contamination in the Bayo Canyon Aggregate Area, as presented in the investigation report, were evaluated using only decision-level data. Any data that could not be validated to current standards were not used for decision purposes (i.e., nature and extent evaluation or risk screening).

Table 1 shows the revalidation results that differ from the historical data set for all samples used to identify data needs in the approved investigation work plan. This table is also included in Appendix F of the revised investigation report as Table F-2.1-1. All rejected data were provided on CD with the original investigation report, as well as with the revised report, and the original and revised Appendix F provides detailed information regarding the rejected data. Because a given sampling location includes several sampling intervals and potentially thousands of individual results, of which a few may be rejected, and because the rejected data consist of 91% undetected results, it is not practical to try to convey the rejected data spatially.

NMED Comment

5. Section 6.2.2.1, Consolidated Unit 10-002(a)-99, Central Area, Radionuclides, page 37, paragraph 4:

Permittees' Statement: *"The average strontium-90 activity from biota (vegetation) samples from chamisa plants within the Central Area is 97.4 pCi/g."*

NMED Comment: *See specific comment # 8.*

LANL Response

5. See response to specific comment #8.

NMED Comment

6. Section 6.2.2.2, Consolidated Unit 10-002(a)-99, Exclusive of the Central Area, Radionuclides, page 39, paragraph 3:

Permittees' Statement: *"Additional soil samples (not specified in the approved investigation work plan) were collected as part of the 2007 investigation to characterize two localized areas of elevated radiation, south of the former radiochemistry building, identified during the 2007 radiological surveys. Two samples, from the surface and from a depth of approximately 1.5-3.0 ft (all in soil), were collected at four locations south of the former radiochemistry building area."*

NMED Comment: *The Permittees must revise the text and all applicable figures to identify the four additional sampling locations used to characterize the two areas of elevated radiation.*

LANL Response

6. The four additional sampling locations and the sampling results were included in the original text, tables, and figures of the Bayo Canyon investigation report. Section 6.2 and Plates 6 and 7 have been revised to clearly indicate the additional sampling locations.

NMED Comment

7. Section 8.0, Recommendations, page 51, paragraph 2:

Permittees' Statement: *"Lastly, removal of two isolated areas of elevated strontium-90 activity identified south of the former radiochemistry laboratory is proposed as a good stewardship practice, pending DOE and Los Alamos County approval."*

NMED Comment: *The Permittees have not provided a map depicting the exact location of the two areas of elevated strontium-90, nor have they described the remedial activities proposed for these areas. The Permittees must submit such a map depicting the two locations of elevated strontium-90 with the response to this NOD. Also see specific comment # 3.*

LANL Response

7. See response to specific comment #6. Plates 6 and 7 have been revised to clearly indicate the two areas of elevated strontium-90. Also see response to specific comment #3.

NMED Comment

8. Appendix J, Section J-4.0, Recommendations, page J-9, paragraph 3:

Permittees' Statement: *"In summary, alternatives 1, 2, 3, 4, and 6 remain as viable alternatives. The final appropriate alternative for SWMU 10-007, based on radioactivity as the only issue, will be negotiated between the DOE and the current property owner, Los Alamos County."*

NMED Comment: *The Permittees must specify the alternative and subsequent corrective measures that will be implemented to protect the public from radioactive contamination. The Permittees must submit a report to NMED, following implementation of the corrective measures, describing the corrective action activities and whether the remedial action successfully mitigated the risk of radionuclides, specifically strontium-90, to receptors at SWMU 10-007 and the Central Area. NMED reminds the Permittees that a Certificate of Completion (COC) or a "corrective action complete without controls" cannot be obtained for this site until all remedial activities have been completed.*

LANL Response

8. Appendix J addresses the requirement in Section IV.C.5.c.iv of the Consent Order that the investigation of Technical Area 10 include an evaluation of the need to remove landfill material at SWMU 10-007. As demonstrated by the risk assessment for Consolidated Unit 10-002(a)-99, which includes SWMU 10-007, no potential unacceptable risk to human health from nonradiological contaminants under a residential scenario and no ecological risk exist. Therefore, the requirements of the Consent Order have been met for this site.

   Consolidated Unit 10-002(a)-99 meets DOE's target dose limits under the recreational scenario, and therefore, no additional actions are needed to protect the public under the current and reasonably foreseeable future land use. Because Consolidated Unit 10-002(a)-99 does not meet DOE's target dose limit for the residential scenario and because this property is owned by the County of Los Alamos, DOE has determined that additional actions to address the strontium-90 contamination at SWMU 10-007 should be undertaken. The corrective action(s) will be determined by DOE in consultation with the County. LANL will notify NMED of any corrective action(s) implemented and will provide a copy of the remedial action report for informational purposes in accordance with DOE policy when that document becomes available.

Pursuant to Section VII.E.6.b of the Consent Order, the site is suitable for a Certificate of Completion when all requirements under the Consent Order have been met. Because the strontium-90 removal is not within the scope of the Consent Order, completion of this removal of radionuclide contamination is not a condition for obtaining a Certificate of Completion for this site.

NMED Comment

9. Appendix K, Geophysical Survey Report: Shrapnel Survey, Section K-1.0, Introduction and Scope, page K-1:

Permittees' Statement: *"ARM Geophysics (a division of ARM Group, Inc.) performed a nonintrusive geophysical investigation using the TM-5emu instrument at former Technical Area (TA) 10 of Los Alamos National Laboratory (the Laboratory), located in Bayo Canyon, from July 19 to August 14, 2007."*

NMED Comment: *ARM Geophysics conducted the geophysical survey of TA-10; therefore, the Permittees must include the ARM Geophysics report as an appendix.*

LANL Response

9. The original ARM shrapnel survey report is included as an attachment to Appendix K.

NMED Comment

10. Appendix L, Geophysical Survey Report: Landfill and Buried Structures Identification Survey, Section L-1.0, Introduction and Scope, page L-1, paragraph 1:

Permittees' Statement: *"From August 14 to 22, 2007, ARM Geophysics, Inc., performed a nonintrusive geophysical investigation at Bayo Canyon, Los Alamos, New Mexico."*

NMED Comment: *See comment # 9.*

LANL Response

10. The original ARM geophysical survey report is included as an attachment to Appendix L.

NMED Comment

11. Appendix M, Radiological Survey Report, Section M-1.0, Introduction, page M-1, paragraph 1:

Permittees' Statement: "*Environmental Restoration Group, Inc. (ERG) conducted a walk-over radiological survey of portions of the former Technical Area 10 in Bayo Canyon, referred to as Bayo Canyon Aggregate Area."*

NMED Comment: *See comment # 9.*

LANL Response

11. The original ERG radiological survey report is included as an attachment to Appendix M.

Table 1
Crosswalk between Data Needs Identified in the Approved Work Plan, Historical Data, and Revalidated Data

Data Need Identified in Investigation Work Plan	Sample ID	Location ID	Analyte	Revalidated Result	Revalidated Reporting Qualifier	Initial Result	Initial Reporting Qualifier	Units	Depth (ft bgs)	Comment
Consolidated Unit 10-001(a)-99										
Lateral extent of cadmium north and south of boreholes 10-01281 and 10-01282	AAB9556	10-01281	Cadmium	1.7		1.7		mg/kg	2.5–3.3	Changes have no impact on lateral extent; decreasing vertical trend
	AAB9558	10-01281	Cadmium	2.4		2.4		mg/kg	12.5–13.3	
	AAB9563	10-01281	Cadmium	2.1	UJ	2.1		mg/kg	27.5–28.5	
	AAB9567	10-01281	Cadmium	0.67	J	0.67	U	mg/kg	49.0–50.0	
Lateral extent of strontium-90 north and south of borehole 10-01281	AAB9556	10-01281	Strontium-90	-0.626	UJ	0.626		mg/kg	2.5–3.3	Changes have no impact
	AAB9558	10-01281	Strontium-90	0.0145	UJ	0.0145	U	mg/kg	12.5–13.3	
	AAB9563	10-01281	Strontium-90	-0.0022	UJ	0.0022	U	mg/kg	27.5–28.5	
	AAB9567	10-01281	Strontium-90	-0.242	UJ	0.242	U	mg/kg	49.0–50.0	
Lateral extent of cadmium north and south of boreholes 10-01281 and 10-01282	AAB9544	10-01282	Cadmium	1.4		1.4		mg/kg	2.5–3.5	Changes have no impact on lateral extent; cadmium is below BV[a] or DL[b] in 2007 boreholes
	AAB9546	10-01282	Cadmium	0.63	J	0.63	U	mg/kg	12.5–13.5	
	AAB9549	10-01282	Cadmium	1	J	1	U	mg/kg	29.0–30.0	
	AAB9554	10-01282	Cadmium	0.76	J	0.76	U	mg/kg	49.0–50.0	
Consolidated Unit 10-002(a)-99 (Central Area)										
Lateral extent of naphthalene detected at boreholes 10-01201 and 10-02221	AAB9337	10-01201	Naphthalene	0.13		0.13		mg/kg	11.1–11.8	No naphthalene detected in deeper 2007 boreholes; decreasing vertical trend
	AAB9341	10-01201	Naphthalene	0.013		0.013		mg/kg	16.9–17.5	
	AAB9342	10-01201	Naphthalene	0.009		0.009		mg/kg	19.2–20.0	
	AAB9347	10-01201	Naphthalene	REJECTED		0.39	U	mg/kg	33.3–33.7	

Table 1 (continued)

Data Need Identified in Investigation Work Plan	Sample ID	Location ID	Analyte	Revalidated Result	Revalidated Reporting Qualifier	Initial Result	Initial Reporting Qualifier	Units	Depth (ft bgs)	Comment
Vertical extent of cadmium at borehole 10-01205 and the lateral extent of cadmium northwest of this location	AAB9360	10-01205	Cadmium	3.3		3.3		mg/kg	10.0–10.5	No change
	AAB9361	10-01205	Cadmium	1.1		1.1		mg/kg	14.3–14.8	
	AAB9363	10-01205	Cadmium	1.3		1.3		mg/kg	19.5–20.0	
	AAB9364	10-01205	Cadmium	0.81	U	0.81	U	mg/kg	20.0–20.9	
	AAB9368	10-01205	Cadmium	2.7		2.7		mg/kg	39.0–40.0	
	AAB9399	10-01205	Cadmium	1.2		1.2		mg/kg	49.3–50.0	
Lateral extent of beryllium, particularly to the northwest of borehole 10-01209 and east of borehole 10-02220	AAB9351	10-01209	Beryllium	0.56	U	0.56	U	mg/kg	14.0–14.7	No change
	AAB9354	10-01209	Beryllium	0.72	U	0.72	U	mg/kg	29.0–29.6	
	AAB9357	10-01209	Beryllium	0.52	U	0.52	U	mg/kg	37.5–38.4	
	AAB9359	10-01209	Beryllium	2.2		2.2		mg/kg	48.4–49.2	
Lateral extent of antimony and zinc to the west of borehole 10-01213	AAB6392	10-01213	Antimony	9.6	U	9.6	U	mg/kg	6.3–6.8	Change has no impact
	AAB6395	10-01213	Antimony	10.4	J	10.4	U	mg/kg	19.2–19.7	
	AAB6404	10-01213	Antimony	18.6		18.6		mg/kg	39.2–39.7	
	AAB6403	10-01213	Antimony	11.7	U	11.7	U	mg/kg	46.8–47.3	
	AAB6392	10-01213	Zinc	24.1		24.1		mg/kg	6.3–6.8	No change
	AAB6395	10-01213	Zinc	87.4		87.4		mg/kg	19.2–19.7	
	AAB6404	10-01213	Zinc	25.1		25.1		mg/kg	39.2–39.7	
	AAB6403	10-01213	Zinc	21.5		21.5		mg/kg	46.8–47.3	
Vertical extent of ethylbenzene and xylene at borehole 10-01294	AAB9269	10-01294	Ethylbenzene	0.005	U	0.005	U	mg/kg	15–15.9	No change
	AAB9271	10-01294	Ethylbenzene	0.006	U	0.006	U	mg/kg	26.5–27.1	
	AAB9272	10-01294	Ethylbenzene	0.006	U	0.006	U	mg/kg	26.5–27.1	
	AAB9274	10-01294	Ethylbenzene	0.035		0.035		mg/kg	36.6–37.4	
	AAB9277	10-01294	Ethylbenzene	0.027		0.027		mg/kg	48.7–49.4	
	AAB9269	10-01294	Xylene (Total)	0.006	U	0.006	U	mg/kg	15–15.9	No change
	AAB9271	10-01294	Xylene (Total)	0.006	U	0.006	U	mg/kg	26.5–27.1	

Table 1 (continued)

Data Need Identified in Investigation Work Plan	Sample ID	Location ID	Analyte	Revalidated Result	Revalidated Reporting Qualifier	Initial Result	Initial Reporting Qualifier	Units	Depth (ft bgs)	Comment
	AAB9272	10-01294	Xylene (Total)	0.016		0.016		mg/kg	26.5–27.1	
	AAB9274	10-01294	Xylene (Total)	0.014		0.014		mg/kg	36.6–37.4	
Lateral extent of beryllium, particularly to the northwest of borehole 10-01209 and east of borehole 10-02220	AAB6583	10-02220	Beryllium	0.53	J	0.53	U	mg/kg	14.0–14.5	Changes have no impact; many 2007 boreholes with valid data surround this location
	AAB6584	10-02220	Beryllium	1.1	J	1.1	U	mg/kg	17.0–17.5	
	AAB9428	10-02220	Beryllium	0.92	J	0.92	U	mg/kg	18.0–18.6	
	AAB6600	10-02220	Beryllium	0.95		0.95		mg/kg	37.0–37.5	
	AAB6603	10-02220	Beryllium	3	J	3		mg/kg	49.4–50.0	
Confirmation of the highest strontium-90 concentrations at borehole 10-02220	AAB6583	10-02220	Strontium-90	37.2		37.2		mg/kg	14.0–14.5	No change
	AAB6584	10-02220	Strontium-90	40325.8		40325.8		mg/kg	17.0–17.5	
	AAB9428	10-02220	Strontium-90	18654		18654		mg/kg	18.0–18.6	
	AAB6600	10-02220	Strontium-90	0.315	U	0.315	U	mg/kg	37.0–37.5	
Lateral extent of naphthalene detected at boreholes 10-01201 and 10-02221	AAB8642	10-02221	Naphthalene	0.4	U	0.4	U	mg/kg	14.2–15.0	No change
Consolidated Unit 10-002(a)-99 (Outside Central Area)										
Lateral extent of beryllium north, west, and south of boreholes 10-01228 and 10-01232	AAB3062	10-01228	Beryllium	0.26	J	0.26	U	mg/kg	3.5–4.2	Changes have no impact on lateral extent; beryllium is below BV or DL in surrounding 2007 boreholes
	AAB3073	10-01228	Beryllium	2.3		2.3		mg/kg	21.4–21.8	
	AAB3069	10-01228	Beryllium	2.5	J	2.5		mg/kg	32.1–32.5	
	AAB3072	10-01228	Beryllium	0.35	J	0.35	U	mg/kg	49.0–49.8	
	AAB3074	10-01232	Beryllium	0.25	J	0.25	U	mg/kg	4.1–4.6	
	AAB3080	10-01232	Beryllium	2.2		2.2		mg/kg	21.5–21.9	
	AAB3085	10-01232	Beryllium	0.63	J	0.63	U	mg/kg	41.8–42.3	
	AAB3086	10-01232	Beryllium	0.58	J	0.58	U	mg/kg	49.4–50.0	

Table 1 (continued)

Data Need Identified in Investigation Work Plan	Sample ID	Location ID	Analyte	Revalidated Result	Revalidated Reporting Qualifier	Initial Result	Initial Reporting Qualifier	Units	Depth (ft bgs)	Comment
Lateral extent of chromium, copper, lead, and mercury north of borehole 10-01242	AAB3033	10-01242	Chromium	3.8		3.8	J	mg/kg	30.3–30.9	Changes have no impact on lateral extent; chromium is below BV or DL in surrounding 2007 boreholes
	AAB3019	10-01242	Chromium	2.8		2.8	J	mg/kg	4.1–4.7	
	AAB3030	10-01242	Chromium	1.5	J	1.5	U	mg/kg	46.5–47.3	
	AAB3032	10-01242	Chromium	20.6		20.6	J	mg/kg	6.2–6.8	
	AAB3033	10-01242	Copper	9.1		9.1		mg/kg	30.3–30.9	Changes have no impact on lateral extent; copper bounded in surrounding 2007 boreholes
	AAB3019	10-01242	Copper	2.8	J	2.8	U	mg/kg	4.1–4.7	
	AAB3030	10-01242	Copper	1.5	J	1.5	U	mg/kg	46.5–47.3	
	AAB3032	10-01242	Copper	14.7		14.7		mg/kg	6.2–6.8	
	AAB3033	10-01242	Lead	28.6		28.6		mg/kg	30.3–30.9	Changes have no impact on lateral extent; lead is below BV or DL in surrounding 2007 boreholes
	AAB3019	10-01242	Lead	12.1		12.1		mg/kg	4.1–4.7	
	AAB3030	10-01242	Lead	3.7		3.7		mg/kg	46.5–47.3	
	AAB3032	10-01242	Lead	52.6		52.6		mg/kg	6.2–6.8	
	AAB3033	10-01242	Mercury	REJECTED		0.06	U	mg/kg	30.3–30.9	Changes have no impact on lateral extent; mercury is below BV or DL in surrounding 2007 boreholes
	AAB3019	10-01242	Mercury	REJECTED		0.1	U	mg/kg	4.1–4.7	
	AAB3030	10-01242	Mercury	REJECTED		0.06	U	mg/kg	46.5–47.3	
	AAB3032	10-01242	Mercury	REJECTED		0.28		mg/kg	6.2–6.8	
Lateral extent of beryllium and cadmium northwest of borehole 10-01244 and northeast of borehole 10-01266	AAB3018	10-01244	Beryllium	0.4	J	0.4	U	mg/kg	12.5–13.1	Changes have no impact on lateral extent; beryllium is below BV or DL in surrounding 2007 boreholes
	AAB3017	10-01244	Beryllium	2.8		2.8		mg/kg	32.0–32.5	
	AAB3004	10-01244	Beryllium	0.63	J	0.63	U	mg/kg	4.3–4.9	
	AAB3016	10-01244	Beryllium	0.6	J	0.6	U	mg/kg	49.1–49.8	
	AAB3018	10-01244	Cadmium	0.52	U	0.52	U	mg/kg	12.5–13.1	Changes have no impact on lateral extent; cadmium is below BV or DL in surrounding 2007 boreholes
	AAB3017	10-01244	Cadmium	1.2	U	1.2		mg/kg	32.0–32.5	
	AAB3004	10-01244	Cadmium	0.4	U	0.4	U	mg/kg	4.3–4.9	
	AAB3016	10-01244	Cadmium	1	U	1	U	mg/kg	49.1–49.8	

Table 1 (continued)

Data Need Identified in Investigation Work Plan	Sample ID	Location ID	Analyte	Revalidated Result	Revalidated Reporting Qualifier	Initial Result	Initial Reporting Qualifier	Units	Depth (ft bgs)	Comment
Lateral extent of beryllium north of borehole 10-01251 and west of 10-01254	AAB6264	10-01251	Beryllium	1.4		1.4	J	mg/kg	28.9–29.5	Changes have no impact; many 2007 boreholes with valid data surround this location
	AAB6258	10-01251	Beryllium	0.46	J	0.46	U	mg/kg	3.1–3.8	
	AAB6268	10-01251	Beryllium	2.4		2.4	J	mg/kg	44.0–44.6	
	AAB6270	10-01251	Beryllium	2.5		2.5	J	mg/kg	49.4–50.0	
Vertical extent of bis(2-ethylhexy)phthalate at borehole 10-01251	AAB6264	10-01251	Bis(2-ethylhexyl)phthalate	0.38	U	0.38	U	mg/kg	28.9–29.5	No change
	AAB6258	10-01251	Bis(2-ethylhexyl)phthalate	0.35	U	0.35	U	mg/kg	3.1–3.8	
	AAB6268	10-01251	Bis(2-ethylhexyl)phthalate	0.41	U	0.41	U	mg/kg	44.0–44.6	
	AAB6270	10-01251	Bis(2-ethylhexyl)phthalate	30		30		mg/kg	49.4–50.0	
Lateral extent of cadmium south of borehole 10-01253	AAB6251	10-01253	Cadmium	0.61	U	0.61	U	mg/kg	26.5–27.1	Change has no impact
	AAB6244	10-01253	Cadmium	0.48	U	0.48	U	mg/kg	3.5–4.1	
	AAB6257	10-01253	Cadmium	2.3	U	2.3		mg/kg	37.5–38.1	
	AAB6256	10-01253	Cadmium	0.55	U	0.55	U	mg/kg	49.4–50.0	
Lateral extent of beryllium north of borehole 10-01251 and west of 10-01254	AAB6281	10-01254	Beryllium	2		2	J	mg/kg	28.4–29.3	Changes have no impact; many 2007 boreholes with valid data surround this location
	AAB6271	10-01254	Beryllium	0.91	J	0.91	U	mg/kg	3.1–4.3	
	AAB6289	10-01254	Beryllium	1.7		1.7	J	mg/kg	33.0–33.6	
	AAB6288	10-01254	Beryllium	0.98	J	0.98	U	mg/kg	49.4–50.0	
Lateral extent of strontium-90 north of borehole 10-01257	AAB6551	10-01257	Strontium-90	-0.21	U	-0.21	U	pCi/g	20.0–20.8	No change
	AAB6546	10-01257	Strontium-90	0.33	U	0.33	U	pCi/g	28.4–29.1	
	AAB6537	10-01257	Strontium-90	340.02		340.02		pCi/g	3.6–4.2	
	AAB6550	10-01257	Strontium-90	0.13	U	0.13	U	pCi/g	48.5–49.4	
Lateral extent of antimony north and south of borehole 10-01259 and south of 10-01262	AAB6525	10-01259	Antimony	10.1	U	10.1	U	mg/kg	15.2–16.0	Changes have no impact on lateral extent; antimony is below BV or DL in surrounding 2007 boreholes
	AAB6512	10-01259	Antimony	REJECTED		9.6	U	mg/kg	2.8–3.7	
	AAB6520	10-01259	Antimony	9.7	U	9.7	U	mg/kg	28.5–29.2	
	AAB6524	10-01259	Antimony	14.9		14.9		mg/kg	48.6–49.5	

Table 1 (continued)

Data Need Identified in Investigation Work Plan	Sample ID	Location ID	Analyte	Revalidated Result	Revalidated Reporting Qualifier	Initial Result	Initial Reporting Qualifier	Units	Depth (ft bgs)	Comment
Lateral extent of antimony north and south of borehole 10-01259 and south of 10-01262	AAB8679	10-01262	Antimony	18.8		18.8		mg/kg	15.0–15.8	Changes have no impact on lateral extent; antimony is below BV or DL in surrounding 2007 boreholes
	AAB8668	10-01262	Antimony	12.2	J	12.2	U	mg/kg	2.7–3.3	
	AAB8674	10-01262	Antimony	11.3	U	11.3	U	mg/kg	29.5–29.8	
	AAB8678	10-01262	Antimony	11.5	U	11.5	U	mg/kg	47.3–48.3	
Lateral extent of beryllium and cadmium northwest of borehole 10-01244 and northeast of borehole 10-01266	AAB2962	10-01266	Beryllium	0.87	J	0.87	U	mg/kg	16.2–16.8	Changes have no impact; beryllium values are below BV
	AAB2949	10-01266	Beryllium	0.84	J	0.84	U	mg/kg	3.0–3.5	
	AAB2958	10-01266	Beryllium	0.33	J	0.33	U	mg/kg	40.2–40.8	
	AAB2959	10-01266	Beryllium	0.36	J	0.36	U	mg/kg	49.3–50.0	
	AAB2962	10-01266	Cadmium	0.52	U	0.52	U	mg/kg	16.2–16.8	No change
	AAB2949	10-01266	Cadmium	0.51	U	0.51	U	mg/kg	3.0–3.5	
	AAB2958	10-01266	Cadmium	0.55	U	0.55	U	mg/kg	40.2–40.8	
	AAB2959	10-01266	Cadmium	0.6	U	0.6	U	mg/kg	49.3–50.0	
Lateral extent of arsenic north and east of borehole 10-01269	AAB2916	10-01269	Arsenic	1.4	J-	1.4	U	mg/kg	14.0–14.5	Changes have no impact on lateral extent; arsenic is below BV or DL in surrounding 2007 boreholes
	AAB2917	10-01269	Arsenic	2.2	J-	2.2	U	mg/kg	26.5–27.0	
	AAB2906	10-01269	Arsenic	0.44	UJ	0.44	U	mg/kg	3.5–4.0	
	AAB2915	10-01269	Arsenic	0.53	UJ	0.53	U	mg/kg	47.5–48.0	
Lateral extent of di-n-butylphthalate south of borehole 10-01271	AAB2928	10-01271	Di-n-butylphthalate	1	J	1		mg/kg	21.8–22.3	Changes have no impact on lateral extent; di-n-butylphthalate is not detected in 2007 boreholes
	AAB2920	10-01271	Di-n-butylphthalate	0.73	J	0.73		mg/kg	3.5–4.0	
	AAB2934	10-01271	Di-n-butylphthalate	0.26	J	0.5	U	mg/kg	38.3–39.0	
	AAB2933	10-01271	Di-n-butylphthalate	0.24	J	0.39	U	mg/kg	48.0–48.6	
Lateral extent of strontium-90 north and south of borehole 10-01289	AAB9227	10-01289	Strontium-90	REJECTED		158		pCi/g	11.4–12.1	Changes have no impact on lateral extent; strontium-90 is below MDA[c] in surrounding 2007 boreholes
	AAB9231	10-01289	Strontium-90	REJECTED		0.0454	U	pCi/g	28.9–29.3	
	AAB9224	10-01289	Strontium-90	0.342	U	0.342	U	pCi/g	3.3–4.1	
	AAB9234	10-01289	Strontium-90	REJECTED		0.754		pCi/g	48.5–49.4	

Table 1 (continued)

Data Need Identified in Investigation Work Plan	Sample ID	Location ID	Analyte	Revalidated Result	Revalidated Reporting Qualifier	Initial Result	Initial Reporting Qualifier	Units	Depth (ft bgs)	Comment
Lateral extent of copper south of borehole 10-01293	AAB9247	10-01293	Copper	9		9		mg/kg	10.0–10.8	Changes have no impact on lateral extent; copper is below BV or DL in surrounding 2007 boreholes
	AAB9235	10-01293	Copper	15.5		15.5		mg/kg	2.5–3.9	
	AAB9242	10-01293	Copper	2.7	J	2.7	U	mg/kg	28.7–29.4	
	AAB9246	10-01293	Copper	1.9	J	1.9	U	mg/kg	48.6–49.6	
Lateral extent of strontium-90 south of borehole 10-01293	AAB9247	10-01293	Strontium-90	3.39	J-	3.39		pCi/g	10.0–10.8	Changes have no impact on lateral extent; strontium-90 is below MDA in surrounding 2007 boreholes
	AAB9235	10-01293	Strontium-90	-0.706	U	0.706	U	pCi/g	2.5–3.9	
	AAB9242	10-01293	Strontium-90	0.191	U	0.191	U	pCi/g	28.7–29.4	
	AAB9246	10-01293	Strontium-90	3.19	J-	3.19		pCi/g	48.6–49.6	
SWMU 10-004(a)										
Lateral extent of mercury north of borehole 10-01273 and east of 10-01274	AAB9455	10-01273	Mercury	REJECTED		0.72		mg/kg	2.5–3.3	Changes have no impact
	AAB9461	10-01273	Mercury	0.52	J+	0.52		mg/kg	27.5–28.3	
	AAB9464	10-01273	Mercury	0.69	J+	0.69		mg/kg	36.0–36.8	
	AAB9465	10-01273	Mercury	0.55	J+	0.55		mg/kg	49.2–50.0	
Lateral extent of bis(2-ethylhexyl)phthalate east of borehole 10-01274 and south of borehole 10-01275	AAB9480	10-01274	Bis(2-ethylhexyl)phthalate	REJECTED		0.35	U	mg/kg	18.5–20	Changes have no impact on lateral extent; bis(2-ethylhexyl)phthalate is not detected in surrounding 2007 boreholes
	AAB9481	10-01274	Bis(2-ethylhexyl)phthalate	REJECTED		1.1		mg/kg	18.5–20	
	AAB9477	10-01274	Bis(2-ethylhexyl)phthalate	REJECTED		0.34	U	mg/kg	2.5–3.4	
	AAB9484	10-01274	Bis(2-ethylhexyl)phthalate	REJECTED		0.36	U	mg/kg	27.5–28.3	
Lateral extent of mercury north of borehole 10-01273 and east of 10-01274	AAB9484	10-01274	Mercury	0.1	U	0.1	UJ	mg/kg	27.5–28.3	Change has no impact
Lateral extent of bis(2-ethylhexyl)phthalate east of borehole 10-01274 and south of borehole 10-01275	AAB9469	10-01275	Bis(2-ethylhexyl)phthalate	REJECTED		0.35	U	mg/kg	14.2–15	Changes have no impact on lateral extent; bis(2-ethylhexyl)phthalate is not detected in surrounding 2007 boreholes
	AAB9474	10-01275	Bis(2-ethylhexyl)phthalate	REJECTED		0.35	U	mg/kg	34.2–35	
	AAB9476	10-01275	Bis(2-ethylhexyl)phthalate	REJECTED		0.44	U	mg/kg	49.2–50	
	AAB9466	10-01275	Bis(2-ethylhexyl)phthalate	REJECTED		0.54		mg/kg	5–5.8	

Table 1 (continued)

Data Need Identified in Investigation Work Plan	Sample ID	Location ID	Analyte	Revalidated Result	Revalidated Reporting Qualifier	Initial Result	Initial Reporting Qualifier	Units	Depth (ft bgs)	Comment
Vertical extent of beryllium at borehole 10-01277	AAB9498	10-01277	Beryllium	0.15	U	0.15	U	mg/kg	2.5–3.5	No change
	AAB9506	10-01277	Beryllium	0.19	U	0.19	U	mg/kg	22.5–23.3	
	AAB9509	10-01277	Beryllium	0.82	U	0.82	U	mg/kg	38.0–39.0	
	AAB9511	10-01277	Beryllium	4.6		4.6		mg/kg	61.5–62.5	
Vertical extent of lead at borehole 10-01277	AAB9498	10-01277	Lead	2.7	J	2.7	J	mg/kg	2.5–3.5	No change
	AAB9506	10-01277	Lead	3.7	J	3.7	J	mg/kg	22.5–23.3	
	AAB9509	10-01277	Lead	7.8	J	7.8	J	mg/kg	38.0–39.0	
	AAB9511	10-01277	Lead	27.5	J	27.5	J	mg/kg	61.5–62.5	
Vertical extent of zinc at borehole 10-01277	AAB9498	10-01277	Zinc	21.3	J+	21.3	J	mg/kg	2.5–3.5	Changes have no impact
	AAB9506	10-01277	Zinc	16.1	J+	16.1	J	mg/kg	22.5–23.3	
	AAB9509	10-01277	Zinc	26.5	J+	26.5	J	mg/kg	38.0–39.0	
	AAB9511	10-01277	Zinc	68.2	J+	68.2	J	mg/kg	61.5–62.5	
Lateral extent of cadmium west of boreholes 10-01278 and 10-01279	AAB9517	10-01278	Cadmium	REJECTED		1.2		mg/kg	19.2–20	Changes have no impact on lateral extent; cadmium is below BV or DL in all but one surrounding 2007 boreholes
	AAB9512	10-01278	Cadmium	REJECTED		1.1		mg/kg	2.5–3.7	
	AAB9520	10-01278	Cadmium	REJECTED		0.86	U	mg/kg	33–33.7	
	AAB9523	10-01278	Cadmium	REJECTED		0.95	U	mg/kg	49–50	
	AAB9527	10-01279	Cadmium	0.79	U	0.79	U	mg/kg	14.0–15.0	
	AAB9524	10-01279	Cadmium	0.76	U	0.76	U	mg/kg	3.0–4.0	
	AAB9533	10-01279	Cadmium	1	J	1	U	mg/kg	38.5–39.4	
	AAB9535	10-01279	Cadmium	1	U	1	U	mg/kg	49.0–50.0	

[a] BV = Background value.

[b] DL = Detection limit.

[c] MDA = Minimum detectable activity.