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ERID-094688

Date: December 6, 2006
Refer to: EP2006-1052

Mr. James Bearzi
NMED-Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe, NM 87505-6303

ESHID-603359

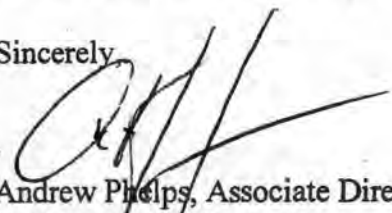
SUBJECT: SUBMITTAL OF THE INVESTIGATION REPORT FOR MATERIAL DISPOSAL AREA C, SOLID WASTE MANAGEMENT UNIT 50-009, AT TECHNICAL AREA 50

Dear Mr. Bearzi:


Enclosed please find two hard copies with electronic files of the "Investigation Report for Material Disposal Area C, Solid Waste Management Unit 50-009, at Technical Area 50." This report addresses the requirement in Section IV.C.3.c.ix of the Consent Order and presents the results of the field activities, summarizes the data collected, and offers recommendations and conclusions for Material Disposal Area (MDA) C. The information in the report characterizes the nature and extent of contamination associated with waste disposal activities at MDA C. However, we understand additional information from four boreholes between waste Pits 2 and 3 is required. Our letter dated November 30, 2006, requests additional time to complete these boreholes and submit the data in an addendum to the investigation report. Plans are in place and work is underway to install all requisite safety measures and to complete the four remaining boreholes in early spring.

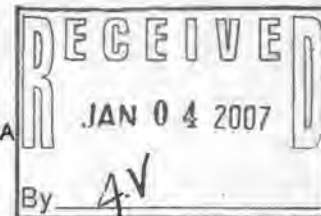
If you have questions, about this report or other issues at MDA C, please contact Kent Rich at (505) 665-4272 (krich@lanl.gov) or Tony Trujillo at (505) 845-5987 (ltrujillo@doeal.gov)

Sincerely,


Andrew Phelps, Associate Director
Environmental Programs
Los Alamos National Laboratory

Sincerely,


David Gregory, Federal Project Director
Department of Energy
Los Alamos Site Office



AP/DG/KR/jr

Enclosure(s): 1) Two hard copies with electronic files - "Investigation Report for Material Disposal Area C, Solid Waste Management Unit 50-009, at Technical Area 50" (EP2006-1000)

Cy: (w/enc):

K. Rich, EP-CAP, MS M992 (with CD)

T. Trujillo, DOE LASO (with CD)

D. Davenport, LATA (with CD)

EP-CAP File, MS M992 (with CD)



Cy: (Letter and CD only)

L. King, EPA Region 6

P. Reneau, EP-ERSS, MS M992

Cy: (w/o enc)

A. Dorries, EP-ERSS, MS M992

G. Dover, EP-CAP, MS M992

A. Phelps, ADEP, MS J591

C. Mangeng, ADEP, MS J591

D. Gregory, DOE LASO, MS A316

D. Cobrain, NMED-HWB

H. Shen, NMED-HWB

T. Skitbiski, NMED OB

IRM-RMMSO, MS A150

Attachment B: Peer Review Comment Form

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Part 1 (Document Manager Completes)

Date: **November 8, 2006**

Title: **Investigation Report for MDA C, SWMU 50-009 at TA-50** Rev. #: ____ Doc. Cat No: **EP2006-1000**

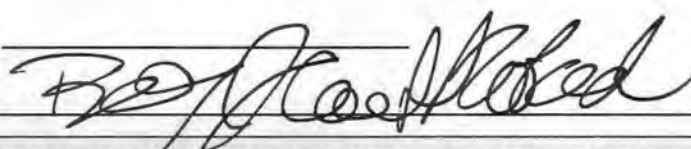
Reviewer's Name (Print): **Becky Coel-Roback** Organization: **EP-CAP** Comments due: **November 15, 2006** (Date)

Author: **Kent Rich** Phone: **665-4272** E-Mail: **krich@lanl.gov**

Return completed and signed forms to: **Saundra Martinez** Phone: **5-6771** E-Mail: **saundra@lanl.gov**

Part 2 (Reviewer Completes)

Date Received: _____ Date Review Completed: _____

Signature & Date (to be signed ONLY upon agreement of comment resolution):  Date: **12/5/06**

Part 3 (If under time constraints, the Author and Reviewer each sign.)

☐ Not all comments resolved; attach PR Comment Form to Document Signature Form.

Author Signature & Date: _____

Reviewer Signature & Date: _____

Comment #	Location ¹	Reviewer's Comment/Suggestion	A/R ²	Author's Proposed Revision/Resolution	Final Resolution
1	General	Please see hard copy markup for editorial corrections, and areas where revised text is suggested for clarity. Call me if you can't read my awful handwriting.	A	Most hard-copy markups incorporated as suggested.	

¹page, section #, paragraph/line ²A = accept / R = reject

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Comment #	Location ¹	Reviewer's Comment/Suggestion	A/R ²	Author's Proposed Revision/Resolution	Final Resolution
2	1.0 and global	I think we are now just using EP to refer to our organization.	A	Corrected globally.	
3	Section 1.1	One thing that I need, but can't find, is an introductory figure showing the locations and numbers of the pits and shafts. Figure 1.1-1 is a little too zoomed out, and the subsequent figures start showing sample locations, etc. There should be something in between, perhaps also showing some of the other features mentioned in this section, like the head of Ten Site canyon.	A	Added Figure 1.1-2 showing pits and shafts with numbers for all.	
4	Section 1.4	Rumor has it the NMED does not care for this type of section, which basically says what's in the report, where. But it could be just one person... who knows.	R	Section retained, other reviewers did not request deletion.	
5	Section 2.1	Again, a figure showing which pits and shafts are which would be very helpful. See comment 3.	A	New Figure 1.1-2; added callout in Section 2.1.	

¹page, paragraph, line

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Comment #	Location ¹	Reviewer's Comment/Suggestion	A/R ²	Author's Proposed Revision/Resolution	Final Resolution
6	Section 2.2	The waste inventories were updated in quite a thorough manner back in 2001 or 2002, by Neptune and a Brian somebody or another. I'm assuming that we are taking advantage of that information here? It was before the order when we were drafting an RFI work plan.	A	This text is based on text in the 2005 work plan, incorporates updates; also included in Appendix J.	
7	Section 2.4 1 st para.	What happens if there is hydraulic head in an area where open fractures exist? Most reports I have seen indicate that downward migration through the fractures would occur under these conditions.	A/R	This is a possibility, though unlikely; however the study referenced did not address fractures.	
8	Section 2.4 bullets and subsequent paras	It is initially unclear that the paragraphs following the bullets are the same thing, expanded. May want to clarify. "the following paragraphs provide more details for these activities, followed by a summary of results"?? Or reorganize a little?	A	Added text suggested after bullet list.	
9	Section 2.4, geophysical surveys	I think we want to reword this to say the results of the geophysical survey indicated the pit boundaries, except where interference from the chainlink fence obscured the boundaries along the southern and eastern edges of MDA C.	A	Revised as suggested.	

¹page, paragraph, line

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Comment #	Location ¹	Reviewer's Comment/Suggestion	A/R ²	Author's Proposed Revision/Resolution	Final Resolution
10	Section 2.4 N&E of surface soil and fill	My recollection is that the radionuclides in the northeast corner were the result of that area NOT having fill put on top of it. So, not necessarily the result of a release limited to that area. Further, I recall that lead and PCBs were detected in the areas where fill had been brought in and were lower in the northeast corner, suggesting that the fill was not totally clean. Was there any attempt to identify the original operational surface at C and grab samples of it during the drilling?	A/R	Wording changed to indicate "elevated concentrations" instead of a release No attempt to characterize the original operational surface at MDA C. There were only 8 borehole samples collected within the 0-10 ft range and they started deeper than 7 ft.	
11	Section 2.4	There is a bit of mixed tense use in here. We need to be sure that we are clear that this is the nature and extent based on the historical data, the gaps from which we were attempting to fill during this investigation. I believe past tense would be best, i.e., "extent was not defined," "numbers and locations were not adequate," etc.	A	Revised to consistently use past tense for previous investigations.	
12	Section 2.4 N&E if sybsurface VOC contamination	We give a range of thickness for pits 1 through 6 (2.5 to 8 ft), then we contradict it in the next sentence by saying it is less than 1 ft thick in some areas. Please clarify.	A	Statement of <1 ft refers to only shaft groups 2 and 3 and the Chemical Pit, as stated; revised text slightly for clarity.	

¹page, paragraph, line

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Comment #	Location ¹	Reviewer's Comment/Suggestion	A/R ²	Author's Proposed Revision/Resolution	Final Resolution
13	Section 3.0	<p>Fourth paragraph would benefit from some breakdown....perhaps chronological bullets?? This is a lot to follow, for those of us who had the good fortune not to be involved! Also, Joe English had us paste the following text into this section of the MDA V report:</p> <p>"The Consent Order does not provide screening levels for VOCs in pore gas. VOC data were screened to determine whether VOCs in subsurface pore gas were a potential source of groundwater contamination through migration of pore gas to groundwater. This screening process, presented in Appendix H, accounts for equilibrium partitioning between VOCs in the gas and liquid phases and compares measured concentrations of VOCs in pore gas to concentrations that would be required to cause groundwater cleanup standards to be exceeded."</p> <p>And then, of course, we discussed it in Appendix H (the risk assessment, in the case of MDA V) as indicated.</p>	A	<p>Moved this section, now Section 5.0. Text is much simplified/clarified per Rich Mirenda.</p> <p>Quoted text has been added (Section 5.4)</p> <p>Also discussed in Appendix G (Risk).</p>	
14	Section 4.1	<p>There is not much discussion of how background information was gathered for comparison to field screening results, if at all.</p>	A	<p>Added brief statement of background determination and usage, also refer to Appendix B for methods.</p>	

¹page, paragraph, line

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Comment #	Location ¹	Reviewer's Comment/Suggestion	A/R ²	Author's Proposed Revision/Resolution	Final Resolution
15	4.0 global	The intro paragraph to this section says it covers the work conducted in 2004, 2005, and 2006, in accordance with the approved work plan. It then goes on to discuss flux samples taken in 2000, boreholes drilled in 1995, etc. These activities were already discussed in Section 3. Section 4 should be limited to current scope to avoid confusion and/or redundancy.	A	Pre-2004 activities now discussed in Previous Investigations, not duplicated in Scope of Activities.	
16	Section 4.4.1	I know I just said this section should be just about current scope, but are the historical borehole logs available for Appendix C? Also, was any geophysical logging conducted? I thought it was an Order requirement. Also, the 9 th paragraph has numerous cut and paste errors that I couldn't wade through.	A	Historical logs not included. Geophysical logging not done(will probably be done during monitoring well installation), except for neutron probe moisture, which is now discussed in Appendix B, Appendix L, and Section 3.4.3 and 4.9. Revised for clarity.	
17	Section 4.4.5	Was there excessive slough in the boreholes preventing collection of a true TD pore gas sample? If so, we need to come clean and explain it, and also present it as a deviation. We got hammered on MDA U for this very thing. Also, if we kept the augers in the borehole to get a TD sample, then a single-packer system, rather than a straddle-packer system, was likely used for those samples. Need to explain any deviations.	A	Added mention of this in Section 3.4.4, refer to Table 3.4-1 which now shows differences in max depths for core and pore-gas. Also in deviation section of Appendix B.	

¹page, paragraph, line

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Comment #	Location ¹	Reviewer's Comment/Suggestion	A/R ²	Author's Proposed Revision/Resolution	Final Resolution
18	Section 4.5	Update the waste discussion to the extent possible. It is my understanding that at least some of this waste has been transported off-site at this point.	A	Updated, added documentation to Appendix I.	
19	Section 4.6	<p>This section should be organized the same as other sections, i.e., going to a third level header. Also, we are lacking a reason for deviations in several instances, and if there was any communication with the state telling them of the deviation or requesting their buy-off.</p> <p>The section on field screening is confusing as to what was discontinued. It would be a good idea to submit the letter from NMED for an ER ID and include it as a reference.</p> <p>The section on collection of tuff samples states that the samples were not put "into....core protect bags. Instead the samples collected were placed immediately into....core protect bags." Confusing.</p> <p>Please see numerous edits in hardcopy.</p>	A	Deviations moved to Appendix B, revised to include reasons for all, adding citation/reference for email from NMED. Text clarified as suggested.	
20	Section 5	There was historically problems with erosion on the north edge of the pit in the northwest corner of MDA C. I've forgotten the number (6?), and there appears to be no figure with pit numbers on it in this report.	A	<p>Changed erosion matrix score to match SWA in Appendix H. Erosion not currently a problem.</p> <p>Added Figure 1.1-2 with pit and shaft numbers.</p>	

¹page, paragraph, line

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Comment #	Location ¹	Reviewer's Comment/Suggestion	A/R ²	Author's Proposed Revision/Resolution	Final Resolution
21	Section 5.3	Are the geophysics survey figures presented anywhere in the report??	A	Geophysics reports now cited as references, not included in this report.	
22	Section 5.4	The second paragraph would benefit from some bullets or something. Was an updated site-specific cross section or fence diagram created from the borehole logs?	A	Changed paragraph to bullet list of stratigraphic units, now state thicknesses as observed at MDA C. There is now a figure showing stratigraphy in MDA C boreholes (Figure 4.4-2).	
23	Section 5.8	Is there anything that can be said about the dust monitoring results? Did not exceed action levels? Range? Presented anywhere?	A	Added action levels to Section 3.1, added reference to action levels here (not exceeded). Dust monitoring results not presented.	
24	Section 6.1.2	I would refer to section 4.1, rather than repeating text. Also, it would be helpful to say a little more about background data collection methods and comparisons. Was there an action for exceeding background? Or 2x background? Or did we just write down the numbers? For VOC results we say nothing was detected (last paragraph). The results tables show hits above 0.2 ppm, so this is not true. Nothing detected above	A	Revised as suggested, with text describing background determination and use. Revised to indicate not detected above action level.	

¹page, paragraph, line

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Comment #	Location ¹	Reviewer's Comment/Suggestion	A/R ²	Author's Proposed Revision/Resolution	Final Resolution
		background? Or some predetermined action level?			
25	Section 6.1.3	This section would benefit from further breakdown (Inorganic, Rad, etc.) A summary COPC table in the main text may also be helpful.	A	Added subheading (not numbered) as suggested. Added summary table to Appendix F, callout here.	
26	Section 6.2.3	Why do we use a, b, c etc. tables? If they are different tables, we should number them sequentially like we always do.	A	Revised, now single table (continued).	
27	Section 7.1	Would be nice to add a sentence under the bulleted list stating that an updated discussion of N&E using 2004-2006 data is presented in Appendix F and summarized below. Also, may want a higher level summary of N&E here. Absent any figure references, it is pretty hard to follow the discussion by location. Also, these are more summaries than conclusions and, although I agree there has to be some summary of the N&E findings, there	A	Text added as suggested. Added more text for N&E, added figure references, clearer conclusion statements.	

¹page, paragraph, line

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Comment #	Location ¹	Reviewer's Comment/Suggestion	A/R ²	Author's Proposed Revision/Resolution	Final Resolution
		should also be an obvious conclusion			
28	Section 7.2.1	Was the flux data already published somewhere? HIR? Qualifiers were modified relative to what? If they have not already been presented somewhere, eliminate this discussion. If they were presented, reference the document.	A	Flux data presented in HIR; text clarified to indicate that some qualifiers changed from what was reported in HIR. HIR is cited as Rev. 2 of work plan.	
29	Section 7.2.3	Change "lowermost" to "deepest". Is there any evidence of poregas hits due to the proximity of Pajarito rd or the utility corridor to the south fo MDA C?	A	Changed "lowermost" to "deepest" globally. No indication of pore-gas contaminants related to Pajarito or utility corridor.	
30	Section 7.3	This N&E argument is dicey at best. We need to be careful because we assert that CST onsite data are not sufficient for decision making purposes. Also, are we sure we have characterized the original operational surface? We say there were pit fires, that radionuclides are present in the northeast due to the fact that cover was not placed there...etc. I'm not sure we have this covered.	A	Text revised to recommend collection of additional surface samples for inorganics, to confirm N&E using decision-level data.	

¹page, paragraph, line

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Comment #	Location ¹	Reviewer's Comment/Suggestion	A/R ²	Author's Proposed Revision/Resolution	Final Resolution
31	Section 7.4	I haven't seen this section before...not sure what it adds that isn't covered in Section 7.5.	A	Added text discussing potential for migration to groundwater.	
32	Section 7.5	Do we need to say that risk is based on current day conditions and assumes that no more stuff leaks out of the pits, or nobody or nothing gets into the pits? Or is that a given?	A/R	That's a given when we say the present and foreseeable land use is industrial worker. Added text to indicate "under an industrial scenario and current conditions at MDA C".	
33	8.0	Need to ensure we have the calculations/write-up from Joe English showing the potential impacts to groundwater from vapor phase contaminants. We should be careful about what details we present regarding monitoring wells. Probably should be general until the monitoring plan can be written.	A	Potential impacts to groundwater from vapor phase is discussed in Appendix G, summarized in Section 7.4. Specifics of monitoring wells deleted per this and other comments.	
34	9.0	Should we wait until approval of the report, rather than submission? Can we commit to this activity right now (question for Kent, really). Also, I would assume a CME is required. NMED is not going to come back and say "No...don't worry about it"	A/R	The vapor monitoring plan is required in the task SOW within 45 days of IR report submittal; defer to Kent Rich on this regarding whether to include this in schedule specifically.	

¹page, paragraph, line

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Comment #	Location ¹	Reviewer's Comment/Suggestion	A/R ²	Author's Proposed Revision/Resolution	Final Resolution
35	Table 3.2-1 and 3.2-2	Why is this table so limited...aren't there a lot more SSLs than these? I don't believe I've seen any table references in the regulatory criteria section before...just refer to risk assessment appendix??	A	These tables have been deleted from main text, now only in Appendix G.	
36	Table 4.2-1	Is there any background information for point of reference?	A	Added background information as footnote.	
37	Figures	Need orientation figure showing pit and shaft numbers, Ten-Site canyon etc. Can we distinguish between historical and current boreholes with symbol and/or color of locations? Is there a non-generic geologic cross section based on results of this drilling campaign?	A	Added Figure 1.1-2 Changed symbols to indicate vintage. Yes, Figure 4.4-2	
38	Appendix A	Ensure current glossary definitions are in use. Eliminate any terms not used in the document.	A	Eliminated unused terms; used "ER" master glossary.	

¹page, paragraph, line

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Comment #	Location ¹	Reviewer's Comment/Suggestion	A/R ²	Author's Proposed Revision/Resolution	Final Resolution
39	Appendix B	We have received numerous NOD comments on the methods appendix. This one could use some expansion. Recently we have been putting in the generic table, but also giving a few pages-worth of discussion on what was actually done in the field. We have also been putting in the deviations in this section. I realize that this would add a lot of work at this late date, but NMED does seem to pick on it less when it has more meat.	A	Extensively revised according to MDA U format, moved deviations section here.	
39	Appendix C	No geophysical or historical borehole logs???	A/R	Only current activity borehole logs.	
40	Appendix D	<p>This appendix could probably focus more on results than process. Has Keith Greene had a chance to review it?</p> <p>For instance, this is where we should discuss what was rejected and why, rather than Appendix F. In Appendix F, we should discuss if there is any impact to our ability to determine nature and extent due to data rejection.</p> <p>We need to discuss inorganic chemicals other than metals (i.e., perchlorate, cyanide, nitrates, etc.). Also, we really don't do anything with field dup data, other than spend plenty of money collecting and analyzing. There is no good way to assess precision with a soil or</p>	A	<p>Revised to summarize results, now matches approach used in MDA V IR.</p> <p>Rejected data information now in Appendix D, not in Appendix F.</p> <p>All analytical suites now discussed specifically.</p>	

¹page, paragraph, line

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Comment #	Location ¹	Reviewer's Comment/Suggestion	A/R ²	Author's Proposed Revision/Resolution	Final Resolution
		<p>rock field dup, due to inhomogeneity, nugget affect, etc. So we shouldn't include the discussion about RPDs, etc.</p> <p>In this section, there are statements such as "All target analyties should be below the CRDL in the method blank"...that begs the question..."are they?" As mentioned before, could use a few more specifics in this section.</p> <p>Tables do not include methods for all analyses (perchlorates, cyanide, etc. left out).</p>		<p>RPDs are mentioned in context of ICSs and lab duplicates, not field duplicates.</p> <p>Now discusses results as opposed to process.</p> <p>Tables revised to include all methods, also deleted methods not specifically used in this investigation.</p>	
41	Appendix E	<p>We don't usually submit SCLs to the state. Just the pdf'd data packages (which include COCs) and the data dump.</p>	A/R	Defer to programmatic policy on this.	
42	Appendix F Global	<p>Maybe look at up-front material in MDA V? There is a bulleted list of the process for identifying COPCs</p> <p>Every other page is a G#</p> <p>Rejected data should be identified in Appendix D. Appendix F should discuss how it impacts decisions.</p> <p>Please number tables sequentially...don't use a,b,c's</p> <p>Use summary tables for COPCs in addition to or instead of long lists of analyte names in text.</p>	A	<p>Comment noted.</p> <p>Page number format corrected.</p> <p>Rejected information has been deleted. Rejected data do not affect COPC decisions.</p> <p>Tables with a,b,c,etc have been combined into one table.</p> <p>A summary table of COPCs by media provided.</p>	

¹page, paragraph, line

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Comment #	Location ¹	Reviewer's Comment/Suggestion	A/R ²	Author's Proposed Revision/Resolution	Final Resolution
		Try to distinguish between things being detected and being detected above BV, where applicable.		Comment noted, text revised accordingly.	
43	Section F-2.1	I think Rich told me during MDA V that we can't just eliminate essential nutrients without some further discussion of concentrations, etc? Check with him.	A	Text added based on his writeup.	
44	Section F-2.3	Need to clarify that there is a tritium FV for surface soil, but we don't use it because of the units conversion, etc. We conservatively evaluate detect status. We have received NOD comments on this in the past.	A	Text modified accordingly.	
45	Section F-2.11	There must be a better, more quantitative way to discuss correlation (or lack thereof) between poregas and tuff VOC data. Some kind of scatter plot? Just because VOCs are detected in poregas samples and not in tuff does not mean there is no correlation. The method is very sensitive. At higher levels of VOCs, I'd be surprised if there isn't a correlation. At lower levels, probably not. Also, please don't say that we are losing VOCs during	A	An updated evaluation has been done based on Joe English's suggestions. Equilibrium concentrations in tuff and water phase have been calculated to illustrate that the correlation is not strong enough to draw any definite conclusion. Please see the revised text and Table F-2.11-6. We have removed speculations on sampling and shipping.	

¹page, paragraph, line

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Comment #	Location ¹	Reviewer's Comment/Suggestion	A/R ²	Author's Proposed Revision/Resolution	Final Resolution
		sampling and shipping. Our procedures are supposed to eliminate/minimize this to the extent possible. We should not call into question the quality of our data just for an easy way to explain an apparent lack of correlation. I think this is simply the method sensitivity issue again.			
46	Section 3	It would be worth noting in the first paragraph that MDA C is primarily a subsurface source of contamination.	A	Text added as suggested.	
47	Section F-3.1.2	<p>Do we have a reference for the comment on aluminum in tuff vs clay?</p> <p>In the 3rd paragraph we state none of the analytes were detected at the bottom of the BH, and most of the concentrations are within 2X the tuff BVs. Which is it?? Are we referring to other boreholes??</p> <p>We focus strongly on vertical extent in the subsurface. What about lateral extent in the subsurface. Do we see decreases in subsurface contamination with distance from MDA C?</p>	A	<p>Text regarding aluminum in tuff vs clay was deleted.</p> <p>Text revised.</p> <p>Lateral extent text has been added.</p>	

¹page, paragraph, line

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Comment #	Location ¹	Reviewer's Comment/Suggestion	A/R ²	Author's Proposed Revision/Resolution	Final Resolution
48	Section F-3.2.1	The two sentences that make up the first paragraph seem to contradict each other. The first says extent is defined. The second says we collected samples to determine extent to the east.	A	Sorry, the work plan stated that extent WITHIN MDA C was defined and that more samples were necessary to define extent EAST of MDA C. Wording has been added to better reflect what the work plan stated.	
49	Section F-3.2.2	If extent is defined, state that. Again, this discussion is limited to vertical extent. What about subsurface lateral extent? Should Pore Gas Tritium Sample section have a number? Also, the text states tritium wasn't detected to the east, but page 14 of this appendix says tritium was detected in at least one sample from each borehole. Which is true? The discussion of tritium in borehole 50-24817 being associated with the industrial waste lines does not indicate what was detected there.	A	Text added for lateral extent. Pore Gas Tritium section given a section number. Text revised as suggested. Text revised.	
50	Section F-3.3.2	The list given in the first paragraph is not the same as the list discussed below. One is broken down by what is detected in six or more samples; the other is broken down by what is detected in five or more samples. Make consistent. What is the distribution of the dioxin/ furans? Near the operational surface? From pit fires? We don't discuss extent, just numbers of detects. Should the Pore-Gas Organic Chemical Samples	A	Text revised. Dioxin/furans were detected throughout the site, but all were at trace levels. Pore Gas given a section number. Borehole by	

¹page, paragraph, line

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Comment #	Location ¹	Reviewer's Comment/Suggestion	A/R ²	Author's Proposed Revision/Resolution	Final Resolution
		<p>section have a number? This discussion needs to rely more heavily on the figures, which are very nice. This is way too much text. I would try to generalize...the highest concentrations were detected on the east side, near pit such and such, decreasing in all direction with the exception of etc. etc. A borehole by borehole discussion defeats the purpose the figures and does not give the reader a sense of distribution. The last few paragraphs of the discussion are more along the lines of what I am talking about, but are perhaps a bit skimpy.</p> <p>Last paragraph would be a good place to insert some discussion (or a reference to a discussion) from Joe English regarding potential impacts of pore gas on groundwater.</p>		<p>borehole discussion deleted and generalized discussion added.</p> <p>Summary section added discussing migration to groundwater. Pore gas section from Joe is discussed in Appendix G, Risk Assessments.</p>	
51	Section F-4.1	Suggest some bullets to call out the individual metal discussions.	R	We agree but were told to make it look like MDA V and MDA U – neither have bullets	

¹page, paragraph, line

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Part 1 (Document Manager Completes)

Date: **November 8, 2006**

Title: **Investigation Report for MDA C, SWMU 50-009 at TA-50** Rev. #: Doc. Cat No: **EP2006-1000**

Reviewer's Name (Print): Richard Mirenda Organization: ERSS Comments due: **November 15, 2006** (Date)

Author: **Kent Rich** Phone: **665-4272** E-Mail: krich@lanl.gov

Return completed and signed forms to: Sandra Martinez Phone: 5-6771 E-Mail: sandra@lanl.gov

Part 2 (Reviewer Completes)

Date Received: 11/8/06 Date Review Completed: 11/13/06

Signature & Date (to be signed ONLY upon agreement of comment resolution): Richard Mirenda Date: 12/06/06

Part 3 (If under time constraints, the Author and Reviewer each sign.)

☐ Not all comments resolved; attach PR Comment Form to Document Signature Form.

Author Signature & Date: I made addition to comment resolution, text was revised in main text, date review, & risk assessment as appropriate along with tables.
Reviewer Signature & Date: Richard Mirenda

Comment #	Location ¹	Reviewer's Comment/Suggestion	AR ²	Author's Proposed Revision/Resolution	Final Resolution
	General	Use MDA U IR as example/template for organization, content, language, etc. Other examples are reports for MDAs T, V, and A. All similar and based on same report format. Also for appendices, tables, and figures.	A	Extensive changes made to match format and organization of MDA U IR.	
	General	See hard copy markup for more details.	A	Most hard-copy markup changes made as suggested.	

¹page, section #, paragraph/line ²A = accept / R = reject

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Comment #	Location ¹	Reviewer's Comment/Suggestion	A/R ²	Author's Proposed Revision/Resolution	Final Resolution
	General	Need to state the inorganic surface data situation correctly. It did not fail data validation. It is just that the CST Onsite data does not have sufficient or any documentation of the analyses as you would get from an off site lab such as GEL, Severn Trent, Paragon, etc. As a result, there is no way to know if the data is correct, no QA/QC to support it or validate it. Not a question of poor quality just no data package or QA/QC support for the results.	A	Changed as suggested.	
	General	We should back off the conclusion that we are done with inorganic chemical surface characterization. Think we should collect surface samples and analyze for TAL metals to confirm earlier results and see if it affects the risk. Strongly suggest that we back off of making strong conclusions based on this data. Since it is screening level quality we should have analytical data to confirm the results. <i>Should recommend in main text that surface samples will be collected and analyzed for TAL metals to support decisions.</i>	A	Revised to recommend additional surface samples for inorganic chemicals to confirm screening-level data results.	
	General	Need to add SID tables to main text as summary tables of data per Consent Order format. See MDA U and MDA V. Provide as presented in Appendix F for inorganics, organics, and rad in soil and tuff and VOCs and tritium in pore gas. Add SSL/SAL rows to tables. Reference tables in section 6, Site Contamination.	A	SID tables added to main text. Referenced in Section 6.	

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Comment #	Location ¹	Reviewer's Comment/Suggestion	A/R ²	Author's Proposed Revision/Resolution	Final Resolution
	General	Section organization is incorrect. Regulatory Criteria should be Section 5 and follow scope of activities and field investigation results.	A	Moved Regulatory Criteria to Section 5, changed numbering of affected sections.	
	General	Suggest using plates rather than many 11x17 maps. Plates present things in larger scale and will decrease the number of maps used.	A	Changed to two plates for VOCs in pore-gas.	
	Global	Whenever referring to sample location by the ID numbers state as location 50-24... or borehole location 50-24... See hard copy.	A	Changed globally.	
	Executive Summary	<p>Second paragraph – the objective is not was. Delete <u>New Mexico Environment Department</u>.</p> <p>Third paragraph – first mention of volatile organics use VOC acronym. State that borehole depths ranged from 90 to 620 ft but later state maximum sample depth was 591 ft. Is this contradictory?</p> <p>Third sentence - ...conducted at the site, the nature and extent of surface and subsurface contamination are defined. Next sentence The nature and extent of contamination in pore gas are defined. Delete the rest of this sentence. See hard copy for more.</p> <p>Fourth paragraph – delete last sentence. Not risk issue; a potential for migration to groundwater. See hard copy.</p>	A	Changed all as suggested.	
	Section 1.0	Just Environmental Programs (EP) Directorate; delete <u>ERSS</u> ; which includes the former ER Project . Delete <u>ERSS Program</u> , just EP EP is	A	Changed globally to EP.	

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Comment #	Location ¹	Reviewer's Comment/Suggestion	A/R ²	Author's Proposed Revision/Resolution	Final Resolution
		investigating sites ...			
	Section 1.1	107 shafts here but later in Section 2.1 state 108. Which is it?	A	Corrected to state 108 shafts (including Sr-90 shaft).	
	Section 1.4	Delete <u>and the potential environmental impact</u> . Delete <u>further actions at</u> . Never mention or discuss biota sampling (Appendix K). What is the anion sampling related to? Not provided in peer review draft.	A	Changed as suggested. Added summary of biota sampling to Section 2.4. Anion summary report now included in Appendix K, summarized in Section 3.4.3 and 4.9.	
	Section 2.1	107 or 108 shafts?	A	108.	
	Section 2.2.1	Page 4, Chemical Pit – indicate quotes but only one given. Should this be more than one quote from the work plan?	A	Changed to "quote was".	
	Section 2.2.2	Reference for activity decay corrected? In summarizing the shafts should refer to figure(s). Page 5 – Oak Ridge National Laboratory . Why is TNY shaded? Why is induced activity in quotes?	A	Refers to Appendix J for decay discussion. Added figure showing shafts, pits. Changed as shown. Removed shading; quotes are from work plan, as cited.	
	Section 2.4	Page 7 – what are the results of the biota screening and sampling? Is this Appendix K? Not referenced.	A	Added summary text, reference to Appendix K.	

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Comment #	Location ¹	Reviewer's Comment/Suggestion	A/R ²	Author's Proposed Revision/Resolution	Final Resolution
	Section 3.0	Should be section 5.0. Delete first paragraph. Second paragraph – signed on not entered into. Third paragraph – this does not belong here. Need to present elsewhere. Notice of Disapproval (NOD) . Delete date from citations.	A	Changed all as suggested; now Section 5.0.	
	Section 3.1	Delete discussed below.	A	Changed as suggested.	
	Section 3.2	Heading should just be Screening Levels and include human health and eco. Delete (<u>see Table 3.2-1</u>) and (<u>see Table 3.2-2</u>) also delete tables. Should be NMED 2006, 92513 . Add EPA 2005, 91002 . Add citations for NMED and EPA guidance to first sentence. Second sentence – The human health screening levels for chemicals were obtained from NMED guidance (NMED 2006, 92513). If screening levels are not available from NMED, EPA Region 6 (EPA 2005, 91002) or EPA Region 9 (....) screening levels are used. For radionuclides, the screening action levels (SALs) provided in LANL guidance (LANL 2005, 88493) derived using RESRAD, version 6.21 are used. Soil screening levels (SSLs) and SALs used in the human health risk/dose screening assessments are presented in Tables... (refer to SID tables added to main text per Monday's discussion) and in Appendix G. For eco add Revision 2 to document title. Also refer to Appendix G, delete <u>and are provided in</u>	A	Changed all as suggested.	

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Comment #	Location ¹	Reviewer's Comment/Suggestion	A/R ²	Author's Proposed Revision/Resolution	Final Resolution
		Table 3.3-1. Delete this table.			
	Section 4.0	Should be section 3.0. Are all 36 boreholes used to nature and extent? Three used for other purpose? See section 4.4.1, page 11. Spell out SOPs first use.	A	Changed section number. Corrected to 33 for N&E, 3 for correlation. Added spell-out.	
	Section 4.4.1	Make sure number of boreholes agree. See page 10. Page 12 – 50-25621 drilled for what reason? Upper part of 50-24818 not sampled? No mention anywhere of this. Fifth paragraph – delete <u>as specified by the Consent Order, section IX.C.3.b.</u> Next paragraph – HAS? Not HSA? Page 13 – the Laboratory's SMO.	A	Corrected number of boreholes. Added explanatory text for these. Deleted. HSA. Changed as suggested.	
	Section 4.4.2	Delete <u>Laboratory's sample management office</u> and parentheses; already spelled out above. Nitrate is singular.	A	Changed as suggested.	
	Section 4.4.5	34 boreholes? State number of samples the same way each time; here state 184 total including 16 field dups, later state 168 samples plus 16 field dups. Page 14 – SUMMA, not Summa.	A	Yes; 33 were drilled (for N&E) 32 were sampled for pore-gas, +2 previously-drilled holes. Changed to be consistent. Corrected globally.	

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Comment #	Location ¹	Reviewer's Comment/Suggestion	A/R ²	Author's Proposed Revision/Resolution	Final Resolution
		Delete <u>as specified by the Consent Order, section IX.C.3.b.</u>		Deleted.	
	Section 4.4.6	Delete <u>Laboratory's.</u>	A	Deleted.	
	Section 4.4.7	15 pore gas samples. Reference is 2005 not 2006?	A	Deleted here, retained only in previous investigations.	
	Section 4.5	Uncapitalize investigation-derived waste storage and disposal. Page 15 – delete appendix title, just Appendix I.	A	Changed as suggested.	
	Section 4.6	Put in Appendix B? Just refer to it here. May summarize the types of deviations, why, and whether they affect the investigation here. Put details in appendix. LANL 2006, 93581 not in references. Page 16 – why wasn't the dioxin/furan sample analyzed? Why were no HE samples collected from 50-24819? Why were no second round pore gas samples collected from 50-24818? Need expknations/justications.	A	Moved to Appendix B. Added to ref. list. No explanation available from SMO. Reasons added for all other deviations.	
	Section 5.0	Should be section 4.0 and moved before Regulatory Criteria.	A	Moved.	
	Section 5.3	Pits capitalized or not? Appendix for geophysical survey results?	A	Capitalized when referring to specific pits, not when referring to pits in general.	

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Comment #	Location ¹	Reviewer's Comment/Suggestion	A/R ²	Author's Proposed Revision/Resolution	Final Resolution
				Geophysics reports added as references.	
	Section 5.4	The thicknesses mentioned are those for MDAC from borehole core? Basis for Guaje pumice, Puye, and Cerros del Rio basalts? Not encountered in this investigation so where did this info come from? Need a reference. Page 19 – percent or %? Moisture content is generally low? Define low. Give % moistures. Greatest moisture? Give value or range.	A	Added statement to clarify thicknesses from MDA C boreholes. Stratigraphy references cited in 1 st paragraph. Added detail, with reference to Appendix L.	
	Section 5.5	Delete <u>following this investigation</u> . Delete <u>Section X.D of the Consent Order</u> . What SOP is followed?	A	Deleted. SOP 05.03.	
	Section 5.6	Not clear how get to approx 1330 ft bgs below MDA C if typically 1100-1200 ft and at 1182 east of MDA C. Also refer to Figure 5.6-1 in second paragraph?	A	R-14 and I-1 are both in canyon bottoms (Ten Site and Mortandad, respectively). Added additional citations for Fig. 4.6-1.	
	Section 5.7	Erosion matrix score of 8.8 does not agree with SOP 2.01 form in Appendix H. Score is 54.8 in appendix.	A	Corrected to 54.8, changed "low" potential to "moderate".	
	Section 6.1	Title Contamination in Soil and Rock ; no sediment sampled.	A	Changed.	
	Section 6.1.1	Soil and Rock Sampling ; no sediment. Reference LANL 2003, 87152 not listed in reference section. More than one 2003 approved work plan?	A	Changed title. Corrected reference (now LANL 2005, 91547 and LANL 2003, 87392).	

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Comment #	Location ¹	Reviewer's Comment/Suggestion	A/R ²	Author's Proposed Revision/Resolution	Final Resolution
		Are number of samples and boreholes correct? Delete last sentence page 20.		Yes, corrected 23 FDs to 22. Deleted.	
	Section 6.1.2	Are field screening results on borehole logs? Appendix E?	A	No, not on borehole logs. Yes, in Appendix E (on SCLs), also in Table 6.1-1.	
	Section 6.1.3	<p>Soil and Rock Sample Analytical Results</p> <p>Delete <u>Data Review</u>. ...frequencies detected or detected above background values... What accompanying tables?</p> <p>Include SID tables with BVs and SSLs/SALs as part of main text. Need to mention surface inorganics here? Box plots should only be presented for those inorganics or rads that are eliminated because they are within range of background concentrations. Otherwise no value for box plots and should be eliminated from Appendix F.</p> <p>One table each for inorganics, rad, and organics, not a,b,c,d,e,etc.</p> <p>Use exposure point concentration rather than representative. Also can use EPC acronym. Delete for a description of the methods used for calculating 95% UCLs. Has UCLs been spelled out? Delete <u>land use</u>. Delete last part of last sentence. Can delete the whole next to last paragraph, not relevant here.</p>	A	<p>Changed title.</p> <p>Changed to "detected or detected above . . ."; added callouts for specific tables.</p> <p>Added duplicate SID tables; added mention of fact that inorganic surface samples are screening-level only; deleted majority of box plots.</p> <p>Made single table (continued).</p> <p>Changed to "exposure point concentration". Deleted text as suggested. Added spell-out for UCL. Deleted "land use". Changed all as suggested.</p>	

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Comment #	Location ¹	Reviewer's Comment/Suggestion	A/R ²	Author's Proposed Revision/Resolution	Final Resolution
	Section 6.2.1	Were the 34 pore gas samples from 2003 used in this report? If not why mention here? Page 23 – 209 of 210 samples analyzed? What happened to the one sample? Deviation?	A	No; paragraph deleted. Not a deviation; added explanation for difference; corrected 210 to 211 and 209 to 210.	
	Section 6.2.3	Second paragraph delete parenthetical. Also delete first sentence next paragraph and combine paragraphs. Tritium was detected in pore gas samples and is a COPC. Only first round tritium samples mentioned, what about second round? Not analyzed? 1,4-dioxane. One table, not a,b,c,d,e,etc. What about second round for VOC results. Chemicals detected? <i>Where is pore gas/tuff comparison for VOCs discussed?</i>	A	Changed all as suggested; added 162 of 168 for 2 nd -round tritium. Corrected to 1,4-dioxane. Made single table (continued). Added text discussing 2 nd -round VOCs. Added Section 6.2.4 for pore-gas/tuff correlation.	
	Section 7.1.1	Delete <u>considered</u> . Make sure nature and extent is defined for all and explain why. Check my nature and extent text.	A	Deleted "considered". Added additional text to N&E summaries.	
	Section 7.1.2	Low concentrations? Define low. Nitrate at naturally occurring levels. Perchlorate at trace levels. Neither related to a release? Make sure nature and extent is defined for all and explain why. Check my nature and extent text. See hard copy.	A	Clarified; <5 mg/kg nitrate, <0.01 mg/kg perchlorate; indicated not a release. Additional text for N&E summaries. Revisions made per hard-copy markup.	

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Comment #	Location ¹	Reviewer's Comment/Suggestion	A/R ²	Author's Proposed Revision/Resolution	Final Resolution
	Section 7.1.3	Delete <u>specifications in the</u> . This is the approved work plan? Top of page 26 – need details. Delete <u>according to the contract requirements of the Laboratory's SMO</u> . Delete first sentence next paragraph. Check my nature and extent text.	A	Deleted; yes (added citation, "approved"). Added details, deleted as suggested. Revised as suggested.	
	Section 7.2	Delete <u>ER project</u> .	A	Deleted.	
	Section 7.2.2	mL not ml. Explain the remaining tritium concentrations. Highest concentration? Value?	A	Corrected. Refers to remaining 13 of the 15. Added these.	
	Section 7.2.3	Pore gas and tuff VOC comparisons? Add no potential for migration to groundwater based on screen in Appendix G. Lowermost samples? TD samples? Make sure nature and extent is defined for all and explain why. Check my nature and extent text. Top of page 27 delete <u>has not been clearly defined</u> .	A	In (new) section 6.2.4. Changed as suggested. Revised as suggested; changed "lowermost" to "deepest", added more detail for N&E. Deleted this phrase, revised text as suggested.	
	Section 7.2.4	Concentrations decrease with depth below max? Nature and extent is defined for all and explain why. Check my nature and extent text. See hard copy.	A	Revised text as suggested on hard copy and to match Appendix F.	

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Comment #	Location ¹	Reviewer's Comment/Suggestion	A/R ²	Author's Proposed Revision/Resolution	Final Resolution
	Section 7.3	Delete <u>considered</u> throughout. ...no additional data were identified... and no additional sampling was proposed in the approved work plan . CST only use in main text? If so delete acronym.	A	Deleted "considered" globally. Changed as suggested. Deleted acronym (only use in main text).	
	Section 7.4	Delete <u>considered</u> throughout. The potential impacts to human receptors is very low? What does this mean? No potential unacceptable risk/dose. No issue. Only one receptor; industrial worker. Exposure only to burrowing animals? Not humans? The ecological risk screening assessment (Appendix G) indicates there is no unacceptable risk to ecological receptors at MDA C. Potential contamination in Ten Site Canyon has been reported in the Mortandad Canyon Investigation Report. Need to cite this document. What others are there? Mortandad/Ten Site Aggregate Area also done and submitted. Cite if appropriate. No others to be done as far as I know.	A	Deleted "considered" globally. Revised as suggested. Added citation for MM/TS investigation report; Mortandad Canyon report not available (just recently submitted, not in RPF?). Deleted mention of "will be reported".	
	Section 7.5	NMED 2006, 92513. Present industrial only, not residential. Need rad risk text. Potential to migrate to groundwater needs to be presented elsewhere. MDA V had a separate section.	A	Corrected reference. Revised as suggested. Moved this text to Section 7.4, added additional detail.	

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Comment #	Location ¹	Reviewer's Comment/Suggestion	A/R ²	Author's Proposed Revision/Resolution	Final Resolution
	Section 8.0	<p>Uncertainty remains? Delete this. Nature and extent defined. Vapor phase contaminants not migrating downward to groundwater in substantial quantities. Why would you say this? Delete this and put in correct text based on screen. No potential for migration. Still recommend vapor monitoring but need a valid reason.</p> <p>What about boreholes NMED wants drilled next to pit 4? Need to explain why not drilled? Take to dispute resolution?</p> <p>Should or will? Shall? ...a CME is proposed to evaluate...</p>	A	<p>Revised as suggested.</p> <p>Not discussing the 4 additional holes; still somewhat uncertain (?). Kent agreed we should not discuss those here.</p> <p>is proposed</p>	
	Section 9.0	<p>Will submit monitoring plan before report approved/ CME plan?</p> <p>Modify to recommend will go back and collect surface samples and analyze for inorganic chemicals to confirm previous data. Can do this a part of CME or when go out and set up monitoring boreholes for pore gas. I think this is the better move rather than have NMED come back and say we must. This is an obvious data requirement that we should not try and avoid or trivialize. The rule is that we confirm screening data with analytical data and decisions are based on analytical data not screening data. Once data is obtained we will go back and re-evaluate the risk to see if there is any change.</p>	A	<p>SOW for this project says submit within 45 days of IR submittal, not after approval.</p> <p>Revised as suggested.</p>	

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Comment #	Location ¹	Reviewer's Comment/Suggestion	A/R ²	Author's Proposed Revision/Resolution	Final Resolution
	Section 10.0	Some references missing? Delete NMED <u>Rev. 3.0</u> reference, add 4.0 reference. Delete <u>Ryti et al.</u> reference. LANL reference already provided.	A	Missing references added, Ryti deleted.	
	Tables	3.2-1 – delete. Provide SSLs in SID tables to be added. 3.2-2 – delete. Provide SALs in SID tables to be added. 3.2-3 and 3.2-4 – delete. Only in Appendix G. 3.3-1 - delete. Only in Appendix G. Add section 6 SID tables per discussion. Include BV and SSL/SAL rows.	A	Deleted tables, added SID tables.	
	Figures	Need a figure showing all utilities and other features. Order requirement. 4.4-1 – which borehole location is which? No differentiating 1995 from 2005-2006 even though figure caption indicates both vintages.	A	Utilities were shown in Fig. 4.3-1; have now added separate figure (4.4-2) and text callout for utilities map. Changed symbols for different vintages on all figures where they appear.	
	Appendix D	See hard copy. Include data validation results. See Appendix E for MDA U and MDA V (attached to hard copy). Both sent electronically to Dave Davenport. Remove qualifier text from data Review. D-1.0 – include validation SOPs. Delete <u>Los Alamos National Laboratory Environmental Restoration Project</u> , just analytical services SOWs. Do both apply?	A	Extensive revision to match approach used in MDA V IR. Both apply; 1995 version used for early samples.	

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Comment #	Location ¹	Reviewer's Comment/Suggestion	A/R ²	Author's Proposed Revision/Resolution	Final Resolution
		<p>Second paragraph – delete. Not true, need to include this information in this appendix.</p> <p>D-2.0 – 377 samples analyzed for inorganics? Same as in main text? In order to avoid number discrepancies suggest deleting this type of info. Has no real value anyway. Analyzed when? 1995? 2005/2006? Besides mercury what others were analyzed by different methods? How many samples for anions? In 2005/2006?</p> <p>D-2.1 – Inorganic Chemical QA/QC Samples.</p> <p>Laboratory duplicates not field. Don't qualify based on field dups only lab dups. Mention method blanks here but later refer to preparation blanks. Delete <u>ER Project</u>.</p> <p>Need a discussion of why inorganic data changed to screening level based on data validation process.</p> <p>Describe lab dups, serial dilutions and interference checks.</p> <p>Provide results of QA/QC samples. Data qualification per sample, how many qualified as J, UJ, J+, J-, R. How affect dataset. See examples for MDAs U and V.</p> <p>D-2.2 – LANL 1998, 59730 not Rytí et al.</p> <p>D-3.0 – 661 samples? In order to avoid number discrepancies suggest deleting this type of info. How many per suite? When collected and analyzed? 1995? 2005/2006? VOCs analyzed in core and pore gas, need to indicate which method</p>		<p>Changed as suggested.</p> <p>Changed to follow MDA V, with breakout by analytical suite. Added detail, including years analyzed, all suites, etc.</p> <p>Changed title.</p> <p>Now only mention field dups to list how they were qualified. Changed as suggested and following MDA V.</p> <p>Added as suggested.</p> <p>Now follows MDA V example.</p> <p>Added these details for all sections.</p> <p>Deleted reference.</p> <p>Now numbers by suite only, added years collected.</p>	

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Comment #	Location ¹	Reviewer's Comment/Suggestion	A/R ²	Author's Proposed Revision/Resolution	Final Resolution
		<p>applies to each medium. PCBs only by 8082 not VOCs and SVOCs. Dioxins and furans method? Delete <u>ER Project</u>. Delete last sentence first paragraph.</p> <p>Analytes not reported are for pore gas only? Ned to implications here not (only) in nature and extent section.</p> <p>D-3.1 – Organic Chemical QA/QC Samples</p> <p>Delete ENV-ECR procedures; SOPs. Which ones? What about dioxins and furans?</p> <p>Provide results of QA/QC samples. Data qualification per sample, how many qualified as J, UJ, J+, J-, R. How affect dataset. See examples for MDAs U and V.</p> <p>D-4.0 – 838 samples? for what? How many per analyses? When collected and analyzed?</p> <p>Gamma spec has only 8 or 9 radionuclides that are assessed the rest are not for various reasons.</p> <p>Explain tracers and dups for rad. Separate out QA/QC samples as in other sections.</p> <p>Provide results of QA/QC samples. Data qualification per sample, how many qualified as J, UJ, J+, J-, R. How affect dataset. See examples for MDAs U and V.</p> <p>D-5.0 – change Ryt reference to LANL.</p> <p>Table D-2.0-1 – anions are only nitrate and perchlorate?</p>		<p>Yes, pore-gas only. Added text about implications.</p> <p>Changed title.</p> <p>Changed as suggested; all suites listed with number analyzed, including dioxins/furans.</p> <p>Results added as suggested.</p> <p>Details added.</p> <p>Not included per MDA V.</p> <p>Not included per MDA V.</p> <p>Details added as suggested.</p> <p>Reference deleted.</p> <p>Added perchlorate method, clarified anion/perchlorate.</p>	

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Comment #	Location ¹	Reviewer's Comment/Suggestion	A/R ²	Author's Proposed Revision/Resolution	Final Resolution
	Appendix F	<p>F-1.0 – delete <u>Environment and Remediation Support Services</u>" (formerly the <u>Environmental restoration [ER] Project's</u>); just Environmental Restoration (ER) Database (DB) or ERDB. Delete <u>In the early years of the ER Project</u>; just Samples were submitted ... so what is point of identifying CST Onsite and offsite? Screening vs. decision level? Add next two paragraphs to this one. Also include CST Offsite as decision level data. Need a discussion of inorganic chemical data based on this presentation.</p> <p>Move fourth paragraph to next section. What about Qct? Not included?</p> <p>Not just rejected data but all qualified data reject ed data not included but other qualified data are. Data quality issues and validation results not currently presented in Appendix D but will be when revised.</p> <p>F-1.1 – delete [95,95]. Delete <u>Table F-1.1-1 lists all inorganic chemicals...</u> Also delete this table.</p> <p>Delete <u>Box plots</u>. Start paragraph The boxplots provide... Only include box plots for those inorganic chemicals or radionuclides that are eliminated because concentrations are within background range otherwise do not include.</p> <p>F-1.2 – magnesium not a COPC. Provide a summary COPC table either here or in main text? What about pore gas COPCs? Included in list? Not clear.</p>	<p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p>	<p>Changes made as requested.</p> <p>Our text is explaining why "CST Onsite" data is not included in this data review. All our data is "SMO"; we don't have "CST Offsite" data.</p> <p>First paragraph of Section 2.0 explains that inorganic data of surface samples collected in 1993 is "CST Onsite", so they are not included in this data review.</p> <p>Change made as requested.</p> <p>We don't have sample from Qct media.</p> <p>All discussions on rejected data have been removed.</p> <p>Changes made as requested.</p> <p>Table F-1.1-1 deleted.</p> <p>All box plots removed except those for potassium, silver, and thallium.</p> <p>Correction made for magnesium.</p> <p>Provided a summary table of COPCs by media (Table F-1.2-1).</p>	

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	Appendix F	<p>F-2.0 – put this section on data before COPC summary?</p> <p>74 surface samples? Correct number? No inorganic surface data? 1993 data includes all surface data for inorganic chemicals. Just for inorganics not rad or organics?</p> <p>291 tuff samples? 44 boreholes? Not all data from these boreholes used to characterize or ID COPCs or risk. Need to clarify. Not even sure this is important. Suggest deleting to avoid number discrepancies or misinterpretations.</p> <p>34 boreholes in first round of pore gas but only 30 in second? Why? Need to explain this somewhere.</p> <p>F-2.1 – anions is just nitrate? TAL metals? Why different number s of analyses per sample</p>	<p>A/R</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p>	<p>Information at the beginning of Section F-2.0 ties closely with the subsequent sections. It's more straightforward/helpful to have this section here.</p> <p>Yes, 74 is correct. Inorganic surface data is "CST Onsite" data. Organic and rad data are presented.</p> <p>These numbers are correct and consistent throughout the text and tables. All data presented are valid and used for characterization and ID COPCs.</p> <p>Numbers are correct. Second-round pore-gas samples were not collected from borehole locations 50-09100 and 50-10131 because those boreholes were drilled prior to 2005 and only re-sampled during 2005-2006. Second-round samples during 2005-2006 would not have tested for any effects of drilling on pore-gas concentrations. Second-round pore-gas samples were not collected from borehole location 50-24818 because that borehole had been fitted with casing during drilling in order to extend it as deeply as possible. The casing precluded collecting second-round samples. Second-round samples were not collected from borehole location 50-25451 because sampling at that location was interrupted by a Laboratory safety stand-down of all drilling, hoisting, and rigging operations. By the time sampling was resumed, any drilling effects would have dissipated and eliminated the need for second-round sampling. Deviation information is provided in Appendix B. Text added to provide reference to App. B.</p> <p>For pre-2005 samples, anion suite included both nitrate and perchlorate. For 05/06 samples,</p>	

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		<p>numbers? Thought would have requested everything for every sample? Per work plan? Frequency of inorganic chemicals above BVs, not just detected. One table for SID, not a and b tables. Presents the inorganic chemicals detected or detected above BVs in tuff at MDA C. delete bullets and rejected data text. PUT IN APPENDIX D. Can put all inorganic chemical data on one plate versus two 11 x 17 figures? Better presentation?</p> <p>Top of page F-12 (text has it as G-12) – delete first paragraph; unnecessary and redundant.</p> <p>Delete all box plots except those that support elimination of a metal.</p> <p>First bullet - Delete magnesium from list of COPCs. An essential nutrient and not retained. Therefore, these inorganic chemicals are retained as COPCs.</p> <p>Second bullet – delete potassium and associated text. Text is incorrect; state that max of 6770 is less than max background of 4720.</p> <p>Third bullet – delete <u>because of their DLs</u>.</p> <p>Fourth bullet – need more to justify eliminating</p>	<p>A</p> <p>A</p> <p>A/R</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p>	<p>anion is just nitrate; perchlorate is a separate suite by itself.</p> <p>Numbers are not the same for each suite mainly because 95/96 samples were not analyzed for all suites. All 05/06 samples were analyzed for anions, cyanide, radionuclides, TAL metals, PCBs, perchlorate, and SVOCs. Selected samples were also analyzed for dioxins/furans, explosives, and VOCs.</p> <p>Tables a,b have been combined into one table.</p> <p>All discussions on rejected data have been removed.</p> <p>Presentation with one figure for western portion and one figure for eastern portion is consistent with the rest of data presentation.</p> <p>Change made as requested.</p> <p>Change made as requested.</p> <p>Change made as requested.</p> <p>Change made as requested.</p> <p>Change made as requested.</p>	

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		<p>calcium. Also potassium and magnesium. See attached page for bullet text to insert for these essential nutrients.</p> <p>Fifth bullet – delete <u>multiple</u>. Therefore, nitrate and perchlorate are retained...</p> <p>F-2.2 – Inorganic Chemical COPC Summary</p> <p>Delete magnesium. Should we summarize the surface inorganic screening results?</p> <p>F-2.3 – second paragraph – Table F-2.3-2 presents the radionuclides detected above BVs, FVs,... Delete <u>The following analytical results were rejected</u> and subsequent bullets. PUT IN APPENDIX D.</p> <p>Top of page F-13 – delete first paragraph; unnecessary.</p> <p>Next paragraph – delete second sentence and box plot reference. Delete the box plots no value.</p> <p>Therefore, these radionuclides are retained as COPCs.</p> <p>Third bullet – delete <u>and the range of background dataset in at least one sample</u>; there is no range for iso U.</p> <p>Delete next paragraph. Unnecessary.</p> <p>F-2.4 – second paragraph – Table F-2.4-2 presents the radionuclides detected above BVs, or detected where FVs are not available... Delete <u>The following analytical results were rejected</u> and</p>	<p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A/R</p> <p>A</p>	<p>Change made as requested.</p> <p>Change made as requested.</p> <p>Change made as requested.</p> <p>Change made as requested. We should not present "CST Onsite" data.</p> <p>Change made as requested.</p> <p>Change made as requested.</p> <p>Change made as requested.</p> <p>Change made as requested.</p> <p>Change made as requested.</p> <p>This paragraph summarizes information on media-specific COPCs.</p> <p>Change made as requested.</p>	

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Comment #	Location ¹	Reviewer's Comment/Suggestion	A/R ²	Author's Proposed Revision/Resolution	Final Resolution
		<p>subsequent bullets. PUT IN APPENDIX D.</p> <p>Next paragraph – Figure F-2.4-1?</p> <p>Bottom of page F-13 – delete this paragraph.</p> <p>Page F-14 – first bullet delete second sentence. Therefore, these radionuclides are retained as COPCs.</p> <p>Second bullet – delete <u>and also above the range of background dataset in at least one tuff sample</u>; there is no range for iso U.</p> <p>Delete the text following the bullets.</p> <p>F-2.5 – third paragraph delete sentence on rejected data.</p> <p>Next paragraph delete numbers, just first and second round pore gas samples.</p> <p>Second bullet – what happened at locations 50-24801 and 50-24818 in second round?</p> <p>Fourth bullet should be regular text not a bullet. Just first sentence, delete second sentence, Nature and Extent text. Same for rest of this text. Delete.</p> <p>Top of page F-15 Tritium is retained as a COPC in pore gas at MDA C is not a bullet.</p> <p>F-2.6 – Radionuclide COPC Summary</p> <p>F-2.7 – second paragraph delete concentrations. Delete sentence on rejected adta.</p> <p>Third paragraph – delete first sentence. bis and pentachlorophenol not COPCs? Not mentioned or</p>	<p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A/R</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p>	<p>Change made as requested.</p> <p>Change made as requested.</p> <p>Change made as requested.</p> <p>Change made as requested.</p> <p>This paragraph summarizes information on media-specific COPCs.</p> <p>Change made as requested.</p> <p>Change made as requested.</p> <p>Tritium was not detected. Text revised to clarify this.</p> <p>Change made as requested.</p> <p>Change made as requested.</p> <p>Change made as requested.</p> <p>Change made as requested.</p> <p>Change made as requested.</p> <p>Change made as requested. They are</p>	

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		discussed in risk appendix or anywhere else. How does this affect risk? According to later text not screening level data but non-detects based on QA/QC data assessment? Why weren't the six surface samples collected in 2006 not analyzed for organic chemicals? Should have been.		determined to be screening-quality data after the work plan. We can't identify COPCs based on invalid data.	
		F-2.8 – second paragraph – one table, not a,b,c,d,e. Table F-2.8-2 presents the organic chemicals detected in tuff samples. Delete next sentence; put in D.	A	Change made as requested.	
		Delete next paragraph, unnecessary.	A	Change made as requested.	
		Top of page F-16 – Results in Table 2.8-2 show that 47 organic chemicals... delete <u>a,b,c,d, and e</u> and <u>the following</u> .	A	Change made as requested.	
		F-2.9 – second paragraph one table not a,b,c., etc. Table F-2.9-3 presents the VOCs detected in... and Table 2.9-3 presents the VOCs detected in... Delete next sentence.	A	Change made as requested.	
		Delete next paragraph.	A	Change made as requested.	
		Is 378 pore gas samples correct? Consistent with rest of report? Necessary?	A	The number is correct and consistent with text and tables.	
		F-2.10 – Organic Chemical COPC Summary	A	Change made as requested.	
		86 total correct? 47 in soil/tuff and at least 42 in pore gas equals 89.		There are 44 in pore-gas (42 first round, 2 more in second round that are not in first round); there are 47 in soil and tuff; and there are 5 overlaps between soil/tuff and pore-gas; thus, the total is 86.	
		F-2.11 – this discussion needs to be summarized in main text, currently not included.			
		Delete <u>that were</u> .	A	This information is now provided in the main text	

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Comment #	Location ¹	Reviewer's Comment/Suggestion	A/R ²	Author's Proposed Revision/Resolution	Final Resolution
		<p>Figure F-2.11-1 not included.</p> <p>Page F-18 second bullet – separate last part as paragraph. Starting with <i>These results indicate that there is no obvious...</i></p> <p>Text is incorrect – VOCs in tuff were not lost during sampling and shipping. Also do not serve as source for pore gas VOCs. Delete this text. Also delete last sentence.</p> <p>What does the comparison really indicate? Current conclusions are incorrect.</p> <p>Last paragraph is misplaced. Tritium not part of this comparison so why referring to figures and tables for tritium? Delete?</p>	<p>A</p> <p>A</p> <p>A</p>	<p>(Section 6.2.4). Text changed accordingly. Figure F-2.11-1 now included.</p> <p>Change made as requested.</p> <p>Change made as requested.</p> <p>Tritium results are now put in a separate section (F-2.11-2).</p>	
	Appendix F	<p>F-3.0 – the approved MDA C work plan; which revision? Delete <u>Section 2.7.3.2, etc.</u></p> <p>What has next paragraph to do with nature and extent? Delete from here and put where relevant. Section F-3.2-1? See hard copy.</p> <p>F-3.1 Inorganic Chemicals</p> <p>F-3.1-1 – rewrite. Should state that The nature and extent of inorganic chemical contamination on the surface of MDA C was defined in the approved investigation work plan and no additional surface samples were collected and analyzed for inorganic chemicals. However, the 1993 inorganic chemical data was found to be CST-Onsite data, which means that the supporting documentation normally provided by an off-site analytical laboratory is not</p>	A	Revisions made as requested	

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Comment #	Location ¹	Reviewer's Comment/Suggestion	A/R ²	Author's Proposed Revision/Resolution	Final Resolution
		<p>available. As a result, the inorganic chemical data from 1993 is screening level data only. The results indicate that surface contamination of inorganic chemicals at MDA C is minor. The results are summarized as follows: <i>Present the bullets currently in text. We should back off the conclusion that we are done with inorganic chemical surface characterization. Think we should collect surface samples and analyze for TAL metals to confirm earlier results and see if it affects the risk.</i></p> <p>Bullets – what statistical analysis? In work plan? Third bullet – delete <u>sufficiently</u> and <u>to support corrective action decisions</u>. Strongly suggest that we back off of making strong conclusions based on this data. Since it is screening level quality we should have analytical data to confirm the results. Should recommend in main text that surface samples will be collected and analyzed for TAL metals to support decisions.</p> <p>Delete last paragraph.</p> <p>F-3.1.2 – see text attached and sent to Tracy regarding nature and extent discussion. Presented by borehole rather than analyte.</p> <p>F-3.2.1 – approved MDA C investigation work plan. Delete <u>sufficiently</u> and <u>to support corrective action decisions</u>.</p> <p>Figure F-3.2-1 or F-2.3-1?</p> <p>Extent is defined by a combination of lateral to the east of MDA C and downslope.</p>	<p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p>	<p>"presented in the Appendix D of the work plan" added to clarify</p> <p>Deletion made</p> <p>Text changed to present analytes by borehole.</p> <p>Revisions made as requested</p> <p>F-2.3-1</p>	

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		<p>First bullet – defined by decreasing concentrations with increasing distance from the fence as well as downslope east of MDA C..... Delete <u>a non-detect and a</u> and <u>at the most downslope locations</u>.</p> <p>Second bullet – delete <u>by non-detects</u> and <u>the two most</u>. ...defined by decreasing concentrations east of the fence and downslope locations...</p> <p>Third bullet – really within the range? Change non-detect to decreasing concentrations.</p> <p>Fifth bullet - Change non-detect to decreasing concentrations or just concentrations < BV.</p> <p>Sixth bullet – just less than BV, not FV for iso U.</p> <p>F-3.2.2 – text is incorrect. See text attached and sent to Tracy regarding nature and extent discussion for rad and tritium in pore gas.</p> <p>F-3.3 – delete <u>because the tuff does not effectively adsorb VOCs</u>. <i>Section B-2.3?</i></p> <p>F-3.3.1 – bis and pentachlorophenol were qualified as non-detects based on blank contamination or some other QA/QC issue? Need to state this better. If need to ask a chemist (Nita Patel) for language to explain this. Also need to be presented in Appendix D. If this is true then not COPCs (U qualified) and not related to being screening level at all. Delete <u>had no pattern, there is no evidence regarding a widespread</u>. Was there a release at all? Just state did not indicate a release? Sporadic detects at low levels; lateral extent defined! Delete</p>	<p>A</p> <p>A</p> <p>A</p> <p>R</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p>	<p>Revisions made as requested</p> <p>Revisions made as requested</p> <p>See p. 18, Tble 3.3-2 of LANL 1998,59730</p> <p>Data does not support this statement</p> <p>Revisions made as requested</p> <p>Text changed as requested.</p> <p>Text deleted.</p> <p>Text changed.</p>	

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		<p><u>sufficiently</u> and <u>to support corrective action decisions</u>.</p> <p>F-3.3.2 - See text attached and sent to Tracy regarding nature and extent discussion for organic chemicals and VOCs in pore gas.</p>	A	Text changed as requested.	
	Appendix F	<p>F-4.0 – put in risk appendix as part of CSM discussion. Fate and transport should only discuss organics in tuff not pore gas. Pore gas VOC fate and transport is addressed by the pore gas screen.</p> <p>NMED 2006, 92513, not 2005, 90802. NMED guidance. Delete <u>in the following order</u> and <u>Human Health Medium Specific Screening Levels</u>.</p> <p>Second paragraph – delete section title. Reference for USGS tests?</p> <p>F-4.1 – Inorganic Chemicals</p> <p>From MDA V text - The physical and chemical factors that determine the distribution of inorganic COPCs within the soil and tuff at Consolidated Unit 21-018(a)-99 are the soil-water partition coefficient (Kd) of the inorganic chemicals, the pH of the soil, soil characteristics (such as sand or clay content), and redox potential.</p> <p>Why write something different? Use the examples provided and modify only for COPCs at MDA C.</p> <p>Delete magnesium.</p> <p>Where is Table F-4.1-1? Other tables for this</p>	<p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p>	<p>F-4.0 put in risk appendix as part of CSM</p> <p>Revisions made as requested</p> <p>Revisions made as requested</p> <p>Revisions made as requested</p> <p>Revisions made as requested</p> <p>Revisions made as requested</p>	

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Comment #	Location ¹	Reviewer's Comment/Suggestion	A/R ²	Author's Proposed Revision/Resolution	Final Resolution
		<p>discussion? Delete calcium and potassium.</p> <p>Where is iron presented? From MDA V - Most copper deposited in soil is strongly adsorbed and remains in the upper few centimeters of soil. In general, the copper adsorbs to organic matter, carbonate minerals, clay minerals, or hydrous iron and manganese oxides. The soil at MDA C is close to neutral pH IS THIS TRUE? and does not exhibit a high rate of leaching for copper.</p> <p>Text should reflect other reports.</p> <p>F-4.2 - Where is Table F-4.2-1? Where did radium-223 come from? Not a COPC. What about other rad COPCs? Sodium-22, cesium-134, europium-152, cobalt-60, ruthenium-106? Need something for these also. AMERICIUM-241???? From MDA V - For sodium-22 no Kd was available. However, sodium-22 was only detected in a single surface soil sample. The extent of sodium-22 is defined and there is no potential for migration to groundwater. A major portion of stable and radioactive strontium in soil dissolves in water, so it might move deeper into the subsurface. However, the K_d value of 35 indicates that strontium-90 is relatively immobile in the subsurface. Strontium-90 was not detected at depth (below 75 ft) and the extent is defined.</p> <p>F-4.3 – Table F-4.3-1?? NMED 2006, 92513. Does this discussion include all the tuff COPCs? At least the types of COPCs? PAHs, Aroclors, SVOCs.</p>	<p>A/R</p> <p>A/R</p> <p>A</p> <p>A</p> <p>A</p>	<p>The section reads: "...was obtained from individual chemical profiles published by the ATSDR...." there is not an ATSDR profile for iron.</p> <p>Soil at MDA C ranges from acidic to basic</p> <p>COPC list updated. The K_d for an element is the same no matter if it is radioactive or not. The K_d for sodium was used for sodium-22.</p> <p>Revisions made as requested.</p> <p>Table includes all tuff COPCs</p>	

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		<p>F-4.4 - From MDA V - Summary Saturation is the primary factor in determining the potential for COPCs to migrate to groundwater. Based on investigation results, saturated conditions are not present within MDA C site. Downward migration in the vadose zone is also limited by the lack of both hydrostatic pressure and a source for the continued release of contamination. Without sufficient moisture and a source, little or no potential migration of materials can occur through the vadose zone to groundwater.</p> <p>The nature and extent of contamination at MDA C is defined, and no source(s) continues to release contamination into the subsurface beneath the site. The lack of saturated conditions and hydrostatic pressure severely limits the movement of contamination toward groundwater. The relative solubilities and/or the partitioning properties also limit the mobility of the COPCs. As a result, the potential for COPC migration to groundwater is very low, based on the site conditions, the physical and chemical properties of the COPCs, the distance to the regional aquifer below the site, and the absence of a source for continued releases into the subsurface.</p> <p>Should be similar or same for MDA C.</p> <p>F-5.0 – delete EPA ProUCL reference, not used in this appendix. Delete LANL rad SAL document. Delete NMED Rev. 3.0, use rev. 4.0 reference</p>	<p>A</p> <p>A</p>	<p>Text used as a summary with the exception of the source. A source for contamination remains at MDA C, i.e., the contamination from the pits and shafts have not been removed.</p> <p>Revisions made as requested</p>	

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	Appendix F Tables	<p>List of tables should be part of TOC for the Appendix and put upfront.</p> <p>F-1.1-1 – delete.</p> <p>F-2.0-1 – no VOCs? Iso thorium?</p> <p>F-2.0-3 – blank spaces are na Not available? Don't just present blank cells.</p> <p>F-2.1-1 – title Frequency of Inorganic Chemicals Above Background Values in Tuff at MDA C. any value in providing a FD table for surface inorganic chemicals to at least summarize what was found? Delete Maximum detect column.</p> <p>F-2.1-2 – one table, no a,b,c,etc. title Summary of Inorganic Chemicals Background Values in Tuff at MDA C. Delete max background rows. Delete (part 1) in title. Redo footnote letters based on deletions. Do not define qualifiers in footnotes.</p> <p>F-2.3-1 – title Frequency of Radionuclides Detected or Detected Above Background/Fallout Values in Surface Soil and Fill at MDA C. Delete nondetect column and max detect column. Delete n/a footnote.</p> <p>F-2.3-2 – title Summary of Radionuclides Detected or Detected Above Background/Fallout Values in Surface Soil and Fill at MDA C. Delete max background row and SSL rows. Footnote FVs that only applicable in 0-0.5 ft. Do not define qualifiers in footnotes. Redo footnote letters based on deletions.</p> <p>F-2.4-1 - title Frequency of Radionuclides</p>	<p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p>	<p>The list has been provided in TOC section.</p> <p>Table F-1.1-1 deleted.</p> <p>Surface samples were not analyzed for VOCs and isotopic thorium.</p> <p>Blank cells are removed.</p> <p>Title modified to "...Detected or Detected Above..." to be consistent with the rest of table titles. Surface inorganic data are screening-quality data AND have been presented in IWP. Maximum detect and nondetect columns deleted to be consistent with the rest of the comments.</p> <p>Changes made as requested.</p> <p>Changes made as requested.</p> <p>Changes made as requested.</p> <p>Changes made as requested.</p>	

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		<p>Detected or Detected Above Background/Fallout Values in Tuff at MDA C. Delete nondetect column and max detect column. Delete n/a use na for Not available in BV column.</p> <p>F-2.4-2 - title Summary of Radionuclides Detected or Detected Above Background/Fallout Values in Tuff at MDA C. Delete max background row and SAL rows. na instead of n/a.</p> <p>F-2.5-1 – number of detected locations? Number of locations where samples collected? Are numbers correct? 33 and 30? Max detect should be presented the same way either scientific notation or written out; choose one.</p> <p>F-2.5-2 - blank spaces are na Not available? Don't just present blank cells. Do not define qualifiers in footnotes.</p> <p>F-2.7-1 – delete Samples from title. Delete max detect column. Delete n/a footnote. Use asterick * for remaining footnote.</p> <p>F-2.7-2 - delete Samples from title. Title Summary of Organic Chemicals Detected in Soil and Fill at MDA C. Delete SSL rows. Do not define qualifiers in footnotes.</p> <p>F-2.8-1 – delete max detect column. Use asterick * for remaining footnote.</p> <p>F-2.8-2 – one table, no a,b,c,etc. Delete (Part 1) from title. Title Summary of Organic Chemicals Detected in Tuff at MDA C. Do not define</p>	<p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p>	<p>Changes made as requested.</p> <p>Changes made as requested.</p> <p>Yes, it corresponds to number of boreholes. Max detect written out.</p> <p>Blank cells removed. Qualifiers removed.</p> <p>Changes made as requested.</p> <p>Changes made as requested.</p> <p>Changes made as requested.</p> <p>Changes made as requested.</p>	

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		<p>qualifiers in footnotes. Redo footnote letters based on deletions.</p> <p>F-2.9-1 and F-2.9-2 - delete Samples from title. Use asterick * for remaining footnote.</p> <p>F-2.9-3 and F-2.9-4 - one table, no a,b,c,etc. Delete (Part 1) from title. Title Summary of Organic Chemicals (VOCs) Detected in First Round or Second Round of Pore Gas at MDA C. delete Samples from title. Do not define qualifiers in footnotes.</p>	<p>A</p> <p>A</p>	<p>Changes made as requested.</p> <p>Changes made as requested.</p>	
	Appendix F Figures	<p>Figure for inorganic chemicals in soil even though screening level data?</p> <p>Use different symbols or colors to differentiate between new boreholes and old?</p> <p>F-2.1-1 and F-2.1-2 – caption detected or detected above... Remove calcium, magnesium from figure, not COPCs.</p> <p>F-2.1-3 to F-2.1-50 – delete all except for thallium? Only include box plots that eliminate analyte from being a COPC in all tuff units.</p> <p>F-2.3-1 – caption or detected where ...</p> <p>F-2.3-2 to F-2.3-6 – delete.</p> <p>F-2.4-1 - caption detected or detected above... Under location 50-24771 last sample ID and depth not in blue.</p> <p>F-2.4-2 to F-2.4-19 – delete.</p>	<p>A/R</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p>	<p>Results of surface inorganic data have been presented in IWP. After IWP, these data have been determined to be screening-quality and are not valid and not presentable.</p> <p>New and old boreholes are now differentiated.</p> <p>Caption changed as requested. Results of non-COPCs removed.</p> <p>The box plots for potassium, silver, and thallium are kept for specific reasons as stated in the text; the rest box plots removed.</p> <p>Caption changed as requested.</p> <p>Figures deleted as requested.</p> <p>Changes made as requested.</p> <p>Figures deleted as requested.</p> <p>Data are for first-round samples. Comparison of</p>	

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Comment #	Location ¹	Reviewer's Comment/Suggestion	AR ²	Author's Proposed Revision/Resolution	Final Resolution
		<p>F-2.5-1 and F-2.5-2 – does figure include both rounds? Just first? If just one round what about second round data? Units are pCi/L, need to include in legend.</p> <p>F-2.5-3 to F-2.5-36 – how are these used for nature and extent discussion? Need to include in my writeup?</p> <p>F-2.11-1 to F-2.11-3 – do these belong in this section? Section 2.11 discusses pore gas vs. core VOCs so tritium not included. Where do these figures go???? F-2.5?</p> <p>F-2.8-1 – location 50-24766 last sample ID and depth not in blue.</p> <p>F-2.8-2 – location 50-24822 last sample ID and depth not in blue.</p> <p>F-2.9-1 to F-2.9-8 – consolidate in plate or plates, easier to use and refer to. What about second round data?</p> <p>F-3.3-1 – this figure should come first because it shows the pore gas locations for both tritium and VOCs.</p> <p>F-3.2-2 – is size of red ellipse supposed to reflect concentrations? Should there be a scale for this?</p> <p>F-3.3-2 to F-3.3-5 - how are these used for nature and extent discussion? Need to include in my writeup? Is size of red ellipse supposed to reflect concentrations? Should there be a scale for this?</p>	<p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p>	<p>two rounds data is presented in Figures F-2.5-6 through 36 (except F-2.5-32). Units added to figure legend. Discussion moved to nature and extent section, as requested.</p> <p>These figures moved to Section F-2.11-2. They are not included in F-2.5 because we would like to keep the data from last three boreholes separate from the rest of the data.</p> <p>Change made as requested.</p> <p>Change made as requested.</p> <p>Data now presented in two plates (one for western portion, the other for eastern). Text added for second round data in Section F-2.9.</p> <p>Figure changed to F-3.2-1</p> <p>Yes, size is proportional to concentration; legend revised to indicate this.</p> <p>Legends revised; these are called out in N&E text.</p>	

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Comment #	Location ¹	Reviewer's Comment/Suggestion	A/R ²	Author's Proposed Revision/Resolution	Final Resolution
	Appendix G	<p>Use MDA U and/or MDA V as models for organization, content, presentation, and language.</p> <p>See hard copy.</p> <p>Executive Summary – delete sentence on residential scenario. Combine first three paragraphs into one.</p> <p>Fix eco paragraph to reflect changes.</p> <p>G-2.2 – section does not summarize the sampling results, just COPCs per scenario. See hard copy for details on text changes. Need to discuss previous data here, not just brief mention. Not a question of passing data validation process. Analyzed by CST, no documentation to support results, no QA/QC info. Therefore screening level only!</p> <p>G-2.2.1 – <i>put under site description</i>. Does not relate to sample results or COPCs. Delete <u>the release of</u>.</p> <p>G-2.2.2 – this seems to be redundant with previous text. Combine into one discussion. Title Summary of Sampling Results. See hard copy for details on text changes. Industrial scenario and ecological assessment; ecological is not an exposure scenario. Delete section titles. Cesium-134 and tritium do not have an FV.</p> <p>Do you mean cesium-137?</p> <p>FVs only good at 0-0.5 ft. if deeper based on detect. Next paragraph – fallout rads do not have</p>	<p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A/R</p>	<p>Requested changes made</p> <p>Text changed as requested.</p> <p>Requested changes made</p> <p>Requested changes made</p> <p>Requested changes made</p> <p>no</p>	

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Content	Unit 1				
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Comme #	Location	Reviewer's Comment/Suggestion	A/R ²	Author's Proposed Revision/Resolution	Final Resolution
		<p>FVs in tuff based on detection status. Naturally occurring rads have BVs. Perchlorate and nitrate have no BVs. Need to rewrite so correctly reflects how become COPCs.</p> <p>Bottom of page G-8 and top of G-9 – use EPC acronym for exposure point concentration. 95% UCLs. Tables G-2.2-1 and G-2.2-2. Industrial scenario, not an ecological exposure scenario, ecological assessment. Residential scenario, delete <u>exposure</u>.</p> <p>Page G-9 – <i>How is the UCL calculations part of the summary of sampling results???</i> Should be own section with an explanation of what was done! 95% UCLs. Tables G-2.2-1 and G-2.2-2.</p> <p>Next paragraph – delete <u>reported</u>. Delete <u>default</u>. Deletes <u>in that depth range</u>.</p> <p>G-3.0 – use CSM acronym for conceptual site model. Merge first sentence and next paragraph together. Do the same pathways apply to the residential scenario? Need to state, just say that it is evaluated for info purposes; relate to pathways.</p> <p>Next paragraph – delete <u>terrestrial</u>. Delete <u>are considered in the conceptual site model of ecological</u> and <u>for MDA C COPECs</u>. Several exposure pathways apply to the exposure of ecological receptors to contaminants. Delete <u>may</u>. Change airborne COPECs to contaminants.</p> <p>ADD FATE AND TRANSPORT TEXT AND TABLES TO THIS SECTION.</p>	<p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A/R</p> <p>A</p> <p>A</p>	<p>Requested changes made</p> <p>Requested changes made</p> <p>Requested changes made</p> <p>Requested changes made</p> <p>Requested changes made except acronym "CSM" not used.</p> <p>Text changed as requested.</p> <p>Requested changes made</p>	

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Comment #	Location ¹	Reviewer's Comment/Suggestion	A/R ²	Author's Proposed Revision/Resolution	Final Resolution
		<p>G-3.1 – change would be to are. Page G-10 – end of paragraph following equations add and SV is the screening value. Next paragraph – delete sentence about EPA Region 9; did not use for MDA C. change would not be to is not. Next paragraph – maximum detected concentration. These results show that the screening value is below 1 for all but nine VOCs. These nine VOCs include... No need to include screening value provided in table.</p> <p>Where did SV of 17 for 4-methyl-2-pentanone come from? I get 0.0007 as the SV. $8.1 \times 1000 \times 0.0057 \times 2000$ is not 17; 7.1×10^{-4}. Assuming my calculation is correct delete subsequent text on frequency of detect. Also delete next sentence regardless. Conclude with The results of the screening indicate that VOCs in subsurface pore gas at MDA C...</p> <p>G-4.0 – REWRITE. Use MDA U language as appropriate. For dioxins and furans use MDA T text as provided.</p> <p>G-5.0 – does not follow either MDAs U or V. Why is this different than the examples provided???? Use EPC. The industrial and residential scenarios, delete <u>exposure</u>. Delete <u>then</u>. Delete <u>(the risk upon which NMED SSLs are based)</u>.</p> <p>Delete <u>exposure</u>.</p> <p>Page G-12 – delete second and third sentences of first paragraph. Table G-5.0-4 shows the carcinogenic risk to be approximately 2×10^{-5}, which is slightly above the NMED target level of</p>	<p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p>	<p>Text changed as requested</p> <p>Text and tables corrected as requested.</p> <p>Requested changes made</p> <p>Requested changes made</p> <p>Requested changes made</p> <p>Requested changes made</p>	

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Comment #	Location ¹	Reviewer's Comment/Suggestion	A/R ²	Author's Proposed Revision/Resolution	Final Resolution
		<p>10-5. Table G-5.0-5 presents the HQs and HI for the residential scenario. The HI is approximately 0.9, which is below the NMED target level of an HI of 1.0. Table G-5.0-6 dose not show the calculations just the comparisons. The total dose is approximately 12 mrem/yr, which is...</p> <p>G-5.1.1 – delete last part of last sentence of first paragraph. First part of sentence Inorganic chemical data was determined to be of screening level quality should start the next paragraph. Not sure if we want to emphasize this too much. Strongly suggest recommending going back out and taking surface samples for inorganic analysis and re-evaluating risk based on that data. Keep text as written but maybe modify conclusions. Max background for lead is 28 mg/kg not 27. This data results in an HQ of 0.04 for lead and an HQ of 0.001 for silver for the industrial scenario. The HQs equal 0.041, which is lees than NMED target level of an HI of 1.0, and does not substantially change the HI presented in Table G-5.0-2. Because the remainder of the surface inorganic chemical data indicated background concentrations for the other inorganic chemicals analyzed, the lack of decision level inorganic chemical data...</p> <p>G-5.1.2 – delete <u>and use</u>, use EPC. #1 – change proposed to reasonably foreseeable; we are not proposing industrial, it is the scenario. Delete <u>may</u> and <u>or underestimate</u>. Should read ...presented here overestimates the potential risk. #3 – EPC.</p>	<p>A</p> <p>A</p>	<p>Requested changes made</p> <p>Requested changes made</p>	

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		<p>surface? Separate section.</p> <p>G-5.5.3 – change heading to be like Mort/Ten Site - COPECs Contributing to HIs Greater Than 1</p> <p>Delete text on acenaphthene and thorium-232. Both have HQs less than 1 and are not relevant to this discussion. Just Aroclor-1254.</p> <p>Aroclor-1254 was detected infrequently at MDA C. Within the 11.8 acre site Aroclor-1254 was detected in 3 of 59 samples from 0-5 ft. The resulting HQs were greater than 1.0 for the omnivorous and insectivorous robin (1.4 and 2.7, respectively). These HQs overestimate the potential exposure and risk of the robin to Aroclor-1254 given the limited presence of this COPEC. In addition, Dourson and Stara (1983, 73474) conducted a study of uncertainty factors incorporated in calculating ESLs for ecological receptors. Based on their study, the LOAEL to NOAEL adjustment indicates that HIs up to 10 may not adversely affect ecological receptors. To maintain conservatism, they state that HIs less than 3 do not adversely affect ecological receptors. Based on the infrequent detection of Aroclor-1254 in samples collected from the 0-5 ft depth interval, the generally low concentrations detected (maximum of 1 mg/kg), and the conclusions of the Dourson and Stara study, the HIs for the robin do not indicate a potential unacceptable ecological risk.</p> <p>G-6.5.4 – not G-6.5.5. HI increase not decreases. Adding more to HI so cannot decrease. Last</p>	<p>A</p> <p>A</p> <p>A</p>	<p>Text changed as requested.</p> <p>Text changed as requested.</p> <p>Text changed as requested.</p>	

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		<p>sentence needs work Therefore, not including these VOCs in the screening assessment does not substantially underestimate the potential risk. Is this what we are trying to say??? Top of page G-18 – this HI increases.</p> <p>G-6.6 – need to update text. ...were eliminated based on HQs/HI less than 1.0 for most receptors. Aroclor-1254 is eliminated as a COPEC based on the infrequency of detection, the relatively low concentrations, and the conclusions of the Dourson and Strata study.</p> <p><u>Need a Conclusion section for the risk appendix. See MDAs U and V.</u></p> <p>G-7.0 – delete PRG reference for rad.</p>	<p>A</p> <p>A</p> <p>A</p>	<p>Text changed as requested.</p> <p>Text added as requested.</p> <p>Requested changes made</p>	
	Appendix G Figure	<p>G-3.0-1 – need receptors for last three columns. Water extraction wells not a pathway. Delete or NA. Last column is eco? Why moderate for inhalation? Not low? Same for surface water. Not pathway for anyone. Why mare pathways moderate fro eco receptors but low for human? Don't understand why different. Where is food web pathway for eco? Root uptake? Nee to be same pathways as presented in text. <i>Use MDA U figure? Also consider using figure from eco scoping checklist for eco CSM figure.</i></p>		Figure from ecoscoping checklist used.	
	Appendix G	<p>Eco scoping checklist goes after figure and tables! SEE HARD COPY FOR CHANGES/COMMENTS.</p>	A	Ecoscoping checklist modified as requested.	

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	Checklist				
	Appendix G Tables	<p>G-2.2-1 – title Exposure Point Concentrations for the Industrial Scenario and the Ecological Assessment (0-0.5 ft and 0-5 ft, respectively) Maximum detected concentration not just max value. Table should be same as for MDA V Table H-4.2-1.</p> <p>G-2.2-2 – title Exposure Point Concentrations for the Residential Scenario (0-10 ft) ProUCL probably would calculate a valid UCL for 7-8 samples.</p> <p>G-3.3-1 – screening level for butadiene[1,3-] is in EPA Region 6 and is 1.3. SV=2.4E-02. 4-methyl-2-pentanone SV is incorrect; should be 0.019. Fix footnotes given the elimination of Region 9 reference.</p> <p>G-3.3-2 – same as above. 4-methyl-2-pentanone SV is incorrect; should be 0.00071. Fix footnotes given the elimination of Region 9 reference.</p> <p>G-4.0-1 – delete.</p> <p>G-4.0-2 – now G-4.0-1. Delete <u>Exposure</u> from title. NMED 2006, 92513 in footnotes.</p> <p>G-4.0-4 – delete.</p> <p>G-4.0-5 – move to follow chemical SSL parameter table. Delete <u>Parameters</u> and <u>Exposure</u> from title. NMED 2006, 92513 in footnotes.</p>	<p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p>	<p>Changes made as requested. There is no MDA V Table H-4.2-1</p> <p>Changes made as requested.</p> <p>Changes made as requested.</p> <p>Changes made as requested.</p> <p>Requested changes made</p> <p>Requested changes made</p> <p>Requested changes made</p> <p>Requested changes made</p>	

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		<p>G-4.0-6 – na for blank cells, footnote as Not available. Also footnote that ESLs from ECORISK Database, version 2.2 (LANL 2005, 90032).</p> <p>NEED FOOTNOTES FOR SCREENING TABLES. WHERE SSLs AND SALs OBTAINED, WHETHER EPC IS UCL OR MAX, SURROGATES USED AND WHY. SEE MAD U TABLES!</p> <p>G-5.0-1 – title Risk Screening Comparisons for the Industrial Scenario Delete <u>UCL/Carcinogenic SSL</u> and <u>NMED Risk Basis</u> columns. Change UCL to EPC in column heading. Round off total risk to 2 x 10⁻⁷.</p> <p>G-5.0-2 – title Comparison of Noncarcinogenic COPCs to Screening Levels for the Industrial Scenario delete <u>NMED Risk or Hazard Basis</u> and <u>UCL/Noncarcinogenic SSL</u> columns. Change UCL to EPC in column heading. Last column is HQ or Hazard Quotient. Total is the HI!!!! Aroclor SSLs from where? EPA Region 6? Need to footnote!</p> <p>G-5.0-3 - Comparison of Radionuclide COPCs to Screening Levels for the Industrial Scenario Delete <u>UCL/Industrial SAL ratio</u> column. Change UCL to EPC in column heading. Delete <u>(ratio x 15 mrem/yr)</u> Round off total does to 10.</p> <p>G-5.0-4 - title Risk Screening Comparisons for the Residential Scenario Delete <u>UCL or Maximum/Carcinogenic SSL</u> and <u>NMED Risk Basis</u> columns. Change UCL to EPC in column heading. Round off total risk to 2 x 10⁻⁵. Dioxin, chromium,</p>	<p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p>	<p>Table changed as requested.</p> <p>Requested changes made</p> <p>Requested changes made</p> <p>Requested changes made</p> <p>Requested changes made</p> <p>Requested changes made</p>	

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Comment #	Location ¹	Reviewer's Comment/Suggestion	A/R ²	Author's Proposed Revision/Resolution	Final Resolution
		<p>and Aroclor SSLs from EPA Region 6. Aroclor carcinogenic SSL is 2.2 not 1.12! FOOTNOTE SOURCES. Footnote dioxin EPC to state how derived.</p> <p>G-5.0-5 - title Comparison of Noncarcinogenic COPCs to Screening Levels for the Residential Scenario Change UCL to EPC in column heading. Last column is HQ or Hazard Quotient. Total is the HI!!!! Round off HI to 0.9. did not analyze for chromium III, just total, delete from table. Arsenic noncarc SSL from EPA Region 6? Perchlorate also. FOOTNOTE SOURCES.</p> <p>G-5.0-6 - Comparison of Radionuclide COPCs to Screening Levels for the Residential Scenario Delete <u>UCL/Residential SAL ratio</u> column. Change UCL to EPC in column heading. Delete (<u>ratio x 15 mrem/yr</u>) Round off total dose to 12.</p> <p>G-6.0-1 – delete subheading rows. Montane shrew.</p> <p>G-6.0-2 – bold 1.4, unbold 0.002.</p>	<p>A</p> <p>A</p> <p>A</p> <p>A</p>	<p>Requested changes made</p> <p>Requested changes made</p> <p>Table changed as requested.</p> <p>Table changed as requested.</p>	
	Appendix K	Never really used this information/data. Was there any value to this?	A	Added summary of results to main text (previous investigations).	

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Part 1 (Document Manager Completes)

Date: **November 8, 2006**

Title: **Investigation Report for MDA C, SWMU 50-009 at TA-50** Rev. #: ____ Doc. Cat No: **EP2006-1000**

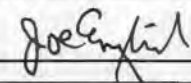
Reviewer's Name (Print): **Joe English** Organization: **ENV-RCRA** Comments due: **November 15, 2006** (Date)

Author: **Kent Rich** Phone: **665-4272** E-Mail: **krich@lanl.gov**

Return completed and signed forms to: **Saundra Martinez** Phone: **5-6771** E-Mail: **saundra@lanl.gov**

Part 2 (Reviewer Completes)

Date Received: **11/8/06** Date Review Completed: **11/15/06**

Signature & Date (to be signed ONLY upon agreement of comment resolution):  Date: **12/5/06**

Part 3 (If under time constraints, the Author and Reviewer each sign.)

☐ Not all comments resolved; attach PR Comment Form to Document Signature Form.

Author Signature & Date: _____

Reviewer Signature & Date: _____

Comment #	Location ¹	Reviewer's Comment/Suggestion	A/R ²	Author's Proposed Revision/Resolution	Final Resolution
1	2, 1.4, 1	Line 4 – The regulatory criteria section is usually Section 5, per the Consent Order outline. Line 7 – Change "Section 7 presents a summary" to "Section 7 presents conclusions, including a summary".	A	Changed as suggested, moved to Section 5. Changed as suggested.	

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Comment #	Location ¹	Reviewer's Comment/Suggestion	A/R ²	Author's Proposed Revision/Resolution	Final Resolution
2	4, 2.2.2, 1/2	Change "TA-35" to "TA-3".	A	Changed.	
3	8, 3.0, 1	Delete first paragraph – the investigation is driven by the Consent Order, not Module VIII.	A	Moved to Section 5, deleted paragraph with mention of Module VIII.	
4	8, 3.0, 2-4	The information in paragraphs 2-4 is related to regulatory status, which is different than the regulatory criteria called out in the Order (e.g., cleanup levels). The information in paragraphs 2 and 3 relates to the regulatory basis for the investigations and is usually presented in Section 1.0. Suggest moving these 2 paragraphs to the end of Section 1.0. Paragraph 4 deals with the history of the requirements for numbers of boreholes. Since this really relates to a deviation from the approved work plan, suggest moving this paragraph to Section 4.6.	A/R	Moved paragraphs 2 and 4 to Section 1.0. Summary of history of requirements; not a deviation but approved change in scope; info moved to Section 1.2.	

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Comment #	Location ¹	Reviewer's Comment/Suggestion	A/R ²	Author's Proposed Revision/Resolution	Final Resolution
5	9, 3.2, 1/3	The NMED screening levels were updated in 2006. New reference is NMED 2006, 92513. Same comment applies to next paragraph.	A	A global changed has been made	
6	9, 3.2, 3/1	Change "Residual Radioactive" to "Residual Radioactivity".	A	Text deleted	
7	9, 3.2, 4	Exposure parameters for screening levels are usually not presented since screening levels are already approved and are not being calculated in this report. Exposure parameters should be presented in the risk assessment section as the basis for calculations. Suggest deleting this paragraph.	A	Exposure parameter text removed from this section (now 5.2).	
8	11, 4.3.1, 1/5-6	Text describes collection of six surface samples, but refers to figure showing all surface sample locations. Suggest modifying figure to highlight the six sample locations being discussed.	A	Figures revised to use different symbols for these six sample locations.	

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Comment #	Location ¹	Reviewer's Comment/Suggestion	AI ²	Author's Proposed Revision/Resolution	Final Resolution
9	11, 4.3.3, 1	Suggest adding a figure showing the locations of the surface flux samples (this figure should be in the HIR).	R	Removed discussion of these per other reviewers, now only discussed in Section 2.4 (previous investigations).	
10	12, 4.4.1, 1	The tables include a table labeled 4.3-1 that includes a list of all borehole samples. This table is not called out, but should be called out in Section 4.4.1.	A	Added callout for Table 3.4-1 (section numbers changed).	
11	14, 4.4.5, 3	Were there any issues with not being able to collect borehole samples from borehole TD due to sloughing? If so, this probably needs to be identified and described.	A	Yes, added text to Section 3.4.4, reference to Table 3.4-1 showing different max depths for core vs. pore-gas.	
12	14, 4.5, 2/8	Is waste actually being managed in a "satellite accumulation area"? Satellite areas are appropriate for less than 55-gal of hazardous waste, which doesn't seem to be the case here. Actual type of waste accumulation/storage area should be verified.	A	Text revised to clarify status; not satellite accumulation area, but some waste managed onsite.	

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Comment #	Location ¹	Reviewer's Comment/Suggestion	A/R ²	Author's Proposed Revision/Resolution	Final Resolution
13	15, 4.6, 1-3	Suggest moving discussion of history and basis for number of boreholes from Section 3.0 to this section (see Comment # 4).	R	Not deviations, approved changes in scope (see response to comment 4).	
14	15, 4.6, 4/1	Suggest adding a reference to February 23, 2006 letter.	A	Reference added.	
15	16, 4.6, 1	Suggest adding reference to communication with NMED approving stopping field screening.	A	Reference added.	
16	16, 4.6, 2	The work plan requires that the pore gas samples be analyzed using Method TO-15. The difference in analytical suites would only be a deviation from the work plan if the laboratories did not following TO-15. Suggest checking with SMO to determine whether the laboratories deviated from the method.	A	No deviation; removed from deviations section (Appendix B).	

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Comment #	Location ¹	Reviewer's Comment/Suggestion	A/R ²	Author's Proposed Revision/Resolution	Final Resolution
17	16, 4.6, 6/5-6	Suggest adding explanation why second round of samples was not collected from borehole 50-24818.	A	Explanation text added (now in Appendix B).	
18	17, 4.6, 2/1	Suggest adding date or reference to e-mail about Encore samples.	A	Reference added.	
19	17, 5.0, 5/4-5	Change "SWMU 50-016" to "SWMU 50-006(d)".	A	Changed.	
20	18, 5.3, 1	Are the geophysical survey results documented in a report? If so, this should be referenced or included as an appendix.	A	Yes, added references for these (two reports).	

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Comment #	Location ¹	Reviewer's Comment/Suggestion	A/R ²	Author's Proposed Revision/Resolution	Final Resolution
21	18, 5.4, 2/10	Text states "but only 10 ft of the unit was encountered in the deepest borehole". This makes it sound like unit was only 10 ft thick. I believe this should say that the borehole was only advanced 10 ft into the unit.	A	Changed as suggested.	
22	19, 5.5, 1/1	Insert "Groundwater" before "monitoring wells".	R	Refers to vapor monitoring wells, which are going to be installed.	
23	20, 6.1.1, 3/6-7	Change "high explosives" to "explosive compounds".	A	Changed.	
24	23, 6.2.1, 3/7-10	Saying that the boreholes could enhance contaminant transport is not a very strong argument. Suggest deleting the last two sentences of the paragraph.	A	Changed as suggested.	

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Comment #	Location ¹	Reviewer's Comment/Suggestion	A/R ²	Author's Proposed Revision/Resolution	Final Resolution
25	24, 7.1.1, 1	Paragraph doesn't have statement of whether extent of chromium contamination has been defined.	A	Added statement that N&E defined for metals, not just chromium.	
26	25, 7.1.2, 1/7-8	Is there a possible explanation for the peak concentrations at the sample taken at 452 ft (e.g., at TA-54 we had high concentrations in paleosol in deep sample)? Otherwise, text implies transport of contaminants to 450 ft which is not consistent with conceptual model.	A/R	Text has been extensively revised per other reviewers, now does not emphasize the concentrations at 452 ft; no obvious explanation for the peak there.	
27	25, 7.1.2, 2/6	Text states that "significant metals contamination does not extend beyond approximately 450 ft bgs". This seems contrary to conclusions of Phase I RFI that release of metals was very limited. See previous comment.	A	See previous comment response.	
28	27, 7.3, 2/5-7	Text states that CST data are only screening data, but are sufficient to determine nature and extent. Screening data are usually not considered sufficient for nature and extent.	A	Added recommendation for additional surface samples to be analyzed for inorganics to confirm the screening sample results with decision-level data.	

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Comment #	Location ¹	Reviewer's Comment/Suggestion	A/R ²	Author's Proposed Revision/Resolution	Final Resolution
29	28, 7.5, 1/4	We are also required to report radiological risk in addition to dose for the decision scenario (i.e., industrial).	A	Risk added	
30	37-38, Tables 3.2-3 and 3.2-4	Should not need to present exposure values for screening levels since screening levels are reported by NMED and were not calculated as part of this report. Suggest deleting these tables. See Comment # 7.	A/R	These have been deleted from main text, still in Appendix G per R. Mirenda.	
31	A-3	For RESRAD, change "Radioactive" to "Radioactivity".	R	RESRAD deleted from Appendix A. The user's manual "Manual for Implementing Residual Radioactive material Guidelines Using RESRAD, Version 5.0" indicates that RESRAD is just the name of the computer program, not an acronym.	
32	Appendix D	The Analytical Program appendix usually includes a discussion of the quality assessments, e.g., how many samples were qualified because of method blank detection, etc. This appendix just includes a description of the quality assurance parameters. Results should be added – see Analytical Program appendix from the Investigation Report for MDA V for recent example.	A	Results of QA activities now included, following format of MDA V.	

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Comment #	Location ¹	Reviewer's Comment/Suggestion	A/R ²	Author's Proposed Revision/Resolution	Final Resolution
33	F-11, F-2.0, 1/1-2	Text states that surface samples from 1993 were determined to be screening data and are not presented in the tables. Need to say what this means as far as using data for nature and extent. See comment 28.	A	Only inorganic data of surface samples are "CST Onsite". Inorganic surface extent has been defined as stated in IWP (see Section F-3.1.1). The inorganic surface data are not used anymore in this report to determine nature and extent.	
34	F-13, F-2.3, 5	Third bullet says that thorium-232 and uranium-238 data exceeded range of background dataset. Box plots for Th-232 and U-238, however, do not show background dataset.	A	These box plots have been eliminated. Text on exceeding "range of background dataset" removed.	
35	F-13, F-2.4, 3/2	Change "Figure F-2A-1" to "Figure F-2.4-1".	A	Done.	
36	F-14, F-2.4, 5/2	Change "Figures F-2.4-2 through F-2.4-18" to "Figures F-2.4-4 through F-2.4-19".	A	Most box plots have been eliminated. Text changed to "Figures F-2.4-3 through F-2.4-5" for the remaining box plots.	

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Comment #	Location ¹	Reviewer's Comment/Suggestion	A/R ²	Author's Proposed Revision/Resolution	Final Resolution
37	F-14, F-2.5	Figures F-2.5-3 through F-2.5-36 show plots of tritium concentrations with depths, but these figures are not called out in the text.	A	They are called out now in Figures F-2.5-4 through F-2.5-37.	
38	F-15, F-2.8, 1/3	Change "high explosives" to "explosive compounds".	A	Done.	
39	F-17, F-2.11	Suggest adding evaluation of co-located tuff and pore gas results to Section F-2.11 similar to what was done for MDA L. This evaluation includes calculation of tuff concentration that would be in equilibrium with the measured pore gas concentration. For MDA L, this evaluation showed that the measured tuff concentrations could be explained by pore gas and concluded that there was no separate solvent phase present, supporting the conceptual model that VOCs are migrating by vapor transport, rather than as liquid solvents.	A	Text and a table added as suggested.	

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Comment #	Location ¹	Reviewer's Comment/Suggestion	A/R ²	Author's Proposed Revision/Resolution	Final Resolution
40	F-18, F-3.0, 2/7	Change "Figure F-3.3-1" to "Figure F-2.3-1".	A	Changed as indicated.	
41	F-19, F-3.1.2, 3	It looks like a lot of the detections of inorganics above BV at the bottoms of boreholes are for samples of Qbt1g, and there are no detections above BV in samples from upper units. This also happened at MDA L and appears to be result of limited background data set for lower tuff units. Suggest adding statement that vertical profile generally shows no detections above BV in upper units and detections above BV in lowest unit are not indicative of release.	A	Text added.	
42	F-21, F-3.1.2, 3	Suggest adding statement that where nitrate is detected, concentrations generally decrease with depth.	A	Text changed by Rich Mirenda to state that nitrate is naturally occurring and there is a slight change or no change in concentration with depth.	
43	F-23, F-3.3.2, 3	Suggest adding statement that many of the dioxin detections are estimated concentrations below the quantitation limit.	A	Text added.	

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ICN2, QP-3.5, R2

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Comment #	Location ¹	Reviewer's Comment/Suggestion	A/R ²	Author's Proposed Revision/Resolution	Final Resolution
44	F-28, F-3.3.2, 4	Suggest deleting last paragraph in section as it really relates to transport potential rather than nature and extent. Also, conclusions related to potential to migrate by water transport are not relevant to VOCs and tritium as these migrate by vapor transport.	A	Text deleted.	
45	F-28, F-4.0	The environmental fate and transport discussion is usually presented in the risk assessment appendix because it is not really an assessment of the sampling results.	A	Fate and transport moved to risk appendix (G).	
46	F-28, F-4.0, 1/5	Text calls out Tables F-4.1-1 through F-4.3-1, but these are not included in the document.	A	These were inadvertently left out. They are now in Appendix G and are G-3.1-1 through G-3.1-3.	
47	F-28, F-4.0, 3	Conclusions regarding potential for advective transport by water do not apply to VOCs and tritium which are transported by vapor diffusion.	A	Text deleted.	

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Comment #	Location ¹	Reviewer's Comment/Suggestion	A/R ²	Author's Proposed Revision/Resolution	Final Resolution
48	F-31, F-4.3	Suggest adding discussion of potential for vapor phase migration. Migration potential exists, but results of pore gas sampling show no current risk of groundwater contamination.	A	Text added as requested.	
49	F-31, F-4.4, 1	Conclusions regarding potential for advective transport by water do not apply to VOCs and tritium which are transported by vapor diffusion.	A	Text deleted.	
50	F-64 – F-90, Tables F-2.1-2a and b	Tables should also show SSLs along with BVs.	A	Per Rich Mirenda's request, all SSLs, SALs have been removed.	
51	F-98 – F-104, Table F-2.4-2	Table should also show SALs along with BVs.	A	Per Rich Mirenda's request, all SSLs, SALs have been removed.	

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Comment #	Location ¹	Reviewer's Comment/Suggestion	A/R ²	Author's Proposed Revision/Resolution	Final Resolution
52	F-119 – F-145, Tables F-2.8-2a, b, c, d, and e	Tables should also show SSLs.	A	Per Rich Mirenda's request, all SSLs, SALs have been removed.	
53	F-228 – F-235, Figures F-2.4-5 – F-2.4-19	These box plots do not have background data – not clear how they can be used to evaluate whether results are within background or not.	A	These box plots have been removed.	
54	G-8, G-2.2, 1&2	First paragraph gives depth of 0-1 ft for industrial scenario (line 2), while second paragraph gives depth of 0-0.5 (line 2). Need to correct inconsistency.	R	There actually is no inconsistency. The scenario is from 0-1 ft. The samples were collected from the 0-.5 ft depth.	
55	G-8, G-2.2.1, 1/5	Change "incineration" to "burning".	A	Change made as requested.	

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Comment #	Location ¹	Reviewer's Comment/Suggestion	A/R ²	Author's Proposed Revision/Resolution	Final Resolution
56	G-12, G-5.0, 1	Need to include radiological risk for industrial scenario, along with dose.	R	It's included in G-5.2 Interpretation.	
57	G-20, Table G-2.2-1	Title of table includes 0-0.5 ft depth for industrial exposure. Is this correct, or should it be 0-1 ft (see Comment # 54).	A/R	The scenario is 0-1 ft but the data is only 0-0.5 ft	
58	Appendix I	Appendix I was missing.	A	All documentation (to date) now included.	

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LA-UR-06-8096
December 2006
EP2006-1000

Investigation Report for Material Disposal Area C, Solid Waste Management Unit 50-009, at Technical Area 50

Prepared by the Environmental Programs Directorate

Los Alamos National Laboratory, operated by Los Alamos National Security, LLC, for the U.S. Department of Energy under Contract No. DE-AC52-06NA25396, has prepared this document pursuant to the Compliance Order on Consent, signed March 1, 2005. The Compliance Order on Consent contains requirements for the investigation and cleanup, including corrective action, of contamination at Los Alamos National Laboratory. The U.S. government has rights to use, reproduce, and distribute this document. The public may copy and use this document without charge, provided that this notice and any statement of authorship are reproduced on all copies.

Investigation Report for Material Disposal Area C, Solid Waste Management Unit 50-009, at Technical Area 50

December 2006


Responsible project leader:

Kent Rich		Project Leader	Environmental Programs	12/04/06
Printed Name	Signature	Title	Organization	Date

Responsible LANS representative:

Andrew Phelps		Associate Director	Environmental Programs	12/6/06
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Responsible DOE representative:

David Gregory		Federal Project Director	DOE-LASO	12/6/06
Printed Name	Signature	Title	Organization	Date

EXECUTIVE SUMMARY

This investigation report presents the results of investigation activities at Material Disposal Area (MDA) C, Solid Waste Management Unit (SWMU) 50-009, at Los Alamos National Laboratory (the Laboratory). MDA C is located within Technical Area 50 at the head of Ten Site Canyon.

The objective of this investigation is to finalize surface and subsurface chemical/radionuclide and geotechnical characterization of MDA C in accordance with the approved MDA C investigation work plan. Characterization data were used to define the nature and extent of contamination associated with waste disposal activities at MDA C and to determine whether the site poses a potential unacceptable risk to human health or the environment.

Field-investigation activities in 2004–2006 included drilling and logging of 36 boreholes, core sampling, pore-gas sampling, collecting a limited number of surface samples, and collecting subsurface samples for geotechnical characterization. Borehole depths ranged from 90 to 620 ft below ground surface. Core samples were analyzed for inorganic chemicals, organic chemicals, and radionuclides. Pore-gas samples were analyzed for volatile organic chemicals (VOCs) and tritium. Based on the characterization data from the 2004–2006 investigation as well as from previous investigations conducted at the site, the nature and extent of surface and subsurface contamination are defined. The nature and extent of contamination in pore gas are also defined. The VOC pore-gas concentrations are low (generally $1000\ \mu\text{g}/\text{m}^3$ or less) for most VOCs detected, with little or no change in concentrations with depth (concentrations remain less than $1000\ \mu\text{g}/\text{m}^3$ at TD). Generally, the VOC pore-gas concentrations in borehole locations inside the fence at MDA C reach the maximum concentration at depths ranging from approximately 125 ft to 200 ft. Below 200 ft, pore-gas concentrations tend to decrease or remain unchanged to 250 ft. Sampling results from the deepest borehole (maximum sample depth 591 ft) indicate pore-gas concentrations decrease substantially below 315 ft ($23,000\ \mu\text{g}/\text{m}^3$ at 315 ft and $360\ \mu\text{g}/\text{m}^3$ at 591 ft). The concentrations of tritium in pore gas are highly variable, and in some cases vary greatly over short lateral distances. The highest detected concentrations of tritium were generally at depths of less than 125 ft. In general, the concentrations of tritium in pore gas decreased with depth from the maximum in each borehole and decreased with distance from the center of MDA C. In addition, no perched groundwater or perched saturation zones were found beneath the site.

Currently, the site is located within an industrial area under Laboratory (i.e., institutional) control and is expected to remain so for the foreseeable future. The risk screening assessment for human health under the industrial scenario resulted in a carcinogenic risk of approximately 2×10^{-7} , a hazard index (HI) of approximately 0.01, and a total dose of approximately 10 mrem/yr. All these values are less than the applicable NMED and DOE target levels for risk, HI, and dose, indicating that MDA C does not pose an unacceptable risk to human health under an industrial scenario. The results of ecological risk screening assessment also indicate no unacceptable risk to ecological receptors at MDA C.

Additional surface sampling will be conducted to confirm the nature and extent of inorganic chemical contamination with decision-level data. Four boreholes will also be drilled between Pit 2 and Pit 3. The results from surface sampling and borehole drilling will be provided as an addendum to this investigation report. Based on the results of this and previous investigations, it is recommended that vapor-monitoring wells be installed to monitor subsurface concentrations of VOCs and tritium. It is also recommended that a corrective measures evaluation be performed to evaluate potential alternatives for remediation and long-term disposition of the site.

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Appendix E	Field and Analytical Records (on CD and DVDs included with this document)
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1.0 INTRODUCTION

Los Alamos National Laboratory (LANL or the Laboratory) is a multidisciplinary research facility owned by the United States Department of Energy (DOE) and managed by the Los Alamos National Security, LLC. The Laboratory is located in north-central New Mexico, approximately 60 mi northeast of Albuquerque and 20 mi northwest of Santa Fe. The Laboratory site covers 40 mi² of the Pajarito Plateau, which consists of a series of finger-like mesas separated by deep canyons containing perennial and intermittent streams running from west to east. Mesa tops range in elevation from approximately 6200 to 7800 ft.

The Laboratory's Environmental Programs (EP) Directorate, which includes the former the Environmental Restoration Project, is participating in a national effort by DOE to clean up sites and facilities formerly involved in weapons research and development. The goal of EP is to ensure that past operations do not threaten human or environmental health and safety in and around Los Alamos County, New Mexico. To achieve this goal, EP is currently investigating sites potentially contaminated by past Laboratory operations. The sites under investigation are designated as either solid waste management units (SWMUs) or areas of concern (AOCs).

This investigation report addresses SWMU 50-009, also known as Material Disposal Area (MDA) C, which is potentially contaminated with both hazardous and radioactive chemicals. Corrective actions at the Laboratory are subject to the Compliance Order on Consent (the Consent Order), signed on March 1, 2005. Information on radioactive materials and radionuclides, including the results of sampling and analysis of radioactive constituents, is voluntarily provided to the New Mexico Environment Department (NMED) in accordance with DOE policy.

1.1 General Site Information

MDA C is located within Technical Area (TA) 50 at the head of Ten Site Canyon. TA-50 is bound on the north by Effluent and Mortandad Canyons, on the east by the upper reaches of Ten Site Canyon, on the south by Two Mile Canyon, and on the west by TA-55. Facilities at TA-50 include a radioactive wastewater treatment facility (RLWTF), a waste reduction characterization facility, offices, several storage areas, SWMUs, and MDA C. Figure 1.1-1 shows the location of MDA C and the surrounding technical areas.

MDA C is an inactive 11.8-acre landfill consisting of 6 disposal pits, a chemical disposal pit, and 108 shafts (Figure 1.1-2). Hazardous waste and mixed waste, as well as radioactive waste, were disposed of in the landfill between 1948 and 1974. The depths of the 7 pits at MDA C range from 12 to 25 ft below the original ground surface, and the depths of the 108 shafts range from 10 to 25 ft below the original ground surface. The original ground surface is defined as the surface beneath the cover that was placed over the site in 1984. The pits and shafts are constructed in the Tshirege Member of the Bandelier Tuff. The regional aquifer is estimated to be approximately 1300 ft deep (LANL 1998, 59599). The topography of MDA C is relatively flat, although the slope steepens to the north where the northeast corner of MDA C abuts the south wall of Ten Site Canyon.

1.2 Purpose of Investigation

The objective of the investigation at MDA C is to determine the nature and extent of releases of hazardous constituents and/or radionuclides to the environment based on historical data and data collected according to the approved investigation work plan (LANL 2005, 91547). This report finalizes the characterization of MDA C and presents recommendations for further activities at the site.

On October 21, 2005, revision 2 of the investigation work plan for MDA C was submitted to NMED. This revision included drilling and sampling 31 vertical boreholes surrounding the pits and shafts and 11 vertical boreholes between Pits 1–4 (LANL 2005, 91547). Subsequent correspondence between the Laboratory and NMED addressed the Laboratory's concerns related to safety and the need for drilling the 11 boreholes between Pits 1–4 after the latest geophysical surveys of those pits were completed. In a letter dated August 18, 2006, the Laboratory submitted a modification to the scope of work for MDA C requesting that the 11 boreholes between pits be eliminated and three additional vertical boreholes be drilled as requested by NMED to evaluate the correlation between pore-gas and core VOC concentrations (LANL 2006, 93581). NMED responded on September 25, 2006, requesting the Laboratory drill 4 of the 11 boreholes between Pits 2 and 3 (NMED 2006, 94192). The Laboratory submitted a letter on November 30, 2006, requesting additional time to complete the four boreholes (LANL 2006, 94194). A response from NMED was pending at the time this report was published.

This report presents details of investigation activities conducted at MDA C in 2004–2006. These activities included collecting surface samples, drilling boreholes, and collecting core samples and pore-gas samples from boreholes to define the nature and extent of contamination in the subsurface. Previous investigation activities are reported in Appendix B of the approved MDA C investigation work plan (LANL 2005, 91547), and are summarized in this report.

1.3 Overview of the Investigation Report

Section 1 of this investigation report describes the site and site contamination, the purpose of investigation, and an overview of the investigations conducted. Section 2 presents the history of site use, waste storage inventory at MDA C, known releases, and a summary of previous investigations. Section 3 describes the scope of field activities. Section 4 presents the results of the field investigation. Section 5 presents the current regulatory criteria for cleanup standards, human health screening levels, and ecological screening levels. The results of surface and subsurface contamination are summarized in section 6. Section 7 presents conclusions, including a summary of the nature and extent of surface and subsurface contamination at MDA C, and the results of the risk screening assessments. Section 8 presents recommendations for the site. Section 9 includes a proposed schedule for the recommended actions. The references and map data sources are provided in section 10.

Appendices include acronyms, glossary, a metric conversion table, and definitions of the data qualifiers used in this report (Appendix A); field methods (Appendix B); borehole logs (Appendix C); analytical program descriptions (Appendix D); field and analytical records (Appendix E); data review (Appendix F); risk screening assessments (Appendix G); a surface water assessment (Appendix H); investigation-derived waste storage and disposal documentation (Appendix I); a radiological inventory (Appendix J); a summary of biota sampling results (Appendix K); and a summary of anion sampling and moisture monitoring results (Appendix L).

2.0 BACKGROUND

2.1 Historical Site Use

MDA C is a decommissioned material disposal area established to replace MDA B at TA-21 as a disposal area for Laboratory-derived waste. MDA C operated from May 1948 to April 1974 but received waste only intermittently from 1968 until it was decommissioned in 1974. Wastes disposed of at MDA C consisted of liquids, solids, and containerized gases generated from a broad range of nuclear energy research and development activities conducted at the Laboratory. These wastes included uncontaminated classified materials, metals, hazardous materials, and radioactively contaminated materials.

There are 7 pits and 108 shafts at MDA C (Figure 1.1-2). Ten shafts in Shaft Group 3 (Shafts 98–107) are lined with 12-in.-thick concrete, while the rest of the pits and shafts are unlined. In 1959, permanent markers consisting of metal stakes with numbered tags were placed next to each shaft. The shafts were sealed by filling them with crushed tuff, followed by concrete (Rogers 1977, 05707, p. C-12). The pits were filled with crushed tuff when they were decommissioned. Fill dirt was used to cover the material disposed in the pits as they were being filled. The dirt acted as a temporary cover. A 1959 memorandum indicates that an approximate ratio of 2.5 yd³ of fill to 1.0 yd³ of waste material was typical of MDA C operations (LASL 1959, 27781). When MDA C was decommissioned in 1974, most of the surface was covered with crushed tuff and fill, and the new surface was recontoured and seeded with a native grama grass mixture. The dimensions and operation dates of the pits and shafts are listed in Appendix B of the approved investigation work plan (LANL 2005, 91547, Table B-1, p. B-33).

2.2 MDA C Waste Inventory

The waste disposal records for MDA C are contained in a series of disposal logbooks (LASL 1948–1969, 76035). The radioactive waste disposal records provide some basis for estimating the location, type, and volume of the waste disposed of and to estimate the number of curies present in specific pits and shafts. However, little data exist on the volume of nonradioactive waste (i.e., hazardous constituents) disposed of at MDA C. Hazardous constituents and uncontaminated classified materials were buried with radioactively contaminated materials.

Routine radioactively contaminated trash disposed at MDA C consisted of cardboard boxes, 5-mil plastic bags of waste generated in Los Alamos Scientific Laboratory (LASL) chemistry labs, and 55-gal. barrels of sludge from wastewater treatment plants at building 35 at TA-21, DP West/TA-21, and TA-45. Nonroutine contaminated waste included debris from the demolition of Bayo Site and TA-01, classified materials, and tuballoy chips (Rogers 1977, 05707, p. C-3). Waste inventory information gleaned from the logbooks is summarized in the approved Resource Conservation and Recovery Act (RCRA) facility investigation (RFI) work plan for Operable Unit (OU) 1147 (LANL 1992, 07672, pp. 2-52–2-56). The logbooks have been reviewed to estimate the specific quantities of individual contaminants in the MDA C disposal inventory.

Present-day radionuclide inventories in the MDA C pits were estimated to be 5600 Ci, 0.75 Ci, and 320 Ci for surface-contaminated waste, soils, and concrete and sludge, respectively. Most of the activity in surface-contaminated waste and concrete and sludge can be attributed to plutonium isotopes. Most of the activity for soils can be attributed to uranium isotopes. For surface-contaminated waste, which contains most of the estimated radioactivity for the MDA C pits, plutonium isotopes are responsible for approximately 90% of the disposed activity. A summary of the radionuclide inventory is presented in Appendix J.

2.2.1 MDA C Disposal Pit Inventory

The pits at MDA C (Figure 1.1-2) were used to dispose of hazardous wastes, uncontaminated classified materials, and radioactive materials. Operating dates for each disposal pit and a discussion of the waste inventory for each disposal pit compiled from disposal records for MDA C follow.

Pit 1 (Nov 1948–Sept 1951)

From LASL logbooks 2587 (LASL 1948, 76035.1) and 3478 (LASL 1950, 76035.80): trichloroethene (TCE), boron, sulfuric acid, graphite, medical laboratory solutions, contaminated materials and trash,

tritium, americium-241, uranium, classified material, plutonium, cyanide, mercury, radium-226, acids, lead, and waste oil.

Pit 2 (Apr 1950–Sept 1951)

From LASL logbooks 2587 (LASL 1948, 76035.1) and 3478 (LASL 1950, 76035-80): TCE and contaminated materials and trash, boron, tritium, americium-241, uranium, sulfuric acid, biological waste, graphite, classified material, plutonium, cyanide, mercury, radium-226, acids, lead, and waste oil.

Pit 3 (Oct 1951–Apr 1953)

From LASL logbook 4644 (LASL 1951, 76053-160): mercury teplers, tritium-contaminated glassware, cyanide solutions, contaminated materials and trash, TCE, boron, americium-241, uranium, sulfuric acid, biological waste, graphite, classified material, plutonium, radium-226, acids, lead, waste oil, and beryllium.

Pit 4 (Oct 1951–Feb 1955)

From LASL logbooks 4644 (LASL 1951, 76053-160) and 6030 (LASL 1953, 76053-239): tritium-contaminated glassware, boxes and urine samples, mercury teplers, actinium-227, vials of radium-226, cyanide and cyanide solutions, a 5-gal. can of actinium waste, empty bottles, contaminated materials and trash, TCE, boron, americium-241, uranium, sulfuric acid, biological waste, graphite, classified material, plutonium, acids, lead, waste oil, silver, and beryllium.

Pit 5 (Apr 1953–Sept 1959)

From LASL logbooks 6030 (LASL 1953, 76053-239), 7277 (LASL 1955, 76053-319), and 9593 (LASL 1958, 76053-497): batteries (acids and lead), a 5-gal. can of actinium-227 waste, lead bricks, vials of radium-226, zirconium shavings, cyanide and cyanide solutions, radionuclide-contaminated waste oil, empty bottles, silver nitrate, beryllium chips, tritium contaminated boxes and urine samples, contaminated materials and trash, TCE, boron, americium-241, uranium, sulfuric acid, biological waste, graphite, classified material, and plutonium.

Pit 6 (Oct 1956–Sept 1959)

From LASL logbooks 9593 (LASL 1958, 76053-497), 11363 (LASL 1961, 76053-510), and 9293 (LASL 1958, 76053-505): radionuclide-contaminated oil, tritium-contaminated oil, copper sheets, cobalt chips, bottles of cadmium-boron tungstate, tritium-contaminated boxes and cans, a can of oil, approximately 100 Ci of source-strength cobalt-60, a lanthanum source, 10 bottles of platinum chloride, beryllium chips, carbon-14-contaminated graphite, a plutonium slug, contaminated materials and trash, TCE, boron, americium-241, uranium, sulfuric acid, biological waste, classified material, mercury, actinium-227, radium-226, acids, and lead.

Chemical Pit (early 1960–June 1964)

No logbook entries were made for specific wastes disposed of in the Chemical Pit at MDA C. The following quote was recorded in the approved RFI work plan for OU 1147: the area “was used for burial of a variety of chemicals, pyrophoric metals, natural uranium powders and hydrides, sealed vessels containing sodium-potassium alloy, compressed gases, and unspecified equipment. Undoubtedly, some

plutonium- and uranium-contaminated objects were inadvertently placed in the pit....No high explosives were ever interred in this pit....low-level radioactive waste placed in the pit may have included cardboard boxes containing materials from the chemistry labs, as well as 55-gal. barrels of sludge from the waste treatment plants at building 35, DP West, and TA-45.” (LANL 1992, 07672, p. 2-54)

2.2.2 MDA C Disposal Shaft Inventory

The disposal shafts at MDA C were primarily used for disposing of beta- and gamma-contaminated waste from the Chemical Metallurgy Research Building at TA-03; however, other Laboratory groups used the MDA C shafts for waste disposal as well. Present-day radionuclide activities (decayed to January 2005) in the shafts are considerably lower than the as-disposed activities since most of the radionuclides associated with the waste are relatively short-lived. Present-day estimated activities for Shaft Groups 1 through 3 are 57 Ci, 620 Ci, and 7100 Ci, respectively. In Shaft Group 1, 67% of present-day activity consists of strontium-90, and 28% consists of cesium-137. Sixty-three percent of present-day activity in Shaft Group 2 consists of cesium-137 and strontium-90, with aluminum-26 and tritium contributing another 28%. In Shaft Group 3, tritium (which has a radioactive half-life of 12 years) accounts for 94% of present-day activity. A summary of the radionuclide inventory is presented in Appendix J.

All of the shafts were unlined with the exception of Shafts 98–107, which were lined with 12-in. thick concrete. In the 1950s or 1960s, a single disposal shaft was dug at MDA C solely for disposing of a single strontium-90 source. Three groups of shafts were used sequentially over time. The Shaft Group 1 consists of 12 shafts numbered 56–67. These shafts were originally numbered 1–12; however, they were renumbered in 1962 to be sequential with subsequent shafts. Shaft Group 1 is south of Pit 5. Shaft Group 2 consists of Shafts 1–55, which are located between Pits 1 and 3. Shaft Group 3 (Shafts 68–107) is west of Pits 1 through 4. The locations of the disposal pits and shafts are included in Figure 1.1-2.

The operating dates for each shaft group and a discussion of the waste inventory for each group of disposal shafts compiled from disposal records for MDA C follows.

Shaft Group 1 (Shafts 56–67 [Feb 1959–Oct 1959])

From LASL logbook 9593 (LASL 1958, 76053-477): barium, tritium, radium, lanthanum-140, strontium-89 and -90, tantalum, cerium waste, two cerium sources, fission products, one lanthanum-140 static source, phosphoric acid, depleted uranium (DU), a charcoal trap, and polonium-beryllium-fluorine compounds.

Shaft Group 2 (Shafts 1–55 [Nov 1959–May 1967])

From LASL logbooks 9593 (LASL 1958, 76053-477) and 11363 (LASL 1961, 76053-510): barium-140, lanthanum-140, fission products from the Omega reactor, uranyl phosphate, graphite slugs, a cobalt-60 capsule, radioactive graphite, radioactive tantalum, 1 g of irradiated plutonium, thallium, irradiated uranium graphite, lead-beryllium sources, thorium, cesium, strontium, plasma thermocouples, fuel elements (rods), cobalt-60 slugs and sources, sulfuric acid solution, zirconium carbide, a copper sphere, two “rabbit” tubes of beryllium (“rabbits” are containers placed in a reactor neutron flux to irradiate the contents), reactor seals, alpha emitters in solution, acid solutions, actinium components, various uranium isotopes, DU, cerium-141, yttrium, silver-110, sodium-22, cesium-137, cesium-144, plutonium waste, oralloy (enriched uranium from Oak Ridge National Laboratory), benzene, isopropyl alcohol, neptunium-237, contaminated materials and trash, americium-241, biological waste, classified material, radium-226, lead, silver, and “induced activity” (activation products, usually from a linear accelerator).

Shaft Group 3 (Shafts 68–107 [Oct 1962–Feb 1966])

From LASL logbooks 11363 (LASL 1961, 76053-510) and 12442 (LASL 1963, 76053-588): plutonium-contaminated trash, fission products, aluminum sheets and tubes, acids, cesium-137, sodium, cobalt-60, antimony, lanthanum-140, cobalt-60 sources, polonium, beryllium, vacuum pump oil, empty glass bottles, graphite, plutonium, boron, fuel element end caps, thermocouples, acetone, uranium, zirconium carbide, zinc and aluminum residues, barium, irradiated tantalum, tuballoy (a uranium alloy), shell waste, yttrium-91, radioactive chemicals and organic solutions, hydrochloric acid waste, plutonium in ether solution, zinc and mercury solutions, DU chips, miscellaneous sources, oralloy solution, iridium-192, tantalum, indium-114, animal tissues, solvents, a Los Alamos Molten Plutonium Reactor Experiment (LAMPRE) rod assembly, waste oil, detonator components, NRX (Navy experiment) reactor parts, trinitrotoluene (TNT) element samples, americium-242, aluminum-105, zinc-65, neptunium-237, contaminated materials and trash, americium-241, classified material, actinium-227, radium-226, lead, silver, strontium-90, and “induced activity.”

2.3 Historical Releases

The results of historical investigations indicated contaminants have been released to environmental media as a direct consequence of disposal activities. Analysis of soil and vegetation samples from MDA C conducted from 1976 to 1983 confirmed the presence of pCi/g levels of radionuclides in localized areas (LANL 1992, 07672). Wastes in some pits (especially in Pit 5 on the north side of MDA C) were exposed at the ground surface as a result of natural degradation or erosion of the shallow soil covers. In 1984, approximately 1.5 ft of crushed tuff, followed by 0.5 to 3 ft of topsoil, was placed over the surface of MDA C, except at the northeast corner of the site where no pits or shafts are located. Additionally, chemical wastes were responsible for many fires at MDA C (LANL 1992, 07672, p. 2-54). It is possible that the fires served as a vehicle of contaminant transport from open pits to the surrounding surface soil. The isotopic plutonium and americium-241 concentrations detected in surface soils in the northeast portion of the site measured during the Phase I RFI resulted in part from windborne deposition of contamination released during waste disposal activities and from the deposition of historical stack emissions (LANL 2005, 91547, p. 6) from operations at TA-50.

2.4 Summary of Previous Investigations

From 1956 to 1961, the U.S. Geological Survey (USGS) conducted water infiltration tests at MDA C. The study concluded that in the presence of a continuous and consistent hydraulic head in the shallow pit, subsurface moisture preferentially moved laterally in the soil profile rather than downward into tuff. The study further concluded that the downward movement through soil and tuff is slow and inefficient, requiring more hydraulic head than is typically present at MDA C (LANL 1992, 07672, p. 2-57).

Several surface radiation surveys and sampling were conducted from 1976 to 1986. In 1985, a radiation survey using a phoswich detector indicated background conditions over most of the site, except in the northeast corner of MDA C where elevated levels of radioactivity were detected. Surface soil samples were collected and analyzed for isotopic plutonium, isotopic uranium, and tritium. Isotopic plutonium was detected on the north and east side of MDA C. Additional surface soil samples were collected in 1986 and were analyzed for americium-241, cesium-137, isotopic plutonium, and tritium, all of which were detected.

In 1989, pore-gas samples were collected from a depth of 4 ft at six locations near the Chemical Pit and 12 perimeter locations immediately surrounding MDA C and analyzed for volatile organic compounds (VOCs). No VOCs were present at concentrations greater than method detection limits (DOE 1989, 15364). Three sediment samples were also collected at 0- to 12-in. intervals from a drainage channel at

the top of Ten Site Canyon and analyzed for pesticides, polychlorinated biphenyls (PCBs), VOCs, semivolatile organic compounds (SVOCs), inorganic chemicals, and radionuclides. Organic chemicals detected were one VOC, eight SVOCs, and four pesticides. Inorganic chemicals detected were barium, chromium, nickel, and zinc. Radionuclides detected were americium-241, cesium-137, plutonium-238, plutonium-239/240, radium-226, uranium-235, and uranium (all isotopes).

Phase I RFI fieldwork was conducted at MDA C from 1993 to 2002. Fieldwork included the following activities:

- three geophysical surveys in 1994, 2001, and 2002
- biota screening and sampling in 2003
- surface investigations that included surface soil and fill sampling (1993) and VOC surface flux measurements (2000)
- subsurface investigations that included core sampling (1995), pore-gas sampling (2001), tritium-probe sampling (2003), and borehole air-flow velocity measurements (1995–1996)

The following paragraphs provide details of these previous investigation activities.

All 68 surface samples collected in 1993 were analyzed at off-site analytical laboratories for americium-241, isotopic plutonium, and strontium-90. In addition, 47 samples were analyzed for gamma-emitting radionuclides by gamma spectroscopy; 59 samples were analyzed for tritium, PCBs, and SVOCs; and 73 samples were analyzed for isotopic uranium.

VOC surface flux was measured across MDA C in two surveys conducted in June and July 2000. EMFLUX collectors, consisting of an adsorbent cartridge suspended on a stake beneath a protective shell for a 72-h period, were used in the survey. A total of 102 samples were collected in the two surveys. Maryland Spectral Services performed the VOC analysis using gas chromatography/mass spectrometry techniques following a modified Environmental Protection Agency (EPA) Method TO-1. Additional information on surface-flux sampling and analysis protocols is provided in the EMFLUX soil gas survey report for MDA C (BES 2000, 76046).

Eleven boreholes (locations 50-09100 through 50-09110), two vertical (locations 50-09100 and 50-09104) and nine angled, were drilled in 1995 as part of the Phase I RFI. A total of 84 core samples and 55 field duplicates were collected in 1995 and 1996.

In 2003, 15 shallow pore-gas vapor probes were installed across MDA C. A total of 15 pore-gas samples were collected, one from each probe, at a depth of 2.5 ft below ground surface (bgs) using silica gel columns. These 15 near-surface pore-gas samples were sent to an off-site analytical laboratory and analyzed for tritium.

Monitoring of Tritium in Air

The Laboratory Meteorology and Air Quality Group collected biweekly airborne tritium data from the TA-50, MDA C air monitoring station beginning February 3, 2003 and ending March 15, 2004. The tritium data is reported in Table 2.4-1 as the 95% upper confidence limit (UCL) of the mean. The average tritium concentration for the monitoring period at the MDA C air monitoring station calculated as the average of the 95% UCL values is 11.5 pCi/m³.

Geophysical Surveys

A magnetometry survey was performed at MDA C in 1994 as a pilot test to locate the boundaries of subsurface disposal units. The survey could identify only ferrous materials within 12 ft bgs. A geophysical survey was performed in 2001 to delineate disposal units and to map the thickness of cover materials across the surface of MDA C. The survey indicated the pit boundaries, except where interference from a chain-link fence obscured the pit boundaries along the southern and eastern edges of MDA C. A second geophysical survey was performed in 2002 after the chain-link fence had been removed. This survey found no evidence of disposal pits outside the fenceline in the surveyed areas.

Biota Screening and Sampling

Biota sampling was conducted to determine whether any evidence of uptake and transport of contaminants by biota could be found at MDA C. On February 12, 2003, ant mounds and animal burrows across the site were field screened for gross alpha, beta, and gamma activity. On March 20, 2003, surface soil samples were collected from ant mounds and animal burrows and submitted to American Radiation Services (ARS) of New Mexico for gross alpha, beta, and gamma analyses. Samples of pine needles were collected on March 21, 2003, from all 16 ponderosa pine trees on the surface of MDA C and submitted to ARS for gross alpha, beta, and gamma analyses.

Biota sampling results indicated that burrowing mammals and ants are not transporting radionuclides from the subsurface to the ground surface at MDA C. The results also showed that pine trees had elevated levels of gross alpha and beta radioactivity, indicating that trees are able to transport radionuclides from the subsurface into their needles. Active mowing and tree removal were recommended to prevent radionuclide transport to the surface. The biota sampling activities and results are summarized in Appendix K.

Nature and Extent of Surface Soil and Fill Contamination

Elevated concentrations of radionuclides, including americium-241, plutonium-238, and plutonium-239/240, were identified in the northeast portion of MDA C and may have been associated with historical site operations, with the deposition of air-borne emissions from historical operations at TA-50, or with contaminants that may have been present in fill material placed on the site. A release of Aroclor-1260 and bis(2-ethylhexyl)phthalate may have occurred in the area of Pit 6 during operation of the site. The detected concentrations of these chemicals are bounded by other soil and fill samples where they were not detected.

Nature and Extent of Subsurface Contamination

Tuff data for metals (including cyanide) and radionuclides indicated releases to subsurface tuff have occurred below Pit 6 because these contaminants are present at concentrations exceeding background values (BVs) and/or fallout values (FVs). However, the number and locations of tuff samples were not adequate to support conclusions regarding the nature and extent of contamination beneath Pits 1–5, Shaft Groups 1 and 2, and the strontium-90 disposal shaft. Tritium pore-gas data in tuff indicated a release of tritium in the subsurface, with higher concentrations measured in the northern portions of the site below Pits 4, 5, and 6. Tritium probe data indicated a release of tritium to the atmosphere was occurring in the western regions of Pits 1 through 4, in an area west of Shaft Group 3 and north of Pit 6. The spatial extent of tritium in the subsurface was not defined.

Nature and Extent of Surface and Subsurface VOC Contamination

With only two vertical boreholes, VOC data were inadequate to define the lateral extent of vapor-phase VOCs in subsurface tuff. Based on VOC surface-flux measurements and the pore-gas data from boreholes 50-09100 and 50-10131, TCE and tetrachloroethene (PCE) were found to be the most prevalent VOCs in the subsurface at MDA C. VOC concentrations were greatest at shallower intervals at the chemical disposal pit (borehole location 50-10131). The nature and extent of VOCs in the vapor phase were not defined.

Engineering drawings ENG-R-1264 (LASL 1970, 76047) and ENG-R-4459 (LASL 1974, 38446) were used to approximate the locations of pits and shafts. Two geophysical surveys verified the general location and horizontal dimensions of the disposal pits (AGS 2001, 73710; AGS 2002, 73711) and the depth of cover thickness, although the pit boundaries inferred from the geophysical investigation did not correspond in all cases to those shown on the engineering drawings. In 2001, the depth of cover materials across MDA C was investigated using ground penetrating radar (GPR) (AGS 2001, 73710). The cover thickness over Pits 1–6 was estimated to range from approximately 2.5 ft to about 8 ft. However, the cover thickness over Shaft Groups 2 and 3, near the western ends of Pits 1–4, and the Chemical Pit was estimated to be less than 1 ft. The depths of the shafts and pits were documented in the OU 1147 work plan (LANL 1992, 07672) and were based on historical documents, but the elevation data were not documented. Subsequent additions of cover material have increased the elevation across the site. The surface elevations of the shafts and pits at the time of excavation were estimated from the tuff/soil interface logged in the 1995 RFI borehole logs.

The results of the investigations conducted under the OU 1147 work plan (LANL 1992, 07672) indicated that VOCs and radionuclides are present in the vadose zone. The vertical and horizontal extent of contamination was not defined.

3.0 SCOPE OF ACTIVITIES

This section describes the investigation activities conducted at MDA C in May 2004 and from August 2005 to August 2006, in accordance with the approved MDA C investigation work plan (LANL 2005, 91547; NMED 2005, 90165; NMED 2005, 91695). Activities included collecting surface samples at the east end of the site, conducting a geophysical survey to better define the locations of Pits 1–4, and collecting subsurface samples at numerous locations.

A total of 33 boreholes were drilled to collect subsurface tuff and pore-gas samples to determine the nature and extent of contamination at MDA C. Characterization drilling was completed in August 2006. Three additional boreholes were subsequently drilled to determine whether any correlation exists between VOC concentrations in pore-gas and core samples.

The quality procedures (QPs) and standard operating procedures (SOPs) used during 2004–2006 characterization activities are listed in Table B-1.0-2 in Appendix B. The most current versions of all QPs and SOPs were used to implement the approved MDA C investigation work plan (LANL 2005, 91547; NMED 2005, 90165; NMED 2005, 91695). Specific details of the methods used for drilling and sampling activities are presented in Appendix B, along with descriptions of deviations from the approved work plan. The data collected at the site are summarized in section 6 and in Appendix F.

3.1 Health and Safety Measures

Screening for radioactivity was performed to ensure worker safety, to determine whether samples could be transported, and to identify locations for additional sampling. For boreholes within the nuclear environmental site (NES) boundary, core barrels were screened for radioactivity immediately upon extraction from the borehole using an Eberline E-600 radiation meter with SHP 380 alpha/beta/gamma probe. In addition, cuttings were screened on a continual basis as they were extracted from the borehole. Core sections were again screened upon opening the core barrel. Screening measurements were compared to local (MDA C) background levels that were determined at least once each day during field activities. The field-screening process, including determining local daily background levels, is described in Appendix B.

Radiological screening instruments were provided by the Laboratory's radiation instrumentation and calibration team, which is part of the Health Physics and Measurements group of the Health, Safety, and Radiation Protection Division (HSR-4). Calibration records can be obtained using the HSR-4 instrument identification numbers recorded in the weekly performance test logs. Weekly performance checks were performed on all radiological field-screening instruments in accordance with the Laboratory's Radiation Protection Program (RPP) and HSR-4 procedures. The performance check records are also on file at HSR-4 and are available upon request.

Each 5-ft interval of core along the borehole was screened for VOCs using a MiniRAE 2000 photoionization detector (PID) with an 11.7-electron-volt (eV) lamp. Calibration of the PIDs was performed at least once each day during field activities, and a yearly calibration was performed by the vendor. Daily calibration was performed using a standard source of 100 ppm isobutylene. The rated detection limit for the PIDs used is 0.2 ppm.

Ambient air conditions at the site were monitored during all drilling and related activities using a Data Ram portable dust monitor. Action levels for dust monitoring were 15.7 mg/m³ for inorganic chemicals and 22.2 mg/m³ for radionuclides. Surface air conditions did not exceed dust action levels for either inorganic chemicals or radionuclides. If the action levels had been exceeded, engineering controls would have been put in place or work would have stopped.

Health and safety measures and monitoring activities did not adversely affect or limit the completion of any investigation activities or result in changes to the scope of activities.

3.2 Field Survey

A radiological survey was conducted east of the MDA C boundary and outside the fenceline on May 4, 2004, to identify potential surface or near-surface radiological contamination and select biased surface sampling locations. The survey was performed with a Berkeley Nucleonics Surveillance and Measurement System, a portable gamma spectroscopy instrument with an integrated multichannel analyzer. This instrument uses a sodium iodide detector to identify multiple isotopes and the isotope specific/total dose rates at each survey location. The radiological survey was conducted on a grid with 15-by-15-ft spacing. The results of the radiological survey, including surveyed coordinates, are presented in Table 3.2-1.

In April 2006, a geophysical investigation was performed by ARM Group, Inc., to delineate the lateral boundaries of Pits 1–4 and to locate any anomalies that could be attributed to the disposal shafts (ARM 2006, 94164). Four geophysical techniques were used: high-sensitivity metal detector (EM61), cesium vapor magnetometer, terrain conductivity (EM31), and GPR.

A seismic survey was also performed in April 2006 by Quantum Geophysics, Inc. The survey used the multichannel analysis of surface waves (MASW) method to identify and map the walls between Pits 1–4 (Lee 2006, 94163). The survey incorporated a Geometrics StrataVisor NZXP 24-channel seismograph and a Geometrics Geode 24-channel seismograph with Oyo Geospace 4.5-Hz geophones connected by 2 24-takeout seismic spread cables. Seismic waves were generated by striking an aluminum plate, placed on the ground surface, with a 12-lb sledge hammer (Lee 2006, 94163).

All sampling locations were surveyed either by traditional surveying methods or by differentially corrected global positioning system (GPS). The survey methods are described in Appendix B. The surveyed coordinates for all sampling locations are presented in Appendix E (on CD).

3.3 Surface Investigation

3.3.1 Collection of Surface Samples

Six surface soil sampling locations were selected based on the gamma spectroscopy survey conducted at the site (section 3.2). Six discrete grab samples and one field duplicate were collected from 0 to 0.5 ft bgs at each of the six locations. The surface samples were collected according to SOP-06.09. A stainless-steel scoop and bowl were used to homogenize the samples, which were then transferred to sterile sample collection jars. Figure 3.3-1 shows the locations of all surface samples at MDA C. Table F-2.0-1 in Appendix F summarizes the surface samples collected.

3.3.2 Analysis of Surface Sample

The six surface soil samples collected in 2004 were analyzed at an off-site analytical laboratory for americium-241, gamma-emitting radionuclides by gamma spectroscopy, isotopic plutonium, isotopic uranium, and strontium-90. Table F-2.0-1 summarizes the laboratory analyses conducted on all surface samples collected at MDA C (1993 and 2004).

3.4 Subsurface Investigation

3.4.1 Collection of Core Samples

A total of 33 boreholes were drilled during the 2005–2006 subsurface investigation at MDA C to define the vertical and lateral extent of site contamination (Table 3.4-1). An additional three boreholes (locations 50-26823, 50-26824, and 50-26825) were drilled to collect paired core and pore-gas samples for the purpose of correlating VOC concentrations in tuff (core) samples with VOC concentrations in pore-gas samples. Pore-gas samples were collected for VOCs and tritium, and corresponding core samples were collected for VOCs. The borehole locations are shown in Figure 3.4-1, and Table 3.4-2 lists the borehole numbers from the approved investigation work plan (LANL 2005, 91547) and their corresponding locations. One borehole at location 50-24818 was drilled to a depth of 620 ft bgs to define the vertical extent of contamination as well as to determine the nature and depth of fracture zones and any possible perched saturation zones. This deep borehole penetrated the Cerro Toledo interval, which contains intermittent sands and gravels within which perched saturation zones have been found at other locations within the Laboratory boundary. The remaining boreholes ranged in depth from 90 to 300 ft bgs. Appendix C presents the borehole logs generated during characterization drilling in 2005–2006 at MDA C. At least five depth intervals were sampled in each borehole (except at borehole location 50-25621).

Because EnCore samples were not collected from the upper portion of borehole location 50-24818, borehole location 50-25621 was drilled to 90 ft adjacent to borehole location 50-24818 to collect VOC samples using EnCore samplers from the same depths as core samples collected in the upper portion of borehole location 50-24818.

Figure 3.4-1 shows the locations of boreholes drilled at MDA C in 1995–1996 and in 2005–2006. Details of the methods used for drilling and sampling are presented in Appendix B. The tuff samples collected are summarized in Table F-2.0-2 in Appendix F.

As directed by the approved investigation work plan (LANL 2005, 91547), core samples were initially selected for laboratory analysis based on the highest pore-gas screening measurement within each 50-ft-depth interval downhole. However, the locations of three samples were fixed in each borehole at the following depths: next to the adjacent disposal unit, below the adjacent disposal unit, and at the borehole total depth (TD). After February 23, 2006, pore-gas screening was not used for sample interval selection because no correlation was found between screening and analytical laboratory results, as approved in an email message from NMED (Chamberlain 2006, 94162).

Core samples were also collected to test for possible contamination transport at significant fractures. Samples were collected above, within, and beneath those fractures that were large enough to make up 80% of the sample volume required by the suite's sampling containers.

Subsurface samples were collected from a minimum of five depths in each borehole. Additional samples were collected at fracture zones, or zones of elevated moisture content. Quality assurance (QA)/quality control (QC) samples were collected according to SOP-01.05, Field Quality Control Samples, at a frequency of approximately 10%. Table F-2.0-2 in Appendix F summarizes the samples collected.

Three drilling rigs were used for subsurface sampling; a CME 750, the Failing F-10, and the Denver/Gardner 1500. The three drilling rigs were equipped with wireline core retrieval systems, 4-in.-outer-diameter (O.D.) stainless steel core barrels, and Truspin 9-in O.D., 4.25-in.-inner-diameter (I.D.) hollow-stem augers (HSAs). The Failing F-1500 drill rig conducted drilling by air coring to extend the borehole beyond the depth of the HSA drilling. During drilling with the HSA technique, the cuttings were brought to the surface through the rotating augers on the outside of the drill stem. Continuous core was recovered by stainless-steel core barrels through the center of the 4.25-in. HSAs drill string. At the surface, the cuttings and core were surveyed for radiological and hazardous material content(s) and for matrix identification by visual and physical inspection by the geologist.

Drilling at borehole location 50-24818 could not be completed to the required depth using HSA drilling; therefore, air coring was used to complete drilling to a TD of 620 ft bgs. During retrieval of core material, a dust-suppression system was used to completely contain and process the air through a high-efficiency particulate air (HEPA) filter before releasing the air to the atmosphere. Once screening of the core barrels was conducted, the core barrels were opened and the core material was sampled. Core sampling activities included taking portions of the core material and placing it in the appropriate sampling containers (glass, amber glass, poly jars, resealable poly bags, or EnCore samplers). The samples were labeled, documented in sample collection logs and chain-of-custody forms, affixed with custody seals, and preserved for transport to the radiation-screening laboratory (ARS and the Laboratory's Sample Management Office [SMO]).

Field screening was conducted continuously during drilling, as described in Appendix B. Each core section was screened for radioactivity and VOCs immediately after it was removed from the borehole, and the results were recorded in the field logbook. Screening for radioactivity using an Eberline E-600

alpha/beta/gamma radiation meter within 1 in. of the sample was performed on each core while it was still in the core barrel. Field screening for VOCs was performed using a PID equipped with an 11.7-eV lamp.

Field screening for the explosives TNT and research department explosive (RDX, also hexahydro-1,3,5-trinitro-1,3,5-triazine) was conducted for all boreholes using DTECH Soil Extraction Packs and TNT or RDX explosives test kits. Samples were collected every 10 ft to a maximum depth of 60 ft using a core-barrel sampler.

Field screening was performed primarily for worker health and safety purposes but was also used to identify additional samples to be collected and laboratory analysis to be performed because of elevated field-screening results. According to the approved MDA C investigation work plan (LANL 2005, 91547; NMED 2005, 90165; NMED 2005, 91695), the depth interval with the highest field-screening result for organic vapors would be sampled and analyzed for dioxins, furans, and high explosive (HE) compounds.

3.4.2 Analysis of Core Samples

All core samples were submitted through the SMO to approved off-site analytical laboratories and analyzed for various combinations of radionuclides (gamma-emitting radionuclides, americium-241, strontium-90, isotopic uranium, and isotopic plutonium), target analyte list (TAL) metals, perchlorate, cyanide, nitrate, PCBs, dioxins and furans, HE, VOCs, and SVOCs. Table F-2.0-2 in Appendix F summarizes the laboratory analyses performed for each of the core samples collected. The analytical methods used for the various analyses are presented in Appendix D.

3.4.3 Geotechnical Characterization

Geotechnical characterization was performed in 2006 at deep borehole location 50-24818 to determine geotechnical properties of the bedrock underlying MDA C. Eight geotechnical samples were collected at depths ranging from 71.5–329 ft bgs. Geotechnical samples were analyzed for moisture content, bulk density, porosity, saturated hydraulic conductivity, and pH. The geotechnical analytical results are discussed in section 4.9.

Volumetric water-content profiles were collected in 19 boreholes across MDA C using neutron thermalization (neutron probe). Measurements were made in April and May 2006 with a Mount Sopris logging system using a CPN neutron source. One-time measurements were taken at 0.5-ft increments over the entire depth of each borehole. All field neutron probe measurements were converted to volumetric water content using a calibration regression derived from comparing neutron probe measurements to corresponding core sample laboratory-determined volumetric moisture contents from four boreholes at MDA C. The results of the neutron probe measurements are presented in section 4.9 and in Appendix L.

3.4.4 Collection of Pore-Gas Samples

Subsurface pore-gas samples were collected from each of 34 boreholes between August 2005 and August 2006 (Table 3.4-1). A total of 210 first-round pore-gas samples were collected, along with 23 field duplicate samples, and analyzed for VOCs and tritium. These samples included pore-gas samples that were collected in 2005–2006 from two boreholes (locations 50-09100 and 50-10131) that had been drilled before the 2005–2006 investigation. Pore gas was not collected from borehole location 50-25621 (only EnCore samples from core were collected at that location).

A second round of pore-gas samples were collected from some of the boreholes to measure the concentrations of VOCs in pore gas after drilling was completed to allow borehole conditions to equilibrate. Second-round samples were collected at least 30 days after the initial pore-gas samples were taken using the same collection methods. A total of 168 second-round pore-gas samples were collected, along with 16 field duplicate samples, and analyzed for VOCs and tritium.

An additional three boreholes (locations 50-26823, 50-26824, and 50-26825) were drilled to collect paired core and pore-gas samples to correlate VOC concentrations in tuff (core) samples with VOC concentrations in pore-gas samples. Pore-gas samples were collected for VOCs and tritium, and corresponding core samples were collected for VOCs.

Figure 3.4-1 shows the locations of all boreholes sampled for pore-gas. Table 3.4-1 presents a list of pore-gas sample depths. At some borehole locations, sloughing of material into the bottom of the borehole prevented collection of pore-gas samples at the TD of the borehole, as indicated by some differences in the maximum core sample depths and maximum pore-gas sample depths. The pore-gas samples collected are summarized in Table F-2.0-3 of Appendix F.

The pore-gas samples were collected in SUMMA canisters using a straddle-packer system capable of isolating discrete 1-ft sample intervals within the boreholes. The pore-gas samples were collected in the field using SOP-06.31, Sampling of Subatmospheric Air.

Subsurface samples for tritium were also collected during the pore-gas sampling events. The same sample depths were used for tritium as for VOCs. Samples for tritium analysis were collected in silica gel sample tubes.

Field trip blank samples were collected by pulling calibration gas (99.9% ultrahigh-purity nitrogen) through the packer sampling apparatus. Field duplicate samples were used to evaluate the reproducibility of field sampling techniques. The QA/QC samples were collected in accordance with SOP-01.05, Field Quality Control Samples, at a frequency of approximately 10%.

3.4.5 Analysis of Pore-Gas Samples

The pore-gas samples collected in 2005–2006 were submitted through the SMO to off-site analytical laboratories for VOC analysis by EPA Method TO-15.

Tritium samples were submitted through the SMO to an off-site analytical laboratory for tritium analysis using EPA Method 906.0.

3.5 Storage and Disposal of Investigation-Derived Waste

Investigation-derived waste (IDW) resulting from the 2005-2006 activities included drill cuttings, returned sample material, personal protective equipment (PPE), and miscellaneous materials used during dry decontamination of sampling equipment (e.g., paper towels and nitrile gloves). The PPE and miscellaneous materials may have come into contact with environmental media containing measurable levels of contamination. The IDW was characterized using analytical data from samples collected from the waste containers. Review of the data indicates that the IDW includes low-level radiological waste, hazardous waste, and solid waste. The waste is currently being managed on-site at TA-50 and will ultimately be disposed of at an appropriate, permitted off-site treatment, storage, and disposal facility. Although final disposition of the waste has not yet been done, all currently available waste documentation, including waste characterization strategy forms (WCSFs), WCSF amendments, and waste profile forms, are provided in Appendix I. Any remaining waste disposition documents not available

at the time this report is published will be included in an addendum to this investigation report when waste disposition is completed.

4.0 FIELD INVESTIGATION RESULTS

4.1 Surface Conditions

MDA C is located on Mesita del Buey, a finger-shaped mesa that trends southeast (Figure 4.1-1). The elevation of Mesita del Buey ranges from 7210 to 7280 ft. The topography at MDA C slopes gently from west to northeast, gradually getting steeper across the northeastern quadrant of the site toward Ten Site Canyon. At MDA C, Mesita del Buey is approximately 2000 ft wide and is bounded by Ten Site Canyon to the north and Two Mile Canyon 750 ft to the south, across Pajarito Road (Figure 4.1-1).

No surface structures other than the surrounding chain-link fence exist at the site. The outlines of the pits and shafts are not visible at the surface because of the fill material emplaced on top of the site.

Vegetation at MDA C consists of a mixture of grasses, small shrubs, and a few piñon pine and juniper trees, which are limited to the extreme north-central edge of the site. The site has been disturbed by excavation and emplacement of backfill and has historically been maintained by mowing and removal of trees. At the time of this investigation, no trees were growing in the areas of the waste pits or shafts. Pine trees were found growing on the site as recently as 2003, when biota sampling was conducted. All trees have since been removed by cutting at ground level.

Because of the relatively flat topography and the presence of vegetation, erosion at MDA C is minimal. Erosion and sediment transport potential is numerically rated from 1 to 100 using a matrix system based on SOP-02.01, Surface Water Site Assessments. SWMUs with scores greater than 60 are considered to have a high erosion potential. In 2002, MDA C was determined to have an erosion matrix score of 54.8, indicating a moderate erosion potential for the site. The surface water assessment for MDA C is presented in Appendix H.

No streams exist on Mesita del Buey; water flows only as stormwater and snowmelt runoff on the mesa and in small drainages off the mesa to the northwest and the south. Runoff consists primarily of sheet flow from MDA C into Ten Site Canyon. Sheet erosion appears to be occurring around the east and northeast portions of the site. The RLWTF at TA-50 [SWMU 50-006(d)] discharges treated effluent to the National Pollutant Discharge Elimination System-permitted Outfall 051 in Mortandad Canyon.

4.1.1 Relationship to Other SWMUs and AOCs

SWMU 50-006(a) is located directly north of Pit 5 at the head of Ten Site Canyon. SWMU 50-006(a) includes the area affected by two accidental operational releases in 1974 of untreated radioactive wastes and unknown chemicals. The outfall area was partially remediated in 1981 when 70 m³ of contaminated soil was removed. Although SWMU 50-006(a) has impacted Ten Site Canyon, the release did not affect MDA C since the SWMU is located downgradient from MDA C (LANL 2005, 91547, Figure 2.3-1).

Emissions from exhaust stacks at a number of the buildings at TA-50 were designated as SWMU 50-006(c). Radioactive emissions from these stacks may potentially have been deposited on surface soils within TA-50, including MDA C. Any surface contamination that may have deposited on MDA C related to stack emissions would be accounted for in the surface soil samples collected during the Phase I RFI.

The other SWMUs within TA-50 include two areas of active underground tanks [SWMUs 50-002(a) and 50-002(c) and Consolidated Unit 50-004(a)-00]; a decommissioned aboveground tank [SWMU 50-002(d)]; a decommissioned septic system [SWMU 50-011(a)]; a number of storage areas [SWMUs 50-003(a,b,c,d,e)]; an active underground drainage system [SWMU 50-001(b)]; and decommissioned waste lines and tanks [Consolidated Unit 50-004(a)-00]. These SWMUs lie 4 to 25 ft below grade, and no viable transport pathways for releases related to these SWMUs exist that can affect MDA C (LANL 2005, 91547, Figure 2.3-1).

Based on the Phase I RFI data for MDA C and adjacent SWMUs at TA-50 and TA-35, the only area within close proximity that may have been affected by MDA C is Ten Site Canyon (Figure 4.1-1), which is considered an AOC. Eroded surface soils from MDA C, in addition to soils and contaminant releases from other SWMUs and/or AOCs at TA-50 and other TAs, have been deposited in the canyon bottom and stream banks (Nyhan et al. 1978, 05702).

4.2 Drilling Investigations

No exploratory drilling or excavation was performed at MDA C. All drilling performed was for the purpose of collecting samples and for geotechnical characterization, as required by the approved investigation work plan (LANL 2005, 91547). Thirty-six boreholes, ranging in depth from 90 to 620 ft bgs, were drilled for sample collection. Borehole sampling is discussed in section 3.4.1, and borehole logs for boreholes drilled and/or sampled in 2005–2006 are provided in Appendix C.

4.3 Geophysical Survey

The results of the geophysical survey completed in 2006 provide clearer delineation of the boundaries of Pits 1–4 than was available previously. The interpreted pit boundaries based on these data show a significant variance in some cases with respect to historical information. Although the shapes and sizes of the pits are generally consistent with engineering drawings and other historical information, the interpreted locations are offset by as much as 25 ft from the historical data. The disposal shafts along the western side of Pits 1–4 are shown as anomaly locations that vary by less than 3 ft in comparison to historical data. The shafts located between Pits 1 and 3 that are shown in historical drawings were not observed in the geophysical data. If the shafts still exist, they were not observed either because they contain very little metal or they are too deep (greater than approximately 15 ft) to be detected (ARM 2006, 94164). In general, the geophysical data indicate that the buried waste materials are contained within the rectangular shapes of the interpreted pit boundaries. However, anomalies attributed to small amounts of metallic debris were observed between the interpreted pit boundaries and are assumed to be contained within the cover materials.

It has been assumed that Pits 1–4 are separated from one another by walls of intact tuff bedrock. However, the seismic survey could not confirm this assumption (Lee 2006, 94163). The seismic survey results noted the wall between Pit 2 and Pit 3 was the most prominent, the wall between Pit 1 and Pit 2 was less prominent or well-defined, and no wall between Pit 2 and Pit 4 was observed (Lee 2006, 94163). An overlay of the geophysical, seismic, and historical pit boundary data is included in Figure 4.3-1.

4.4 Subsurface Conditions

The general stratigraphy of the bedrock beneath MDA C can be inferred from descriptions of the regional geology (Broxton and Eller 1995, 58207; Broxton et al. 1995, 50119) and has been further defined using geologic logs from the boreholes drilled at the site as part of this investigation (Appendix C).

- The predominant tuff unit at the surface is Unit 3 of the Tshirege Member of the Bandelier Tuff (Qbt 3), a series of volcanic ashfall and ashflow deposits. Unit Qbt 3 is approximately 100 ft thick at MDA C, borehole location 50-24818.
- Below Unit 3 is Unit 2 of the Tshirege Member (Qbt 2), which is approximately 65 ft thick at MDA C.
- Below Unit 2 is Unit 1v of the Tshirege Member (Qbt 1v), which is approximately 75 ft thick at MDA C.
- Below Unit 1v is Unit 1g of the Tshirege Member (Qbt 1g), which is approximately 75 ft thick at MDA C.
- Below Unit 1g is approximately 2 ft of pumice (the Tsankawi Pumice, Qbtt).
- Below Qbtt is the Cerro Toledo interval (Qct), a zone of reworked tuff that is approximately 65 ft thick at MDA C.
- Below the Cerro Toledo interval is the Otowi Member of the Bandelier Tuff (Qbo), which is approximately 230 ft thick at MDA C.
- Below the Otowi Member lies the Guaje Pumice Bed, which is the deepest unit encountered at MDA C. The Guaje Pumice Bed is typically about 35-ft thick, but the deepest borehole was advanced only 10 ft into the unit (610–620 ft bgs at borehole location 50-24818).
- Below the Guaje Pumice Bed are the Puye Formation and the Cerros del Rio basalts with a combined thickness of at least 680 ft in this area (these units were not encountered in any boreholes at MDA C). The Puye Formation contains the regional groundwater aquifer.

A generalized stratigraphic cross-section is shown in Figure 4.4-1, and the stratigraphy as identified in MDA C boreholes is presented in Figure 4.4-2.

Known subsurface features at MDA C include disposal pits and shafts, as discussed in sections 1.1, 2.1, and 2.2. These features were specifically avoided during this investigation to prevent waste containers or loose material in the pits and shafts from being disturbed.

A buried utility corridor extends roughly east to west along the southern boundary of MDA C, between the boundary fence and Pajarito Road (Figure 4.4-3). This utility corridor contains electrical, water, industrial waste, and communications lines. The utilities were not disturbed during this investigation.

4.5 Monitoring Well Construction and Boring Abandonment

Monitoring wells were not installed as part of this investigation. An as yet undetermined number of the boreholes drilled during the investigation will be instrumented as pore-gas monitoring wells. None of the investigation boreholes have been abandoned. The boreholes have been fitted with surface casings to a depth of 10 ft bgs and have locked covers at the surface. When pore-gas monitoring wells have been installed in selected boreholes, the remaining boreholes will be abandoned following SOP-05.03.

4.6 Groundwater Conditions

Groundwater occurs in three distinct modes on the Pajarito Plateau:

1. the deep regional aquifer, the upper surface of which is typically contained within the conglomerates and sandstones of the Puye Formation;
2. intermediate-depth saturated horizons; and
3. shallow alluvial groundwater found in canyon-bottom alluvium (LANL 1998, 59730).

The top of the regional aquifer is typically 1100–1200 ft bgs on the mesas of the Pajarito Plateau. In characterization well R-14, located in Ten Site Canyon approximately 3000 ft (900 m) east of MDA C, groundwater was encountered at a depth of 1182 ft bgs (LANL 2003, 76062, p. 5). In intermediate well I-1, located approximately 2300 ft northeast of MDA C (Figure 4.1-1), groundwater was not detected to a depth of 825 ft bgs (Kleinfelder 2006, 92494). Data from other wells at the Laboratory and predictions of the hydrogeologic conceptual model for the Pajarito Plateau place the regional aquifer at an approximate depth of 1300 ft below MDA C (LANL 1998, 59599). A map showing elevations of the top of the regional aquifer across the Laboratory is presented in Figure 4.6-1.

The regional aquifer is the only known aquifer in the Los Alamos area capable of producing a municipal and industrial water supply. The direction of groundwater flow in the regional aquifer is to the east-southeast, toward the Rio Grande. The velocity of groundwater flow ranges from about 20 ft/yr to 250 ft/yr (LANL 1998, 59599). Details of depths to the regional aquifer, flow directions and rates, and well locations (Figure 4.6-1) are presented in various Laboratory documents (Purtymun 1995, 45344; LANL 1997, 55622; LANL 2000, 66802).

No perched groundwater or intermediate-depth saturated horizons were encountered in previous investigations at MDA C (LANL 1998, 59599; LANL 2005, 91547, p. 6) or in any of the boreholes drilled during this investigation. MDA C is located on a mesa top, so no shallow alluvial groundwater is present in the immediate vicinity. Alluvial groundwater is not known to be present in Ten Site Canyon to the north and northeast of MDA C.

4.7 Surface Water Conditions

No permanent surface water exists at MDA C. Occasional surface runoff occurs as a result of snowmelt or seasonal thunderstorms that can produce significant rainfall in short time periods. Surface runoff may occur as minor sheet flow that drains toward the east-northeast into the upper portion of Ten Site Canyon, which borders the site on the northeast corner. No significant drainage channels exist on the site.

In 2002, the Laboratory conducted a surface water assessment at MDA C following the mitigation of the surface subsidence, which occurred along the northern boundary of MDA C. MDA C received an erosion matrix score of 54.8, indicating a moderate erosion potential. The surface water assessment is included in Appendix H.

4.8 Surface Air and Subsurface Vapor Conditions

Surface air conditions were monitored for health and safety purposes during the investigation using a Data Ram portable dust monitor. Surface air sampling using discrete samples was not included as part of the investigation, nor was surface air monitoring. Surface air conditions did not exceed dust action levels (section 3.1) for either inorganic chemicals or radionuclides, and did not result in any impacts to the investigation activities. Subsurface vapor sampling results are discussed in section 6.4.

4.9 Materials Testing Results

Geotechnical characterization samples were collected from borehole location 50-24818. Analyses performed included calculated total porosity, bulk density, moisture content, pH, and saturated hydraulic conductivity. The results of geotechnical characterization sampling are presented in Table 4.9-1.

The total calculated porosity ranged from 38.90 to 67.00%, with the highest porosity in the Tsankawi pumice (Qbtt). Bulk density ranged from 0.88 g/cm³ (Qbtt) to 1.62 g/cm³ (Qbt 3). The moisture content ranged from 6.80 to 31.30%, with the highest moisture content at a depth of 236.5–237.5 ft in tuff unit Qbt 1v. The pH ranged from 6.01 (Qbt 1g) to 8.77 (Qbo). The saturated hydraulic conductivity ranged from a low of 0.00024 cm/sec in tuff unit Qbt 3 to a high of 0.02 cm/sec in the Tsankawi pumice (Qbtt). Porosity, bulk density, and saturated hydraulic conductivity correspond well and reflect the variation between the extremes of welded tuff at the Qbt 3/Qbt 2 boundary and the loose pumice deposit of unit Qbtt. The moisture content is generally low, with the highest moisture content occurring at the base of unit Qbt 1v.

Volumetric water-content profiles were collected in 19 boreholes across MDA C using neutron thermalization (neutron probe). All field neutron probe measurements were converted to volumetric water content using a calibration that was established based on known water-content values in core taken from four of the boreholes. Because logging was done in open boreholes where the borehole diameters varied, the volumetric water-content data do not have the same accuracy as measurements from a uniform diameter borehole. Despite this limitation, the agreement between the laboratory-based water-content values and field-based values is generally good.

In general, the water contents were low, with average water contents for each borehole/unit below 13%, and most values less than 10%. Maximum water contents were also low (with the exception of a few values in the 18-20% range), and the average maximum values for the various units were less than 18%. Most of the water content values indicate percent saturations below 25%, and a good number of those values indicate water contents substantially below that. Thus, none of the boreholes appeared to contact any zones of saturation, and much of the mesa subsurface is very dry.

Vadose zone fluxes and residence times were also measured using a chloride mass-balance approach. This approach involves measuring chloride concentrations in vadose zone pore water with depth. Relatively low chloride contents indicate a high downward flux because water is able to move through the vadose zone at a fast enough rate to flush chloride from the vadose zone. At MDA C, all of the boreholes measured had substantial inventories of chloride, which qualitatively indicates that fluxes are low and the residence times are long. Residence times for a packet of water to travel 150 ft in the vadose zone at MDA C was estimated to be greater than 1000 yr for the majority of the boreholes, and at two of the boreholes, the results were greater than 10,000 yr.

Additional details of neutron probe moisture measurements and chloride-based flux estimates are provided in Appendix L.

5.0 REGULATORY CRITERIA

This section describes the criteria used to screen chemicals of potential concern (COPCs) and to evaluate potential risk to ecological and human receptors. Regulatory criteria identified in the Consent Order include cleanup standards, risk-based screening levels, and risk-based cleanup goals and are established by medium.

5.1 Screening Levels

The human health risk screening assessments follow guidance provided by the EPA and NMED. The human health industrial soil screening levels (SSLs) for chemicals are obtained from NMED guidance (NMED 2006, 92513). If screening levels are not available from NMED, the EPA Region 6 (EPA 2005, 91002) or EPA Region 9 (<http://www.epa.gov/region09/waste/sfund/prg/index.html>) SSLs are used. For radionuclides, the industrial screening action levels (SALs) are derived according to Laboratory guidance (LANL 2005, 88493) using the residual radioactive (RESRAD) model, Version 6.21. The SSLs and SALs used in the human health risk/dose screening assessments are presented in Tables G-5.0-1 through G-5.0-3 in Appendix G.

5.2 Ecological Screening Levels

The ecological risk screening assessment follows guidance provided in the Laboratory's "Screening Level Ecological Risk Assessment Methods, Revision 2" (LANL 2004, 87360). The evaluation involves the calculation of hazard quotients for all chemicals of potential ecological concern (COPECs) and all appropriate screening receptors. The ecological screening levels (ESLs) for terrestrial receptors are taken from the ECORISK Database, Version 2.2 (LANL 2005, 90032) and are presented in Table G-4.0-4 in Appendix G.

5.3 Cleanup Standards

As specified in Section VIII.B.1 of the Consent Order, the screening levels will be used as soil cleanup levels unless they are determined to be impracticable or unless values do not exist for the current and reasonably foreseeable future land use. Because the current and reasonably foreseeable future land use is industrial, industrial SSLs/SALs are the cleanup levels for MDA C.

The cleanup goals specified in Section VIII of the Consent Order are a target risk level of 10^{-5} for carcinogens and a hazard index (HI) of 1.0 for noncarcinogens. For radionuclides, the target dose is 15 mrem/yr based on DOE guidance (DOE 2000, 67153). The screening levels presented in Appendix G (Tables G-5.0-1 through G-5.0-3) are based on these cleanup goals.

5.4 Screening of Pore-Gas Potential for Groundwater Contamination

The Consent Order does not provide screening levels for VOCs in pore gas. VOC pore-gas data were screened to determine whether contaminants are a potential source of groundwater contamination through migration of pore gas to groundwater. This screening process, discussed in Appendix G, accounts for equilibrium partitioning between VOCs in the gas and liquid phases and compares measured concentrations of VOCs in pore gas to concentrations required to cause groundwater cleanup standards to be exceeded.

6.0 SITE CONTAMINATION

6.1 Soil and Tuff Sampling

As reported in Appendix B of the approved MDA C investigation work plan (LANL 2005, 91547), previous investigations were conducted at MDA C from 1993 to 2002, based on the RFI work plan for OU 1147 (LANL 1992, 07672). Those investigations included collecting and analyzing 68 surface soil and fill samples and 82 core samples from two vertical and nine angled boreholes.

As directed by the 2003 MDA C work plan (LANL 2003, 87392), a total of six surface soil samples, along with one field duplicate sample, were collected from the east end of MDA C in 2004 (Figure 3.3-1) using the spade-and-scoop method described in Appendix B of this investigation report. The surface samples were analyzed for radionuclides (gamma-emitting radionuclides, americium-241, strontium-90, isotopic plutonium, and isotopic uranium). All soil and fill samples, including those collected before 2004, are summarized in Table F-2.0-1 in Appendix F.

A total of 209 tuff samples, along with 22 field duplicate samples, were collected from 33 borehole locations in 2005–2006 (Figure 3.4-1). The tuff samples collected in 2005–2006 characterization activities are summarized in Table F-2.0-2 in Appendix F. The 2005–2006 sampling was directed by the approved MDA C investigation work plan (LANL 2005, 91547). The tuff samples were collected using a drill rig and core barrel sampling methods, as described in Appendix B. Tuff samples collected in 2005–2006 were analyzed for various combinations of TAL metals, perchlorate, cyanide, nitrate, PCBs, dioxins and furans, explosive compounds, VOCs, SVOCs, and radionuclides (gamma-emitting radionuclides, americium-241, strontium-90, isotopic plutonium, and isotopic uranium). Not all samples were analyzed for the analyses listed.

6.2 Soil and Tuff Sample Field Screening Results

Radiological and organic chemical vapor field screening performed are described in sections 3.1 and 3.4.1.

Organic vapor screening was initially performed on borehole samples to determine the final sample depth at each location. However, after initial laboratory analytical results for VOCs were received, it was determined that no correlation existed between field-screening and analytical results. Use of PID field screening for the purpose of determining final sample depth was discontinued after February 23, 2006 with NMED's concurrence (Chamberlain 2006, 94162).

Field-screening results did not indicate radioactivity elevated above twice the local background levels or detected organic vapors above predetermined action levels. No field-screening results led to a change in sampling location, depth, or analytical requests, and no actions related to health and safety were taken as a result of field screening. The field-screening results were recorded in sample collection logs, which are included in Appendix E. Field screening results for 2005–2006 borehole samples are presented in Table 6.2-1.

Neither TNT nor RDX were detected during field screening for HE. All screening results were less than 0.5 ppm for the HE compounds and are included in Table 6.2-2.

6.3 Soil and Tuff Sample Analytical Results

Analytical results for all soil/fill and tuff samples are discussed in Appendix F and summarized below. Tables F-2.0-1, F-2.0-2, and F-2.0-3 in Appendix F present the samples collected and analyses requested for each sample. Tables F-2.1-1, F-2.2-1, F-2.4-1, F-2.5-1, F-2.8-1, and F-2.9-1 in Appendix F present the frequencies of inorganic chemicals, radionuclides, and organic chemicals detected or detected above BVs. Tables 6.3-1, 6.3-2, 6.3-3, 6.3-4 and 6.3-5 present the analytical results for samples with inorganic chemicals, radionuclides, and organic chemicals detected or detected above BVs or FVs.

Appendix F presents an overview of the process for identifying COPCs. Inorganic chemicals are identified as COPCs based on comparisons of site data to applicable background data. Radionuclides are identified as COPCs based on comparisons to BVs or FVs, if applicable, or by detection status if no BV or FV applies because of media or sample depths. Organic chemicals are identified as COPCs based on

detection status (all detected organic chemicals are COPCs). A summary of all COPCs identified at MDA C is presented in Table F-1.2-1.

6.3.1 Inorganic Chemicals

The following 21 inorganic chemicals are identified as COPCs in tuff at MDA C:

aluminum, antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, cyanide, iron, lead, manganese, mercury, nickel, nitrate, perchlorate, selenium, silver, vanadium, and zinc

The frequency of inorganic chemicals detected or detected above BVs in tuff is presented in Table F-2.2-1 in Appendix F. The concentrations of inorganic COPCs detected or detected above BVs in tuff are presented in Table 6.3-1 and on Figures F-2.2-1 and F-2.2-2.

No inorganic chemical results for surface soil or fill, other than screening-level data, are available (Tables F-2.1-1 and F-2.1-2).

6.3.2 Radionuclides

The following 15 radionuclides were identified as COPCs in soil/fill and tuff at MDA C:

americium-241, cesium-134, cesium-137, cobalt-60, europium-152, plutonium-238, plutonium-239, ruthenium-106, sodium-22, strontium-90, thorium-232, tritium, uranium-234, uranium-235, and uranium-238

The frequency of radionuclides detected or detected above BVs or FVs are presented in Appendix F (Tables F-2.4-1 [soil and fill] and F-2.5-1 [tuff]). The concentrations of radionuclide COPCs detected or detected above BVs or FVs at MDA C are presented in Table 6.3-2 (soil and fill) and Table 6.3-3 (tuff). The concentrations of radionuclides detected or detected above BVs or FVs are presented in Figure F-2.4-1 (soil and fill) and in Figure F-2.5-1 (tuff) in Appendix F.

6.3.3 Organic Chemicals

The following 47 organic chemicals were identified as COPCs in soil/fill and tuff at MDA C:

acenaphthene, acenaphthylene; acetone; anthracene; Aroclor-1242; Aroclor-1254; Aroclor-1260; benzo(a)pyrene; benzo(b)fluoranthene; benzo(k)fluoranthene; benzoic acid; bis(2-ethylhexyl)phthalate; 2-chloronaphthalene; chrysene; 1,1-dichloroethene; di-n-butylphthalate; di-n-octylphthalate; fluoranthene; fluorene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; total heptachlorodibenzofurans; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; methylene chloride; 2-methylnaphthalene; 2-methylphenol; 2-nitrotoluene; 3-nitrotoluene; 4-nitrotoluene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; total pentachlorodibenzodioxins; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; RDX; 2,3,7,8-tetrachlorodibenzofuran; total tetrachlorodibenzofurans; toluene; and trichloroethene

The frequency of detected organic chemicals is presented in Appendix F (Tables F-2.8-1 [soil and fill] and F-2.9-1 [tuff]). The concentrations of detected organic COPCs are presented in Table 6.3-4 (soil and fill)

and Table 6.3-5 (tuff). The concentrations of organic COPCs in soil and fill are shown in Figure F-2.8-1 (soil) and in Figures F-2.9-1 and F-2.9-2 (tuff) in Appendix F.

Appendix F includes a discussion of the nature and extent of contamination at MDA C. Calculations and discussion of potential human health and ecological risks are presented in Appendix G.

6.4 Subsurface Vapor Sampling

In 2005–2006, a total of 210 subsurface pore-gas samples, along with 23 field duplicate samples, were collected in the first round of sampling and analyzed for VOCs and tritium. (At borehole location 50-24821, 137.5–140 ft bgs, sample RE50-05-61467 was analyzed for only tritium and sample RE50-05-61469 was analyzed only for VOCs.) Second-round pore gas samples were collected at least 30 d after the first round samples using the same collection methods. A total of 168 second-round pore-gas samples (along with 16 field duplicate samples) were collected and analyzed for VOCs and tritium. The 2005–2006 sampling was directed by the approved MDA C investigation work plan (LANL 2005, 91547). The pore-gas samples collected in 2005–2006 are summarized in Table F-2.0-3 in Appendix F. The locations of all boreholes at MDA C are shown in Figure 3.4-1.

The approved MDA C investigation work plan (LANL 2005, 91547) called for drilling 11 boreholes between Pits 1–4. No boreholes were drilled between Pits 1–4, although six boreholes were drilled between Pits 4 and 5, and three boreholes were drilled immediately adjacent to the south side of Pit 1. These nine boreholes provide characterization data for the subsurface tuff at depths immediately adjacent to and beneath the bottom of Pits 1 and 4. Samples at multiple depths in these nine boreholes, as well as additional boreholes around the site, probably have identified the presence of any contaminants released from Pits 1–4.

The Laboratory submitted a letter to NMED on August 18, 2006, requesting a modification to the scope of work to eliminate drilling the 11 boreholes between Pits 1–4 and to add 3 vertical boreholes to evaluate the correlation between pore-gas and core VOC concentrations (LANL 2006, 93581). NMED responded on September 25, 2006, requesting the Laboratory drill 4 of the 11 boreholes between Pit 2 and Pit 3 (NMED 2006, 94192). The Laboratory submitted a letter on November 30, 2006 (LANL 2006, 94194) requesting additional time to drill and collect subsurface vapor samples at these four locations. A response from NMED was pending at the time this report was published.

6.5 Subsurface Vapor Sampling Field-Screening Results

Pore gas was initially screened using a PID to determine sampling intervals in boreholes. In February 2006 the PID screening results were compared to analytical results for the same intervals. No correlation was observed between field screening results and laboratory analytical results, and field screening generally failed to detect the presence of organic compounds that were confirmed by the analytical results. Therefore the decision was made, with the NMED's concurrence, to stop pore-gas screening during drilling (Chamberlain 2006, 94162). For all boreholes drilled after February 23, 2006, no pore-gas screening was performed during drilling operations. Pore gas screening was conducted on borehole locations 50-24784, 50-24785, 50-24796, 50-24797, 50-24799, 50-24801, 50-24817, 50-24818, 50-24819, 50-24821, and 50-24822 (Figure 3.4-1). Field screening results are presented in Table 6.2-1.

6.6 Subsurface Vapor Sampling Analytical Results

Pore-gas samples were analyzed for VOCs and tritium. Tritium was detected in 197 of 210 first-round pore-gas samples (162 of 168 second-round pore-gas samples) and is a COPC.

Pore gas VOCs are identified as COPCs based on detection status. The following 42 VOCs were detected in 2005-2006 first-round pore-gas samples:

acetone; benzene; 1,3-butadiene; 1-butanol; 2-butanone; carbon disulfide; carbon tetrachloride; chlorodifluoromethane; chloroform; chloromethane; cyclohexane; 1,2-dichloro-1,1,2,2-tetrafluoroethane; dichlorodifluoromethane; 1,1-dichloroethane; 1,2-dichloroethane; 1,1-dichloroethene; cis-1,2-dichloroethene; 1,2-dichloropropane; 1,4-dioxane, ethanol; ethylbenzene; 4-ethyltoluene; n-heptane; hexane; 2-hexanone; methanol; 4-methyl-2-pentanone; methylene chloride; propylene; styrene; tetrachloroethene; toluene; 1,1,2-trichloro-1,2,2-trifluoroethane; 1,1,1-trichloroethane; 1,1,2-trichloroethane; trichloroethene; trichlorofluoromethane; 1,2,4-trimethylbenzene; 1,3,5-trimethylbenzene; xylene (total); 1,2-xylene; and 1,3-xylene+1,4-xylene

The frequency of detected analytes for first-round pore-gas samples are summarized in Tables F-2.10-1 (VOCs) and F-2.6-1 (tritium) in Appendix F. The analytical results for first-round pore-gas samples are presented in Table 6.6-1 (VOCs) and Table 6.6-2 (tritium). Detected concentrations of VOCs in first-round pore-gas samples are shown in Plates 1 and 2. Detected concentrations of tritium in first-round pore-gas samples are shown in Figures F-2.6-1 and F-2.6-2.

Thirty-three VOCs were detected in second-round pore-gas samples. All but two of the VOCs detected in the second-round samples were also detected in first-round samples. However, 11 VOCs detected in first-round samples were not detected in any of the second-round samples. The results of the second-round pore-gas samples are presented in section F-2.10 in Appendix F. The analytical results for second-round pore-gas samples are presented in Table 6.6-2 (tritium) and Table 6.6-3 (VOCs).

6.7 Comparison of Pore-Gas and Core Sample Results

Samples were collected at borehole locations 50-26823, 50-26824, and 50-26825 to determine the relationship between the concentrations of VOCs in pore gas and in core samples. Reported concentrations of VOCs in pore-gas and the corresponding core samples are presented in Table 6.7-1. Pairs of results for individual analytes were evaluated using various regression techniques to determine whether the two sets of concentrations are correlated. The concentrations of VOCs in core samples are much lower than the concentrations in pore-gas samples. It was found that the correlations between concentrations of individual analytes in core and in pore-gas are very poor, with r-squared values on the order of 0.1 or less for most analytes, indicating very low correlation (strong correlations are indicated by r-squared values approaching 1.0). The highest correlation was for methylene chloride, with an r-squared value of 0.2589.

The low correlation between core and pore-gas VOC concentrations indicates that no clear relationship can be found between the two. Core-sample concentrations are very low and in most cases qualified as "not detected," even when the corresponding analyte was detected in the pore-gas sample. It is clear from these data that core sample results may not be reasonably extrapolated to estimate pore-gas VOC concentrations. In the case of MDA C, it appears that much of the VOC contamination is present only in the vapor phase, without a corresponding source of liquid-phase contaminants adsorbed to pore-space surfaces in the tuff matrix.

7.0 CONCLUSIONS

7.1 Nature and Extent of Soil and Tuff Contamination

The MDA C investigation work plan (LANL 2005, 91547) and approval with modifications (NMED 2005, 90165; NMED 2005, 91695) stipulated additional sampling to complete the definition of the nature and extent of soil and tuff contamination at MDA C. Sample locations and analytical suites were selected to address the additional data needs. The additional data were required to determine the extent of

- metals, cyanide, and radionuclide contamination in tuff beneath Pit 6,
- potential releases of metals, cyanide and radionuclides to tuff beneath Pits 1 through 5, Shaft Groups 1 and 2, and the strontium-90 disposal shaft, and
- radionuclide contamination in surface soil on the eastern boundary of MDA C.

The nature and extent of soil and tuff contamination, incorporating the additional data collected in 2004–2006, is presented in Appendix F and is summarized below.

7.1.1 Extent of Metals, Cyanide, and Radionuclide Contamination in Tuff beneath Pit 6

The highest frequency of inorganic chemicals above BVs is generally found in borehole locations 50-24784 and 50-24785, near the southwest corner of Pit 6, and in borehole location 50-24799, near the southeast corner of Pit 6 (Figure F-2.2-1). No inorganic chemicals were detected above BVs in the deepest samples collected in the other borehole locations (50-09101, 50-09108, 50-09109, 50-09110, 50-24766, 50-24796, 50-24797, and 50-24816) around Pit 6.

Chromium was detected above its BV in 13 samples in the borehole locations nearest Pit 6 and was detected in the deepest sample at borehole location 50-24784 (19.4 mg/kg, compared to the BV of 2.6 mg/kg). Chromium was detected below the BV or at the BV in shallower samples from 55 ft to 275 ft. The concentration (19.4 mg/kg) is less than the maximum concentration of 23.4 mg/kg detected at 50 ft. In addition, nearby borehole location 50-24785 (within approximately 50 ft) did not detect chromium above BV at 275 ft.

Lead was detected above its BV in the deepest sample at borehole location 50-24785, but it was not detected above the BV at depths below 50 ft bgs in the two boreholes nearest that location (50-24784 and 50-09108).

Arsenic, selenium, and zinc were also detected above their Qbt 1g BVs in the deepest sample at borehole location 50-24785. The arsenic concentration (0.67 mg/kg) was within the range of background concentrations. The selenium concentration decreased from 3.14 mg/kg at 250 ft to 1.75 mg/kg at 275 ft depth. The zinc concentration (81.7 mg/kg) was less than twice the maximum background concentration (46 mg/kg).

Beryllium was detected above its Qbt 2 BV (1.21 mg/kg) in borehole location 50-24799. The beryllium concentration (2.67 mg/kg) was less than 2 times the maximum background concentration (1.8 mg/kg). Also beryllium was not detected above its BV in shallower depths from 40 ft to 100 ft and was not detected above BV in nearby borehole locations (50-24801 and 50-24766 approximately 60 ft away).

Seven metals (aluminum, arsenic, barium, beryllium, iron, manganese, and zinc) were detected above their BVs in the deepest sample at 250 ft bgs in borehole location 50-24817, north of Pit 6, but were not detected above BVs in any of the shallower samples. The zinc concentration (44.8 mg/kg) is within the range of background concentrations. Aluminum, barium, beryllium, iron, and manganese concentrations

are less than 2 times the maximum background concentrations. The arsenic concentration (2.88 mg/kg) is approximately 4 times the maximum background concentration. The extent of metals contamination in subsurface tuff at Pit 6 is defined.

Cyanide was detected in the vicinity of Pit 6 only in five samples in borehole locations 50-09101, 50-09108, and 50-09110 (Figure F-2.2-1). The highest concentration (10.2 mg/kg) was at a depth of 15–17 ft bgs in borehole location 50-09101 near the northeast corner of Pit 6, and the concentration decreased with depth (all samples at or below 75 ft bgs were nondetects). In borehole location 50-09108, cyanide was detected in only one sample (1 mg/kg at a depth of 95.5–97.5 ft bgs) and decreased to nondetect in the deepest sample. In borehole location 50-09110, cyanide was detected only once (3.9 mg/kg at a depth of 38–40 ft bgs) and decreased to nondetect in the deeper samples. The extent of cyanide contamination in the subsurface around Pit 6 is defined both vertically and laterally.

The radionuclide most commonly detected or detected above the BV in the vicinity of Pit 6 is uranium-235, which was detected above its BV in the deepest sample at locations 50-24784, 50-24785, 50-24799, and 50-24817 (Figure F-2.5-1). The concentration of uranium-235 in the deep samples is less than twice the BV. Strontium-90 was detected in three borehole locations near Pit 6 (50-09108, 50-09109, and 50-24766) but was not detected in the deepest sample in any borehole. The extent of strontium-90 contamination is defined both laterally and vertically.

Tritium was detected in tuff samples in five boreholes near Pit 6 (borehole locations 50-09101, 50-09107, 50-09108, 50-09109, and 50-09110), with a maximum concentration of 34,171 pCi/g at 57–59 ft bgs in borehole location 50-09107 (Figure F-2.5-1). Its concentrations decreased with depth following an increase at shallower depths at three borehole locations. Tritium increase in concentrations with depth in borehole locations 50-09101 and 50-09108; the maximum concentration was at TD. In borehole location 50-09101, tritium was detected (3.67 pCi/g) at 114.5 ft along the fence near the northeast corner of Pit 6. In borehole location 50-09108, tritium was detected (106.71 pCi/g) at 115 ft south of Pit 6. Tritium was not analyzed for in core in the 2005–2006 borehole samples. Tritium was not detected at higher concentrations at TD in the closest 1995 boreholes to borehole location 50-09108 (50-09107 and 50-09109).

Americium-241 (borehole locations 50-09107 and 50-09110), plutonium-239 (borehole location 50-09108), sodium-22 (borehole location 50-09109), and uranium-234 and uranium-238 (borehole location 50-24816) were also detected or detected above BVs at TD. Americium-241 concentrations were low (0.032 pCi/g and 0.09 pCi/g), and it was not detected at similar depths in the surrounding borehole locations. Plutonium-239 and sodium-22 were detected only in the deep sample (0.005 pCi/g and 0.056 pCi/g, respectively) in one borehole each and were not detected in shallower samples or surrounding borehole locations. Uranium-234 and uranium-238 concentrations (2.15 pCi/g and 2.43 pCi/g) were less than a pCi/g above the BVs, and neither isotope was detected at shallower depths.

The nature and extent of metals, cyanide, and radionuclide contamination in tuff in the area of Pit 6 are defined. The nature and extent of inorganic chemical contamination in the subsurface are discussed in greater detail in section F-3.1.2 in Appendix F. The nature and extent of radionuclide contamination in the subsurface are discussed in section F-3.2.2 in Appendix F.

7.1.2 Potential Releases of Metals, Cyanide and Radionuclides to Tuff beneath Pits 1 through 5, Shaft Groups 1 and 2, and the Strontium-90 Disposal Shaft

Several boreholes had inorganic chemicals detected or detected above BVs at TD (Figures F-2.2-1 and F-2.2-2). In many cases, nitrate or nitrate and perchlorate were the only detected inorganic chemicals. Both were detected at low levels (less than 1.5 mg/kg for nitrate and less than 0.05 mg/kg for perchlorate)

at TD and either showed a slight change or no change in concentrations with depth. Nitrate is also naturally occurring. The nature and extent of nitrate and perchlorate are defined.

Inorganic chemicals were detected slightly above background (less than twice the BV or maximum background concentration) at TD at other boreholes. In the deepest borehole, location 50-24818 to the north of Pit 5, only copper was detected above the BV in the deepest sample (600.5 ft bgs). The copper concentration (11.3 mg/kg) is approximately 3 times the BV and decreases from concentrations reported in shallower depths. The nature and extent of inorganic chemical contamination in tuff is defined.

Cyanide was only detected once in the vicinity of Pits 1–5 and the disposal shafts, at location 50-09100 (Figure F-2.2-2). The single detected concentration (0.53 mg/kg) was at a depth of 43.6 ft bgs. The extent of cyanide contamination is defined.

Americium-241, plutonium-238, plutonium-239, tritium, and uranium-235 were detected or detected above the BV in samples at multiple locations and depths in the vicinity of Pits 1–5 and the disposal shafts.

Americium-241 was detected at seven locations around Pits 1–5 (Figure F-2.5-1). The concentration of americium-241 ranged from 0.002 to 0.42 pCi/g, with most concentrations at 0.01 pCi/g. The maximum concentration (150.3–152.5 ft bgs at location 50-24783) is an isolated occurrence, with americium-241 either not detected or detected at low concentrations and decreasing with depth in all nearby boreholes. The extent of americium-241 contamination is defined.

The maximum concentration of plutonium-238 (0.3 pCi/g) coincided with the maximum detected concentration of plutonium-239 (0.68 pCi/g) at 123.5–125 ft bgs in borehole location 50-24782 (Figure F-2.5-1). The concentration of both decreased to less than 0.1 pCi/g in the deepest sample at that location. Plutonium concentrations are generally less than 0.1 pCi/g at all locations and depths. The extent of plutonium-238 and plutonium-239 is defined.

Tritium was detected in tuff samples at multiple locations around Pits 1–5, with a maximum concentration (1959 pCi/g) at a depth of 41–44 ft bgs at borehole location 50-09106 (Figure F-2.5-1). This location is within 100 ft laterally from the highest concentration of tritium in pore gas (location 50-24783, section 7.2.2). Tritium was also detected (1800 pCi/g) near the northeast corner of Pit 5 at location 50-09102 (57–60 ft bgs). The highest concentrations of tritium were detected at depths of 75 ft bgs or below, with very low concentrations (generally less than 0.5 pCi/g) in deeper samples. The extent of tritium contamination in tuff is defined.

Uranium-235 was detected above its BV at multiple locations (Figure F-2.5-1), with concentrations ranging from 0.091 to 0.31 pCi/g (maximum at 248.7–250 ft bgs, location 50-24822). The uranium-235 concentrations are only slightly above background, and less than twice the BV in all samples. The extent of uranium-235 contamination in tuff is defined. Uranium-235 was detected above the BV in two samples (280–282.5 ft bgs and 313.5–315 ft bgs) in the deepest borehole location (50-24818), but no radionuclides were detected or detected above BV in any samples deeper than 315 ft bgs at that location.

Strontium-90 was not detected in the vicinity of the strontium-90 disposal shaft. The nearest detection of strontium-90 was at borehole location 50-09106 (0.48 pCi/g at 102–104 ft bgs and 0.77 pCi/g at 115.5–118 ft bgs), approximately 200 ft north of the shaft. Strontium-90 was detected in only two other samples near Pits 1–5 (0.069 pCi/g at 122.5–124.6 ft bgs in borehole location 50-24766; and 0.6 pCi/g at 114.8–116.8 ft bgs in borehole location 50-09103). Strontium-90 was not detected in any samples collected in borehole locations 50-24814 and 50-24802, approximately 25 ft or less of borehole locations 50-09103 and 50-09106, respectively. Strontium-90 was also not detected in borehole location 50-24799,

approximately 75 ft south of borehole location 50-24766. The extent of strontium-90 contamination in tuff is defined.

The nature and extent of inorganic chemical contamination in the subsurface are discussed in greater detail in section F-3.1.2 in Appendix F. The nature and extent of radionuclide contamination in the subsurface are discussed in section F-3.2.2 in Appendix F.

7.1.3 Radionuclide Contamination in Surface Soil on the Eastern Boundary of MDA C

Additional surface sampling was specified in the approved investigation work plan (LANL 2005, 91547) along the eastern boundary of MDA C to define the lateral extent of radionuclide contamination (LANL 2005, 91547, p. 10). Six surface soil samples were collected from locations on a gamma spectroscopy survey grid east of MDA C. The sampling locations were to be biased toward both the highest radionuclide readings and from bounding locations on the grid perimeter. No anomalies were detected of the ground surface east of MDA C during the radiological survey. Therefore, the six surface soil samples and one field duplicate were collected from bounding locations (locations 50-22742 through 50-22747) at 0–6 in. (Figure 3.3-1), according to SOP-06.09. Samples were submitted through the SMO for fixed laboratory analysis of americium-241, isotopic plutonium, isotopic uranium, and gamma-emitting radionuclides.

The data from the six surface samples collected east of the MDA C fence line support the determination of lateral extent for americium-241, cesium-134, isotopic plutonium, and isotopic uranium (Figure F-2.4-1). Extent was defined because the concentrations decreased with increasing distance from the fence as well as downslope east of MDA C (locations 50-22746 and 50-22747). The nature and extent of radionuclide contamination in surface soil on the eastern boundary of MDA C are defined.

The nature and extent of radionuclide contamination in surface soil and fill are discussed in section F-3.2.1 in Appendix F.

7.2 Nature and Extent of Subsurface Vapor Contamination

The approved MDA C investigation work plan stipulated additional sampling to complete the definition of the nature and extent of subsurface vapor contamination at MDA C (LANL 2005, 91547). Sample locations and analytical suites were selected to address the additional data needs required to determine the extent of VOCs and tritium in the vapor phase in subsurface tuff.

7.2.1 Organic Chemicals in Subsurface Pore Gas

VOC pore-gas concentrations are low (generally 1000 $\mu\text{g}/\text{m}^3$ or less) for most VOCs detected with little or no change in concentrations with depth (concentrations remain less than 1000 $\mu\text{g}/\text{m}^3$ at TD) (Tables F-2.10-3 and F-2.10-4). Generally, the VOC pore-gas concentrations in borehole locations inside the fence at MDA C reach the maximum concentration at depths ranging from approximately 125 ft to 200 ft. Below 200 ft, the concentrations tend to decrease or remain unchanged to 250 ft.

In the deepest borehole (location 50-24818), VOC pore-gas concentrations decrease substantially below 315 ft. VOC pore-gas concentrations to the north of MDA C in borehole location 50-24817 are generally less than or similar to VOC pore-gas concentrations in borehole locations inside the fence (location 50-24796 and 50-24797) and less than concentrations detected in the deep borehole location 50-24818 and borehole location 50-09100. The concentrations are generally also lower in the western perimeter borehole locations (50-24784, 50-24785, and 50-24816) and in the eastern perimeter borehole locations (50-24768, 50-24814, and 50-24815). VOC pore-gas concentrations were also low in borehole location

50-24822, outside the fenced area to the east of MDA C. The TCE concentrations in borehole location 50-24822 are higher than in borehole locations 50-24814 and 50-24815 but are similar to those in borehole location 50-24768; TCE concentrations decrease with depth in borehole location 50-24822. Borehole locations to the south of MDA C (locations 50-24820, 50-24821, and 50-24451) also have lower VOC pore-gas concentrations than borehole locations along the southern fenceline (50-24810, 50-24811, 50-24812, and 50-24813). In addition, borehole location 50-24451, the southern most borehole location, has lower concentrations of VOCs than borehole locations 50-24820 and 50-24821. The nature and extent of VOC contamination in subsurface pore gas are discussed in section F-3.3.3 in Appendix F.

Downward migration of VOCs in pore gas is limited by hydrostatic pressure and the lack of saturated conditions. In addition, the pore-gas screening evaluation presented in Appendix G indicates no potential for migration to groundwater. Based on the site conditions, pore-gas screening, and the pore-gas data (including the substantial decrease in VOC concentrations in the deep borehole location 50-24818), the extent of VOCs in pore gas at MDA C has been defined.

7.2.2 Tritium in Subsurface Pore-Gas

Tritium was detected at least once in all boreholes sampled and was detected in the deepest sample (first- or second-round samples or both) in all but two boreholes. The highest tritium concentration (1×10^8 pCi/L) was detected at a depth of 20 ft at location 50-24783, between the east end of Pits 4 and 5, and it decreases with depth by more than a factor of 100 in the deepest sample (151 ft bgs). This location is also near the northern end of Shaft Group 3 (Figures F-2.6-1 and F-2.6-2).

The concentrations of tritium in pore gas are highly variable and in some cases vary greatly over short, lateral distances. However, the highest tritium concentrations are generally found along a line between Pits 4 and 5 (Figures F-2.6-1 and F-2.6-2). Isolated high concentrations of tritium were also detected in a single borehole to the north and a single borehole to the south of Pit 6. In general, the concentrations of tritium in pore gas decreased with depth from the maximum in each borehole and decreased with distance from the center of MDA C. The extent of tritium contamination in pore gas is defined. Figure F-3.2-1 shows the locations of the boreholes and the depths of the pore-gas samples. The tritium concentrations from the first-round samples are shown in a three-dimensional plot in Figure F-2.6-3. The extent of tritium contamination in subsurface pore gas is discussed in section F-3.2.3 in Appendix F.

7.3 Nature and Extent of Inorganic Chemical Contamination in Surface Soil and Fill

The results of surface soil and fill inorganic chemical analyses are reported in Appendix B of the approved MDA C investigation work plan (LANL 2005, 91547; p. B-10). The results indicated that lead and silver were the only inorganic chemicals detected above their respective BVs. On the basis of these data, the surface extent of inorganic chemicals was defined, and no additional sampling was proposed in the approved investigation work plan (LANL 2005, 91547).

The surface soil and fill samples were analyzed for inorganic chemicals by the former Chemical Science and Technology Division at an on-site rather than an off-site laboratory. The samples do not have the accompanying data-quality information required to evaluate the results. As such, the surface inorganic chemical data are screening-level quality and are not part of the current decision-level data set (the screening-level data are provided on CD in Appendix E as a separate data file). As a result, the nature and extent of inorganic chemicals on the surface of MDA C need to be verified using analytical data provided by an off-site laboratory.

7.4 Summary of Risk Screening

MDA C was evaluated for potential risk to human health using SSLs and SALs for an industrial scenario (Appendix G). The potential carcinogenic risk of approximately 2×10^{-7} , HI of approximately 0.01, and total dose of approximately 10 mrem/yr are less than the applicable target levels (NMED 2006, 92513; DOE 2000, 67153). In addition, the total dose corresponds to a radiological risk of approximately 2×10^{-6} based on a comparison to EPA radionuclide preliminary remediation goals (PRGs) for an outdoor worker (epa-prgs.ornl.gov/radionuclides/download.shtml). The results of the human health risk screening assessment do not indicate a potential unacceptable risk, hazard, or dose under an industrial scenario at MDA C.

An ecological risk screening assessment was conducted for MDA C (Appendix G). Based on the assessment, several chemicals of potential ecological concern (COPECs) were identified. The COPECs were eliminated based on HIs less than 1.0 and the uncertainty analysis, which evaluated a number of factors, including infrequency of detection and relatively low concentrations and HIs. The results of the ecological risk screening assessment do not indicate an unacceptable risk to ecological receptors at MDA C.

8.0 RECOMMENDATIONS

The nature and extent of surface and subsurface contamination are defined at MDA C. No unacceptable risk exists to human health or ecological receptors at the site, and subsurface vapor-phase contaminants are not likely to migrate downward to groundwater in the regional aquifer. However, continued monitoring of pore gas should be conducted. Therefore, it is recommended that vapor-monitoring wells be installed at the site to monitor the concentrations of vapor-phase contaminants in the subsurface. The number, placement, and configuration of the vapor-monitoring wells will be described in detail in a vapor-monitoring plan.

Additional surface samples should be collected to confirm the results of the screening-level data for inorganic chemicals and to define the nature and extent of potential inorganic chemical contamination with decision-level data. A sufficient number of locations will be selected to represent site surface conditions, and samples will be collected from the surface (0–0.5 ft bgs) and a second depth. The samples will be analyzed for TAL metals. When data from these samples are received, the nature and extent of potential inorganic chemical contamination will be reevaluated. The risk screening assessments will be reevaluated using the new inorganic chemical results. The sampling results and reevaluated risk screening assessments will be included in an addendum to this investigation report.

Four additional boreholes will be drilled between Pit 2 and Pit 3. Core and pore-gas samples will be collected and submitted to an analytical laboratory for analysis. The sampling results will be included in an addendum to this investigation report.

In addition to vapor monitoring, a corrective measures evaluation (CME) is proposed to evaluate potential alternatives for remediation and long-term disposition of the site. The CME will be based on current conditions as described in this report and may incorporate future vapor-monitoring analytical results as they become available.

9.0 SCHEDULE FOR RECOMMENDED ACTIVITIES

Additional surface sampling for inorganic chemicals and drilling the four boreholes between Pit 2 and Pit 3 at MDA C will be completed as soon as practical. The results will be submitted in an addendum to the investigation report within a month after all analytical data has been received.

A vapor monitoring plan will be developed immediately upon submission of this report. The plan will be submitted to the NMED for approval within 45 days of submission of this report. The plan will be implemented as soon as practicable after approval by NMED.

10.0 REFERENCES AND MAP DATA SOURCES

10.1 References

The following list includes all documents cited in this report. Parenthetical information following each reference provides the author(s), publication date, and ER ID number. This information is also included in text citations. ER ID numbers are assigned by the Environmental Programs Directorate's Records Processing Facility (RPF) and are used to locate the document at the RPF and, where applicable, in the master reference set.

Copies of the master reference set are maintained at the NMED Hazardous Waste Bureau; the U.S. Department of Energy—Los Alamos Site Office; the U.S. Environmental Protection Agency, Region 6; and the Directorate. The set was developed to ensure that the administrative authority has all material needed to review this document, and it is updated with every document submitted to the administrative authority. Documents previously submitted to the administrative authority are not included.

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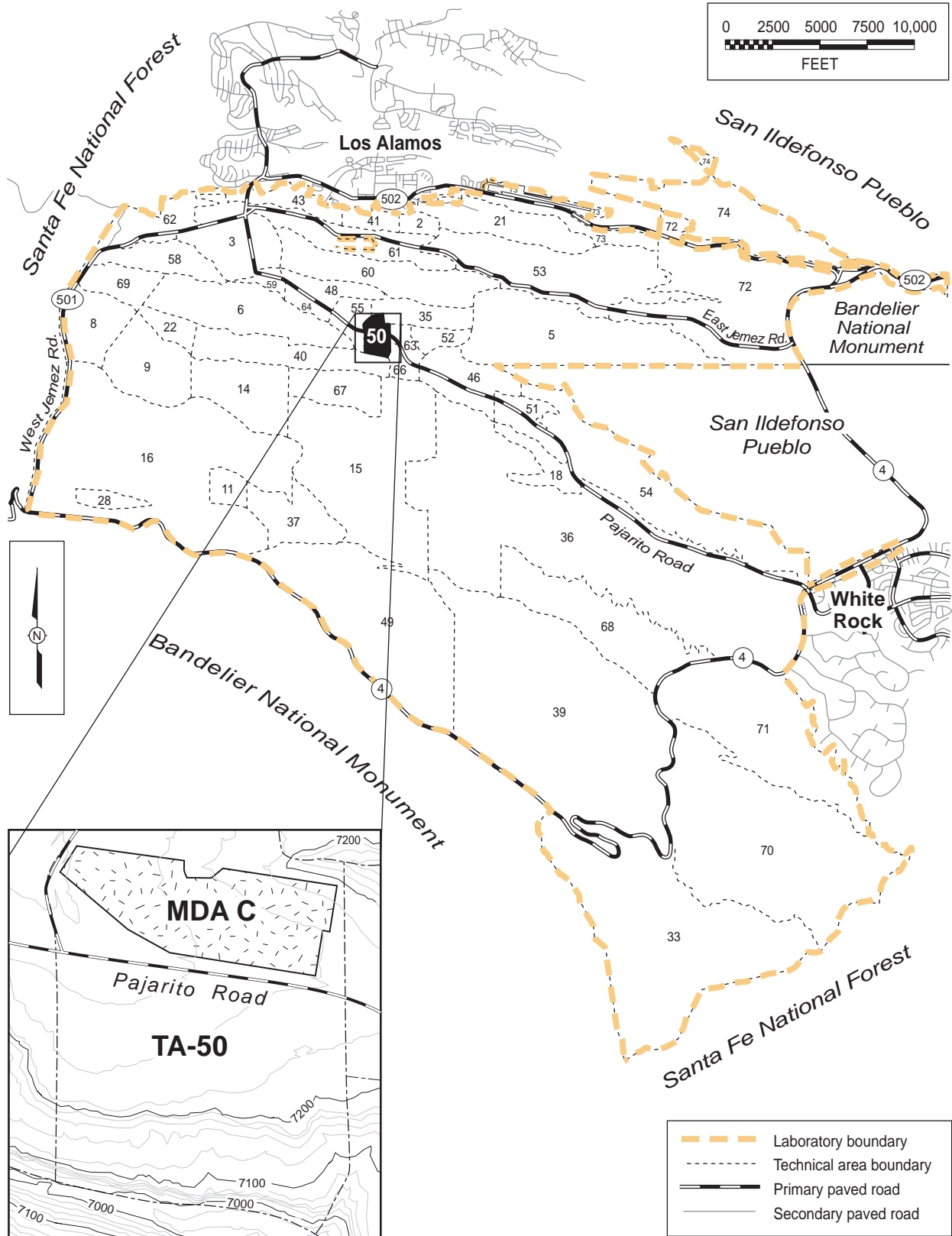
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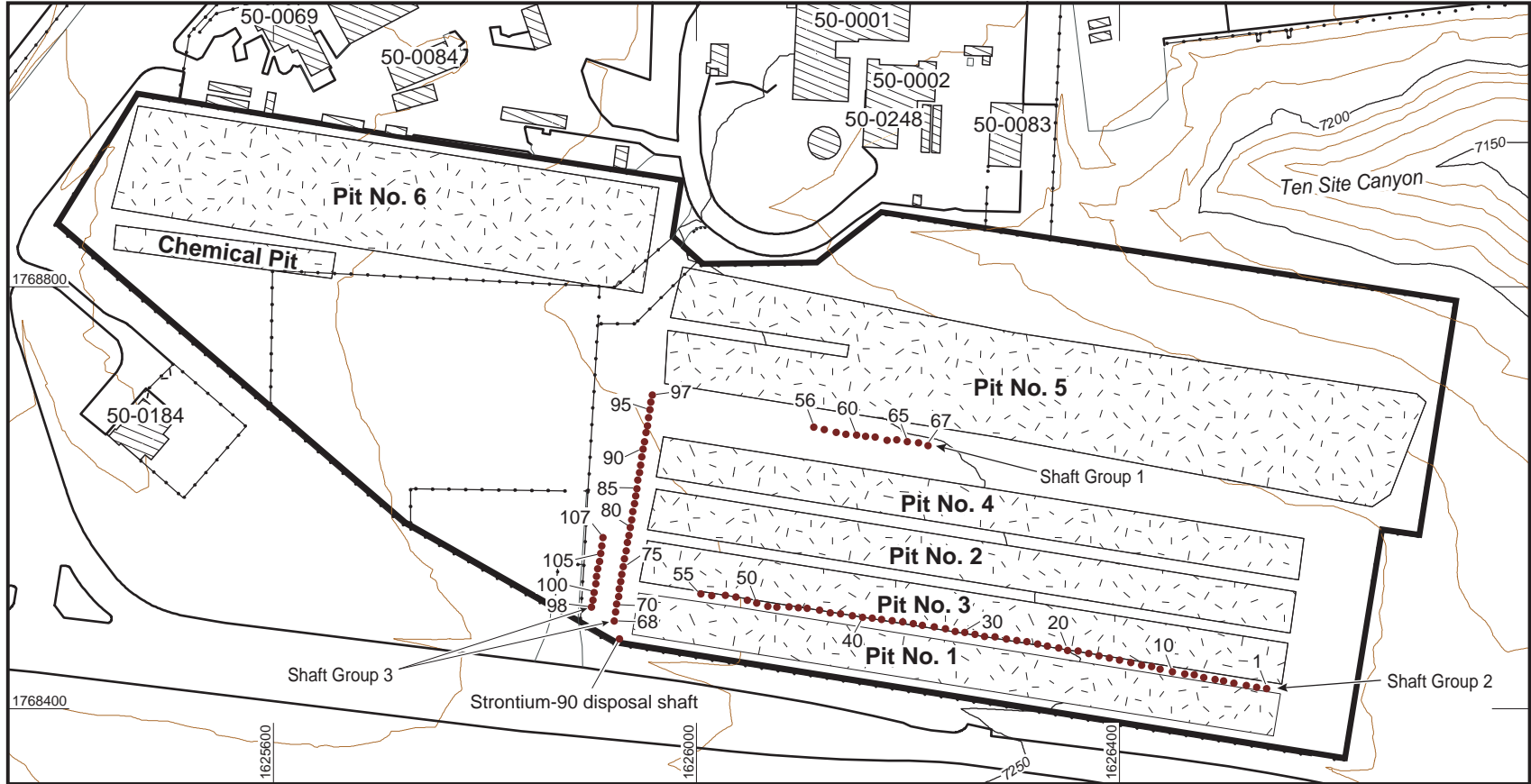
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F1.0-1, 50-002d RFI RPT, 060200, PTM_Rev. for F1.1-1, MDA C IR, 103106, dwd

Figure 1.1-1. Location of MDA C with respect to Laboratory TAs and surrounding land holdings



Source: GISLab map no. m200615, Richard Kelley, 031703_Rev. for F3, MDA C IWP, 072403, cf

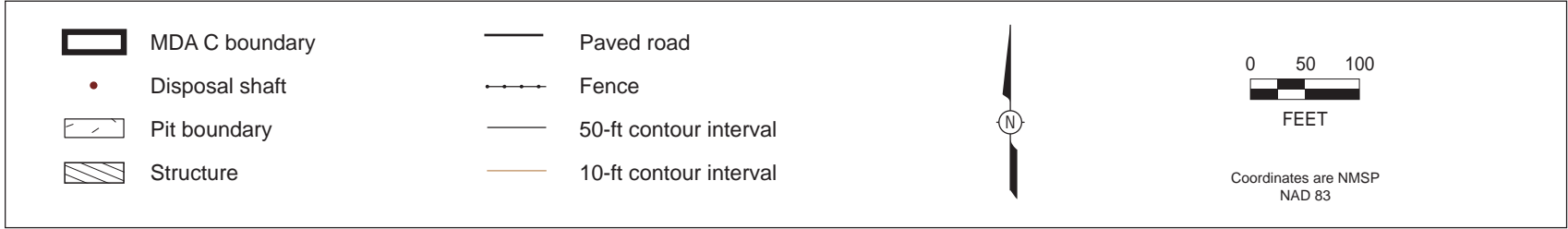


Figure 1.1-2. Locations of pits and shafts at MDA C

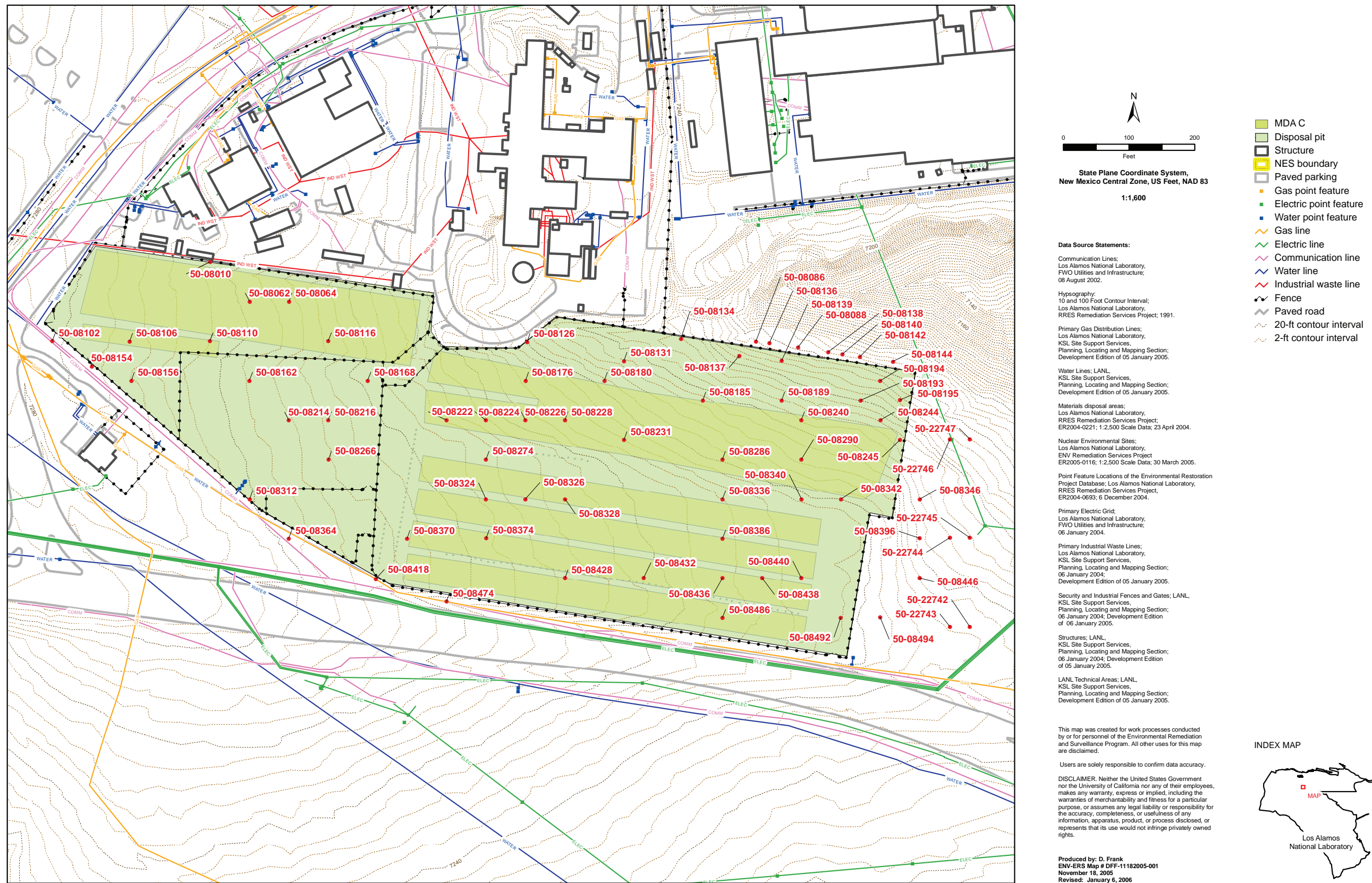


Figure 3.3-1. Surface soil and fill sample locations at MDA C

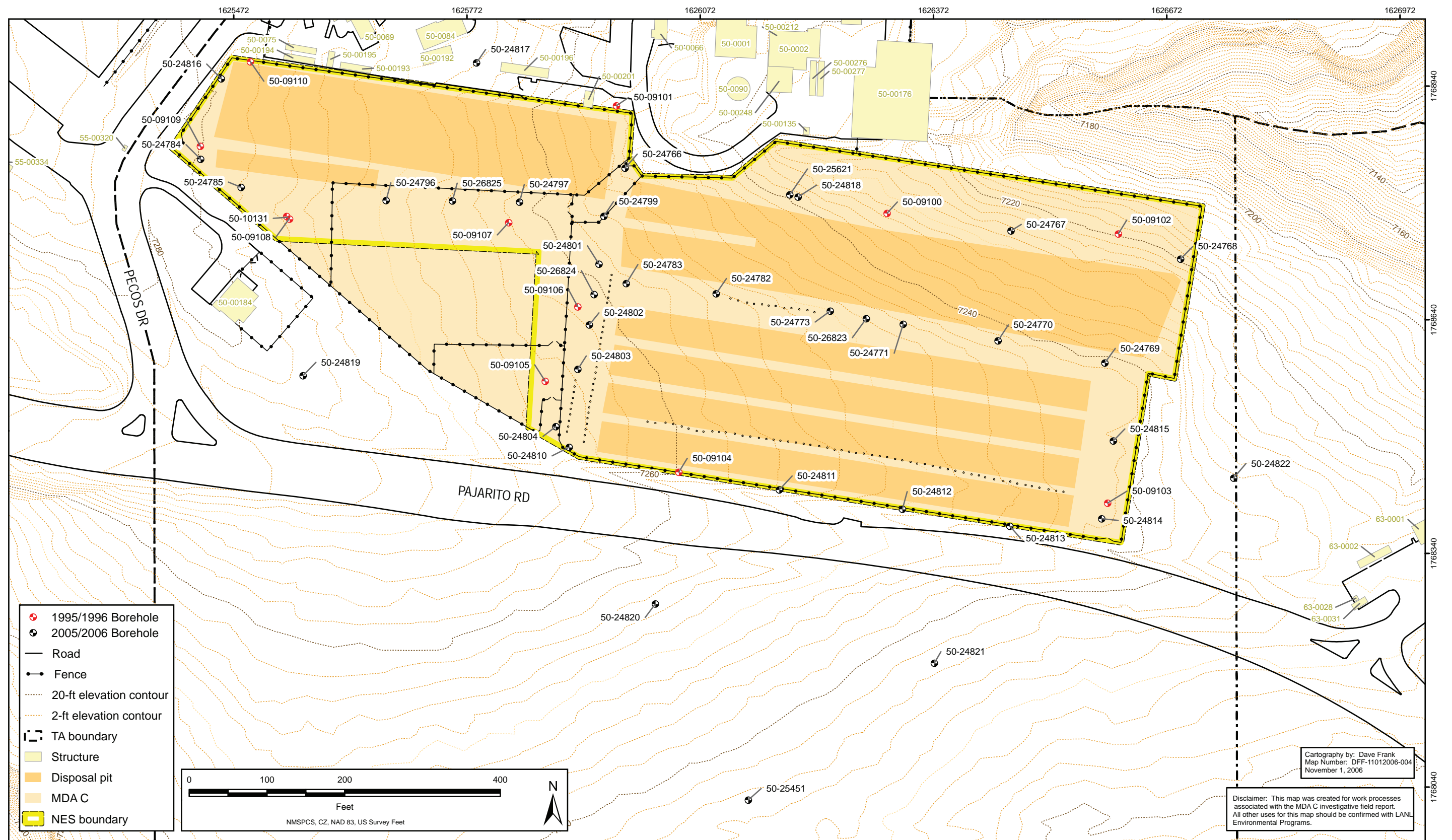


Figure 3.4-1. Locations of boreholes drilled at MDA C from 1995 to 1996 and 2005 to 2006

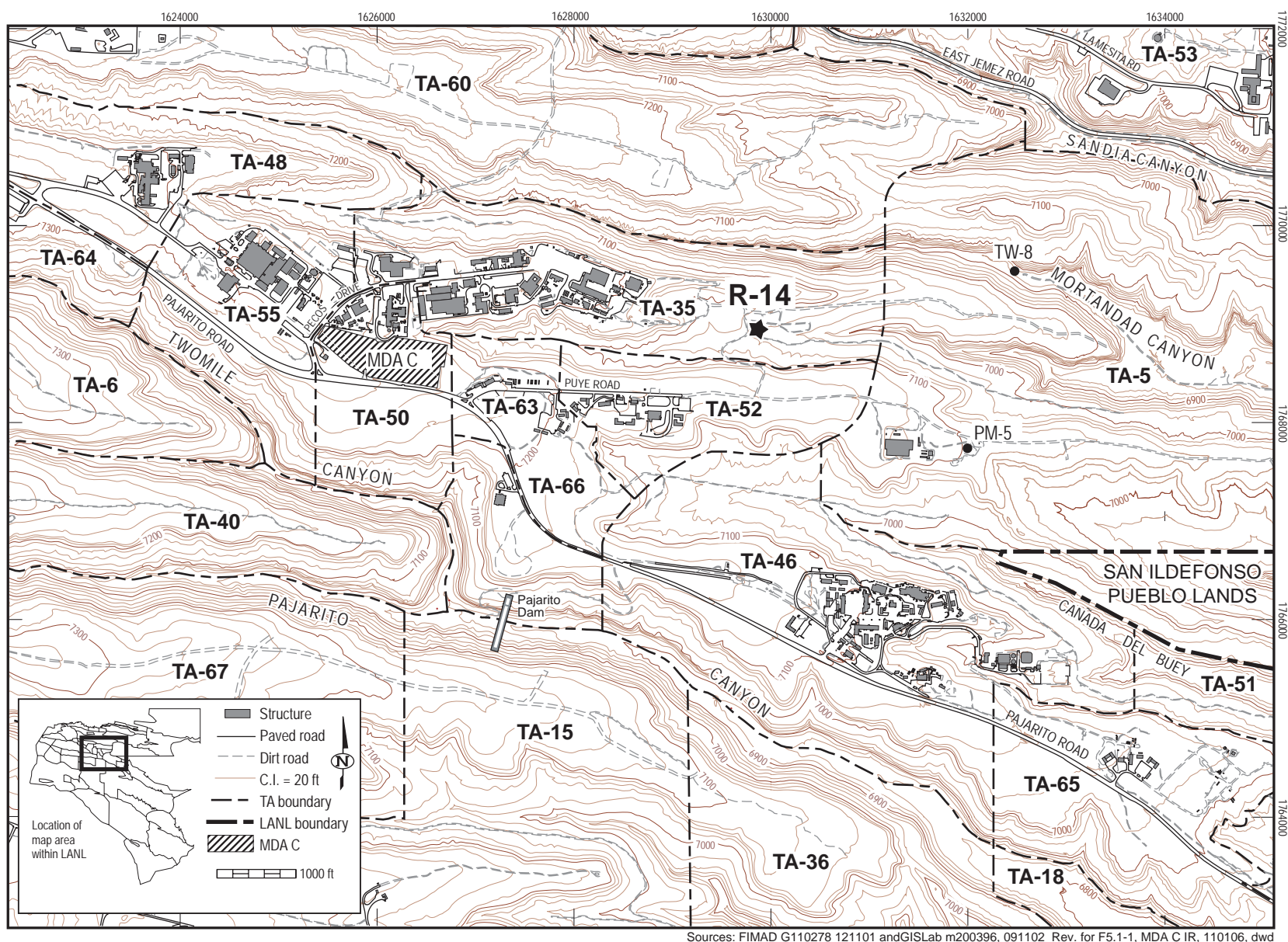


Figure 4.1-1. Area map of MDA C showing mesa-top setting and related canyons

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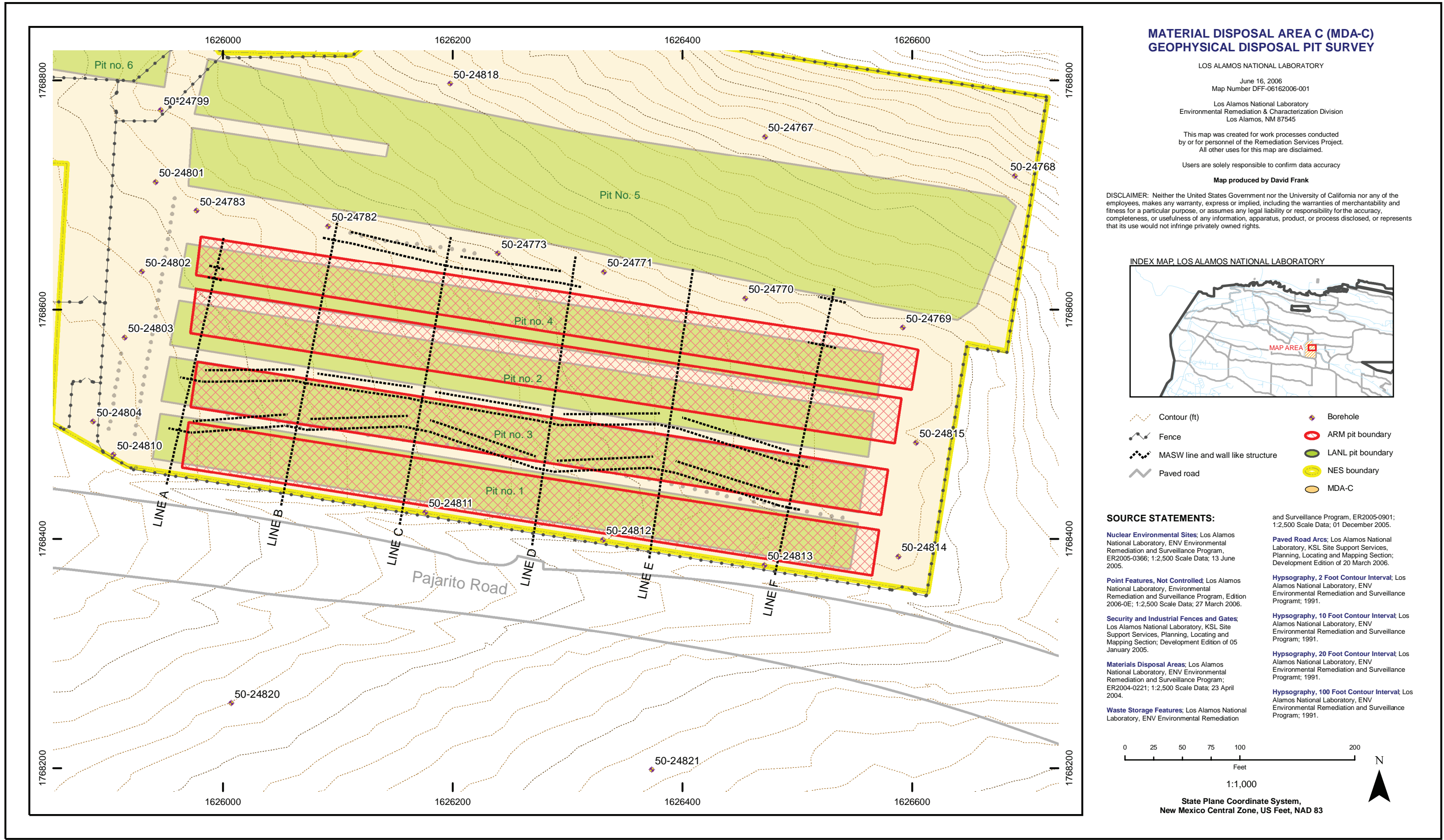


Figure 4.3-1. Overlay of geophysical, seismic, and historical pit boundary data

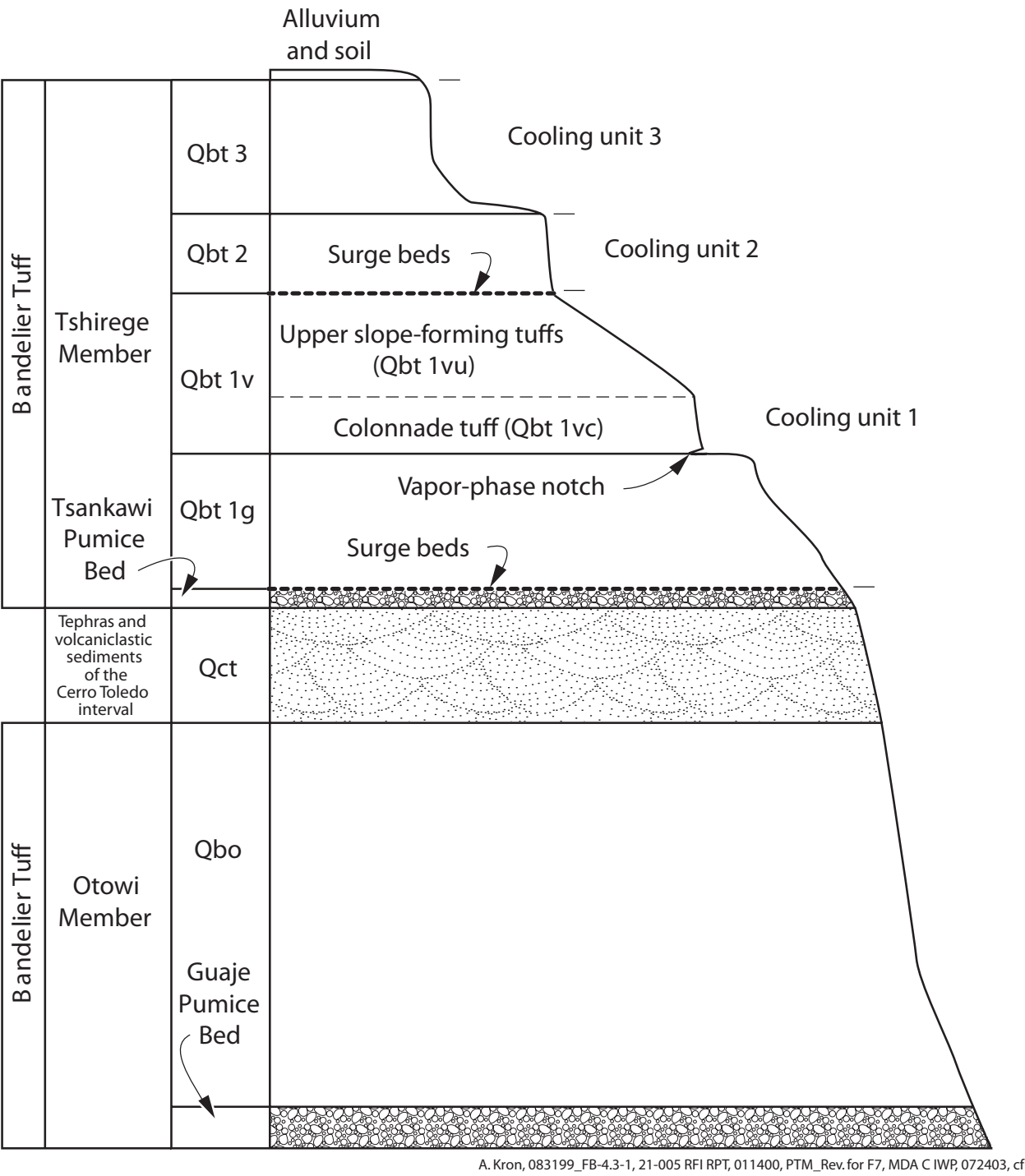


Figure 4.4-1. Generalized stratigraphy of Bandelier Tuff in the vicinity of MDA C

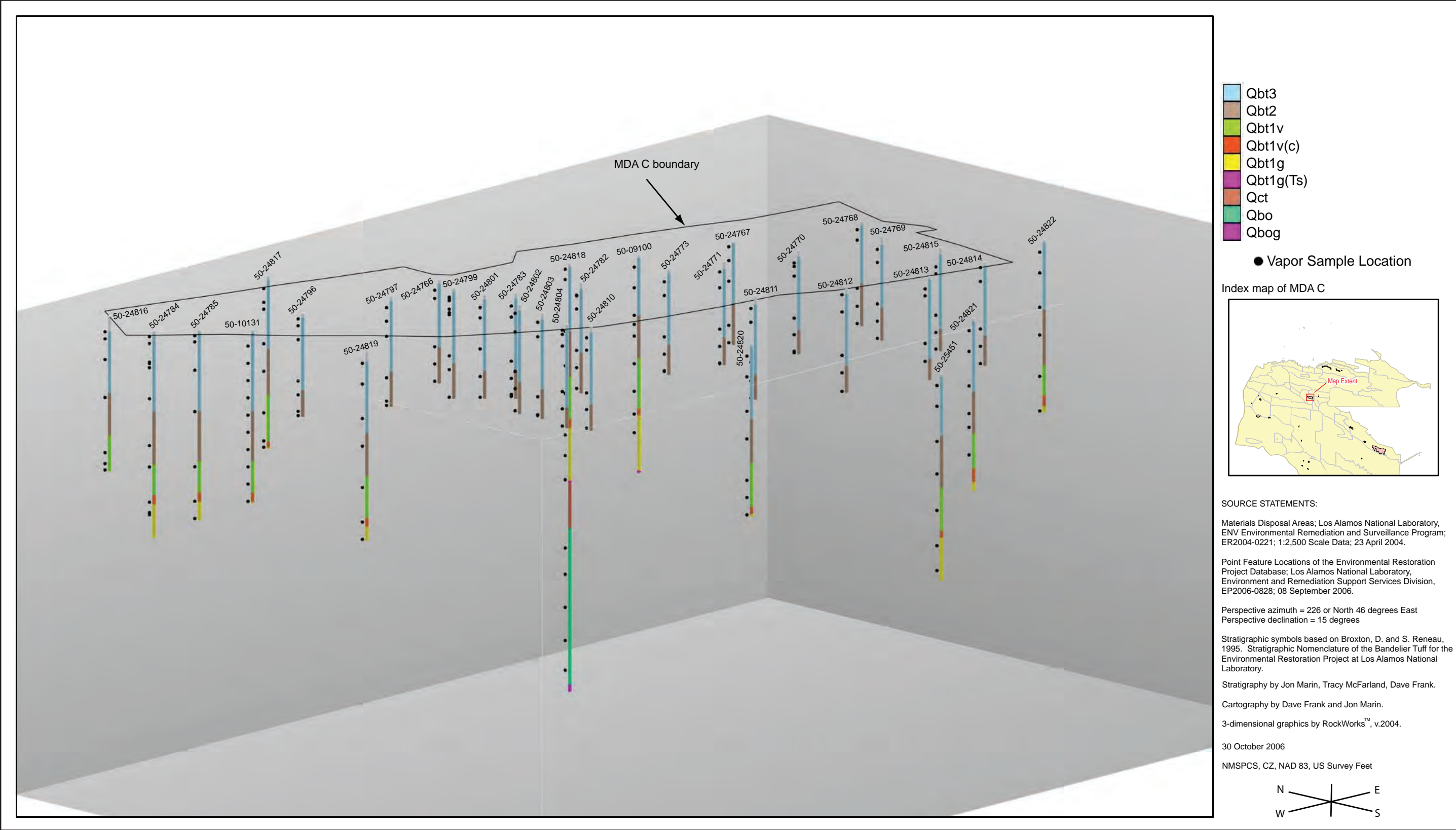


Figure 4.4-2. Stratigraphy as identified in MDA C boreholes

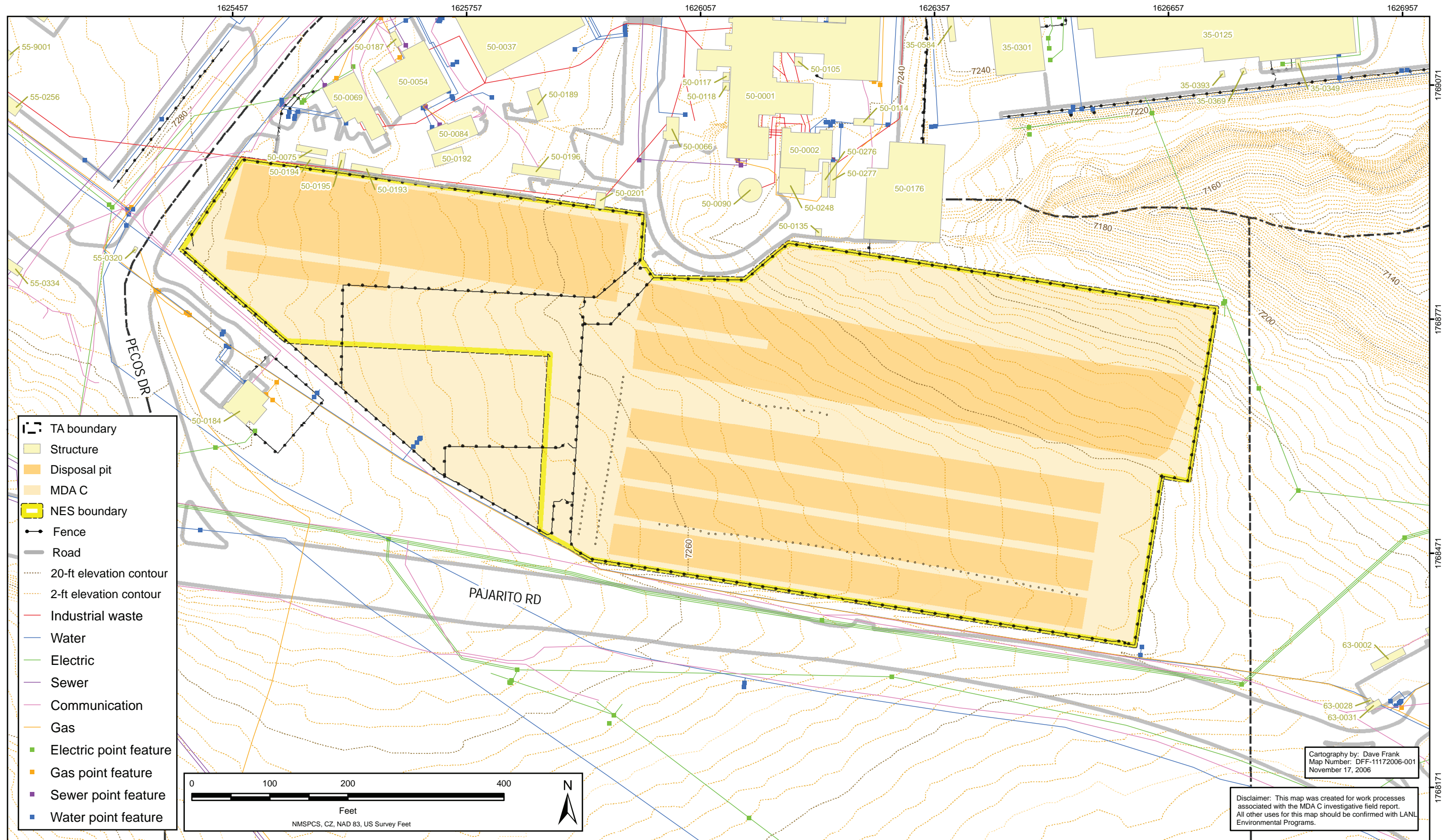
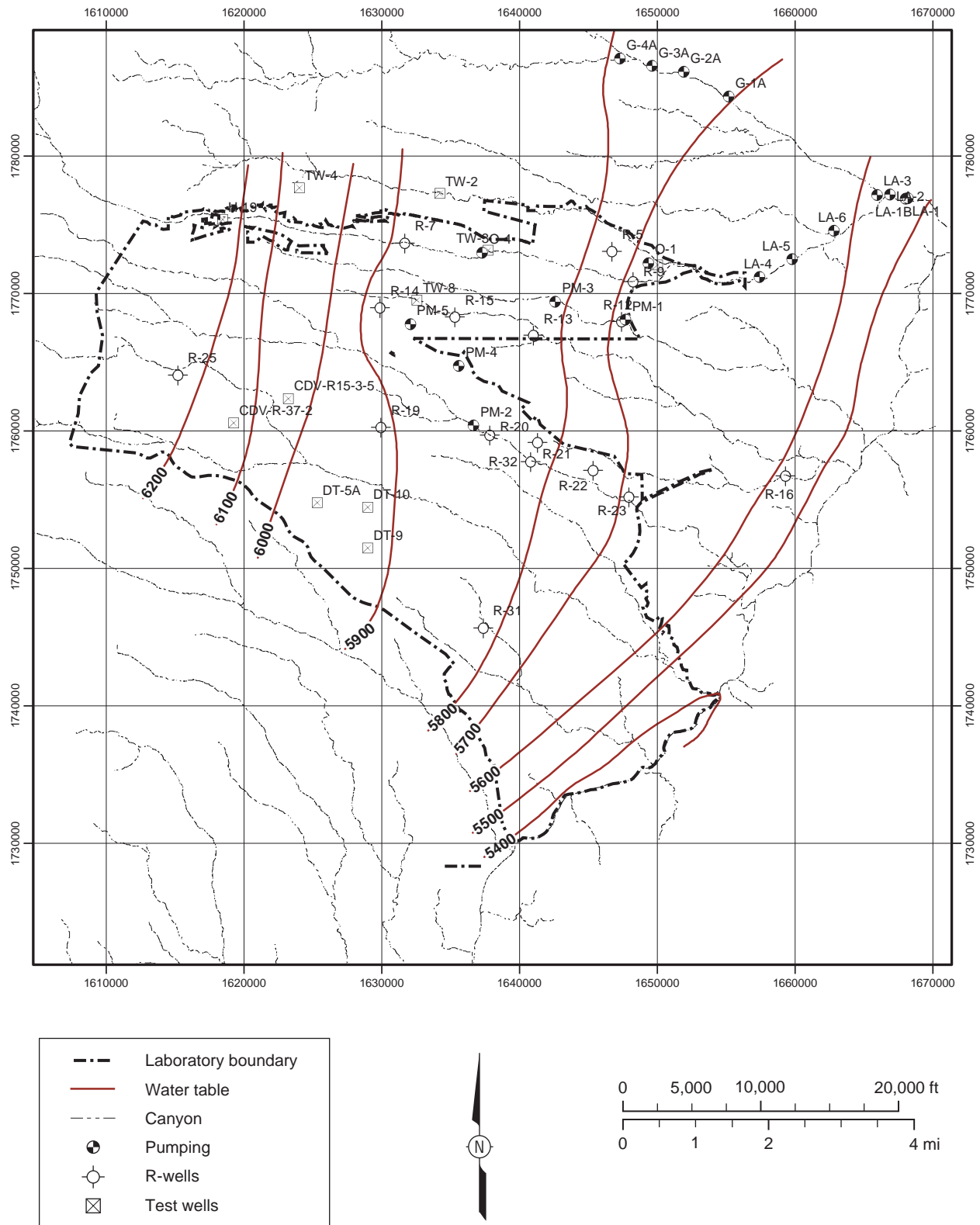


Figure 4.4-3. Utilities and other subsurface and surface structures at MDA C



Source: GIS Lab m200714, REK, 061703

Figure 4.6-1. Elevations of the top of the regional aquifer beneath the Laboratory

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Table 2.4-1
Ambient Air Tritium Concentrations at the MDA C Air-Monitoring Station

Sample Start Date	95% UCL (pCi/m ³)	Sample Start Date	95% UCL (pCi/m ³)
2/3/03	9.7	10/27/03	8.7
2/17/03	6.9	11/10/03	4.5
3/3/03	6.7	11/24/03	6.9
3/17/03	5.9	12/8/03	4.6
3/31/03	5.1	12/22/03	3.6
4/14/03	2.8	1/5/04	3.4
4/28/03	3.9	1/19/04	4.0
5/12/03	10.0	2/2/04	2.7
5/26/03	17.6	2/16/04	1.7
6/9/03	18.3	3/1/04	5.2
6/23/03	25.0	3/15/04	3.6
7/7/03	25.0	10/27/03	8.7
7/21/03	24.8	11/10/03	4.5
8/4/03	30.3	11/24/03	6.9
8/18/03	22.4	12/8/03	4.6
9/1/03	15.7	12/22/03	3.6
9/15/03	25.6	1/5/04	3.4
9/29/03	16.5	1/19/04	4.0
10/13/03	22.9	2/2/04	2.7

Table 3.2-1
Results of Surface Radiation Survey at East End of MDA C

Survey Point ID	Easting (ft)	Northing (ft)	Low-Energy Gamma (cpm)*	Gamma (cpm)*
1	1626770.287	1768698.439	1862	12220
2	1626770.287	1768683.439	2190	13430
3	1626770.287	1768668.439	2090	13720
4	1626770.287	1768653.439	2310	14280
5	1626770.287	1768638.439	2330	13910
6	1626770.287	1768623.439	2180	14030
7	1626770.287	1768608.439	2300	14740
8	1626770.287	1768593.439	1920	13950
9	1626770.287	1768578.439	2000	13660
10	1626770.287	1768563.439	1790	13720
11	1626770.287	1768548.439	2290	12840
12	1626770.287	1768533.439	2010	12860
13	1626770.287	1768518.439	2010	13720
14	1626770.287	1768503.439	1865	12960
15	1626770.287	1768488.439	1993	13390
16	1626770.287	1768473.439	2200	15000
17	1626770.287	1768458.439	2020	12810
18	1626770.287	1768443.439	1886	13720
19	1626770.287	1768428.439	1913	12990
20	1626770.287	1768413.439	1884	13500
21	1626770.287	1768398.439	1778	12820
22	1626770.287	1768383.439	1867	12460
23	1626785.287	1768698.439	2060	13920
24	1626785.287	1768683.439	2050	14080
25	1626785.287	1768668.439	1973	13770
26	1626785.287	1768653.439	2130	13410
27	1626785.287	1768638.439	1942	14540
28	1626785.287	1768623.439	2050	14720
29	1626785.287	1768608.439	2190	14490
30	1626785.287	1768593.439	2110	13530
31	1626785.287	1768578.439	2020	13600
32	1626785.287	1768563.439	1923	12180
33	1626785.287	1768548.439	1957	12620
34	1626785.287	1768533.439	2120	13210
35	1626785.287	1768518.439	1958	12380
36	1626785.287	1768503.439	1889	12670

Table 3.2-1 (continued)

Survey Point ID	Easting (ft)	Northing (ft)	Low-Energy Gamma (cpm)*	Gamma (cpm)*
37	1626785.287	1768488.439	1738	12860
38	1626785.287	1768473.439	1629	12900
39	1626785.287	1768458.439	1818	12370
40	1626785.287	1768443.439	1987	12880
41	1626785.287	1768428.439	1892	12110
42	1626785.287	1768413.439	2050	12520
43	1626785.287	1768398.439	1822	11500
44	1626785.287	1768383.439	1695	12570
45	1626800.287	1768698.439	2440	15610
46	1626800.287	1768683.439	2440	13480
47	1626800.287	1768668.439	2190	13690
48	1626800.287	1768653.439	2240	13100
49	1626800.287	1768638.439	1927	13280
50	1626800.287	1768623.439	2250	14310
51	1626800.287	1768608.439	2010	13840
52	1626800.287	1768593.439	1985	13610
53	1626800.287	1768578.439	2090	14100
54	1626800.287	1768563.439	1743	13370
55	1626800.287	1768548.439	2010	12440
56	1626800.287	1768533.439	2000	13060
57	1626800.287	1768518.439	2070	13450
58	1626800.287	1768503.439	2080	12280
59	1626800.287	1768488.439	2150	13740
60	1626800.287	1768473.439	2080	13460
61	1626800.287	1768458.439	1821	12850
62	1626800.287	1768443.439	1962	11990
63	1626800.287	1768428.439	1729	11650
64	1626800.287	1768413.439	2010	12170
65	1626800.287	1768398.439	1800	12620
66	1626800.287	1768383.439	1987	13380

*Locally determined background values: low-energy gamma = 1800 cpm; gamma = 12,000 cpm.

Table 3.4-1
Drilling Depths and Numbers of Samples Collected per Borehole at MDA C (2005–2006)

Location ID	Pore-Gas Samples	Core Samples	2nd-Round Gas Samples	Duplicate Samples	Trip Blanks	Rinsates	Max. Core Depth (ft)	Max. Pore-Gas Depth (ft)
50-09100 ^a	9	0	0	1	1	0	260	260
50-10131 ^a	10	0	0	1	1	0	250	250
50-24766	5	5	5	1	2	0	149.5	149
50-24767	5	8	5	1	2	0	149.8	149
50-24768	5	5	5	2	2	1	151.5	150
50-24769	5	5	5	1	2	0	149.8	149
50-24770	6	6	6	1	2	1	150	150
50-24771	5	5	5	1	2	0	150	150
50-24773	5	5	5	2	2	1	152.8	150
50-24782	5	5	5	0	2	0	157.5	155
50-24783	5	5	5	2	2	0	152.5	151
50-24784	10	11	10	3	2	1	299.8	268
50-24785	7	7	7	2	2	1	275	275
50-24796	6	6	6	2	2	1	149.4	150
50-24797	5	5	5	2	2	0	159	159
50-24799	9	9	5	1	2	0	160	160
50-24801	5	5	5	2	2	1	150	150
50-24802	5	5	5	2	2	1	159.1	156.4
50-24803	5	5	5	2	2	1	153.9	151
50-24804	6	7	6	1	2	1	149.8	149
50-24810	5	5	5	2	2	1	151.6	150
50-24811	5	5	5	1	2	0	150.6	150
50-24812	5	5	5	2	2	1	150	150
50-24813	5	5	5	1	2	0	150	150
50-24814	5	5	5	3	2	1	149.5	149
50-24815	5	5	5	2	2	1	149.7	149
50-24816	6	6	6	1	2	0	225	225
50-24817	6	8	6	3	2	0	250	250
50-24818	13	27	0	4	2	1	600.5	591
50-24819	7	7	7	3	2	1	275	275
50-24820	6	7	6	2	2	1	250	250
50-24821	6	8	7	1	1	0	250	250
50-24822	6	7	6	2	2	1	250	250
50-25451	7	7	0	2	1	1	300	287
50-25621	0	2	0	0	0	0	60	n/a ^b

^a Drilled prior to 2005.^b n/a = Not applicable.

Table 3.4-2
Borehole Numbers from
Work Plan and Corresponding Location IDs

Work Plan Borehole No.	Corresponding Borehole Location ID
BH-01	50-24816
BH-02	50-24784
BH-03	50-24785
BH-04	50-24796
BH-05	50-24797
BH-06	50-24799
BH-07	50-24766
BH-08	50-24817
BH-09	50-24818
BH-10	50-24767
BH-11	50-24768
BH-12	50-24769
BH-13	50-24770
BH-14	50-24771
BH-15	50-24773
BH-16	50-24782
BH-17	50-24783
BH-18	50-24801
BH-19	50-24802
BH-20	50-24803
BH-21	50-24804
BH-22	50-24810
BH-23	50-24811
BH-24	50-24812
BH-25	50-24813
BH-26	50-24814
BH-27	50-24815
BH-28	Not drilled
BH-29	Not drilled
BH-30	Not drilled
BH-31	Not drilled
BH-32	Not drilled
BH-33	Not drilled
BH-34	Not drilled
BH-35	Not drilled

Table 3.4-2 (continued)

Work Plan Borehole No.	Corresponding Borehole Location ID
BH-36	Not drilled
BH-37	Not drilled
BH-38	Not drilled
BH-39	50-24819
BH-40	50-24820
BH-41	50-24821
BH-42	50-24822
NA*	50-25451
NA	50-25621
NA	50-26823
NA	50-26824
NA	50-26825

*NA = These boreholes not specifically called for in work plan.

Table 4.9-1
Results of Geotechnical Characterization Sample Analyses at Borehole Location 50-24818

Depth (ft)	Tuff Unit	Sample ID	Calculated Total Porosity (%)	Bulk Density (g/cm ³)	Moisture Content (%)	pH	Saturated Hydraulic Conductivity (cm/sec)
8.5–10	Qbt3	MD50-06-65229	n.c. ^a	n.c.	n.c.	7.56	n.c.
22.1–25	Qbt3	MD50-06-65230	n.c.	n.c.	n.c.	7.80	n.c.
71.5–72.5	Qbt3	MD50-06-66061	38.90	1.62	18.00	n.c.	0.00024
98.5–100	Qbt2	MD50-06-65261	n.c.	n.c.	n.c.	7.11	n.c.
137.5–138.5	Qbt2	MD50-06-66063	49.80	1.33	6.80	n.c.	0.0047
147.5–149.2	Qbt2	MD50-06-65262	n.c.	n.c.	n.c.	7.52	n.c.
189.9–190	Qbt1v	MD50-06-65263	n.c.	n.c.	n.c.	6.63	n.c.
197.5–198	Qbt1v	MD50-06-66736	61.00	1.03	7.00	n.c.	0.0055
236.5–237.5	Qbt1v	MD50-06-66737	58.00	1.11	31.30	n.c.	0.00094
247.7–249.2	Qbt1g	MD50-06-65264	n.c.	n.c.	n.c.	7.32	n.c.
268.5–269	Qbt1g	MD50-06-66738	65.60	0.91	9.30	n.c.	0.0028
280–282.5	Qbt1g	MD50-06-65265	n.c.	n.c.	n.c.	7.10	n.c.
313.5–315	Qbt1g	MD50-06-65266	n.c.	n.c.	n.c.	6.01	n.c.
315.5–316.5	Qbtt ^b	MD50-06-66739	67.00	0.88	20.70	n.c.	0.02
328.5–329	Qct	MD50-06-66740	57.30	1.13	17.60	n.c.	0.0022
396–402	Qbo	MD50-06-65267	n.c.	n.c.	n.c.	8.35	n.c.
449–452	Qbo	MD50-06-65268	n.c.	n.c.	n.c.	7.69	n.c.
452–453	Qbo	MD50-06-66741	51.60	1.28	17.50	n.c.	0.00081
497–500.5	Qbo	MD50-06-65269	n.c.	n.c.	n.c.	8.44	n.c.
547–551.5	Qbo	MD50-06-65270	n.c.	n.c.	n.c.	8.77	n.c.
597–600.4	Qbo	MD50-06-65271	n.c.	n.c.	n.c.	8.12	n.c.

^a n.c. = Sample not collected.

^b Tsankawi pumice.

Table 6.2-1
Field Screening Results for 2005–2006 Borehole Sampling

Location ID	Core						Pore Gas						
	Date Collected	Depth (ft)	Core Sample ID	Alpha (dpm)	Beta/Gamma (dpm)	PID (ppm)	Depth (ft)	Date Collected (1st round)	Pore Gas Sample ID (1st round)	PID (ppm)	Date Collected (2nd round)	Pore Gas Sample ID (2nd round)	PID (ppm)
50-09100	— ^a	—	—	—	—	—	20	5/24/2006	MD50-06-70880	0.0	—	—	—
50-09100	—	—	—	—	—	—	50	5/23/2006	MD50-06-70881	0.0	—	—	—
50-09100	—	—	—	—	—	—	90	5/23/2006	MD50-06-70882	0.0	—	—	—
50-09100	—	—	—	—	—	—	103	5/23/2006	MD50-06-70883	0.0	—	—	—
50-09100	—	—	—	—	—	—	120	5/22/2006	MD50-06-70884	0.0	—	—	—
50-09100	—	—	—	—	—	—	160	5/22/2006	MD50-06-70885	1.8	—	—	—
50-09100	—	—	—	—	—	—	200	5/23/2006	MD50-06-70886	2.4	—	—	—
50-09100	—	—	—	—	—	—	233	5/19/2006	MD50-06-70887	0.0	—	—	—
50-09100	—	—	—	—	—	—	260	5/18/2006	MD50-06-70888	0.0	—	—	—
50-10131	—	—	—	—	—	—	25	5/22/2006	MD50-06-70868	0.0	—	—	—
50-10131	—	—	—	—	—	—	50	5/22/2006	MD50-06-70869	0.0	—	—	—
50-10131	—	—	—	—	—	—	75	5/22/2006	MD50-06-70870	0.9	—	—	—
50-10131	—	—	—	—	—	—	100	5/18/2006	MD50-06-70871	6.3	—	—	—
50-10131	—	—	—	—	—	—	125	5/18/2006	MD50-06-70872	0.0	—	—	—
50-10131	—	—	—	—	—	—	150	5/17/2006	MD50-06-70873	0.0	—	—	—
50-10131	—	—	—	—	—	—	175	5/17/2006	MD50-06-70874	0.0	—	—	—
50-10131	—	—	—	—	—	—	200	5/17/2006	MD50-06-70875	0.0	—	—	—
50-10131	—	—	—	—	—	—	225	5/16/2006	MD50-06-70876	0.0	—	—	—
50-10131	—	—	—	—	—	—	250	5/16/2006	MD50-06-70877	0.0	—	—	—
50-24766	4/21/2006	15.6–17.1	MD50-06-64603	<20	<1723	0	17	5/3/2006	MD50-06-64597	0.0	7/20/2006	MD50-06-65331	0.0
50-24766	4/21/2006	27.5–29.2	MD50-06-64604	<20	<1723	0.1	29	5/2/2006	MD50-06-64596	0.0	7/19/2006	MD50-06-65330	0.0
50-24766	4/24/2006	97.5–99.9	MD50-06-64586	<16.7	<1609	0	99	5/2/2006	MD50-06-64595	0.0	7/19/2006	MD50-06-65329	0.0
50-24766	4/24/2006	122.5–124.6	MD50-06-64587	<16.7	<1609	0	124	5/2/2006	MD50-06-64594	0.0	7/18/2006	MD50-06-65328	0.0
50-24766	4/24/2006	148.1–149.5	MD50-06-64605	<16.7	<1609	0	149	5/1/2006	MD50-06-64593	0.8	7/18/2006	MD50-06-65327	0.0
50-24767	3/9/2006	8.0–10.0	MD50-06-64635	<40	<3030	0.5	10	3/28/2006	MD50-06-64625	0.0	5/25/2006	MD50-06-65362	0.0

Table 6.2-1 (continued)

Location ID	Core						Pore Gas						
	Date Collected	Depth (ft)	Core Sample ID	Alpha (dpm)	Beta/Gamma (dpm)	PID (ppm)	Depth (ft)	Date Collected (1st round)	Pore Gas Sample ID (1st round)	PID (ppm)	Date Collected (2nd round)	Pore Gas Sample ID (2nd round)	PID (ppm)
50-24767	3/13/2006	28.1–30	MD50-06-64636	<25	<1975	7.3	30	3/28/2006	MD50-06-64626	1.6	5/25/2006	MD50-06-65361	0.0
50-24767	3/13/2006	29.5–30	MD50-06-66770	<25	<1975	7.3	—	—	—	—	—	—	—
50-24767	3/14/2006	58.3–59.8	MD50-06-64618	<17	<1340	0	—	—	—	—	—	—	—
50-24767	3/14/2006	59.9–60	MD50-06-66772	<17	<1340	0	60	3/27/2006	MD50-06-64627	0.0	5/25/2006	MD50-06-65360	0.0
50-24767	3/14/2006	123.2–125	MD50-06-64619	<17	<1340	0	124	3/24/2006	MD50-06-64628	1.7	5/25/2006	MD50-06-65359	0.0
50-24767	3/14/2006	148.3–149.8	MD50-06-64637	<17	<1340	0	149	3/24/2006	MD50-06-64629	0.5	5/24/2006	MD50-06-65358	0.0
50-24768	3/15/2006	12.5–15	MD50-06-64667	<22	<1350	0	14	3/30/2006	MD50-06-64661	0.0	6/1/2006	MD50-06-65370	0.0
50-24768	3/15/2006	27.5–29.5	MD50-06-64668	<22	<1350	0	29	3/30/2006	MD50-06-64660	0.7	5/31/2006	MD50-06-65369	0.0
50-24768	3/16/2006	96.7–99.5	MD50-06-64650	<22	<1380	1.5	99	3/29/2006	MD50-06-64659	0.0	5/31/2006	MD50-06-65368	0.0
50-24768	3/16/2006	123.2–125	MD50-06-64651	<22	<1380	1.5	125	3/29/2006	MD50-06-64658	0.0	5/30/2006	MD50-06-65367	0.0
50-24768	3/16/2006	148.6–151.5	MD50-06-64669	<22	<1380	1.7	150	3/29/2006	MD50-06-64657	0.0	5/30/2006	MD50-06-65366	0.0
50-24769	3/17/2006	18.1–20	MD50-06-64699	<27	<1195	0	20	5/10/2006	MD50-06-64693	0.0	6/13/2006	MD50-06-65378	0.0
50-24769	3/17/2006	37.5–39.9	MD50-06-64700	<27	<1195	0	39	5/10/2006	MD50-06-64692	0.0	6/13/2006	MD50-06-65377	0.0
50-24769	3/20/2006	97.5–99.3	MD50-06-64682	<16	<1240	0.2	99	5/9/2006	MD50-06-64691	1.6	6/13/2006	MD50-06-65376	0.0
50-24769	3/20/2006	122.5–124.5	MD50-06-64683	<16	<1240	0.5	124	5/9/2006	MD50-06-64690	7.7	6/12/2006	MD50-06-65375	0.0
50-24769	3/20/2006	147.9–149.8	MD50-06-64701	<16	<1240	0.3	149	5/9/2006	MD50-06-64689	3.5	6/12/2006	MD50-06-65374	2.5
50-24770	3/27/2006	18.1–22.5	MD50-06-64731	<32	<1412	0.2	20	4/20/2006	MD50-06-64738	6.1	6/16/2006	MD50-06-65387	5.9
50-24770	3/27/2006	24.6–25	MD50-06-64717	<32	<1412	0	25	4/20/2006	MD50-06-64725	2.3	6/15/2006	MD50-06-65386	1.9
50-24770	3/27/2006	38.2–39.9	MD50-06-64732	<32	<1412	0	39	4/19/2006	MD50-06-64724	0.3	6/15/2006	MD50-06-65385	1.8
50-24770	3/28/2006	98.7–100.0	MD50-06-64714	<44	<2050	0	100	4/19/2006	MD50-06-64723	0.0	6/15/2006	MD50-06-65384	3.6
50-24770	3/29/2006	123.2–124.6	MD50-06-64715	<27	<1961	0	124	4/19/2006	MD50-06-64722	1.9	6/14/2006	MD50-06-65383	3.2
50-24770	3/29/2006	147.5–150	MD50-06-64733	<27	<1961	0	150/148	4/19/2006	MD50-06-64721	17.1	6/14/2006	MD50-06-65382	2.1
50-24771	3/22/2006	15.9–17.5	MD50-06-64756	<40	<2880	0	17	4/18/2006	MD50-06-64750	1.3	6/13/2006	MD50-06-65394	0.0
50-24771	3/23/2006	38.0–40.0	MD50-06-64757	<22	<1285	0	40	4/18/2006	MD50-06-64749	0.6	6/13/2006	MD50-06-65393	0.0
50-24771	3/23/2006	98.8–100	MD50-06-64739	<22	<1285	0	100	4/12/2006	MD50-06-64748	0.0	6/13/2006	MD50-06-65392	0.0
50-24771	3/24/2006	123.6–125	MD50-06-64740	<22	<1285	0	125	4/12/2006	MD50-06-64747	0.0	6/12/2006	MD50-06-65391	0.0
50-24771	3/24/2006	148.2–150	MD50-06-64758	<31	<1412	0	150/149	4/12/2006	MD50-06-64746	9.2	6/12/2006	MD50-06-65390	3.1

Table 6.2-1 (continued)

Location ID	Core						Pore Gas						
	Date Collected	Depth (ft)	Core Sample ID	Alpha (dpm)	Beta/Gamma (dpm)	PID (ppm)	Depth (ft)	Date Collected (1st round)	Pore Gas Sample ID (1st round)	PID (ppm)	Date Collected (2nd round)	Pore Gas Sample ID (2nd round)	PID (ppm)
50-24773	3/17/2006	20.0–22.5	MD50-06-64781	<25	<2320	0	20	4/11/2006	MD50-06-64775	4.6	6/12/2006	MD50-06-65405	0.0
50-24773	3/20/2006	38.0–40.0	MD50-06-64782	<25	<2320	0	40	4/11/2006	MD50-06-64774	1.6	6/9/2006	MD50-06-65404	0.0
50-24773	3/21/2006	98.5–100.0	MD50-06-64764	<39	<2080	0	100	4/11/2006	MD50-06-64773	1.6	6/9/2006	MD50-06-65403	0.0
50-24773	3/21/2006	123.7–124.8	MD50-06-64765	<39	<2080	0	125	4/10/2006	MD50-06-64776	0.0	6/8/2006	MD50-06-65402	0.0
50-24773	3/21/2006	150.0–152.8	MD50-06-64783	<39	<2080	0	150/149	4/6/2006	MD50-06-64772	0.0	6/8/2006	MD50-06-65401	0.0
50-24782	3/14/2006	20.9–22.5	MD50-06-64813	<39	<2080	1.5	21	4/6/2006	MD50-06-64803	0.0	6/8/2006	MD50-06-65413	0.0
50-24782	3/14/2006	35.3–37.1	MD50-06-64814	<39	<2298	0	40	4/5/2006	MD50-06-64804	0.0	6/7/2006	MD50-06-65412	0.0
50-24782	3/15/2006	98.5–100	MD50-06-64796	<39	<2878	0	100	4/5/2006	MD50-06-64805	1.5	6/7/2006	MD50-06-65411	0.0
50-24782	3/16/2006	123.5–125	MD50-06-64797	<25	<2150	0	125	4/5/2006	MD50-06-64806	0.6	6/7/2006	MD50-06-65410	0.0
50-24782	3/16/2006	156–157.5	MD50-06-64815	<25	<2150	0	155/151	4/4/2006	MD50-06-64807	1.8	6/6/2006	MD50-06-65409	0.0
50-24783	3/8/2006	17.5–20	MD50-06-64838	<22	<1240	2.5	20	4/4/2006	MD50-06-64832	2.9	6/5/2006	MD50-06-65421	0.0
50-24783	3/8/2006	35.4–37.5	MD50-06-64839	<22	<1240	1.5	36	4/3/2006	MD50-06-64831	0.0	6/2/2006	MD50-06-65420	0.0
50-24783	3/10/2006	98.6–100	MD50-06-64821	<25	<1300	1.1	100	4/3/2006	MD50-06-64830	0.0	6/2/2006	MD50-06-65419	0.0
50-24783	3/13/2006	123.3–125	MD50-06-64822	<15	<1290	2.0	125	4/3/2006	MD50-06-64829	3.0	6/1/2006	MD50-06-65418	1.3
50-24783	3/13/2006	150.3–152.5	MD50-06-64840	<15	<1290	1.8	151/148	3/31/2006	MD50-06-64828	2.2	6/1/2006	MD50-06-65417	2.3
50-24784	2/10/2006	8.0–10.0	MD50-06-64380	<21	<1305	0	10	3/16/2006	MD50-06-64374	0.0	4/28/2006	MD50-06-70724	0.0
50-24784	2/14/2006	18–20	MD50-06-64381	<22	<1125	0	20	3/16/2006	MD50-06-64373	0.0	4/28/2006	MD50-06-70723	0.0
50-24784	2/14/2006	46.1–47.5	MD50-06-64363	<22	<1125	0	47	3/15/2006	MD50-06-64372	0.0	4/28/2006	MD50-06-70722	0.0
50-24784	2/14/2006	48.7–50	MD50-06-64364	<22	<1125	2.5	49	3/15/2006	MD50-06-64371	0.0	4/27/2006	MD50-06-70721	8.0
50-24784	2/21/2006	51–55	MD50-06-64365	<25	<1180	2.8	55	3/15/2006	MD50-06-64370	0.0	4/27/2006	MD50-06-65292	5.6
50-24784	2/21/2006	98.5–100	MD50-06-64367	<25	<1180	3.5	100	3/14/2006	MD50-06-64375	0.0	4/27/2006	MD50-06-65291	0.0
50-24784	2/24/2006	167.5–169.0	MD50-06-64366	<20	<1135	2.5	168	3/14/2006	MD50-06-64379	6.6	4/27/2006	MD50-06-65290	0.0
50-24784	2/27/2006	197.9–199.2	MD50-06-64369	<18	<1110	0	199	3/13/2006	MD50-06-64378	0.0	4/26/2006	MD50-06-65289	0.0
50-24784	2/27/2006	248–250	MD50-06-64368	<18	<1110	0	250	3/13/2006	MD50-06-64377	2.2	4/26/2006	MD50-06-65288	0.0
50-24784	2/28/2006	273.5–275	MD50-06-65526	<35	<2440	2.1	268/265	3/10/2006	MD50-06-64376	0.0	4/26/2006	MD50-06-65287	1.1
50-24784	2/28/2006	298.3–299.8	MD50-06-64382	<35	<2440	0.7	—	—	—	—	—	—	—
50-24785	1/23/2006	8.5–10	MD50-06-64412	<28	<1240	0	10	1/23/2006	MD50-06-64402	0.0	5/3/2006	MD50-06-66783	0.0

Table 6.2-1 (continued)

Location ID	Core						Pore Gas						
	Date Collected	Depth (ft)	Core Sample ID	Alpha (dpm)	Beta/Gamma (dpm)	PID (ppm)	Depth (ft)	Date Collected (1st round)	Pore Gas Sample ID (1st round)	PID (ppm)	Date Collected (2nd round)	Pore Gas Sample ID (2nd round)	PID (ppm)
50-24785	1/24/2006	17.5–19	MD50-06-64413	<24	<2510	0	19	1/24/2006	MD50-06-64403	5.0	5/3/2006	MD50-06-65300	0.0
50-24785	1/25/2006	57.5–60	MD50-06-64395	<17.13	<2330	0.5	60	2/10/2006	MD50-06-64408	0.6	5/2/2006	MD50-06-65299	0.0
50-24785	1/27/2006	117.5–120	MD50-06-64396	<45	<2130	0	120	2/9/2006	MD50-06-64407	0.0	5/2/2006	MD50-06-65298	0.0
50-24785	1/31/2006	198.7–200	MD50-06-64397	<31	<2020	0	200	1/31/2006	MD50-06-64404	2.0	5/1/2006	MD50-06-65297	0.0
50-24785	2/2/2005	248.5–250	MD50-06-64398	<21	<2210	6.7	250	2/2/2006	MD50-06-64405	5.0	5/1/2006	MD50-06-65296	0.0
50-24785	2/6/2006	273.8–275	MD50-06-64414	<21	<2360	0	275/256	2/6/2006	MD50-06-64406	0.0	5/1/2006	MD50-06-65295	0.0
50-24796	12/21/2005	8.0–10.0	MD50-06-64457	NDA ^b	<666	1.9	10	12/21/2005	MD50-06-64448	0.0	5/24/2006	MD50-06-65308	0.0
50-24796	12/21/2005	17.5–19.3	MD50-06-64458	NDA	<666	0	20	12/21/2005	MD50-06-64447	0.4	5/24/2006	MD50-06-65307	0.0
50-24796	1/3/2006	37.5–39.3	MD50-06-64440	<10	<600	0	40	1/3/2006	MD50-06-64449	0.0	5/24/2006	MD50-06-65306	0.0
50-24796	1/4/2006	97.5–100	MD50-06-64441	<10	<2960	0	100	1/4/2006	MD50-06-64450	0.0	5/23/2006	MD50-06-65305	0.0
50-24796	1/5/2006	118.7–120	MD50-06-64442	<12	<1700	0	120	1/5/2006	MD50-06-64451	0.0	5/23/2006	MD50-06-65304	0.0
50-24796	1/5/2006	147.5–149.4	MD50-06-64459	<12	<1700	0	150/144	1/5/2006	MD50-06-64452	0.0	5/23/2006	MD50-06-65303	0.0
50-24797	1/10/2006	17.5–18.3	MD50-06-64506	<32	<1882	0	18.3	1/10/2006	MD50-06-64496	0.0	6/6/2006	MD50-06-65315	0.0
50-24797	1/11/2006	37.0–38	MD50-06-64509	<66	<471	1.2	38	1/11/2006	MD50-06-64497	0.0	6/5/2006	MD50-06-65314	0.0
50-24797	1/12/2006	58–60	MD50-06-64489	<40	<2330	0.6	60	2/8/2006	MD50-06-66198	0.4	5/30/2006	MD50-06-65313	2.5
50-24797	1/13/2006	117–120	MD50-06-64490	<40	<2330	0.6	120	1/13/2006	MD50-06-64498	0.0	5/25/2006	MD50-06-65312	0.0
50-24797	1/19/2006	157.5–159	MD50-06-64508	<43	<2280	0	160	1/19/2006	MD50-06-64500	0.0	5/25/2006	MD50-06-65311	0.0
50-24799	1/9/2006	13.1–15.0	MD50-06-64516	<10	<1090	0	15	2/8/2006	MD50-06-66197	0.0	—	—	—
50-24799	1/9/2006	15.0–16.5	MD50-06-64517	<10	<1090	1.4	17.5	1/9/2006	MD50-06-64521	0.0	—	—	—
50-24799	1/9/2006	18–20	MD50-06-64531	<10	<1090	0	20	1/9/2006	MD50-06-64522	0.0	7/24/2006	MD50-06-65323	1.4
50-24799	1/10/2006	30.6–32.5	MD50-06-64532	<35	<1040	0	32.5	1/10/2006	MD50-06-64523	0.0	7/24/2006	MD50-06-65322	0.0
50-24799	1/10/2006	34.5–36	MD50-06-64518	<35	<1040	0	37.5	1/10/2006	MD50-06-64538	0.0	—	—	—
50-24799	1/10/2006	38.5–40	MD50-06-64519	<35	<1040	0	40.5	1/11/2006	MD50-06-64524	0.0	—	—	—
50-24799	1/13/2006	98.3–100	MD50-06-64514	<20	<1030	0	100	1/13/2006	MD50-06-64525	0.0	7/21/2006	MD50-06-65321	0.0
50-24799	1/17/2006	118.4–120	MD50-06-64515	<10	<1085	0	120	1/17/2006	MD50-06-64526	0.0	7/21/2006	MD50-06-65320	0.0
50-24799	1/17/2006	158.5–160	MD50-06-64533	<10	<1085	0	160	1/17/2006	MD50-06-64527	0.0	7/20/2006	MD50-06-65319	0.0
50-24801	2/1/2006	16.8–20	MD50-06-64863	<16	<2370	0	20	2/1/2006	MD50-06-64853	0.2	7/18/2006	MD50-06-65429	0.6

Table 6.2-1 (continued)

Location ID	Core						Pore Gas						
	Date Collected	Depth (ft)	Core Sample ID	Alpha (dpm)	Beta/Gamma (dpm)	PID (ppm)	Depth (ft)	Date Collected (1st round)	Pore Gas Sample ID (1st round)	PID (ppm)	Date Collected (2nd round)	Pore Gas Sample ID (2nd round)	PID (ppm)
50-24801	2/1/2006	33–35	MD50-06-64864	<16	<2370	0	35	2/1/2006	MD50-06-64870	1.8	7/17/2006	MD50-06-65428	0.0
50-24801	2/2/2006	78–80	MD50-06-64846	<10.4	<1201	0.1	80	2/7/2006	MD50-06-64856	0.2	7/17/2006	MD50-06-65427	0.0
50-24801	2/3/2006	118–120	MD50-06-64847	<15	<1275	0	120	2/7/2006	MD50-06-64855	0.1	7/17/2006	MD50-06-65426	0.0
50-24801	2/6/2006	148.3–150	MD50-06-64865	<15	<1275	0	150	2/6/2006	MD50-06-64854	1.2	7/14/2006	MD50-06-65425	0.0
50-24802	3/1/2006	12.5–16.1	MD50-06-64888	<22	<1795	0.3	15	3/20/2006	MD50-06-64878	0.0	6/28/2006	MD50-06-65437	0.0
50-24802	3/2/2006	40.6–42.5	MD50-06-64889	<22	<1240	0.1	42	3/20/2006	MD50-06-64879	0.0	6/27/2006	MD50-06-65436	0.0
50-24802	3/2/2006	98.2–100	MD50-06-64871	<22	<1240	0	124.4/124	3/17/2006	MD50-06-64881	2.6	6/27/2006	MD50-06-65434	0.0
50-24802	3/2/2006	123.1–125	MD50-06-64872	<22	<1240	0	156.4/156	3/17/2006	MD50-06-64882	1.9	6/27/2006	MD50-06-65433	1.2
50-24802	3/2/2006	157.5–159.1	MD50-06-64890	<22	<1240	0	99.4/99	3/17/2006	MD50-06-64880	1.3	6/27/2006	MD50-06-65435	0.0
50-24803	3/3/2006	15.4–17.5	MD50-06-64913	<8	<1569	0	16	3/23/2006	MD50-06-64904	0.0	6/26/2006	MD50-06-65445	0.0
50-24803	3/6/2006	36–37.5	MD50-06-64914	<15	<1210	0.2	37	3/23/2006	MD50-06-64903	0.0	6/26/2006	MD50-06-65444	0.0
50-24803	3/6/2006	98.7–99.8	MD50-06-64896	<15	<1210	0	99.5	3/22/2006	MD50-06-64905	1.9	6/26/2006	MD50-06-65443	0.0
50-24803	3/6/2006	123.3–124.8	MD50-06-64897	<15	<1210	0	124	3/22/2006	MD50-06-64906	1.9	6/23/2006	MD50-06-65442	0.0
50-24803	3/7/2006	150–153.9	MD50-06-64915	<15	<1290	0	151	3/21/2006	MD50-06-64907	3.2	6/23/2006	MD50-06-65441	2.6
50-24804	4/26/2006	8.6–9.8	MD50-06-64965	<140.9	<1034	0	—	—	—	—	—	—	—
50-24804	4/26/2006	10–11.4	MD50-06-64966	<140.9	<1034	0	10	5/4/2006	MD50-06-64970	0.0	7/21/2006	MD50-06-65454	0.2
50-24804	4/26/2006	15.4–17.1	MD50-06-64980	<140.9	<1034	0	16	5/4/2006	MD50-06-64971	0.0	7/21/2006	MD50-06-65453	0.0
50-24804	4/27/2006	32.5–34.2	MD50-06-64981	<121	<2580	0	33	5/4/2006	MD50-06-64972	0.1	7/20/2006	MD50-06-65452	0.0
50-24804	4/27/2006	97.8–99.2	MD50-06-64963	<121	<2580	0	99	5/5/2006	MD50-06-64973	1.2	7/20/2006	MD50-06-65451	0.0
50-24804	4/28/2006	122.5–124.1	MD50-06-64964	<0	<2000	0	124	5/5/2006	MD50-06-64974	1.8	7/19/2006	MD50-06-65450	0.2
50-24804	4/28/2006	147.5–149.8	MD50-06-64982	<0	<2000	0	149	5/5/2006	MD50-06-64975	3.2	7/19/2006	MD50-06-65449	0.3
50-24810	4/14/2006	17.5–19	MD50-06-65005	<16	<1737	0.6	19	5/15/2006	MD50-06-64999	0.0	7/18/2006	MD50-06-65461	0.0
50-24810	4/14/2006	35.5–37.1	MD50-06-65006	<16	<1737	0	37	5/15/2006	MD50-06-64998	0.0	7/18/2006	MD50-06-65460	0.0
50-24810	4/14/2006	97.5–99.0	MD50-06-64988	<16	<1737	0	99	5/15/2006	MD50-06-64997	0.0	7/18/2006	MD50-06-65459	0.0
50-24810	4/14/2006	122.5–123.9	MD50-06-64989	<16	<1737	0	123	5/15/2006	MD50-06-64996	0.0	7/17/2006	MD50-06-65458	0.0
50-24810	4/17/2006	148.3–151.6	MD50-06-65007	<20	<1425	0	150	5/11/2006	MD50-06-64995	0.0	7/17/2006	MD50-06-65457	0.0
50-24811	4/10/2006	18.5–20	MD50-06-65075	<65	<2470	0	20	5/11/2006	MD50-06-65069	1.8	7/14/2006	MD50-06-65469	0.0

Table 6.2-1 (continued)

Location ID	Core						Pore Gas						
	Date Collected	Depth (ft)	Core Sample ID	Alpha (dpm)	Beta/Gamma (dpm)	PID (ppm)	Depth (ft)	Date Collected (1st round)	Pore Gas Sample ID (1st round)	PID (ppm)	Date Collected (2nd round)	Pore Gas Sample ID (2nd round)	PID (ppm)
50-24811	4/10/2006	38.5–40	MD50-06-65076	<65	<2470	0	40	5/10/2006	MD50-06-65068	0.0	7/13/2006	MD50-06-65468	0.2
50-24811	4/11/2006	97.5–98.7	MD50-06-65058	<55	<2370	0	98	5/10/2006	MD50-06-65067	0.0	7/13/2006	MD50-06-65467	2.0
50-24811	4/11/2006	123.2–125	MD50-06-65059	<55	<2370	6.3	125	5/10/2006	MD50-06-65066	0.0	7/12/2006	MD50-06-65466	0.0
50-24811	4/12/2006	147.5–150.6	MD50-06-65077	<55	<2250	0	150	5/10/2006	MD50-06-65065	0.0	6/28/2006	MD50-06-65465	0.5
50-24812	4/3/2006	8.4–10	MD50-06-65100	<24	<1280	0	10	5/9/2006	MD50-06-65094	0.4	6/27/2006	MD50-06-65477	0.0
50-24812	4/3/2006	33.5–35	MD50-06-65101	<24	<1280	0	35	5/9/2006	MD50-06-65093	0.7	6/27/2006	MD50-06-65476	0.0
50-24812	4/4/2006	97.5–98.9	MD50-06-65083	<35	<1275	0	98	5/9/2006	MD50-06-65092	8.8	6/27/2006	MD50-06-65474	0.0
50-24812	4/4/2006	122.5–123.7	MD50-06-65084	<35	<1275	1.2	123	5/8/2006	MD50-06-65091	1.0	6/26/2006	MD50-06-65475	2.0
50-24812	4/5/2006	146.0–150.0	MD50-06-65102	<60	<2550	6.2	150	5/5/2006	MD50-06-65090	19.8	6/26/2006	MD50-06-65473	1.9
50-24813	3/29/2006	18.2–20	MD50-06-65132	<30	<1280	0	20	5/5/2006	MD50-06-65126	0.4	6/23/2006	MD50-06-65485	1.8
50-24813	3/29/2006	30–31.9	MD50-06-65133	<30	<1280	0	30	5/4/2006	MD50-06-65125	0.0	6/23/2006	MD50-06-65484	2.1
50-24813	3/30/2006	98.2–99.7	MD50-06-65115	<35	<1470	0	99	5/4/2006	MD50-06-65124	1.3	6/22/2006	MD50-06-65483	2.2
50-24813	3/30/2006	123.5–125	MD50-06-65116	<35	<1470	0	125	5/4/2006	MD50-06-65123	3.0	6/21/2006	MD50-06-65482	2.1
50-24813	3/30/2006	148–150	MD50-06-65134	<35	<1470	0	150	5/3/2006	MD50-06-65122	5.0	6/21/2006	MD50-06-65481	0.5
50-24814	3/24/2006	7.5–9.1	MD50-06-65157	<15	<1250	0	10	5/16/2006	MD50-06-65151	0.0	6/20/2006	MD50-06-65493	0.0
50-24814	3/27/2006	30–31.6	MD50-06-65158	<20	<1150	0.1	30	5/16/2006	MD50-06-65150	0.0	6/20/2006	MD50-06-65492	0.6
50-24814	3/27/2006	96.8–99.9	MD50-06-65140	<20	<1150	0	99	5/15/2006	MD50-06-65149	0.0	6/19/2006	MD50-06-65491	0.9
50-24814	3/27/2006	123.5–124.8	MD50-06-65141	<20	<1150	0	124	5/15/2006	MD50-06-65148	0.0	6/19/2006	MD50-06-65490	1.8
50-24814	3/27/2006	147.5–149.5	MD50-06-65159	<20	<1150	0	149	5/15/2006	MD50-06-65147	0.0	6/19/2006	MD50-06-65489	5.2
50-24815	3/21/2006	17.5–20	MD50-06-65189	<25	<1290	0	30	5/12/2006	MD50-06-65183	0.2	6/15/2006	MD50-06-65501	2.8
50-24815	3/21/2006	37.8–41.5	MD50-06-65190	<25	<1290	0	40	5/11/2006	MD50-06-65182	0.0	6/15/2006	MD50-06-65500	3.2
50-24815	3/22/2006	98.8–100.0	MD50-06-65172	<40	<1255	0	100	5/11/2006	MD50-06-65181	0.9	6/15/2006	MD50-06-65499	6.5
50-24815	3/22/2006	123.4–125.0	MD50-06-65173	<40	<1255	0	125	5/11/2006	MD50-06-65180	0.9	6/14/2006	MD50-06-65498	0.0
50-24815	3/22/2006	147.8–149.7	MD50-06-65191	<40	<1255	0	149	5/10/2006	MD50-06-65179	0.0	6/14/2006	MD50-06-65497	0.0
50-24816	1/20/2006	23.1–24.7	MD50-06-65214	<5.73	<1100	0	25	1/20/2006	MD50-06-65204	0.0	4/21/2006	MD50-06-65510	2.1
50-24816	1/20/2006	32.2–34.0	MD50-06-65215	<5.73	<1100	0	35	1/20/2006	MD50-06-65205	1.8	4/20/2006	MD50-06-65509	0.0
50-24816	1/23/2006	63.8–65	MD50-06-65197	<10	<1030	0.3	65	1/31/2006	MD50-06-65209	2.5	4/20/2006	MD50-06-65508	0.0

Table 6.2-1 (continued)

Location ID	Core						Pore Gas						
	Date Collected	Depth (ft)	Core Sample ID	Alpha (dpm)	Beta/Gamma (dpm)	PID (ppm)	Depth (ft)	Date Collected (1st round)	Pore Gas Sample ID (1st round)	PID (ppm)	Date Collected (2nd round)	Pore Gas Sample ID (2nd round)	PID (ppm)
50-24816	1/24/2006	118.7–120	MD50-06-65198	<10	<1030	0	120	1/24/2006	MD50-06-65206	0.4	4/20/2006	MD50-06-65507	0.0
50-24816	1/27/2006	198.8–200	MD50-06-65199	<15	<1160	0	200	1/30/2006	MD50-06-65208	0.0	4/19/2006	MD50-06-65506	3.1
50-24816	1/27/2006	223.4–225	MD50-06-65216	<15	<1160	0	225/215.8	1/27/2006	MD50-06-65207	0.0	4/19/2006	MD50-06-65505	0.0
50-24817	9/22/2005	18.4–20	MD50-05-63837	<30	<1419	0	20	9/22/2005	MD50-05-63841	0.0	11/7/2005	MD50-06-65903	—
50-24817	9/22/2005	18.4–20	RE50-05-63807	<30	<1419	0	—	—	—	—	—	—	—
50-24817	9/22/2005	37–40	MD50-05-63838	<50	<1195	0	40	9/22/2005	MD50-05-63842	0.8	11/7/2005	MD50-06-65904	0
50-24817	9/22/2005	37–40	RE50-05-63809	<50	<1195	0	—	—	—	—	—	—	—
50-24817	9/22/2005	37–40	RE50-05-63808	<50	<1195	0	—	—	—	—	—	—	—
50-24817	9/26/2005	98.8–100	RE50-05-63810	<250	<463	0	100	9/26/2005	RE50-05-63816	3.9	11/7/2005	MD50-06-65905	1.5
50-24817	9/27/2005	138–140	RE50-05-63811	<111	<2700	0	140	9/27/2005	RE50-05-63817	0.0	11/4/2005	MD50-06-65906	0
50-24817	9/28/2005	198.4–200	RE50-05-63812	<46	<1244	0	200	9/28/2005	RE50-05-63818	3.0	11/4/2005	MD50-06-65907	0
50-24817	10/3/2005	248.1–250	MD50-05-63839	<18	<1341	0	250/240.9	10/3/2005	MD50-05-63843	0.0	11/4/2005	MD50-06-65908	4.1
50-24818	2/8/2006	8.5–10	MD50-06-65229	<28	<2130	1.0	10	2/8/2006	MD50-06-65232	3.3	—	—	—
50-24818	2/9/2006	22.1–25	MD50-06-65230	<32	<1220	1.0	25	2/9/2006	MD50-06-65233	0.0	—	—	—
50-24818	2/13/2006	71.5–72.5	MD50-06-66061	<22	<1150	0	—	—	—	—	—	—	—
50-24818	2/14/2006	98.5–100	MD50-06-65261	<25	<1120	0	100	2/14/2006	MD50-06-65234	3.6	—	—	—
50-24818	2/16/2006	100.4–100.5	MD50-06-66758	<25	<1160	0	—	—	—	—	—	—	—
50-24818	2/21/2006	137.5–138.5	MD50-06-66063	<34	<2560	0	—	—	—	—	—	—	—
50-24818	2/21/2006	147.5–149.2	MD50-06-65262	<34	<2560	0	150	2/21/2006	MD50-06-65235	10.0	—	—	—
50-24818	2/23/2006	189.9–190	MD50-06-65263	<54	<2650	0	190	2/23/2006	MD50-06-65236	3.7	—	—	—
50-24818	2/23/2006	190	MD50-06-66759	<54	<2650	0	—	—	—	—	—	—	—
50-24818	2/23/2006	197.5–198	MD50-06-66736	<54	<2650	0	—	—	—	—	—	—	—
50-24818	2/24/2006	236.5–237.5	MD50-06-66737	<19	<1160	0	—	—	—	—	—	—	—
50-24818	2/24/2006	247.7–249.2	MD50-06-65264	<19	<1160	0	250	2/24/2006	MD50-06-65237	17.0	—	—	—
50-24818	2/27/2006	268.5–269	MD50-06-66738	<32	<2010	0	—	—	—	—	—	—	—
50-24818	2/27/2006	280–282.5	MD50-06-65265	<32	<2010	1	280	2/27/2006	MD50-06-65238	7.0	—	—	—
50-24818	2/28/2006	312.9–313	MD50-06-66760	<32	<2440	8.4	—	—	—	—	—	—	—

Table 6.2-1 (continued)

Location ID	Core						Pore Gas						
	Date Collected	Depth (ft)	Core Sample ID	Alpha (dpm)	Beta/Gamma (dpm)	PID (ppm)	Depth (ft)	Date Collected (1st round)	Pore Gas Sample ID (1st round)	PID (ppm)	Date Collected (2nd round)	Pore Gas Sample ID (2nd round)	PID (ppm)
50-24818	2/28/2006	313.5–315	MD50-06-65266	<32	<2440	8.4	315	2/28/2006	MD50-06-65239	19.1	—	—	—
50-24818	2/28/2006	315.5–316.5	MD50-06-66739	<32	<2440	8.4	—	—	—	—	—	—	—
50-24818	3/1/2006	328.5–329	MD50-06-66740	<37	<2130	0	—	—	—	—	—	—	—
50-24818	4/27/2006	397.9–398	MD50-06-66761	0	<1314	0	414	5/17/2006	MD50-06-65240	0.0	—	—	—
50-24818	4/27/2006	396.0–402	MD50-06-65267	0	<1314	0	414	5/17/2006	MD50-06-67516	0.0	—	—	—
50-24818	5/22/2006	449–452	MD50-06-65268	<26.6	<1572	0	452	6/16/2006	MD50-06-65242	0.0	—	—	—
50-24818	5/23/2006	452–453	MD50-06-66741	<76.6	<1572	0	470	6/23/2006	MD50-06-71578	0.0	—	—	—
50-24818	5/24/2006	497.0–500.5	MD50-06-65269	<40.7	<1408	4.1	500	6/23/2006	MD50-06-65245	0.0	—	—	—
50-24818	5/24/2006	498.4–498.5	MD50-06-66762	<40.7	<1408	4.1	500	6/23/2006	MD50-06-67520	0.0	—	—	—
50-24818	5/24/2006	547.0–551.5	MD50-06-65270	<40.7	<1408	4.3	548	6/22/2006	MD50-06-65244	0.0	—	—	—
50-24818	—	—	—	—	—	—	548	6/22/2006	MD50-06-67519	0.0	—	—	—
50-24818	5/24/2006	597.0–600.4	MD50-06-65271	<7.65	<1984	0.9	591	6/22/2006	MD50-06-65243	0.0	—	—	—
50-24818	5/25/2006	600.4–600.5	MD50-06-66763	<7.65	<1984	0.9	591	6/22/2006	MD50-06-67518	0.0	—	—	—
50-24819	8/10/2005	18.5–20	RE50-05-61422	NDA	NDA	0.0	20	8/10/2005	RE50-05-61430	0.0	10/18/2005	MD50-06-63863	0.0
50-24819	8/11/2005	48–50	RE50-05-61423	NDA	NDA	0.0	50	8/11/2005	RE50-05-61431	0.0	10/18/2005	MD50-06-63864	0.1
50-24819	8/15/2005	97.5–100	RE50-05-61424	<250	<140	0	100	8/15/2005	RE50-05-61432	0.0	10/17/2005	MD50-06-63865	0.0
50-24819	8/15/2005	138.5–140	RE50-05-61425	<250	<140	0	140	8/15/2005	RE50-05-61732	28	10/17/2005	MD50-06-63866	0.0
50-24819	8/17/2005	198.1–200	RE50-05-61426	<250	<140	0	200	8/17/2005	RE50-05-61733	7.6	10/13/2005	MD50-06-63867	0.1
50-24819	8/18/2005	246.5–250	RE50-05-61427	<250	<140	0	250	8/18/2005	RE50-05-61734	8.0	10/13/2005	MD50-06-63868	0.0
50-24819	8/19/2005	273–275	RE50-05-61428	<250	<140	0	275	8/19/2005	RE50-05-61735	0.0	10/12/2005	MD50-06-63869	0.0
50-24820	8/23/2005	17.5–20	RE50-05-61438	<250	<140	0	20	8/23/2005	RE50-05-61446	0.0	10/20/2005	MD50-06-64240	0.1
50-24820	8/24/2005	48.4–50	RE50-05-63429	<250	<140	0	50	8/24/2005	RE50-05-61449	1.3	10/20/2005	MD50-06-64241	0.0
50-24820	8/24/2005	48.4–50	RE50-05-61439	<250	<140	0	—	—	—	—	—	—	—
50-24820	8/25/2005	97.5–100	RE50-05-61440	<250	<140	0	100	8/25/2005	RE50-05-61447	0.0	10/20/2005	MD50-06-64242	0.0
50-24820	8/26/2005	138.7–140	RE50-05-61441	<250	<140	0	140	8/26/2005	RE50-05-61448	0.0	10/20/2005	MD50-06-64243	5.0
50-24820	8/29/2005	198.2–200	RE50-05-61442	<240	<150	0	200	8/29/2005	RE50-05-61450	0.0	10/19/2005	MD50-06-64244	4.3
50-24820	8/30/2005	248.3–250	RE50-05-61443	<250	<140	0	250/225	8/30/2005	RE50-05-61736	0.0	10/19/2005	MD50-06-64245	7.9

Table 6.2-1 (continued)

Location ID	Core						Pore Gas						
	Date Collected	Depth (ft)	Core Sample ID	Alpha (dpm)	Beta/Gamma (dpm)	PID (ppm)	Depth (ft)	Date Collected (1st round)	Pore Gas Sample ID (1st round)	PID (ppm)	Date Collected (2nd round)	Pore Gas Sample ID (2nd round)	PID (ppm)
50-24821	9/1/2005	18.6–20	RE50-05-63430	NDA	NDA	0	20	9/1/2005	RE50-05-61464	0	11/3/2005	MD50-06-64248	0.0
50-24821	9/1/2005	18.6–20	RE50-05-61456	NDA	NDA	0	—	—	—	—	—	—	—
50-24821	9/2/2005	48.6–50	RE50-05-63535	<250	<262	0	50	9/2/2005	RE50-05-61466	2.7	11/2/2005	MD50-06-64249	3.1
50-24821	9/2/2005	48.6–50	RE50-05-61457	<250	<262	0	—	—	—	—	—	—	—
50-24821	9/6/2005	98.4–100	RE50-05-61458	<250	<262	0	100	9/6/2005	RE50-05-61465	0	10/28/2005	MD50-06-64250	2.0
50-24821	—	—	—	—	—	—	140	9/7/2005	RE50-05-61469	1.5	10/27/2005	MD50-06-64251	0.0
50-24821	9/7/2005	137.5–140	RE50-05-61460	<250	<75	0	140	9/7/2005	RE50-05-61467	1.5	—	—	—
50-24821	9/8/2005	157–5–160	RE50-05-61459	NDA	NDA	1.8	160	10/11/2005	RE50-05-61473	0	11/14/2005	MD50-06-64254	11.3
50-24821	—	—	—	—	—	—	200	—	—	—	10/27/2005	MD50-06-64252	—
50-24821	9/12/2005	248.6–250	RE50-05-61461	NDA	<250	0	250/238	9/12/2005	RE50-05-61468	0	10/27/2005	MD50-06-64253	8.0
50-24822	9/14/2005	18.6–20	RE50-05-61474	<12	<1700	0	20	9/14/2005	RE50-05-61482	0	10/25/2005	MD50-06-64928	0
50-24822	9/15/2005	47.5–49.1	RE50-05-61475	<12	<88	1.3	50	9/15/2005	RE50-05-61483	0	10/24/2005	MD50-06-64929	0
50-24822	9/15/2005	47.5–49.1	RE50-05-63431	<12	<88	1.3	—	—	—	—	—	—	—
50-24822	9/15/2005	98.6–100	RE50-05-61476	<12	<88	0	100	9/15/2005	RE50-05-61484	0	10/24/2005	MD50-06-64930	0
50-24822	9/16/2005	137.5–139.2	RE50-05-61477	<45	<2040	0	140	9/16/2005	RE50-05-61485	0	10/24/2005	MD50-06-64931	0
50-24822	9/19/2005	198.5–200	RE50-05-61478	<3	<1251	0	200	9/19/2005	RE50-05-61486	0	10/24/2005	MD50-06-64932	2.0
50-24822	9/20/2005	248.7–250	RE50-05-61479	<70	<1451	0	250	9/20/2005	RE50-05-61737	0	10/21/2005	MD50-06-64933	0
50-25451	4/4/2006	18.7–19.9	MD50-06-66697	NDA	<380	0	19	7/14/2006	MD50-06-66691	0.0	—	—	—
50-25451	4/4/2006	48.1–49.9	MD50-06-66698	NDA	<380	0	49	7/13/2006	MD50-06-66690	0.0	—	—	—
50-25451	4/6/2007	96.0–100.0	MD50-06-66671	NDA	<940	0	100	7/13/2006	MD50-06-66689	0.0	—	—	—
50-25451	4/6/2007	146.0–147.5	MD50-06-66672	NDA	<940	0.3	147	7/13/2006	MD50-06-66688	0.0	—	—	—
50-25451	4/10/2006	198.9–200.0	MD50-06-66673	<22	<1272	0	200	7/13/2006	MD50-06-66687	0.0	—	—	—
50-25451	4/11/2006	251.2–252.5	MD50-06-66674	<500	<290	0	251	4/25/2006	MD50-06-66686	0.0	—	—	—
50-25451	4/12/2006	298.5–300	MD50-06-66699	<25	<1476	0	287	4/25/2006	MD50-06-66685	0.0	—	—	—
50-26823	8/7/2006	19.7–20	MD50-06-72711	<0	<2190	0.0	20	8/14/2006	MD50-06-72730	4.8	—	—	—
50-26823	8/7/2006	37.2–37.5	MD50-06-72712	<0	<2190	0.0	37.5	8/14/2006	MD50-06-72729	0.0	—	—	—
50-26823	8/7/2006	69.7–70	MD50-06-72713	<0	<2190	0.0	70	8/14/2006	MD50-06-72728	0.2	—	—	—

Table 6.2-1 (continued)

Location ID	Core						Pore Gas						
	Date Collected	Depth (ft)	Core Sample ID	Alpha (dpm)	Beta/Gamma (dpm)	PID (ppm)	Depth (ft)	Date Collected (1st round)	Pore Gas Sample ID (1st round)	PID (ppm)	Date Collected (2nd round)	Pore Gas Sample ID (2nd round)	PID (ppm)
50-26823	8/8/2006	98.9–99.2	MD50-06-72714	0	<3110	0.0	99	8/11/2006	MD50-06-72727	1.1	—	—	—
50-26823	8/8/2006	148.3–148.5	MD50-06-72715	0	<3110	0.0	148.5	8/11/2006	MD50-06-72726	3.3	—	—	—
50-26823	8/8/2006	199.7–200.0	MD50-06-72716	0	<3110	0.0	200	8/10/2006	MD50-06-72725	4.2	—	—	—
50-26823	8/8/2006	249.7–250.0	MD50-06-72717	0	<3110	0.0	250	8/10/2006	MD50-06-72724	8.5	—	—	—
50-26823	8/9/2006	299.7–300	MD50-06-72718	<240	<3570	0.0	300	8/9/2006	MD50-06-72723	0.0	—	—	—
50-26824	8/3/2006	19.7–20	MD50-06-72739	<43.6	<3050	0	20	8/16/2006	MD50-06-72751	0.0	—	—	—
50-26824	8/3/2006	37.2–37.5	MD50-06-72740	<43.6	<3050	0	37.5	8/16/2006	MD50-06-72750	0.0	—	—	—
50-26824	8/3/2006	69.6–70	MD50-06-72741	<43.6	<3050	0	70	8/16/2006	MD50-06-72749	0.0	—	—	—
50-26824	8/3/2006	99.7–100	MD50-06-72742	<43.6	<3050	0	100	8/15/2006	MD50-06-72748	0.0	—	—	—
50-26824	8/3/2006	149.7–150	MD50-06-72743	<43.6	<3050	0	150	8/15/2006	MD50-06-72747	0.0	—	—	—
50-26824	8/3/2006	195.5–200	MD50-06-72744	<43.6	<3050	0	200	8/15/2006	MD50-06-72746	0.0	—	—	—
50-26825	7/31/2006	19.5–20	MD50-06-72757	<205	<2310	0.0	20	8/18/2006	MD50-06-72770	0.0	—	—	—
50-26825	7/31/2006	36.8–37.5	MD50-06-72758	<205	<2310	1.9	37.5	8/18/2006	MD50-06-72768	0.0	—	—	—
50-26825	8/1/2006	69–69.3	MD50-06-72759	<118.4	<1378	1.5	69	8/17/2006	MD50-06-72767	0.0	—	—	—
50-26825	8/1/2006	99.4–99.7	MD50-06-72760	<118.4	<1378	0.0	99.5	8/17/2006	MD50-06-72766	0.0	—	—	—
50-26825	8/1/2006	148.7–149	MD50-06-72761	<118.4	<1378	0.0	149	8/17/2006	MD50-06-72765	0.0	—	—	—
50-26825	8/2/2006	199.7–200	MD50-06-72762	<118.4	<1378	0.0	200	8/17/2006	MD50-06-72764	0.0	—	—	—
50-25621	3/23/2006	29.7–30.0	MD50-06-68034	<39	<1380	0	—	—	—	—	—	—	—
50-25621	3/24/2006	59.7–60	MD50-06-68035	<32	<1250	1.1	—	—	—	—	—	—	—

^a — = No field screening conducted.

^b NDA = No detectable activity.

Table 6.2-2
HE Screening Results

Borehole	Depth (ft)	Date Collected	TNT Screen Results (ppm)	RDX Screen Results (ppm)
50-24766	9.2–9.3	4/21/2006	≤0.5	≤0.5
50-24766	19.2–19.3	4/21/2006	≤0.5	≤0.5
50-24766	27.5–29.2	4/21/2006	≤0.5	≤0.5
50-24766	39.3–39.4	4/21/2006	≤0.5	≤0.5
50-24766	49.2–49.3	4/21/2006	≤0.5	≤0.5
50-24766	59.4–59.5	4/21/2006	≤0.5	≤0.5
50-24767	8.0–10.0	3/9/2006	≤0.5	≤0.5
50-24767	22.5–22.6	3/9/2006	≤0.5	≤0.5
50-24767	28.1–30	3/13/2006	≤0.5	≤0.5
50-24767	40	n.c.*	n.c.	n.c.
50-24767	49.9–50	3/14/2006	≤0.5	≤0.5
50-24767	58.3–59.8	3/14/2006	≤0.5	≤0.5
50-24768	9.9–10	3/14/2006	≤0.5	≤0.5
50-24768	19.7–20	3/15/2006	≤0.5	≤0.5
50-24768	27.5–29.5	3/15/2006	≤0.5	≤0.5
50-24768	39.6–39.8	3/15/2006	≤0.5	≤0.5
50-24768	49.2–49.3	3/15/2006	≤0.5	≤0.5
50-24768	59.2–59.3	3/15/2006	≤0.5	≤0.5
50-24769	9.9–10	3/17/2006	≤0.5	≤0.5
50-24769	18.1–20	3/17/2006	≤0.5	≤0.5
50-24769	30.2–30.3	3/17/2006	≤0.5	≤0.5
50-24769	37.5–39.9	3/17/2006	≤0.5	≤0.5
50-24769	49.9–50	3/17/2006	≤0.5	≤0.5
50-24769	59.8–59.9	3/17/2006	≤0.5	≤0.5
50-24770	10.4–10.5	3/27/2006	≤0.5	≤0.5
50-24770	19.9–20	3/27/2006	≤0.5	≤0.5
50-24770	29.9–30	3/27/2006	≤0.5	≤0.5
50-24770	39.9–40	3/27/2006	≤0.5	≤0.5
50-24770	49.9–50	3/27/2006	≤0.5	≤0.5
50-24770	59.8–60	3/27/2006	≤0.5	≤0.5
50-24771	9.9–10.0	3/22/2006	≤0.5	≤0.5
50-24771	15.9–17.5	3/22/2006	≤0.5	≤0.5
50-24771	29.9–30	3/23/2006	≤0.5	≤0.5
50-24771	40	n.c.	n.c.	n.c.
50-24771	49.9–50	3/23/2006	≤0.5	≤0.5
50-24771	62.4–62.5	3/23/2006	≤0.5	≤0.5
50-24773	9.9–10	3/17/2006	≤0.5	≤0.5

Table 6.2-2 (continued)

Borehole	Depth (ft)	Date Collected	TNT Screen Results (ppm)	RDX Screen Results (ppm)
50-24773	20	3/17/2006	≤0.5	≤0.5
50-24773	32.4–32.5	3/20/2006	≤0.5	≤0.5
50-24773	39.9–40	3/20/2006	≤0.5	≤0.5
50-24773	49.9–50	3/20/2006	≤0.5	≤0.5
50-24773	59.9–60	3/21/2006	≤0.5	≤0.5
50-24782	8.7–8.8	3/14/2006	≤0.5	≤0.5
50-24782	17.8–17.9	3/14/2006	≤0.5	≤0.5
50-24782	29.9–30	3/14/2006	≤0.5	≤0.5
50-24782	39.9–40	3/14/2006	≤0.5	≤0.5
50-24782	48.4–48.5	3/14/2006	≤0.5	≤0.5
50-24782	60–60.1	3/14/2006	≤0.5	≤0.5
50-24783	9.8–10	3/8/2006	≤0.5	≤0.5
50-24783	17.5–20	3/8/2006	≤0.5	≤0.5
50-24783	29.9–30	3/8/2006	≤0.5	≤0.5
50-24783	39.9–40	3/8/2006	≤0.5	≤0.5
50-24783	49.8–50	3/9/2006	≤0.5	≤0.5
50-24783	59.9–60	3/9/2006	≤0.5	≤0.5
50-24784	10	n.c.	n.c.	n.c.
50-24784	17.5–20	2/14/2006	≤0.5	≤0.5
50-24784	27.5–30	2/14/2006	≤0.5	≤0.5
50-24784	39.7–40	2/14/2006	≤0.5	≤0.5
50-24784	48.7–50	2/14/2006	≤0.5	≤0.5
50-24784	59.8–60	2/21/2006	≤0.5	≤0.5
50-24785	8.5–10	1/23/2006	≤0.5	≤0.5
50-24785	17.5–19	1/24/2006	≤0.5	≤0.5
50-24785	30	n.c.	n.c.	n.c.
50-24785	38.5–40	1/24/2006	≤0.5	≤0.5
50-24785	50	n.c.	n.c.	n.c.
50-24785	57.5–60	1/24/2006	≤0.5	≤0.5
50-24796	8–10	12/21/2005	≤0.5	≤0.5
50-24796	20	12/21/2005	≤0.5	≤0.5
50-24796	30	1/3/2006	≤0.5	≤0.5
50-24796	37.5–39.3	1/3/2006	≤0.5	≤0.5
50-24796	50	1/3/2006	≤0.5	≤0.5
50-24796	58.8–59.3	1/4/2006	≤0.5	≤0.5
50-24797	9.8–10	1/10/2006	≤0.5	≤0.5
50-24797	17.5–18.3	1/10/2006	≤0.5	≤0.5
50-24797	29.8–30	1/10/2006	≤0.5	≤0.5

Table 6.2-2 (continued)

Borehole	Depth (ft)	Date Collected	TNT Screen Results (ppm)	RDX Screen Results (ppm)
50-24797	39.9–40	1/11/2006	≤0.5	≤0.5
50-24797	49.8–50	1/11/2006	≤0.5	≤0.5
50-24797	58–60	1/12/2006	≤0.5	≤0.5
50-24799	10	1/9/2006	≤0.5	≤0.5
50-24799	20	1/9/2006	≤0.5	≤0.5
50-24799	27.5–30	1/10/2006	≤0.5	≤0.5
50-24799	40	1/10/2006	≤0.5	≤0.5
50-24799	49.8–50	1/11/2006	≤0.5	≤0.5
50-24799	59.8–60	1/11/2006	≤0.5	≤0.5
50-24801	9.8–10	1/31/2006	≤0.5	≤0.5
50-24801	16.8–20	2/1/2006	≤0.5	≤0.5
50-24801	29.8–30	2/1/2006	≤0.5	≤0.5
50-24801	33–35	2/1/2006	≤0.5	≤0.5
50-24801	45	2/2/2006	≤0.5	≤0.5
50-24801	55	2/2/2006	≤0.5	≤0.5
50-24802	9.8–10	3/1/2006	≤0.5	≤0.5
50-24802	19.9–20	3/1/2006	≤0.5	≤0.5
50-24802	29.9–30	3/1/2006	≤0.5	≤0.5
50-24802	40.6–42.5	3/2/2006	≤0.5	≤0.5
50-24802	50	3/2/2006	≤0.5	≤0.5
50-24802	60	3/2/2006	≤0.5	≤0.5
50-24803	10–10.1	3/3/2006	≤0.5	≤0.5
50-24803	19.7–19.8	3/6/2006	≤0.5	≤0.5
50-24803	30	3/6/2006	≤0.5	≤0.5
50-24803	39.7–40	3/6/2006	≤0.5	≤0.5
50-24803	49–50	3/6/2006	≤0.5	≤0.5
50-24803	59.7–59.8	3/6/2006	≤0.5	≤0.5
50-24804	7.7–7.8	4/26/2006	≤0.5	≤0.5
50-24804	19.9–20	4/27/2006	≤0.5	≤0.5
50-24804	28.9–29	4/27/2006	≤0.5	≤0.5
50-24804	38.8–38.9	4/27/2006	≤0.5	≤0.5
50-24804	48.9–49	4/27/2006	≤0.5	≤0.5
50-24804	58.8–58.9	4/27/2006	≤0.5	≤0.5
50-24810	9.7–9.8	4/14/2006	≤0.5	≤0.5
50-24810	19–19.1	4/14/2006	≤0.5	≤0.5
50-24810	29.2–29.3	4/14/2006	≤0.5	≤0.5
50-24810	39.2–39.3	4/14/2006	≤0.5	≤0.5
50-24810	49.1–49.2	4/14/2006	≤0.5	≤0.5

Table 6.2-2 (continued)

Borehole	Depth (ft)	Date Collected	TNT Screen Results (ppm)	RDX Screen Results (ppm)
50-24810	59.7–59.8	4/14/2006	≤0.5	≤0.5
50-24811	10	n.c.	n.c.	n.c.
50-24811	18.5–20	4/10/2006	≤0.5	≤0.5
50-24811	29.9–30	4/10/2006	≤0.5	≤0.5
50-24811	38.5–40	4/10/2006	≤0.5	≤0.5
50-24811	50–50.1	4/10/2006	≤0.5	≤0.5
50-24811	59.3–59.4	4/10/2006	≤0.5	≤0.5
50-24812	8.4–10	4/3/2006	≤0.5	≤0.5
50-24812	19.4–19.5	4/3/2006	≤0.5	≤0.5
50-24812	29.2–29.3	4/3/2006	≤0.5	≤0.5
50-24812	38.9–39	4/4/2006	≤0.5	≤0.5
50-24812	49.4–49.5	4/4/2006	≤0.5	≤0.5
50-24812	59.2–59.3	4/4/2006	≤0.5	≤0.5
50-24813	9.8–10	3/29/2006	≤0.5	≤0.5
50-24813	18.2–20	3/29/2006	≤0.5	≤0.5
50-24813	29.9–30	3/29/2006	≤0.5	≤0.5
50-24813	39.9–40	3/29/2006	≤0.5	≤0.5
50-24813	49.9–50	3/29/2006	≤0.5	≤0.5
50-24813	59.9–60	3/29/2006	≤0.5	≤0.5
50-24814	7.5–9.1	3/24/2006	≤0.5	≤0.5
50-24814	19.7–20	3/24/2006	≤0.5	≤0.5
50-24814	29.5–29.6	3/24/2006	≤0.5	≤0.5
50-24814	39.3–39.8	3/27/2006	≤0.5	≤0.5
50-24814	49.9–50	3/27/2006	≤0.5	≤0.5
50-24814	59.5–59.6	3/27/2006	≤0.5	≤0.5
50-24815	9.9–10	3/21/2006	≤0.5	≤0.5
50-24815	17.5–20	3/21/2006	≤0.5	≤0.5
50-24815	29.9–30	3/21/2006	≤0.5	≤0.5
50-24815	37.8–41.5	3/21/2006	≤0.5	≤0.5
50-24815	49.9–50	3/21/2006	≤0.5	≤0.5
50-24815	59.2–59.3	3/21/2006	≤0.5	≤0.5
50-24816	10	n.c.	n.c.	n.c.
50-24816	23.1–24.7	1/20/2006	≤0.5	≤0.5
50-24816	30	1/20/2006	≤0.5	≤0.5
50-24816	40	n.c.	n.c.	n.c.
50-24816	50	1/23/2006	≤0.5	≤0.5
50-24816	60	1/23/2006	≤0.5	≤0.5
50-24817	10	9/22/2005	≤0.5	≤0.5

Table 6.2-2 (continued)

Borehole	Depth (ft)	Date Collected	TNT Screen Results (ppm)	RDX Screen Results (ppm)
50-24817	20	9/22/2005	≤0.5	≤0.5
50-24817	30	9/22/2005	≤0.5	≤0.5
50-24817	40	9/22/2005	≤0.5	≤0.5
50-24817	50	9/23/2005	≤0.5	≤0.5
50-24817	60	9/23/2005	≤0.5	≤0.5
50-24818	8.5–10	2/8/2006	≤0.5	≤0.5
50-24818	22.1–25	2/9/2006	≤0.5	≤0.5
50-24818	30	n.c.	n.c.	n.c.
50-24818	38.1–40	2/13/2006	≤0.5	≤0.5
50-24818	48.4–50	2/13/2006	≤0.5	≤0.5
50-24818	59.8–60	2/13/2006	≤0.5	≤0.5
50-24819	10	n.c.	n.c.	n.c.
50-24819	18.5–20	8/10/2005	≤0.5	≤0.5
50-24819	30	n.c.	n.c.	n.c.
50-24819	40	n.c.	n.c.	n.c.
50-24819	47.5–50	8/11/2005	≤0.5	≤0.5
50-24820	10	n.c.	n.c.	n.c.
50-24820	17.5–20	8/23/2005	≤0.5	≤0.5
50-24820	30	n.c.	n.c.	n.c.
50-24820	40	n.c.	n.c.	n.c.
50-24820	48.4–50	8/24/2005	≤0.5	≤0.5
50-24821	10	n.c.	n.c.	n.c.
50-24821	19.6–20	9/1/2005	≤0.5	≤0.5
50-24821	30	n.c.	n.c.	n.c.
50-24821	40	n.c.	n.c.	n.c.
50-24821	50	n.c.	n.c.	n.c.
50-24822	10	n.c.	n.c.	n.c.
50-24822	18.6–20	9/14/2005	≤0.5	≤0.5
50-24822	30	n.c.	n.c.	n.c.
50-24822	40	n.c.	n.c.	n.c.
50-24822	47.5–49.1	9/15/2005	≤0.5	≤0.5
50-25451	9.9–10	4/4/2006	≤0.5	≤0.5
50-25451	19.9–20	4/4/2006	≤0.5	≤0.5
50-25451	29.9–30	4/4/2006	≤0.5	≤0.5
50-25451	39.9–40	4/4/2006	≤0.5	≤0.5
50-25451	49.9–50	4/4/2006	≤0.5	≤0.5
50-25451	59.9–60	4/4/2006	≤0.5	≤0.5

*n.c. = Not collected.

Table 6.3-1
Summary of Inorganic Chemicals Detected or Detected above Background Values in Tuff at MDA C

Location ID	Sample ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium
Qbt2, 3, 4 BV^a				7340	0.5	2.79	46	1.21	1.63	2200	7.14
Qbt1v BV^a				8170	0.5	1.81	26.5	1.7	0.4	3700	2.24
Qbt1g, Qct, Qbo BV^a				3560	0.5	0.56	25.7	1.44	0.4	1900	2.6
Industrial Soil Screening Level^{b,c}				100000	454	17.7	100000	2250	564	na^d	5000
Residential Soil Screening Level^{b,c}				77800	31.3	3.9	15600	156	39	na	2100
50-09100	0550-95-0362	10.60–12.60	QBT3	— ^e	—	—	—	—	—	—	—
50-09100	0550-95-0365	26.50–28.50	QBT3	—	0.73 (U)	—	—	—	—	—	—
50-09100	0550-96-0100	32.70–33.70	QBT3	—	3.3 (UJ)	—	—	—	—	—	—
50-09100	0550-95-0368	41.50–43.50	QBT3	—	0.72 (U)	—	—	—	—	—	—
50-09100	0550-95-0371	58.20–60.00	QBT3	—	0.69 (U)	—	—	—	—	—	—
50-09100	0550-95-0374	71.50–73.50	QBT2	—	—	—	—	—	—	—	—
50-09100	0550-95-0383	115.10–116.90	QBT2	—	—	—	—	—	—	—	—
50-09100	0550-95-0392	161.30–163.10	QBT1V	—	—	—	—	—	—	—	—
50-09101	0550-95-0284	15.00–17.00	QBT3	—	9.8 (U)	—	—	—	—	—	—
50-09101	0550-96-0101	26.85–27.85	QBT3	—	3.3 (UJ)	—	—	—	—	—	—
50-09101	0550-95-0289	35.00–36.20	QBT3	—	10.3 (U)	—	—	—	—	—	—
50-09101	0550-96-0102	44.00–45.10	QBT3	—	3.5 (UJ)	—	—	—	—	—	—
50-09101	0550-95-0294	55.00–55.70	QBT3	—	9.5 (U)	—	—	—	—	—	—
50-09101	0550-96-0103	62.50–63.20	QBT3	—	3.5 (UJ)	—	—	—	—	—	—
50-09101	0550-95-0299	75.00–77.00	QBT3	—	9.5 (U)	—	—	—	—	—	—
50-09101	0550-95-0304	96.00–98.00	QBT3	—	9.4 (U)	—	—	—	—	—	—
50-09101	0550-95-0309	112.00–114.50	QBT3	—	9.4 (U)	—	—	—	—	—	—
50-09102	0550-95-0004	16.00–19.00	QBT3	—	—	—	—	—	—	—	—
50-09102	0550-95-0009	37.00–40.90	QBT3	—	—	—	—	—	—	—	—

Table 6.3-1 (continued)

Location ID	Sample ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium
Qbt2, 3, 4 BV^a				7340	0.5	2.79	46	1.21	1.63	2200	7.14
Qbt1v BV^a				8170	0.5	1.81	26.5	1.7	0.4	3700	2.24
Qbt1g, Qct, Qbo BV^a				3560	0.5	0.56	25.7	1.44	0.4	1900	2.6
Industrial Soil Screening Level^{b,c}				100000	454	17.7	100000	2250	564	na^d	5000
Residential Soil Screening Level^{b,c}				77800	31.3	3.9	15600	156	39	na	2100
50-09102	0550-95-0014	57.00–60.00	QBT3	—	—	—	—	—	—	—	—
50-09102	0550-95-0019	73.20–76.00	QBT3	—	5.8 (U)	—	—	—	—	—	—
50-09102	0550-95-0024	95.00–97.00	QBT3	—	5.8 (U)	—	—	—	—	—	—
50-09102	0550-95-0029	108.00–110.00	QBT3	—	5.6 (U)	—	—	—	—	—	—
50-09103	0550-95-0104	18.50–20.80	QBT3	—	0.69 (U)	—	—	—	—	—	—
50-09103	0550-95-0109	36.00–38.80	QBT3	—	0.71 (U)	—	—	—	—	—	—
50-09103	0550-96-0104	46.50–47.82	QBT3	—	3.5 (UJ)	—	—	—	—	—	—
50-09103	0550-95-0114	56.00–58.80	QBT3	—	0.75 (U)	—	—	—	—	—	—
50-09103	0550-95-0119	78.00–80.00	QBT3	—	0.75 (U)	—	—	—	—	—	—
50-09103	0550-95-0124	94.70–98.00	QBT3	—	0.72 (U)	—	—	—	—	—	—
50-09103	0550-95-0129	114.80–116.80	QBT3	—	0.71 (U)	—	—	—	—	—	—
50-09104	0550-95-0079	26.30–28.00	QBT3	—	—	—	—	—	—	—	—
50-09104	0550-95-0083	36.60–38.60	QBT3	—	—	—	—	1.3	—	—	—
50-09104	0550-96-0105	44.10–45.10	QBT3	—	3.6 (UJ)	3.2	—	—	—	—	—
50-09105	0550-95-0135	16.10–18.50	QBT3	—	0.72 (U)	—	—	—	—	—	—
50-09105	0550-95-0140	35.00–38.00	QBT3	—	0.69 (U)	—	—	—	—	—	—
50-09105	0550-95-0145	57.00–59.00	QBT3	—	0.72 (U)	—	—	—	—	—	—
50-09105	0550-96-0106	62.10–63.00	QBT3	—	3.4 (UJ)	3	—	—	—	—	—
50-09105	0550-95-0150	77.00–79.70	QBT3	—	0.68 (U)	—	—	—	—	—	—
50-09105	0550-95-0155	97.00–99.80	QBT3	—	0.7 (U)	—	—	—	—	—	—

Table 6.3-1 (continued)

Location ID	Sample ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium
Qbt2, 3, 4 BV^a				7340	0.5	2.79	46	1.21	1.63	2200	7.14
Qbt1v BV^a				8170	0.5	1.81	26.5	1.7	0.4	3700	2.24
Qbt1g, Qct, Qbo BV^a				3560	0.5	0.56	25.7	1.44	0.4	1900	2.6
Industrial Soil Screening Level^{b,c}				100000	454	17.7	100000	2250	564	na^d	5000
Residential Soil Screening Level^{b,c}				77800	31.3	3.9	15600	156	39	na	2100
50-09105	0550-95-0160	117.70–120.00	QBT3	—	0.7 (U)	—	—	—	—	—	—
50-09106	0550-95-0046	27.50–30.50	QBT3	—	0.77 (UJ)	9.8	—	—	—	—	—
50-09106	0550-95-0050	41.00–44.00	QBT3	—	0.7 (U)	—	—	—	—	—	—
50-09106	0550-95-0054	56.50–58.50	QBT3	—	0.65 (U)	—	—	—	—	—	—
50-09106	0550-95-0058	70.50–73.00	QBT3	—	0.68 (U)	—	—	—	—	—	—
50-09106	0550-95-0063	86.00–88.50	QBT3	—	0.68 (U)	—	—	—	—	—	—
50-09106	0550-95-0067	102.00–104.00	QBT3	—	0.86 (J)	—	—	—	—	—	—
50-09106	0550-95-0071	115.50–118.00	QBT3	—	0.65 (U)	—	—	—	—	—	—
50-09107	0550-96-0107	46.90–48.50	QBT3	—	3.3 (UJ)	2.8	—	—	—	—	—
50-09107	0550-96-0108	66.20–67.00	QBT3	—	3.4 (UJ)	—	—	—	—	—	—
50-09108	0550-95-0195	15.00–16.80	QBT3	—	11 (UJ)	—	—	—	—	—	—
50-09108	0550-96-0109	24.50–25.50	QBT3	—	3.4 (UJ)	—	—	—	—	—	—
50-09108	0550-95-0200	37.00–38.60	QBT3	—	11 (UJ)	—	—	—	—	—	—
50-09108	0550-96-0110	44.90–45.90	QBT3	—	3.3 (UJ)	—	—	—	—	—	—
50-09108	0550-95-0205	57.00–59.00	QBT3	—	10 (UJ)	—	—	—	—	—	—
50-09108	0550-95-0210	76.60–78.60	QBT3	—	10 (UJ)	—	—	—	—	—	—
50-09108	0550-95-0215	95.50–97.50	QBT3	—	5.7 (U)	—	—	—	—	—	—
50-09108	0550-95-0220	112.00–115.00	QBT3	—	5.8 (U)	—	—	—	—	—	—
50-09109	0550-95-0226	18.20–20.20	QBT3	—	11 (UJ)	—	—	—	—	—	—
50-09109	0550-95-0231	34.10–36.00	QBT3	—	11	—	100	—	—	—	—

Table 6.3-1 (continued)

Location ID	Sample ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium
Qbt2, 3, 4 BV^a				7340	0.5	2.79	46	1.21	1.63	2200	7.14
Qbt1v BV^a				8170	0.5	1.81	26.5	1.7	0.4	3700	2.24
Qbt1g, Qct, Qbo BV^a				3560	0.5	0.56	25.7	1.44	0.4	1900	2.6
Industrial Soil Screening Level^{b,c}				100000	454	17.7	100000	2250	564	na^d	5000
Residential Soil Screening Level^{b,c}				77800	31.3	3.9	15600	156	39	na	2100
50-09109	0550-96-0111	46.00–47.00	QBT3	—	3.3 (UJ)	—	—	—	—	—	—
50-09109	0550-95-0236	57.80–60.00	QBT3	—	11 (UJ)	—	—	—	—	—	—
50-09109	0550-96-0112	66.00–67.00	QBT3	7900	3.6 (UJ)	—	71.6	—	—	73900	12.7
50-09109	0550-95-0246	77.40–79.70	QBT3	—	11 (U)	—	—	—	—	—	—
50-09109	0550-95-0251	88.60–88.80	QBT3	—	10 (U)	—	—	—	—	—	—
50-09109	0550-95-0241	113.00–114.70	QBT3	—	11 (U)	—	—	—	—	—	—
50-09110	0550-95-0259	17.00–19.00	QBT3	—	2.9 (U)	—	—	—	—	—	—
50-09110	0550-96-0113	24.10–24.80	QBT3	—	3.4 (UJ)	—	—	—	—	—	—
50-09110	0550-95-0264	38.00–40.00	QBT3	—	3.1 (J)	—	—	—	—	—	—
50-09110	0550-96-0114	48.50–49.50	QBT3	—	3.3 (UJ)	—	—	—	—	—	—
50-09110	0550-95-0269	59.00–60.80	QBT3	—	3 (U)	—	—	—	—	—	—
50-09110	0550-95-0274	74.00–76.60	QBT3	—	2.9 (U)	—	—	—	—	—	—
50-09110	0550-95-0279	88.00–89.40	QBT3	—	2.9 (U)	—	—	—	—	—	—
50-24766	MD50-06-64604	27.50–29.20	QBT3	—	—	—	—	—	—	—	—
50-24766	MD50-06-64586	97.50–99.90	QBT2	—	—	—	—	—	—	—	—
50-24766	MD50-06-64587	122.50–124.60	QBT2	—	—	—	—	—	—	—	—
50-24766	MD50-06-64605	148.10–149.50	QBT2	—	—	—	—	—	—	—	—
50-24767	MD50-06-64635	8.00–10.00	QBT3	—	—	—	—	—	—	—	—
50-24767	MD50-06-64636	28.10–30.00	QBT3	—	—	—	—	—	—	—	—
50-24767	MD50-06-64618	58.30–59.80	QBT3	—	—	—	—	—	—	—	—

Table 6.3-1 (continued)

Location ID	Sample ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium
Qbt2, 3, 4 BV^a				7340	0.5	2.79	46	1.21	1.63	2200	7.14
Qbt1v BV^a				8170	0.5	1.81	26.5	1.7	0.4	3700	2.24
Qbt1g, Qct, Qbo BV^a				3560	0.5	0.56	25.7	1.44	0.4	1900	2.6
Industrial Soil Screening Level^{b,c}				100000	454	17.7	100000	2250	564	na^d	5000
Residential Soil Screening Level^{b,c}				77800	31.3	3.9	15600	156	39	na	2100
50-24767	MD50-06-64619	123.20–125.00	QBT2	16300 (J+)	—	2.93	56.3	3.4	—	—	—
50-24767	MD50-06-64637	148.30–149.80	QBT2	—	—	—	—	—	—	—	—
50-24768	MD50-06-64667	12.50–15.00	QBT3	—	—	—	—	—	—	—	—
50-24768	MD50-06-64668	27.50–29.50	QBT3	—	—	—	—	—	—	—	—
50-24768	MD50-06-64650	96.70–99.50	QBT2	—	—	—	—	—	—	—	—
50-24768	MD50-06-64651	123.20–125.00	QBT2	—	—	—	—	—	—	—	—
50-24768	MD50-06-64669	148.60–151.50	QBT2	7580 (J+)	—	—	—	1.5	—	—	—
50-24769	MD50-06-64699	18.10–20.00	QBT3	—	—	—	—	—	—	—	—
50-24769	MD50-06-64700	37.50–39.90	QBT3	—	—	—	—	—	—	—	—
50-24769	MD50-06-64682	97.50–99.30	QBT3	25400	—	4.76	87.2 (J+)	—	—	3970	14.8
50-24769	MD50-06-64683	122.50–124.50	QBT2	—	—	—	—	—	—	—	—
50-24769	MD50-06-64701	147.90–149.80	QBT2	—	—	—	—	—	—	—	—
50-24770	MD50-06-64731	18.10–22.50	QBT3	15200 (J+)	—	3.45	96.2	—	—	2540 (J+)	7.84
50-24770	MD50-06-64717	24.60–25.00	QBT3	—	—	—	217	—	—	3400 (J+)	—
50-24770	MD50-06-64732	38.20–39.90	QBT3	—	—	—	—	—	—	—	—
50-24770	MD50-06-64714	98.70–100.00	QBT3	—	—	—	—	—	—	—	—
50-24770	MD50-06-64715	123.20–124.60	QBT3	—	—	—	—	—	—	—	—
50-24770	MD50-06-64733	147.50–150.00	QBT2	—	—	—	—	—	—	—	—
50-24771	MD50-06-64756	15.90–17.50	QBT3	—	—	—	—	—	—	—	—
50-24771	MD50-06-64757	38.00–40.00	QBT3	—	—	—	—	—	—	—	—

Table 6.3-1 (continued)

Location ID	Sample ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium
Qbt2, 3, 4 BV^a				7340	0.5	2.79	46	1.21	1.63	2200	7.14
Qbt1v BV^a				8170	0.5	1.81	26.5	1.7	0.4	3700	2.24
Qbt1g, Qct, Qbo BV^a				3560	0.5	0.56	25.7	1.44	0.4	1900	2.6
Industrial Soil Screening Level^{b,c}				100000	454	17.7	100000	2250	564	na^d	5000
Residential Soil Screening Level^{b,c}				77800	31.3	3.9	15600	156	39	na	2100
50-24771	MD50-06-64739	98.80–100.00	QBT2	—	—	—	—	—	—	—	—
50-24771	MD50-06-64740	123.60–125.00	QBT2	—	—	—	—	—	—	—	—
50-24771	MD50-06-64758	148.20–150.00	QBT2	—	—	—	—	—	—	—	—
50-24773	MD50-06-64781	20.00–22.50	QBT3	—	—	—	—	—	—	—	—
50-24773	MD50-06-64782	38.00–40.00	QBT3	—	—	—	—	—	—	—	—
50-24773	MD50-06-64764	98.50–100.00	QBT2	—	—	—	—	—	—	—	—
50-24773	MD50-06-64765	123.70–124.80	QBT2	—	—	—	—	—	—	—	—
50-24773	MD50-06-64783	150.00–152.80	QBT2	—	—	—	—	—	—	—	—
50-24782	MD50-06-64813	20.90–22.50	QBT3	—	—	—	—	—	—	—	—
50-24782	MD50-06-64814	35.30–37.10	QBT3	—	—	—	—	—	—	—	—
50-24782	MD50-06-64796	98.50–100.00	QBT3	—	—	—	—	—	—	—	—
50-24782	MD50-06-64797	123.50–125.00	QBT3	—	—	—	—	—	—	—	—
50-24782	MD50-06-64815	156.00–157.50	QBT3	—	—	—	—	—	—	—	—
50-24783	MD50-06-64838	17.50–20.00	QBT3	—	—	—	—	—	—	—	—
50-24783	MD50-06-64839	35.40–37.50	QBT3	—	—	—	—	—	—	—	—
50-24783	MD50-06-64821	98.60–100.00	QBT3	—	—	—	—	—	—	—	—
50-24783	MD50-06-64822	123.30–125.00	QBT2	—	—	—	—	—	—	—	—
50-24783	MD50-06-64840	150.30–152.50	QBT2	—	—	—	—	—	—	—	—
50-24784	MD50-06-64380	8.00–10.00	QBT3	—	—	—	—	—	—	—	7.89
50-24784	MD50-06-64381	18.00–20.00	QBT3	—	—	—	—	—	—	—	—

Table 6.3-1 (continued)

Location ID	Sample ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium
Qbt2, 3, 4 BV^a				7340	0.5	2.79	46	1.21	1.63	2200	7.14
Qbt1v BV^a				8170	0.5	1.81	26.5	1.7	0.4	3700	2.24
Qbt1g, Qct, Qbo BV^a				3560	0.5	0.56	25.7	1.44	0.4	1900	2.6
Industrial Soil Screening Level^{b,c}				100000	454	17.7	100000	2250	564	na^d	5000
Residential Soil Screening Level^{b,c}				77800	31.3	3.9	15600	156	39	na	2100
50-24784	MD50-06-64363	46.10–47.50	QBT3	—	—	—	—	—	—	—	—
50-24784	MD50-06-64364	48.70–50.00	QBT3	51100 (J+)	0.557 (U)	7.06	258	6.67	—	6040	23.4
50-24784	MD50-06-64365	51.00–55.00	QBT3	—	—	—	—	—	—	—	—
50-24784	MD50-06-64367	98.50–100.00	QBT3	—	—	—	—	—	—	—	—
50-24784	MD50-06-64366	167.50–169.00	QBT2	—	—	—	—	—	—	—	—
50-24784	MD50-06-64369	197.90–199.20	QBT1V	—	—	1.84	—	—	0.506 (U)	—	—
50-24784	MD50-06-64368	248.00–250.00	QBT1V	—	—	2.94	—	—	0.52 (U)	—	2.29
50-24784	MD50-06-65526	273.50–275.00	QBT1G	—	—	1.57 (U)	—	—	0.524 (U)	—	—
50-24784	MD50-06-64382	298.30–299.80	QBT1G	—	—	1.62 (U)	—	—	0.541 (U)	—	19.4
50-24785	MD50-06-64412	8.50–10.00	QBT3	11800 (J+)	—	—	65.2	—	—	—	9.36 (J)
50-24785	MD50-06-64413	17.50–19.00	QBT3	—	—	—	—	—	—	—	—
50-24785	MD50-06-64395	57.50–60.00	QBT3	—	—	—	—	—	—	—	—
50-24785	MD50-06-64396	117.50–120.00	QBT2	—	—	—	—	1.39	—	—	—
50-24785	MD50-06-64397	198.70–200.00	QBT1V	—	—	—	—	—	0.502 (U)	—	—
50-24785	MD50-06-64398	248.50–250.00	QBT1G	—	—	2.93	—	—	0.575 (U)	—	4.67 (J)
50-24785	MD50-06-64414	273.80–275.00	QBT1G	—	—	0.668 (J)	—	—	0.541 (U)	—	—
50-24796	MD50-06-64457	8.00–10.00	QBT3	15100 (J+)	—	—	—	—	—	—	29
50-24796	MD50-06-64458	17.50–19.30	QBT3	—	—	—	—	—	—	—	—
50-24796	MD50-06-64440	37.50–39.30	QBT3	—	—	—	—	—	—	—	—
50-24796	MD50-06-64441	97.50–100.00	QBT3	—	—	—	—	—	—	—	—

Table 6.3-1 (continued)

Location ID	Sample ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium
Qbt2, 3, 4 BV^a				7340	0.5	2.79	46	1.21	1.63	2200	7.14
Qbt1v BV^a				8170	0.5	1.81	26.5	1.7	0.4	3700	2.24
Qbt1g, Qct, Qbo BV^a				3560	0.5	0.56	25.7	1.44	0.4	1900	2.6
Industrial Soil Screening Level^{b,c}				100000	454	17.7	100000	2250	564	na^d	5000
Residential Soil Screening Level^{b,c}				77800	31.3	3.9	15600	156	39	na	2100
50-24796	MD50-06-64442	118.70–120.00	QBT2	—	—	—	—	—	—	—	—
50-24796	MD50-06-64459	147.50–149.40	QBT2	—	—	—	—	—	—	—	—
50-24797	MD50-06-64506	17.50–18.30	QBT3	—	—	—	—	—	—	—	—
50-24797	MD50-06-64509	37.00–38.00	QBT3	—	—	—	—	—	—	—	—
50-24797	MD50-06-64489	58.00–60.00	QBT3	—	—	—	—	—	—	—	—
50-24797	MD50-06-64490	117.00–120.00	QBT2	—	—	—	—	—	—	—	—
50-24797	MD50-06-64508	157.50–159.00	QBT2	—	—	—	—	—	—	—	—
50-24799	MD50-06-64516	13.10–15.00	QBT3	—	—	—	—	—	—	—	—
50-24799	MD50-06-64517	15.00–16.50	QBT3	9940 (J+)	—	2.82	51.2	—	—	—	7.69
50-24799	MD50-06-64531	18.00–20.00	QBT3	18000 (J+)	—	2.99	58	—	—	2330	11.5
50-24799	MD50-06-64532	30.60–32.50	QBT3	—	—	—	—	—	—	—	—
50-24799	MD50-06-64518	34.50–36.00	QBT3	22600 (J+)	—	2.96	84.1 (J+)	2.32 (J)	—	3560 (J)	11.8
50-24799	MD50-06-64519	38.50–40.00	QBT3	—	—	—	—	—	—	—	10.4
50-24799	MD50-06-64514	98.30–100.00	QBT3	—	—	—	—	—	—	—	—
50-24799	MD50-06-64515	118.40–120.00	QBT2	—	—	—	—	—	—	—	—
50-24799	MD50-06-64533	158.50–160.00	QBT2	—	—	—	—	2.67	—	—	—
50-24801	MD50-06-64863	16.80–20.00	QBT3	—	—	—	—	—	—	—	—
50-24801	MD50-06-64864	33.00–35.00	QBT3	—	—	—	—	—	—	—	—
50-24801	MD50-06-64846	78.00–80.00	QBT3	—	—	—	—	—	—	—	—
50-24801	MD50-06-64847	118.00–120.00	QBT2	—	—	—	—	—	—	—	—

Table 6.3-1 (continued)

Location ID	Sample ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium
Qbt2, 3, 4 BV^a				7340	0.5	2.79	46	1.21	1.63	2200	7.14
Qbt1v BV^a				8170	0.5	1.81	26.5	1.7	0.4	3700	2.24
Qbt1g, Qct, Qbo BV^a				3560	0.5	0.56	25.7	1.44	0.4	1900	2.6
Industrial Soil Screening Level^{b,c}				100000	454	17.7	100000	2250	564	na^d	5000
Residential Soil Screening Level^{b,c}				77800	31.3	3.9	15600	156	39	na	2100
50-24801	MD50-06-64865	148.30–150.00	QBT2	—	—	—	—	—	—	—	—
50-24802	MD50-06-64888	12.50–16.10	QBT3	—	—	—	—	—	—	—	—
50-24802	MD50-06-64889	40.60–42.50	QBT3	—	—	—	—	—	—	—	—
50-24802	MD50-06-64871	98.20–100.00	QBT3	—	—	—	—	—	—	—	—
50-24802	MD50-06-64872	123.10–125.00	QBT2	—	—	—	—	—	—	—	—
50-24802	MD50-06-64890	157.50–159.10	QBT2	—	—	—	—	—	—	—	—
50-24803	MD50-06-64913	15.40–17.50	QBT3	—	—	—	—	—	—	—	—
50-24803	MD50-06-64914	36.00–37.50	QBT3	—	—	—	—	—	—	—	—
50-24803	MD50-06-64896	98.70–99.80	QBT3	—	—	—	—	—	—	—	—
50-24803	MD50-06-64897	123.30–124.80	QBT2	—	—	—	—	—	—	—	—
50-24803	MD50-06-64915	150.00–153.90	QBT2	—	—	—	—	—	—	—	—
50-24804	MD50-06-64965	8.60–9.80	QBT3	—	—	3.63	—	—	—	—	—
50-24804	MD50-06-64966	10.00–11.40	QBT3	12700 (J+)	—	3.82	47.8	—	—	—	—
50-24804	MD50-06-64980	15.40–17.10	QBT3	—	—	—	—	—	—	—	—
50-24804	MD50-06-64981	32.50–34.20	QBT3	—	—	—	—	—	—	—	—
50-24804	MD50-06-64963	97.80–99.20	QBT3	—	1.08	—	—	—	—	—	—
50-24804	MD50-06-64964	122.50–124.10	QBT3	—	1.01	—	—	—	—	—	—
50-24804	MD50-06-64982	147.50–149.80	QBT2	—	—	—	—	—	—	—	—
50-24810	MD50-06-65005	17.50–19.00	QBT3	—	—	—	—	—	—	—	—
50-24810	MD50-06-65006	35.50–37.10	QBT3	—	—	—	—	—	—	—	—

Table 6.3-1 (continued)

Location ID	Sample ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium
Qbt2, 3, 4 BV^a				7340	0.5	2.79	46	1.21	1.63	2200	7.14
Qbt1v BV^a				8170	0.5	1.81	26.5	1.7	0.4	3700	2.24
Qbt1g, Qct, Qbo BV^a				3560	0.5	0.56	25.7	1.44	0.4	1900	2.6
Industrial Soil Screening Level^{b,c}				100000	454	17.7	100000	2250	564	na^d	5000
Residential Soil Screening Level^{b,c}				77800	31.3	3.9	15600	156	39	na	2100
50-24810	MD50-06-64988	97.50–99.00	QBT3	—	—	—	—	—	—	—	—
50-24810	MD50-06-64989	122.50–123.90	QBT2	—	—	—	—	—	—	—	—
50-24810	MD50-06-65007	148.30–151.60	QBT2	—	—	—	—	—	—	—	—
50-24811	MD50-06-65075	18.50–20.00	QBT3	—	—	—	—	—	—	—	—
50-24811	MD50-06-65076	38.50–40.00	QBT3	—	—	—	—	—	—	—	—
50-24811	MD50-06-65058	97.50–98.70	QBT3	—	—	—	—	—	—	—	—
50-24811	MD50-06-65059	123.20–125.00	QBT2	—	—	—	—	—	—	—	—
50-24811	MD50-06-65077	147.50–150.60	QBT2	—	—	—	—	—	—	—	—
50-24812	MD50-06-65100	8.40–10.00	QBT3	—	—	7.11	—	—	—	4850 (J)	8.08 (J)
50-24812	MD50-06-65101	33.50–35.00	QBT3	—	—	—	—	—	—	—	—
50-24812	MD50-06-65083	97.50–98.90	QBT3	—	—	—	—	—	—	—	—
50-24812	MD50-06-65084	122.50–123.70	QBT2	—	—	—	—	—	—	—	—
50-24812	MD50-06-65102	146.00–150.00	QBT2	24300 (J+)	—	4.56	—	5.62 (J)	—	2560 (J)	9.95 (J)
50-24813	MD50-06-65132	18.20–20.00	QBT3	—	—	—	—	—	—	—	—
50-24813	MD50-06-65133	30.00–31.90	QBT3	—	—	—	—	—	—	—	—
50-24813	MD50-06-65115	98.20–99.70	QBT3	—	—	—	—	—	—	—	—
50-24813	MD50-06-65116	123.50–125.00	QBT2	—	—	—	—	—	—	—	—
50-24813	MD50-06-65134	148.00–150.00	QBT2	—	—	—	—	—	—	—	—
50-24814	MD50-06-65157	7.50–9.10	QBT3	—	—	—	—	—	—	—	—
50-24814	MD50-06-65158	30.00–31.60	QBT3	—	—	—	—	1.26	—	—	—

Table 6.3-1 (continued)

Location ID	Sample ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium
Qbt2, 3, 4 BV ^a				7340	0.5	2.79	46	1.21	1.63	2200	7.14
Qbt1v BV ^a				8170	0.5	1.81	26.5	1.7	0.4	3700	2.24
Qbt1g, Qct, Qbo BV ^a				3560	0.5	0.56	25.7	1.44	0.4	1900	2.6
Industrial Soil Screening Level ^{b,c}				100000	454	17.7	100000	2250	564	na ^d	5000
Residential Soil Screening Level ^{b,c}				77800	31.3	3.9	15600	156	39	na	2100
50-24814	MD50-06-65140	96.80–99.90	QBT3	—	—	—	—	—	—	—	—
50-24814	MD50-06-65141	123.50–124.80	QBT2	—	—	—	—	—	—	—	—
50-24814	MD50-06-65159	147.50–149.50	QBT2	—	—	—	—	—	—	—	—
50-24815	MD50-06-65189	17.50–20.00	QBT3	9660 (J+)	—	—	—	—	—	—	—
50-24815	MD50-06-65190	37.80–41.50	QBT3	—	—	—	—	—	—	—	—
50-24815	MD50-06-65172	98.80–100.00	QBT3	—	—	—	—	—	—	—	—
50-24815	MD50-06-65173	123.40–125.00	QBT2	—	—	—	—	—	—	—	—
50-24815	MD50-06-65191	147.80–149.70	QBT2	—	—	—	—	—	—	—	—
50-24816	MD50-06-65214	23.10–24.70	QBT3	—	—	—	—	—	—	—	—
50-24816	MD50-06-65215	32.20–34.00	QBT3	—	—	—	—	—	—	—	—
50-24816	MD50-06-65197	63.80–65.00	QBT3	—	—	—	—	1.69	—	—	—
50-24816	MD50-06-65198	118.70–120.00	QBT2	—	—	—	—	—	—	—	—
50-24816	MD50-06-65199	198.80–200.00	QBT2	—	—	—	—	—	—	—	8.14 (J)
50-24816	MD50-06-65216	223.40–225.00	QBT2	—	—	—	—	—	—	—	—
50-24817	MD50-05-63837	18.40–20.00	QBT3	—	—	—	—	—	—	—	—
50-24817	MD50-05-63838	37.00–40.00	QBT3	—	—	—	—	—	—	—	—
50-24817	RE50-05-63810	98.80–100.00	QBT3	—	—	—	—	—	—	—	—
50-24817	RE50-05-63811	138.00–140.00	QBT2	—	—	—	—	—	—	—	—
50-24817	RE50-05-63812	198.40–200.00	QBT1V	—	—	—	—	—	0.525 (U)	—	—
50-24817	MD50-05-63839	248.10–250.00	QBT1G	7870	—	2.88	31.2	2.07	0.576 (U)	—	—

Table 6.3-1 (continued)

Location ID	Sample ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium
Qbt2, 3, 4 BV^a				7340	0.5	2.79	46	1.21	1.63	2200	7.14
Qbt1v BV^a				8170	0.5	1.81	26.5	1.7	0.4	3700	2.24
Qbt1g, Qct, Qbo BV^a				3560	0.5	0.56	25.7	1.44	0.4	1900	2.6
Industrial Soil Screening Level^{b,c}				100000	454	17.7	100000	2250	564	na^d	5000
Residential Soil Screening Level^{b,c}				77800	31.3	3.9	15600	156	39	na	2100
50-24818	MD50-06-65229	8.50–10.00	QBT3	—	—	—	—	—	—	—	—
50-24818	MD50-06-65230	22.10–25.00	QBT3	—	—	2.86	—	—	—	—	—
50-24818	MD50-06-65261	98.50–100.00	QBT2	—	—	—	—	—	—	—	—
50-24818	MD50-06-65262	147.50–149.20	QBT2	—	—	—	—	—	—	—	—
50-24818	MD50-06-65263	189.90–190.00	QBT1V	—	—	—	—	—	0.515 (U)	—	5.7
50-24818	MD50-06-65264	247.70–249.20	QBT1G	—	—	0.762 (J)	—	—	0.531 (U)	—	—
50-24818	MD50-06-65265	280.00–282.50	QBT1G	—	—	1.61 (U)	—	—	0.537 (U)	—	7.63
50-24818	MD50-06-65266	313.50–315.00	QBT1G	—	—	1.71 (U)	—	—	0.571 (U)	—	—
50-24818	MD50-06-65267	396.00–402.00	QBO	—	—	0.75 (J)	—	—	0.534 (U)	—	4.33
50-24818	MD50-06-65268	449.00–452.00	QBO	—	—	13.3	29.9	—	11.1 (U)	—	998
50-24818	MD50-06-65269	497.00–500.50	QBO	—	—	1.61 (U)	27 (J+)	—	0.538 (U)	—	3.56 (J)
50-24818	MD50-06-65270	547.00–551.50	QBO	—	—	1.63 (U)	—	—	0.545 (U)	—	2.66 (J)
50-24818	MD50-06-65271	597.00–600.40	QBO	—	—	1.72 (U)	—	—	0.572 (U)	—	—
50-24819	RE50-05-61422	18.50–20.00	QBT3	—	—	—	—	—	—	—	—
50-24819	RE50-05-61423	48.00–50.00	QBT3	—	—	—	—	—	—	—	—
50-24819	RE50-05-61424	97.50–100.00	QBT3	—	—	—	—	—	—	—	—
50-24819	RE50-05-61425	138.50–140.00	QBT2	—	—	—	—	—	—	—	—
50-24819	RE50-05-61426	198.10–200.00	QBT1V	—	—	—	—	—	0.502 (U)	—	2.68 (J)
50-24819	RE50-05-61427	246.50–250.00	QBT1V	—	—	—	—	—	0.541 (U)	—	—
50-24819	RE50-05-61428	273.00–275.00	QBT1G	—	—	1.6 (U)	—	—	0.534 (U)	—	—

Table 6.3-1 (continued)

Location ID	Sample ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium
Qbt2, 3, 4 BV^a				7340	0.5	2.79	46	1.21	1.63	2200	7.14
Qbt1v BV^a				8170	0.5	1.81	26.5	1.7	0.4	3700	2.24
Qbt1g, Qct, Qbo BV^a				3560	0.5	0.56	25.7	1.44	0.4	1900	2.6
Industrial Soil Screening Level^{b,c}				100000	454	17.7	100000	2250	564	na^d	5000
Residential Soil Screening Level^{b,c}				77800	31.3	3.9	15600	156	39	na	2100
50-24820	RE50-05-61438	17.50–20.00	QBT3	—	—	—	—	—	—	—	—
50-24820	RE50-05-61439	48.40–50.00	QBT3	—	—	—	—	—	—	—	—
50-24820	RE50-05-61440	97.50–100.00	QBT3	10600 (J+)	—	—	108	—	—	2410	—
50-24820	RE50-05-61441	138.70–140.00	QBT2	—	—	—	—	—	—	—	—
50-24820	RE50-05-61442	198.20–200.00	QBT1V	—	—	—	—	—	0.498 (U)	—	—
50-24820	RE50-05-61443	248.30–250.00	QBT1G	—	—	1.84	33.5	—	0.536 (U)	—	—
50-24821	RE50-05-61456	18.60–20.00	QBT3	—	—	—	—	—	—	—	—
50-24821	RE50-05-61457	48.60–50.00	QBT3	—	—	—	—	—	—	—	—
50-24821	RE50-05-61458	98.40–100.00	QBT3	—	—	—	—	—	—	—	—
50-24821	RE50-05-61460	137.50–140.00	QBT2	—	—	—	—	—	—	—	—
50-24821	RE50-05-61459	157.50–160.00	QBT2	—	—	4.21	—	—	—	—	14.9 (J)
50-24821	RE50-05-61461	248.60–250.00	QBT1G	—	—	1.56 (U)	—	—	0.519 (U)	—	3.8 (J)
50-24822	RE50-05-61474	18.60–20.00	QBT3	—	—	—	—	—	—	—	—
50-24822	RE50-05-61475	47.50–49.10	QBT3	—	—	—	—	1.36	—	—	—
50-24822	RE50-05-61476	98.60–100.00	QBT3	—	—	—	—	—	—	—	—
50-24822	RE50-05-61477	137.50–139.20	QBT2	—	—	—	—	—	—	—	—
50-24822	RE50-05-61478	198.50–200.00	QBT1V	—	—	—	—	—	0.499 (U)	—	—
50-24822	RE50-05-61479	248.70–250.00	QBT1G	—	—	0.643 (J)	—	—	0.519 (U)	—	2.76
50-25451	MD50-06-66697	18.70–19.90	QBT3	—	—	—	—	—	—	—	—
50-25451	MD50-06-66698	48.10–49.90	QBT3	—	—	—	—	2.07 (J)	—	—	—

Table 6.3-1 (continued)

Location ID	Sample ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium
Qbt2, 3, 4 BV^a				7340	0.5	2.79	46	1.21	1.63	2200	7.14
Qbt1v BV^a				8170	0.5	1.81	26.5	1.7	0.4	3700	2.24
Qbt1g, Qct, Qbo BV^a				3560	0.5	0.56	25.7	1.44	0.4	1900	2.6
Industrial Soil Screening Level^{b,c}				100000	454	17.7	100000	2250	564	na^d	5000
Residential Soil Screening Level^{b,c}				77800	31.3	3.9	15600	156	39	na	2100
50-25451	MD50-06-66671	96.00–100.00	QBT2	—	—	—	—	—	—	—	—
50-25451	MD50-06-66672	146.00–147.50	QBT2	—	—	—	—	—	—	—	—
50-25451	MD50-06-66673	198.90–200.00	QBT2	—	—	—	—	—	—	—	—
50-25451	MD50-06-66674	251.20–252.50	QBT1G	—	—	1.56 (U)	—	—	0.519 (U)	—	—
50-25451	MD50-06-66699	298.50–300.00	QBT1G	—	—	1.61 (U)	—	—	0.538 (U)	—	2.99

Table 6.3-1 (continued)

Location ID	Sample ID	Depth (ft)	Media	Cobalt	Copper	Cyanide (Total)	Iron	Lead	Magnesium	Manganese	Mercury
Qbt2, 3, 4 BV^a				3.14	4.66	0.5	14500	11.2	1690	482	0.1
Qbt1v BV^a				1.78	3.26	0.5	9900	18.4	780	408	0.1
Qbt1g, Qct, Qbo BV^a				8.89	3.96	0.5	3700	13.5	739	189	0.1
Industrial Soil Screening Level^{b,c}				20500	45400	13700	100000	800	na	48400	340
Residential Soil Screening Level^{b,c}				15200	31300	1220	13800	400	na	3590	23
50-09100	0550-95-0362	10.60–12.60	QBT3	—	—	—	—	—	—	—	—
50-09100	0550-95-0365	26.50–28.50	QBT3	—	—	0.535 (U)	—	—	—	—	0.11 (U)
50-09100	0550-96-0100	32.70–33.70	QBT3	—	—	—	—	—	—	—	—
50-09100	0550-95-0368	41.50–43.50	QBT3	—	—	0.533	—	—	—	—	0.11 (U)
50-09100	0550-95-0371	58.20–60.00	QBT3	—	—	0.506 (U)	—	—	—	—	—
50-09100	0550-95-0374	71.50–73.50	QBT2	—	—	—	—	—	—	—	—
50-09100	0550-95-0383	115.10–116.90	QBT2	—	—	—	—	—	—	—	—
50-09100	0550-95-0392	161.30–163.10	QBT1V	—	—	—	—	—	—	—	—
50-09101	0550-95-0284	15.00–17.00	QBT3	—	—	10.2	—	—	—	—	—
50-09101	0550-96-0101	26.85–27.85	QBT3	—	—	—	—	—	—	—	—
50-09101	0550-95-0289	35.00–36.20	QBT3	—	—	6.2	—	—	—	—	—
50-09101	0550-96-0102	44.00–45.10	QBT3	—	—	—	—	—	—	—	—
50-09101	0550-95-0294	55.00–55.70	QBT3	—	—	0.92	—	—	—	—	—
50-09101	0550-96-0103	62.50–63.20	QBT3	—	—	—	—	—	—	—	—
50-09101	0550-95-0299	75.00–77.00	QBT3	—	—	0.55 (U)	—	—	—	—	—
50-09101	0550-95-0304	96.00–98.00	QBT3	—	—	0.54 (U)	—	—	—	—	—
50-09101	0550-95-0309	112.00–114.50	QBT3	—	—	0.54 (U)	—	—	—	—	—
50-09102	0550-95-0004	16.00–19.00	QBT3	—	—	—	—	—	—	—	—
50-09102	0550-95-0009	37.00–40.90	QBT3	—	—	—	—	—	—	—	—
50-09102	0550-95-0014	57.00–60.00	QBT3	—	—	—	—	—	—	—	—

Table 6.3-1 (continued)

Location ID	Sample ID	Depth (ft)	Media	Cobalt	Copper	Cyanide (Total)	Iron	Lead	Magnesium	Manganese	Mercury
Qbt2, 3, 4 BV^a				3.14	4.66	0.5	14500	11.2	1690	482	0.1
Qbt1v BV^a				1.78	3.26	0.5	9900	18.4	780	408	0.1
Qbt1g, Qct, Qbo BV^a				8.89	3.96	0.5	3700	13.5	739	189	0.1
Industrial Soil Screening Level^{b,c}				20500	45400	13700	100000	800	na	48400	340
Residential Soil Screening Level^{b,c}				15200	31300	1220	13800	400	na	3590	23
50-09102	0550-95-0019	73.20–76.00	QBT3	—	—	0.53 (U)	—	—	—	—	—
50-09102	0550-95-0024	95.00–97.00	QBT3	—	—	0.53 (U)	—	—	—	—	—
50-09102	0550-95-0029	108.00–110.00	QBT3	—	—	0.52 (U)	—	—	—	—	—
50-09103	0550-95-0104	18.50–20.80	QBT3	—	—	0.511 (U)	—	—	—	—	—
50-09103	0550-95-0109	36.00–38.80	QBT3	—	—	0.525 (U)	—	—	—	—	—
50-09103	0550-96-0104	46.50–47.82	QBT3	—	—	—	—	16.2 (J-)	—	—	—
50-09103	0550-95-0114	56.00–58.80	QBT3	—	—	0.554 (U)	—	—	—	—	—
50-09103	0550-95-0119	78.00–80.00	QBT3	—	—	0.553 (U)	—	—	—	—	—
50-09103	0550-95-0124	94.70–98.00	QBT3	—	—	0.532 (U)	—	—	—	—	—
50-09103	0550-95-0129	114.80–116.80	QBT3	—	—	0.53 (U)	—	—	—	—	—
50-09104	0550-95-0079	26.30–28.00	QBT3	—	—	—	—	13.8	—	—	—
50-09104	0550-95-0083	36.60–38.60	QBT3	—	5	—	—	50.3	—	—	—
50-09104	0550-96-0105	44.10–45.10	QBT3	—	—	—	—	—	—	—	—
50-09105	0550-95-0135	16.10–18.50	QBT3	—	—	—	—	—	—	—	—
50-09105	0550-95-0140	35.00–38.00	QBT3	—	—	—	—	—	—	—	—
50-09105	0550-95-0145	57.00–59.00	QBT3	—	—	—	—	—	—	—	—
50-09105	0550-96-0106	62.10–63.00	QBT3	—	—	—	—	—	—	—	—
50-09105	0550-95-0150	77.00–79.70	QBT3	—	—	—	—	—	—	—	0.11 (U)
50-09105	0550-95-0155	97.00–99.80	QBT3	—	—	—	—	—	—	—	—
50-09105	0550-95-0160	117.70–120.00	QBT3	—	—	0.511 (U)	—	—	—	—	—

Table 6.3-1 (continued)

Location ID	Sample ID	Depth (ft)	Media	Cobalt	Copper	Cyanide (Total)	Iron	Lead	Magnesium	Manganese	Mercury
Qbt2, 3, 4 BV^a				3.14	4.66	0.5	14500	11.2	1690	482	0.1
Qbt1v BV^a				1.78	3.26	0.5	9900	18.4	780	408	0.1
Qbt1g, Qct, Qbo BV^a				8.89	3.96	0.5	3700	13.5	739	189	0.1
Industrial Soil Screening Level^{b,c}				20500	45400	13700	100000	800	na	48400	340
Residential Soil Screening Level^{b,c}				15200	31300	1220	13800	400	na	3590	23
50-09106	0550-95-0046	27.50–30.50	QBT3	—	—	0.574 (U)	—	51.1	—	—	0.11 (U)
50-09106	0550-95-0050	41.00–44.00	QBT3	—	—	0.528 (U)	—	—	—	—	—
50-09106	0550-95-0054	56.50–58.50	QBT3	—	—	0.517 (U)	—	—	—	—	—
50-09106	0550-95-0058	70.50–73.00	QBT3	—	—	0.507 (U)	—	—	—	—	—
50-09106	0550-95-0063	86.00–88.50	QBT3	—	—	0.507 (U)	—	—	—	—	—
50-09106	0550-95-0067	102.00–104.00	QBT3	—	—	0.508 (U)	—	—	—	—	—
50-09106	0550-95-0071	115.50–118.00	QBT3	—	—	0.504 (U)	—	—	—	—	—
50-09107	0550-96-0107	46.90–48.50	QBT3	—	—	—	—	—	—	—	—
50-09107	0550-96-0108	66.20–67.00	QBT3	—	—	—	—	—	—	—	—
50-09108	0550-95-0195	15.00–16.80	QBT3	—	—	0.53 (U)	—	65	—	—	0.11 (U)
50-09108	0550-96-0109	24.50–25.50	QBT3	—	—	—	—	—	—	—	—
50-09108	0550-95-0200	37.00–38.60	QBT3	—	—	0.54 (U)	—	22	—	—	0.11 (U)
50-09108	0550-96-0110	44.90–45.90	QBT3	—	—	—	—	—	—	—	—
50-09108	0550-95-0205	57.00–59.00	QBT3	—	—	0.51 (U)	—	—	—	—	—
50-09108	0550-95-0210	76.60–78.60	QBT3	—	—	0.52 (U)	—	—	—	—	—
50-09108	0550-95-0215	95.50–97.50	QBT3	—	—	1	—	—	—	—	—
50-09108	0550-95-0220	112.00–115.00	QBT3	—	—	—	—	—	—	—	—
50-09109	0550-95-0226	18.20–20.20	QBT3	—	—	0.54 (U)	—	—	—	—	0.11 (U)
50-09109	0550-95-0231	34.10–36.00	QBT3	—	11	0.54 (U)	—	41	—	—	0.11 (U)
50-09109	0550-96-0111	46.00–47.00	QBT3	—	—	—	—	—	—	—	—

Table 6.3-1 (continued)

Location ID	Sample ID	Depth (ft)	Media	Cobalt	Copper	Cyanide (Total)	Iron	Lead	Magnesium	Manganese	Mercury
Qbt2, 3, 4 BV^a				3.14	4.66	0.5	14500	11.2	1690	482	0.1
Qbt1v BV^a				1.78	3.26	0.5	9900	18.4	780	408	0.1
Qbt1g, Qct, Qbo BV^a				8.89	3.96	0.5	3700	13.5	739	189	0.1
Industrial Soil Screening Level^{b,c}				20500	45400	13700	100000	800	na	48400	340
Residential Soil Screening Level^{b,c}				15200	31300	1220	13800	400	na	3590	23
50-09109	0550-95-0236	57.80–60.00	QBT3	—	—	0.53 (U)	—	—	—	—	0.11 (U)
50-09109	0550-96-0112	66.00–67.00	QBT3	3.8 (J)	30.7	—	—	11.3 (J-)	2690	—	—
50-09109	0550-95-0246	77.40–79.70	QBT3	—	—	0.53 (U)	—	—	—	—	0.11 (U)
50-09109	0550-95-0251	88.60–88.80	QBT3	—	—	0.52 (U)	—	—	—	—	—
50-09109	0550-95-0241	113.00–114.70	QBT3	—	—	0.53 (U)	—	—	—	—	0.11 (U)
50-09110	0550-95-0259	17.00–19.00	QBT3	—	—	0.53 (U)	—	—	—	—	—
50-09110	0550-96-0113	24.10–24.80	QBT3	—	—	—	—	—	—	—	—
50-09110	0550-95-0264	38.00–40.00	QBT3	—	—	3.9	—	—	—	—	—
50-09110	0550-96-0114	48.50–49.50	QBT3	—	—	—	—	—	—	—	—
50-09110	0550-95-0269	59.00–60.80	QBT3	—	—	0.54 (U)	—	75.2	—	—	—
50-09110	0550-95-0274	74.00–76.60	QBT3	—	—	0.53 (U)	—	—	—	—	—
50-09110	0550-95-0279	88.00–89.40	QBT3	—	—	0.53 (U)	—	—	—	—	—
50-24766	MD50-06-64604	27.50–29.20	QBT3	—	—	—	—	—	—	—	—
50-24766	MD50-06-64586	97.50–99.90	QBT2	—	—	—	—	—	—	—	—
50-24766	MD50-06-64587	122.50–124.60	QBT2	—	—	—	—	—	—	—	—
50-24766	MD50-06-64605	148.10–149.50	QBT2	—	—	—	—	—	—	—	—
50-24767	MD50-06-64635	8.00–10.00	QBT3	—	—	—	—	17.1	—	—	—
50-24767	MD50-06-64636	28.10–30.00	QBT3	—	—	—	—	18.6	—	—	—
50-24767	MD50-06-64618	58.30–59.80	QBT3	—	—	—	—	19.9	—	—	—
50-24767	MD50-06-64619	123.20–125.00	QBT2	—	4.73	—	—	—	1730 (J+)	—	—

Table 6.3-1 (continued)

Location ID	Sample ID	Depth (ft)	Media	Cobalt	Copper	Cyanide (Total)	Iron	Lead	Magnesium	Manganese	Mercury
Qbt2, 3, 4 BV^a				3.14	4.66	0.5	14500	11.2	1690	482	0.1
Qbt1v BV^a				1.78	3.26	0.5	9900	18.4	780	408	0.1
Qbt1g, Qct, Qbo BV^a				8.89	3.96	0.5	3700	13.5	739	189	0.1
Industrial Soil Screening Level^{b,c}				20500	45400	13700	100000	800	na	48400	340
Residential Soil Screening Level^{b,c}				15200	31300	1220	13800	400	na	3590	23
50-24767	MD50-06-64637	148.30–149.80	QBT2	—	—	—	—	—	—	—	—
50-24768	MD50-06-64667	12.50–15.00	QBT3	—	—	—	—	—	—	—	—
50-24768	MD50-06-64668	27.50–29.50	QBT3	—	—	—	—	—	—	—	—
50-24768	MD50-06-64650	96.70–99.50	QBT2	—	—	—	—	—	—	—	—
50-24768	MD50-06-64651	123.20–125.00	QBT2	—	—	—	—	14.6	—	—	—
50-24768	MD50-06-64669	148.60–151.50	QBT2	—	—	—	—	19.7	—	—	—
50-24769	MD50-06-64699	18.10–20.00	QBT3	—	—	—	—	—	—	—	—
50-24769	MD50-06-64700	37.50–39.90	QBT3	—	—	—	—	—	—	—	—
50-24769	MD50-06-64682	97.50–99.30	QBT3	3.63	9.25	—	15600	12.6	4000 (J+)	—	—
50-24769	MD50-06-64683	122.50–124.50	QBT2	—	—	—	—	—	—	—	—
50-24769	MD50-06-64701	147.90–149.80	QBT2	—	—	—	—	—	—	—	—
50-24770	MD50-06-64731	18.10–22.50	QBT3	—	7.49	—	—	24.6	2400	—	—
50-24770	MD50-06-64717	24.60–25.00	QBT3	—	—	—	—	14.1	—	—	—
50-24770	MD50-06-64732	38.20–39.90	QBT3	—	—	—	—	—	—	—	—
50-24770	MD50-06-64714	98.70–100.00	QBT3	—	—	—	—	—	—	—	—
50-24770	MD50-06-64715	123.20–124.60	QBT3	—	—	—	—	—	—	—	—
50-24770	MD50-06-64733	147.50–150.00	QBT2	—	—	—	—	—	—	—	—
50-24771	MD50-06-64756	15.90–17.50	QBT3	—	—	—	—	—	—	—	—
50-24771	MD50-06-64757	38.00–40.00	QBT3	—	—	—	—	—	—	—	—
50-24771	MD50-06-64739	98.80–100.00	QBT2	—	—	—	—	—	—	—	—

Table 6.3-1 (continued)

Location ID	Sample ID	Depth (ft)	Media	Cobalt	Copper	Cyanide (Total)	Iron	Lead	Magnesium	Manganese	Mercury
Qbt2, 3, 4 BV^a				3.14	4.66	0.5	14500	11.2	1690	482	0.1
Qbt1v BV^a				1.78	3.26	0.5	9900	18.4	780	408	0.1
Qbt1g, Qct, Qbo BV^a				8.89	3.96	0.5	3700	13.5	739	189	0.1
Industrial Soil Screening Level^{b,c}				20500	45400	13700	100000	800	na	48400	340
Residential Soil Screening Level^{b,c}				15200	31300	1220	13800	400	na	3590	23
50-24771	MD50-06-64740	123.60–125.00	QBT2	—	—	—	—	—	—	—	—
50-24771	MD50-06-64758	148.20–150.00	QBT2	—	—	—	—	—	—	—	—
50-24773	MD50-06-64781	20.00–22.50	QBT3	—	—	—	—	—	—	—	—
50-24773	MD50-06-64782	38.00–40.00	QBT3	—	—	—	—	—	—	—	—
50-24773	MD50-06-64764	98.50–100.00	QBT2	—	—	—	—	—	—	—	—
50-24773	MD50-06-64765	123.70–124.80	QBT2	—	—	—	—	—	—	—	—
50-24773	MD50-06-64783	150.00–152.80	QBT2	—	—	—	—	—	—	—	—
50-24782	MD50-06-64813	20.90–22.50	QBT3	—	—	—	—	—	—	—	—
50-24782	MD50-06-64814	35.30–37.10	QBT3	—	—	—	—	—	—	—	—
50-24782	MD50-06-64796	98.50–100.00	QBT3	—	—	—	—	—	—	—	—
50-24782	MD50-06-64797	123.50–125.00	QBT3	—	—	—	—	—	—	—	—
50-24782	MD50-06-64815	156.00–157.50	QBT3	—	—	—	—	—	—	—	—
50-24783	MD50-06-64838	17.50–20.00	QBT3	—	—	—	—	—	—	—	—
50-24783	MD50-06-64839	35.40–37.50	QBT3	—	—	—	—	—	—	—	—
50-24783	MD50-06-64821	98.60–100.00	QBT3	—	—	—	—	14.2	—	—	—
50-24783	MD50-06-64822	123.30–125.00	QBT2	—	—	—	—	—	—	—	—
50-24783	MD50-06-64840	150.30–152.50	QBT2	—	—	—	—	—	—	—	—
50-24784	MD50-06-64380	8.00–10.00	QBT3	—	—	—	—	—	—	—	—
50-24784	MD50-06-64381	18.00–20.00	QBT3	—	—	—	—	—	—	—	—
50-24784	MD50-06-64363	46.10–47.50	QBT3	—	—	—	—	—	—	—	—

Table 6.3-1 (continued)

Location ID	Sample ID	Depth (ft)	Media	Cobalt	Copper	Cyanide (Total)	Iron	Lead	Magnesium	Manganese	Mercury
Qbt2, 3, 4 BV^a				3.14	4.66	0.5	14500	11.2	1690	482	0.1
Qbt1v BV^a				1.78	3.26	0.5	9900	18.4	780	408	0.1
Qbt1g, Qct, Qbo BV^a				8.89	3.96	0.5	3700	13.5	739	189	0.1
Industrial Soil Screening Level^{b,c}				20500	45400	13700	100000	800	na	48400	340
Residential Soil Screening Level^{b,c}				15200	31300	1220	13800	400	na	3590	23
50-24784	MD50-06-64364	48.70–50.00	QBT3	5.79	20.7	—	26500	25.8	7720	—	—
50-24784	MD50-06-64365	51.00–55.00	QBT3	—	—	—	—	—	—	—	—
50-24784	MD50-06-64367	98.50–100.00	QBT3	—	—	—	—	—	—	—	—
50-24784	MD50-06-64366	167.50–169.00	QBT2	—	—	—	—	—	—	—	—
50-24784	MD50-06-64369	197.90–199.20	QBT1V	—	—	—	—	—	—	—	—
50-24784	MD50-06-64368	248.00–250.00	QBT1V	—	—	—	—	—	—	—	—
50-24784	MD50-06-65526	273.50–275.00	QBT1G	—	—	—	—	—	—	—	—
50-24784	MD50-06-64382	298.30–299.80	QBT1G	—	—	—	—	—	—	—	—
50-24785	MD50-06-64412	8.50–10.00	QBT3	—	—	—	—	—	—	—	—
50-24785	MD50-06-64413	17.50–19.00	QBT3	—	—	—	—	—	—	—	—
50-24785	MD50-06-64395	57.50–60.00	QBT3	—	—	—	—	—	—	—	—
50-24785	MD50-06-64396	117.50–120.00	QBT2	—	—	—	—	—	—	—	—
50-24785	MD50-06-64397	198.70–200.00	QBT1V	—	—	—	—	—	—	—	—
50-24785	MD50-06-64398	248.50–250.00	QBT1G	—	—	—	7640	25.6	—	275	—
50-24785	MD50-06-64414	273.80–275.00	QBT1G	—	—	—	—	81.5	—	—	—
50-24796	MD50-06-64457	8.00–10.00	QBT3	—	6.69	—	—	60.9 (J)	2530	—	—
50-24796	MD50-06-64458	17.50–19.30	QBT3	—	—	—	—	17.3 (J)	—	—	—
50-24796	MD50-06-64440	37.50–39.30	QBT3	—	—	—	—	—	—	—	—
50-24796	MD50-06-64441	97.50–100.00	QBT3	—	—	—	—	—	—	—	—
50-24796	MD50-06-64442	118.70–120.00	QBT2	—	—	—	—	—	—	—	—

Table 6.3-1 (continued)

Location ID	Sample ID	Depth (ft)	Media	Cobalt	Copper	Cyanide (Total)	Iron	Lead	Magnesium	Manganese	Mercury
Qbt2, 3, 4 BV^a				3.14	4.66	0.5	14500	11.2	1690	482	0.1
Qbt1v BV^a				1.78	3.26	0.5	9900	18.4	780	408	0.1
Qbt1g, Qct, Qbo BV^a				8.89	3.96	0.5	3700	13.5	739	189	0.1
Industrial Soil Screening Level^{b,c}				20500	45400	13700	100000	800	na	48400	340
Residential Soil Screening Level^{b,c}				15200	31300	1220	13800	400	na	3590	23
50-24796	MD50-06-64459	147.50–149.40	QBT2	—	—	—	—	—	—	—	—
50-24797	MD50-06-64506	17.50–18.30	QBT3	—	—	—	—	—	—	—	—
50-24797	MD50-06-64509	37.00–38.00	QBT3	—	—	—	—	—	—	—	—
50-24797	MD50-06-64489	58.00–60.00	QBT3	—	—	—	—	—	—	—	—
50-24797	MD50-06-64490	117.00–120.00	QBT2	—	—	—	—	—	—	—	—
50-24797	MD50-06-64508	157.50–159.00	QBT2	—	—	—	—	—	—	—	—
50-24799	MD50-06-64516	13.10–15.00	QBT3	—	—	—	—	—	—	—	—
50-24799	MD50-06-64517	15.00–16.50	QBT3	—	—	—	—	—	—	—	—
50-24799	MD50-06-64531	18.00–20.00	QBT3	—	5.82	—	—	—	2550	—	—
50-24799	MD50-06-64532	30.60–32.50	QBT3	—	—	—	—	—	—	—	—
50-24799	MD50-06-64518	34.50–36.00	QBT3	—	6.19	—	17200	16	3000	—	—
50-24799	MD50-06-64519	38.50–40.00	QBT3	—	—	—	—	—	—	—	—
50-24799	MD50-06-64514	98.30–100.00	QBT3	—	—	—	—	—	—	—	—
50-24799	MD50-06-64515	118.40–120.00	QBT2	—	—	—	—	—	—	—	—
50-24799	MD50-06-64533	158.50–160.00	QBT2	—	—	—	—	—	—	—	—
50-24801	MD50-06-64863	16.80–20.00	QBT3	—	—	—	—	—	—	—	—
50-24801	MD50-06-64864	33.00–35.00	QBT3	—	—	—	—	—	—	—	—
50-24801	MD50-06-64846	78.00–80.00	QBT3	—	—	—	—	—	—	—	—
50-24801	MD50-06-64847	118.00–120.00	QBT2	—	—	—	—	—	—	—	—
50-24801	MD50-06-64865	148.30–150.00	QBT2	—	—	—	—	—	—	—	—

Table 6.3-1 (continued)

Location ID	Sample ID	Depth (ft)	Media	Cobalt	Copper	Cyanide (Total)	Iron	Lead	Magnesium	Manganese	Mercury
Qbt2, 3, 4 BV^a				3.14	4.66	0.5	14500	11.2	1690	482	0.1
Qbt1v BV^a				1.78	3.26	0.5	9900	18.4	780	408	0.1
Qbt1g, Qct, Qbo BV^a				8.89	3.96	0.5	3700	13.5	739	189	0.1
Industrial Soil Screening Level^{b,c}				20500	45400	13700	100000	800	na	48400	340
Residential Soil Screening Level^{b,c}				15200	31300	1220	13800	400	na	3590	23
50-24802	MD50-06-64888	12.50–16.10	QBT3	—	—	—	—	—	—	—	—
50-24802	MD50-06-64889	40.60–42.50	QBT3	—	—	—	—	—	—	—	—
50-24802	MD50-06-64871	98.20–100.00	QBT3	—	—	—	—	—	—	—	—
50-24802	MD50-06-64872	123.10–125.00	QBT2	—	—	—	—	—	—	—	—
50-24802	MD50-06-64890	157.50–159.10	QBT2	—	—	—	—	—	—	—	—
50-24803	MD50-06-64913	15.40–17.50	QBT3	—	—	—	—	—	—	—	—
50-24803	MD50-06-64914	36.00–37.50	QBT3	—	—	—	—	42.8	—	—	—
50-24803	MD50-06-64896	98.70–99.80	QBT3	—	—	—	—	—	—	—	—
50-24803	MD50-06-64897	123.30–124.80	QBT2	—	—	—	—	—	—	—	—
50-24803	MD50-06-64915	150.00–153.90	QBT2	—	—	—	—	—	—	—	—
50-24804	MD50-06-64965	8.60–9.80	QBT3	—	5.16	—	—	51.9	—	—	—
50-24804	MD50-06-64966	10.00–11.40	QBT3	—	4.95	—	—	32.4	2060	—	—
50-24804	MD50-06-64980	15.40–17.10	QBT3	—	—	—	—	68.6	—	—	—
50-24804	MD50-06-64981	32.50–34.20	QBT3	—	—	—	—	34.9	—	—	—
50-24804	MD50-06-64963	97.80–99.20	QBT3	—	—	—	—	—	—	—	—
50-24804	MD50-06-64964	122.50–124.10	QBT3	—	—	—	—	36	—	—	—
50-24804	MD50-06-64982	147.50–149.80	QBT2	—	—	—	—	47.8	—	—	—
50-24810	MD50-06-65005	17.50–19.00	QBT3	—	—	—	—	—	—	—	—
50-24810	MD50-06-65006	35.50–37.10	QBT3	—	—	—	—	—	—	—	—
50-24810	MD50-06-64988	97.50–99.00	QBT3	—	—	—	—	—	—	—	—

Table 6.3-1 (continued)

Location ID	Sample ID	Depth (ft)	Media	Cobalt	Copper	Cyanide (Total)	Iron	Lead	Magnesium	Manganese	Mercury
Qbt2, 3, 4 BV^a				3.14	4.66	0.5	14500	11.2	1690	482	0.1
Qbt1v BV^a				1.78	3.26	0.5	9900	18.4	780	408	0.1
Qbt1g, Qct, Qbo BV^a				8.89	3.96	0.5	3700	13.5	739	189	0.1
Industrial Soil Screening Level^{b,c}				20500	45400	13700	100000	800	na	48400	340
Residential Soil Screening Level^{b,c}				15200	31300	1220	13800	400	na	3590	23
50-24810	MD50-06-64989	122.50–123.90	QBT2	—	—	—	—	—	—	—	—
50-24810	MD50-06-65007	148.30–151.60	QBT2	—	—	—	—	—	—	—	—
50-24811	MD50-06-65075	18.50–20.00	QBT3	—	—	—	—	—	—	—	—
50-24811	MD50-06-65076	38.50–40.00	QBT3	—	—	—	—	—	—	—	—
50-24811	MD50-06-65058	97.50–98.70	QBT3	—	—	—	—	—	—	—	—
50-24811	MD50-06-65059	123.20–125.00	QBT2	—	—	—	—	—	—	—	—
50-24811	MD50-06-65077	147.50–150.60	QBT2	—	—	—	—	—	—	—	—
50-24812	MD50-06-65100	8.40–10.00	QBT3	3.56	11.4 (J)	—	—	29.8	—	—	—
50-24812	MD50-06-65101	33.50–35.00	QBT3	—	—	—	—	17.7	—	—	—
50-24812	MD50-06-65083	97.50–98.90	QBT3	—	—	—	—	—	—	—	—
50-24812	MD50-06-65084	122.50–123.70	QBT2	—	—	—	—	—	—	—	—
50-24812	MD50-06-65102	146.00–150.00	QBT2	—	7.75 (J)	—	—	11.3	3420 (J)	—	—
50-24813	MD50-06-65132	18.20–20.00	QBT3	—	—	—	—	—	—	—	—
50-24813	MD50-06-65133	30.00–31.90	QBT3	—	—	—	—	—	—	—	—
50-24813	MD50-06-65115	98.20–99.70	QBT3	—	—	—	—	—	—	—	—
50-24813	MD50-06-65116	123.50–125.00	QBT2	—	—	—	—	—	—	—	—
50-24813	MD50-06-65134	148.00–150.00	QBT2	—	—	—	—	—	—	—	—
50-24814	MD50-06-65157	7.50–9.10	QBT3	—	—	—	—	—	—	—	—
50-24814	MD50-06-65158	30.00–31.60	QBT3	—	—	—	—	—	—	—	—
50-24814	MD50-06-65140	96.80–99.90	QBT3	—	—	—	—	—	—	—	—

Table 6.3-1 (continued)

Location ID	Sample ID	Depth (ft)	Media	Cobalt	Copper	Cyanide (Total)	Iron	Lead	Magnesium	Manganese	Mercury
Qbt2, 3, 4 BV^a				3.14	4.66	0.5	14500	11.2	1690	482	0.1
Qbt1v BV^a				1.78	3.26	0.5	9900	18.4	780	408	0.1
Qbt1g, Qct, Qbo BV^a				8.89	3.96	0.5	3700	13.5	739	189	0.1
Industrial Soil Screening Level^{b,c}				20500	45400	13700	100000	800	na	48400	340
Residential Soil Screening Level^{b,c}				15200	31300	1220	13800	400	na	3590	23
50-24814	MD50-06-65141	123.50–124.80	QBT2	—	—	—	—	—	—	—	—
50-24814	MD50-06-65159	147.50–149.50	QBT2	—	—	—	—	—	—	—	—
50-24815	MD50-06-65189	17.50–20.00	QBT3	—	—	—	—	23.1	—	—	—
50-24815	MD50-06-65190	37.80–41.50	QBT3	—	—	—	—	—	—	—	—
50-24815	MD50-06-65172	98.80–100.00	QBT3	—	—	—	—	—	—	—	—
50-24815	MD50-06-65173	123.40–125.00	QBT2	—	—	—	—	—	—	—	—
50-24815	MD50-06-65191	147.80–149.70	QBT2	—	—	—	—	—	—	—	—
50-24816	MD50-06-65214	23.10–24.70	QBT3	—	—	—	—	15.4	—	—	—
50-24816	MD50-06-65215	32.20–34.00	QBT3	—	—	—	—	28.6	—	—	—
50-24816	MD50-06-65197	63.80–65.00	QBT3	—	—	—	—	—	—	—	—
50-24816	MD50-06-65198	118.70–120.00	QBT2	—	—	—	—	—	—	—	—
50-24816	MD50-06-65199	198.80–200.00	QBT2	—	—	—	—	—	—	—	—
50-24816	MD50-06-65216	223.40–225.00	QBT2	—	—	—	—	—	—	—	—
50-24817	MD50-05-63837	18.40–20.00	QBT3	—	—	—	—	—	—	—	—
50-24817	MD50-05-63838	37.00–40.00	QBT3	—	—	—	—	—	—	—	—
50-24817	RE50-05-63810	98.80–100.00	QBT3	—	—	—	—	—	—	—	—
50-24817	RE50-05-63811	138.00–140.00	QBT2	—	—	—	—	—	—	—	—
50-24817	RE50-05-63812	198.40–200.00	QBT1V	—	—	—	—	—	—	—	—
50-24817	MD50-05-63839	248.10–250.00	QBT1G	—	—	—	5740	—	—	243	—
50-24818	MD50-06-65229	8.50–10.00	QBT3	—	—	—	—	—	—	—	—

Table 6.3-1 (continued)

Location ID	Sample ID	Depth (ft)	Media	Cobalt	Copper	Cyanide (Total)	Iron	Lead	Magnesium	Manganese	Mercury
Qbt2, 3, 4 BV^a				3.14	4.66	0.5	14500	11.2	1690	482	0.1
Qbt1v BV^a				1.78	3.26	0.5	9900	18.4	780	408	0.1
Qbt1g, Qct, Qbo BV^a				8.89	3.96	0.5	3700	13.5	739	189	0.1
Industrial Soil Screening Level^{b,c}				20500	45400	13700	100000	800	na	48400	340
Residential Soil Screening Level^{b,c}				15200	31300	1220	13800	400	na	3590	23
50-24818	MD50-06-65230	22.10–25.00	QBT3	—	—	—	—	—	—	—	—
50-24818	MD50-06-65261	98.50–100.00	QBT2	—	—	—	—	—	—	—	—
50-24818	MD50-06-65262	147.50–149.20	QBT2	—	—	—	—	—	—	—	—
50-24818	MD50-06-65263	189.90–190.00	QBT1V	—	—	—	—	—	—	—	—
50-24818	MD50-06-65264	247.70–249.20	QBT1G	—	—	—	3760	—	—	—	—
50-24818	MD50-06-65265	280.00–282.50	QBT1G	—	—	—	—	—	—	—	—
50-24818	MD50-06-65266	313.50–315.00	QBT1G	—	—	—	—	13.8 (J+)	—	—	—
50-24818	MD50-06-65267	396.00–402.00	QBO	—	18.2 (J)	—	5600	—	—	—	—
50-24818	MD50-06-65268	449.00–452.00	QBO	17.4	446	—	184000	22.1 (U)	—	1900	—
50-24818	MD50-06-65269	497.00–500.50	QBO	—	14.3	—	5150	—	1180 (J+)	—	—
50-24818	MD50-06-65270	547.00–551.50	QBO	—	127	—	—	—	872 (J+)	—	—
50-24818	MD50-06-65271	597.00–600.40	QBO	—	11.3	—	—	—	—	—	—
50-24819	RE50-05-61422	18.50–20.00	QBT3	—	—	—	—	—	—	—	—
50-24819	RE50-05-61423	48.00–50.00	QBT3	—	—	—	—	—	—	—	—
50-24819	RE50-05-61424	97.50–100.00	QBT3	—	—	—	—	—	—	—	—
50-24819	RE50-05-61425	138.50–140.00	QBT2	—	—	—	—	—	—	—	—
50-24819	RE50-05-61426	198.10–200.00	QBT1V	—	—	—	—	—	—	—	—
50-24819	RE50-05-61427	246.50–250.00	QBT1V	—	—	—	—	—	—	—	—
50-24819	RE50-05-61428	273.00–275.00	QBT1G	—	—	—	—	—	—	—	—
50-24820	RE50-05-61438	17.50–20.00	QBT3	—	—	—	—	—	—	—	—

Table 6.3-1 (continued)

Location ID	Sample ID	Depth (ft)	Media	Cobalt	Copper	Cyanide (Total)	Iron	Lead	Magnesium	Manganese	Mercury
Qbt2, 3, 4 BV^a				3.14	4.66	0.5	14500	11.2	1690	482	0.1
Qbt1v BV^a				1.78	3.26	0.5	9900	18.4	780	408	0.1
Qbt1g, Qct, Qbo BV^a				8.89	3.96	0.5	3700	13.5	739	189	0.1
Industrial Soil Screening Level^{b,c}				20500	45400	13700	100000	800	na	48400	340
Residential Soil Screening Level^{b,c}				15200	31300	1220	13800	400	na	3590	23
50-24820	RE50-05-61439	48.40–50.00	QBT3	—	—	—	—	—	—	—	—
50-24820	RE50-05-61440	97.50–100.00	QBT3	—	—	—	—	—	—	—	—
50-24820	RE50-05-61441	138.70–140.00	QBT2	—	—	—	—	—	—	—	—
50-24820	RE50-05-61442	198.20–200.00	QBT1V	—	—	—	—	—	—	—	—
50-24820	RE50-05-61443	248.30–250.00	QBT1G	—	—	—	4660	—	—	225	—
50-24821	RE50-05-61456	18.60–20.00	QBT3	—	—	—	—	—	—	—	—
50-24821	RE50-05-61457	48.60–50.00	QBT3	—	—	—	—	—	—	—	—
50-24821	RE50-05-61458	98.40–100.00	QBT3	—	—	—	—	—	—	—	—
50-24821	RE50-05-61460	137.50–140.00	QBT2	—	—	—	—	—	—	—	—
50-24821	RE50-05-61459	157.50–160.00	QBT2	—	—	—	—	—	—	—	—
50-24821	RE50-05-61461	248.60–250.00	QBT1G	—	—	—	5260	—	—	264	—
50-24822	RE50-05-61474	18.60–20.00	QBT3	—	—	—	—	17.8	—	—	—
50-24822	RE50-05-61475	47.50–49.10	QBT3	—	—	—	—	20.3	—	—	—
50-24822	RE50-05-61476	98.60–100.00	QBT3	—	—	—	—	50.9	—	—	—
50-24822	RE50-05-61477	137.50–139.20	QBT2	—	—	—	—	—	—	—	—
50-24822	RE50-05-61478	198.50–200.00	QBT1V	—	—	—	—	—	—	—	—
50-24822	RE50-05-61479	248.70–250.00	QBT1G	—	—	—	4520	—	—	257 (J)	—
50-25451	MD50-06-66697	18.70–19.90	QBT3	—	—	—	—	—	—	—	—
50-25451	MD50-06-66698	48.10–49.90	QBT3	—	—	—	—	—	—	—	—
50-25451	MD50-06-66671	96.00–100.00	QBT2	—	—	—	—	—	—	—	—

Table 6.3-1 (continued)

Location ID	Sample ID	Depth (ft)	Media	Cobalt	Copper	Cyanide (Total)	Iron	Lead	Magnesium	Manganese	Mercury
Qbt2, 3, 4 BV^a				3.14	4.66	0.5	14500	11.2	1690	482	0.1
Qbt1v BV^a				1.78	3.26	0.5	9900	18.4	780	408	0.1
Qbt1g, Qct, Qbo BV^a				8.89	3.96	0.5	3700	13.5	739	189	0.1
Industrial Soil Screening Level^{b,c}				20500	45400	13700	100000	800	na	48400	340
Residential Soil Screening Level^{b,c}				15200	31300	1220	13800	400	na	3590	23
50-25451	MD50-06-66672	146.00–147.50	QBT2	—	—	—	—	—	—	—	—
50-25451	MD50-06-66673	198.90–200.00	QBT2	—	—	—	—	—	—	—	—
50-25451	MD50-06-66674	251.20–252.50	QBT1G	—	—	—	—	—	—	—	—
50-25451	MD50-06-66699	298.50–300.00	QBT1G	—	—	—	—	—	—	—	—

Table 6.3-1 (continued)

Location ID	Sample ID	Depth (ft)	Media	Nickel	Nitrate	Perchlorate	Potassium	Selenium	Silver	Thallium	Vanadium	Zinc
Qbt2, 3, 4 BV^a				6.58	na	na	3500	0.3	1	1.1	17	63.5
Qbt1v BV^a				2	na	na	6670	0.3	1	1.24	4.48	84.6
Qbt1g, Qct, Qbo BV^a				2	na	na	2390	0.3	1	1.22	4.59	40
Industrial Soil Screening Level^{b,c}				22700	100000	790	na	5680	5680	na	1140	100000
Residential Soil Screening Level^{b,c}				1560	100000	55	na	391	391	na	78.2	23500
50-09100	0550-95-0362	10.60–12.60	QBT3	—	—	—	—	0.45 (J)	—	—	—	—
50-09100	0550-95-0365	26.50–28.50	QBT3	—	—	—	—	0.79 (U)	—	1.3 (U)	—	—
50-09100	0550-96-0100	32.70–33.70	QBT3	—	—	—	—	0.47 (U)	—	—	—	—
50-09100	0550-95-0368	41.50–43.50	QBT3	—	—	—	—	0.79 (U)	—	1.3 (U)	—	—
50-09100	0550-95-0371	58.20–60.00	QBT3	—	—	—	—	0.75 (U)	—	1.3 (U)	—	—
50-09100	0550-95-0374	71.50–73.50	QBT2	—	—	—	—	0.44 (U)	—	—	—	—
50-09100	0550-95-0383	115.10–116.90	QBT2	—	—	—	—	0.44 (U)	—	—	—	—
50-09100	0550-95-0392	161.30–163.10	QBT1V	—	—	—	—	0.45 (U)	—	—	—	—
50-09101	0550-95-0284	15.00–17.00	QBT3	—	—	—	—	0.36 (U)	—	—	—	—
50-09101	0550-96-0101	26.85–27.85	QBT3	—	—	—	—	0.64 (U)	—	—	—	—
50-09101	0550-95-0289	35.00–36.20	QBT3	—	—	—	—	0.35 (U)	—	—	—	—
50-09101	0550-96-0102	44.00–45.10	QBT3	—	—	—	—	0.71 (U)	—	—	—	—
50-09101	0550-95-0294	55.00–55.70	QBT3	—	—	—	—	0.35 (U)	—	—	—	—
50-09101	0550-96-0103	62.50–63.20	QBT3	—	—	—	—	0.92 (U)	—	—	—	—
50-09101	0550-95-0299	75.00–77.00	QBT3	—	—	—	—	0.35 (U)	—	—	—	—
50-09101	0550-95-0304	96.00–98.00	QBT3	—	—	—	—	0.35	—	—	—	—
50-09101	0550-95-0309	112.00–114.50	QBT3	—	—	—	—	0.35 (U)	—	—	—	—
50-09102	0550-95-0004	16.00–19.00	QBT3	—	—	—	—	0.47 (U)	—	—	—	—
50-09102	0550-95-0009	37.00–40.90	QBT3	—	—	—	—	0.47 (U)	—	—	—	—
50-09102	0550-95-0014	57.00–60.00	QBT3	—	—	—	—	0.47 (U)	—	—	—	—

Table 6.3-1 (continued)

Location ID	Sample ID	Depth (ft)	Media	Nickel	Nitrate	Perchlorate	Potassium	Selenium	Silver	Thallium	Vanadium	Zinc
Qbt2, 3, 4 BV ^a				6.58	na	na	3500	0.3	1	1.1	17	63.5
Qbt1v BV ^a				2	na	na	6670	0.3	1	1.24	4.48	84.6
Qbt1g, Qct, Qbo BV ^a				2	na	na	2390	0.3	1	1.22	4.59	40
Industrial Soil Screening Level ^{b,c}				22700	100000	790	na	5680	5680	na	1140	100000
Residential Soil Screening Level ^{b,c}				1560	100000	55	na	391	391	na	78.2	23500
50-09102	0550-95-0019	73.20–76.00	QBT3	—	—	—	—	0.32 (U)	—	—	—	—
50-09102	0550-95-0024	95.00–97.00	QBT3	—	—	—	—	0.32 (U)	—	—	—	—
50-09102	0550-95-0029	108.00–110.00	QBT3	—	—	—	—	0.31 (U)	—	—	—	—
50-09103	0550-95-0104	18.50–20.80	QBT3	—	—	—	—	0.75 (U)	—	1.3 (U)	—	—
50-09103	0550-95-0109	36.00–38.80	QBT3	—	—	—	—	0.77 (U)	—	1.3 (U)	—	—
50-09103	0550-96-0104	46.50–47.82	QBT3	—	—	—	—	—	—	—	—	—
50-09103	0550-95-0114	56.00–58.80	QBT3	—	—	—	—	0.82 (U)	—	1.4 (U)	—	—
50-09103	0550-95-0119	78.00–80.00	QBT3	—	—	—	—	0.82 (U)	—	1.4 (U)	—	—
50-09103	0550-95-0124	94.70–98.00	QBT3	—	—	—	—	0.78 (U)	—	1.3 (U)	—	—
50-09103	0550-95-0129	114.80–116.80	QBT3	—	—	—	—	0.78 (U)	—	1.3 (U)	—	—
50-09104	0550-95-0079	26.30–28.00	QBT3	—	—	—	—	—	—	—	—	—
50-09104	0550-95-0083	36.60–38.60	QBT3	—	—	—	—	—	—	—	—	—
50-09104	0550-96-0105	44.10–45.10	QBT3	—	—	—	—	1.1 (U)	—	1.2	—	—
50-09105	0550-95-0135	16.10–18.50	QBT3	—	—	—	—	0.79 (U)	—	1.3 (U)	—	—
50-09105	0550-95-0140	35.00–38.00	QBT3	—	—	—	—	0.75 (U)	—	1.2 (U)	—	—
50-09105	0550-95-0145	57.00–59.00	QBT3	—	—	—	—	0.78 (U)	—	1.3 (U)	—	—
50-09105	0550-96-0106	62.10–63.00	QBT3	—	—	—	—	0.88 (U)	—	—	—	—
50-09105	0550-95-0150	77.00–79.70	QBT3	—	—	—	—	0.74 (U)	—	1.2 (U)	—	—
50-09105	0550-95-0155	97.00–99.80	QBT3	—	—	—	—	0.76 (U)	—	1.3 (U)	—	—
50-09105	0550-95-0160	117.70–120.00	QBT3	—	—	—	—	0.76 (U)	—	1.3 (U)	—	—

Table 6.3-1 (continued)

Location ID	Sample ID	Depth (ft)	Media	Nickel	Nitrate	Perchlorate	Potassium	Selenium	Silver	Thallium	Vanadium	Zinc
Qbt2, 3, 4 BV^a				6.58	na	na	3500	0.3	1	1.1	17	63.5
Qbt1v BV^a				2	na	na	6670	0.3	1	1.24	4.48	84.6
Qbt1g, Qct, Qbo BV^a				2	na	na	2390	0.3	1	1.22	4.59	40
Industrial Soil Screening Level^{b,c}				22700	100000	790	na	5680	5680	na	1140	100000
Residential Soil Screening Level^{b,c}				1560	100000	55	na	391	391	na	78.2	23500
50-09106	0550-95-0046	27.50–30.50	QBT3	—	—	—	—	0.84 (UJ)	—	1.4 (U)	—	—
50-09106	0550-95-0050	41.00–44.00	QBT3	—	—	—	—	0.77 (U)	—	1.3 (U)	—	—
50-09106	0550-95-0054	56.50–58.50	QBT3	—	—	—	—	0.71 (U)	—	1.2 (U)	—	—
50-09106	0550-95-0058	70.50–73.00	QBT3	—	—	—	—	0.74 (U)	—	1.2 (U)	—	—
50-09106	0550-95-0063	86.00–88.50	QBT3	—	—	—	—	0.74 (U)	—	1.2 (U)	—	—
50-09106	0550-95-0067	102.00–104.00	QBT3	—	—	—	—	0.74 (U)	—	1.2 (U)	—	—
50-09106	0550-95-0071	115.50–118.00	QBT3	—	—	—	—	0.71 (U)	—	1.2 (J)	—	—
50-09107	0550-96-0107	46.90–48.50	QBT3	—	—	—	—	1.1	—	—	—	—
50-09107	0550-96-0108	66.20–67.00	QBT3	—	—	—	—	0.95 (U)	—	—	—	—
50-09108	0550-95-0195	15.00–16.80	QBT3	—	—	—	—	—	2.1 (U)	—	—	—
50-09108	0550-96-0109	24.50–25.50	QBT3	—	—	—	—	0.53 (U)	—	—	—	—
50-09108	0550-95-0200	37.00–38.60	QBT3	—	—	—	—	—	2.2 (U)	—	—	—
50-09108	0550-96-0110	44.90–45.90	QBT3	—	—	—	—	0.85 (U)	—	—	—	—
50-09108	0550-95-0205	57.00–59.00	QBT3	—	—	—	—	—	2 (U)	—	—	—
50-09108	0550-95-0210	76.60–78.60	QBT3	—	—	—	—	—	2.1 (U)	—	—	—
50-09108	0550-95-0215	95.50–97.50	QBT3	—	—	—	—	—	—	—	—	—
50-09108	0550-95-0220	112.00–115.00	QBT3	—	—	—	—	—	—	—	—	—
50-09109	0550-95-0226	18.20–20.20	QBT3	—	—	—	—	—	2.2 (U)	—	—	—
50-09109	0550-95-0231	34.10–36.00	QBT3	—	—	—	—	—	2.2 (U)	—	—	—
50-09109	0550-96-0111	46.00–47.00	QBT3	—	—	—	—	0.61 (U)	—	—	—	—

Table 6.3-1 (continued)

Location ID	Sample ID	Depth (ft)	Media	Nickel	Nitrate	Perchlorate	Potassium	Selenium	Silver	Thallium	Vanadium	Zinc
Qbt2, 3, 4 BV ^a				6.58	na	na	3500	0.3	1	1.1	17	63.5
Qbt1v BV ^a				2	na	na	6670	0.3	1	1.24	4.48	84.6
Qbt1g, Qct, Qbo BV ^a				2	na	na	2390	0.3	1	1.22	4.59	40
Industrial Soil Screening Level ^{b,c}				22700	100000	790	na	5680	5680	na	1140	100000
Residential Soil Screening Level ^{b,c}				1560	100000	55	na	391	391	na	78.2	23500
50-09109	0550-95-0236	57.80–60.00	QBT3	—	—	—	—	—	2.1 (U)	—	—	—
50-09109	0550-96-0112	66.00–67.00	QBT3	13.2	—	—	—	1.3	—	1.4	—	—
50-09109	0550-95-0246	77.40–79.70	QBT3	—	—	—	—	1.1 (UJ)	2.1 (U)	—	—	—
50-09109	0550-95-0251	88.60–88.80	QBT3	—	—	—	—	1 (UJ)	2.1 (U)	—	—	—
50-09109	0550-95-0241	113.00–114.70	QBT3	—	—	—	—	1.1 (UJ)	2.1 (U)	—	—	—
50-09110	0550-95-0259	17.00–19.00	QBT3	—	—	—	—	—	—	—	—	—
50-09110	0550-96-0113	24.10–24.80	QBT3	—	—	—	—	0.71 (U)	—	—	—	—
50-09110	0550-95-0264	38.00–40.00	QBT3	—	—	—	—	—	—	—	—	—
50-09110	0550-96-0114	48.50–49.50	QBT3	—	—	—	—	0.82 (U)	—	—	—	—
50-09110	0550-95-0269	59.00–60.80	QBT3	—	—	—	—	—	—	—	—	—
50-09110	0550-95-0274	74.00–76.60	QBT3	—	—	—	—	—	—	—	—	—
50-09110	0550-95-0279	88.00–89.40	QBT3	—	—	—	—	—	—	—	—	—
50-24766	MD50-06-64604	27.50–29.20	QBT3	—	1.76	—	—	—	—	—	—	—
50-24766	MD50-06-64586	97.50–99.90	QBT2	—	1.19	0.00101 (J)	—	0.772 (J)	—	—	—	—
50-24766	MD50-06-64587	122.50–124.60	QBT2	—	1.24	0.00728	—	0.667 (J)	—	—	—	—
50-24766	MD50-06-64605	148.10–149.50	QBT2	—	1.1	—	—	1.57 (U)	—	—	—	—
50-24767	MD50-06-64635	8.00–10.00	QBT3	—	1.32	—	—	1.56 (U)	—	—	—	—
50-24767	MD50-06-64636	28.10–30.00	QBT3	—	2.36	—	—	1.53 (U)	—	—	—	—
50-24767	MD50-06-64618	58.30–59.80	QBT3	—	1.1	—	—	1.56 (U)	—	—	—	—
50-24767	MD50-06-64619	123.20–125.00	QBT2	—	—	—	—	1.65 (U)	—	—	—	—

Table 6.3-1 (continued)

Location ID	Sample ID	Depth (ft)	Media	Nickel	Nitrate	Perchlorate	Potassium	Selenium	Silver	Thallium	Vanadium	Zinc
Qbt2, 3, 4 BV ^a				6.58	na	na	3500	0.3	1	1.1	17	63.5
Qbt1v BV ^a				2	na	na	6670	0.3	1	1.24	4.48	84.6
Qbt1g, Qct, Qbo BV ^a				2	na	na	2390	0.3	1	1.22	4.59	40
Industrial Soil Screening Level ^{b,c}				22700	100000	790	na	5680	5680	na	1140	100000
Residential Soil Screening Level ^{b,c}				1560	100000	55	na	391	391	na	78.2	23500
50-24767	MD50-06-64637	148.30–149.80	QBT2	—	—	—	—	1.53 (U)	—	—	—	—
50-24768	MD50-06-64667	12.50–15.00	QBT3	—	—	—	—	1.47 (U)	—	—	—	—
50-24768	MD50-06-64668	27.50–29.50	QBT3	—	—	—	—	1.5 (U)	—	—	—	—
50-24768	MD50-06-64650	96.70–99.50	QBT2	—	—	—	—	1.49 (U)	—	—	—	—
50-24768	MD50-06-64651	123.20–125.00	QBT2	—	—	—	—	1.45 (U)	—	—	—	—
50-24768	MD50-06-64669	148.60–151.50	QBT2	—	—	—	—	1.57 (U)	—	—	—	—
50-24769	MD50-06-64699	18.10–20.00	QBT3	—	6.99	0.00085 (J)	—	9.09	—	—	—	—
50-24769	MD50-06-64700	37.50–39.90	QBT3	—	2.9	0.000893 (J)	—	8.4	—	—	—	—
50-24769	MD50-06-64682	97.50–99.30	QBT3	—	—	0.00118 (J)	—	1.49 (U)	—	—	27.1	—
50-24769	MD50-06-64683	122.50–124.50	QBT2	—	1.22	0.00174 (J)	—	1.5 (U)	—	—	—	—
50-24769	MD50-06-64701	147.90–149.80	QBT2	—	—	—	—	1.5 (U)	—	—	—	—
50-24770	MD50-06-64731	18.10–22.50	QBT3	—	0.771 (J-)	0.00823	—	1.62 (U)	—	—	—	—
50-24770	MD50-06-64717	24.60–25.00	QBT3	—	0.741 (J-)	0.0209	—	1.54 (U)	—	—	—	—
50-24770	MD50-06-64732	38.20–39.90	QBT3	—	0.754 (J-)	0.00348	—	1.49 (U)	—	—	—	—
50-24770	MD50-06-64714	98.70–100.00	QBT3	—	0.786 (J)	—	—	1.51 (U)	—	—	—	—
50-24770	MD50-06-64715	123.20–124.60	QBT3	—	0.751 (J)	—	—	1.48 (U)	—	—	—	—
50-24770	MD50-06-64733	147.50–150.00	QBT2	—	0.795 (J)	—	—	1.5 (U)	—	—	—	—
50-24771	MD50-06-64756	15.90–17.50	QBT3	—	2.9	—	—	1.55 (U)	—	—	—	—
50-24771	MD50-06-64757	38.00–40.00	QBT3	—	0.828 (J)	0.000538 (J)	—	11	—	—	—	—
50-24771	MD50-06-64739	98.80–100.00	QBT2	—	2.06	0.00507	—	10.1	—	—	—	—

Table 6.3-1 (continued)

Location ID	Sample ID	Depth (ft)	Media	Nickel	Nitrate	Perchlorate	Potassium	Selenium	Silver	Thallium	Vanadium	Zinc
Qbt2, 3, 4 BV^a				6.58	na	na	3500	0.3	1	1.1	17	63.5
Qbt1v BV^a				2	na	na	6670	0.3	1	1.24	4.48	84.6
Qbt1g, Qct, Qbo BV^a				2	na	na	2390	0.3	1	1.22	4.59	40
Industrial Soil Screening Level^{b,c}				22700	100000	790	na	5680	5680	na	1140	100000
Residential Soil Screening Level^{b,c}				1560	100000	55	na	391	391	na	78.2	23500
50-24771	MD50-06-64740	123.60–125.00	QBT2	—	0.919 (J)	0.00318	—	11.4	—	—	—	—
50-24771	MD50-06-64758	148.20–150.00	QBT2	—	0.694 (J)	—	—	12	—	—	—	—
50-24773	MD50-06-64781	20.00–22.50	QBT3	—	1.03 (J-)	0.00118 (J)	—	1.52 (U)	—	—	—	—
50-24773	MD50-06-64782	38.00–40.00	QBT3	—	1.13	—	—	1.54 (U)	—	—	—	—
50-24773	MD50-06-64764	98.50–100.00	QBT2	—	0.795 (J)	—	—	1.48 (U)	—	—	—	—
50-24773	MD50-06-64765	123.70–124.80	QBT2	—	0.693 (J)	—	—	1.45 (U)	—	—	—	—
50-24773	MD50-06-64783	150.00–152.80	QBT2	—	0.707 (J)	—	—	1.49 (U)	—	—	—	—
50-24782	MD50-06-64813	20.90–22.50	QBT3	—	1.51	0.00647	—	1.48 (U)	—	—	—	—
50-24782	MD50-06-64814	35.30–37.10	QBT3	—	2.43	0.0211	—	1.54 (U)	—	—	—	—
50-24782	MD50-06-64796	98.50–100.00	QBT3	—	—	—	—	1.46 (U)	—	—	—	—
50-24782	MD50-06-64797	123.50–125.00	QBT3	—	—	—	—	1.46 (U)	—	—	—	—
50-24782	MD50-06-64815	156.00–157.50	QBT3	—	—	—	—	1.51 (U)	—	—	—	—
50-24783	MD50-06-64838	17.50–20.00	QBT3	—	1.96	0.000591 (J)	—	1.52 (U)	—	—	—	—
50-24783	MD50-06-64839	35.40–37.50	QBT3	—	1.2	—	—	1.52 (U)	—	—	—	—
50-24783	MD50-06-64821	98.60–100.00	QBT3	—	—	—	—	1.5 (U)	—	—	—	—
50-24783	MD50-06-64822	123.30–125.00	QBT2	—	—	—	—	1.47 (U)	—	—	—	—
50-24783	MD50-06-64840	150.30–152.50	QBT2	—	—	—	—	1.5 (U)	—	—	—	—
50-24784	MD50-06-64380	8.00–10.00	QBT3	—	2.18 (J-)	—	—	15	—	—	—	—
50-24784	MD50-06-64381	18.00–20.00	QBT3	—	2.31	0.000758 (J)	—	6.12	—	—	—	—
50-24784	MD50-06-64363	46.10–47.50	QBT3	—	—	—	—	6.79	—	—	—	—

Table 6.3-1 (continued)

Location ID	Sample ID	Depth (ft)	Media	Nickel	Nitrate	Perchlorate	Potassium	Selenium	Silver	Thallium	Vanadium	Zinc
Qbt2, 3, 4 BV ^a				6.58	na	na	3500	0.3	1	1.1	17	63.5
Qbt1v BV ^a				2	na	na	6670	0.3	1	1.24	4.48	84.6
Qbt1g, Qct, Qbo BV ^a				2	na	na	2390	0.3	1	1.22	4.59	40
Industrial Soil Screening Level ^{b,c}				22700	100000	790	na	5680	5680	na	1140	100000
Residential Soil Screening Level ^{b,c}				1560	100000	55	na	391	391	na	78.2	23500
50-24784	MD50-06-64364	48.70–50.00	QBT3	20.3	2.48	0.00123 (J)	6770 (J+)	20	—	—	39.3	103
50-24784	MD50-06-64365	51.00–55.00	QBT3	—	0.652 (J)	—	—	1.54 (U)	—	—	—	—
50-24784	MD50-06-64367	98.50–100.00	QBT3	—	0.51 (J)	—	—	1.55 (U)	—	—	—	—
50-24784	MD50-06-64366	167.50–169.00	QBT2	—	0.498 (J-)	—	—	1.48 (U)	—	—	—	—
50-24784	MD50-06-64369	197.90–199.20	QBT1V	—	0.53 (J-)	—	—	1.52 (U)	—	—	—	—
50-24784	MD50-06-64368	248.00–250.00	QBT1V	—	0.879 (J-)	0.00201 (J)	—	1.56 (U)	—	—	—	—
50-24784	MD50-06-65526	273.50–275.00	QBT1G	—	0.658 (J)	—	—	1.57 (U)	—	—	—	—
50-24784	MD50-06-64382	298.30–299.80	QBT1G	—	0.625 (J)	—	—	1.62 (U)	—	—	—	—
50-24785	MD50-06-64412	8.50–10.00	QBT3	—	—	0.00145 (J)	—	1.76 (U)	—	—	—	—
50-24785	MD50-06-64413	17.50–19.00	QBT3	—	—	—	—	1.52 (U)	—	—	—	—
50-24785	MD50-06-64395	57.50–60.00	QBT3	—	0.893	—	—	1.54 (U)	—	—	—	—
50-24785	MD50-06-64396	117.50–120.00	QBT2	—	—	—	—	1.54 (U)	—	—	—	—
50-24785	MD50-06-64397	198.70–200.00	QBT1V	—	1.12 (J-)	—	—	1.51 (U)	—	—	—	—
50-24785	MD50-06-64398	248.50–250.00	QBT1G	—	1.67	0.000926	—	3.14	—	—	—	62
50-24785	MD50-06-64414	273.80–275.00	QBT1G	—	—	—	—	1.75	—	—	—	81.7 (J)
50-24796	MD50-06-64457	8.00–10.00	QBT3	—	4.54	0.00412	—	1.55 (U)	—	—	—	—
50-24796	MD50-06-64458	17.50–19.30	QBT3	—	1.89	0.000583 (J)	—	1.54 (U)	—	—	—	—
50-24796	MD50-06-64440	37.50–39.30	QBT3	—	0.659 (J)	—	—	1.5 (U)	—	—	—	—
50-24796	MD50-06-64441	97.50–100.00	QBT3	—	0.54 (J)	—	—	1.5 (U)	—	—	—	—
50-24796	MD50-06-64442	118.70–120.00	QBT2	—	0.555 (J-)	—	—	1.46 (U)	—	—	—	—

Table 6.3-1 (continued)

Location ID	Sample ID	Depth (ft)	Media	Nickel	Nitrate	Perchlorate	Potassium	Selenium	Silver	Thallium	Vanadium	Zinc
Qbt2, 3, 4 BV^a				6.58	na	na	3500	0.3	1	1.1	17	63.5
Qbt1v BV^a				2	na	na	6670	0.3	1	1.24	4.48	84.6
Qbt1g, Qct, Qbo BV^a				2	na	na	2390	0.3	1	1.22	4.59	40
Industrial Soil Screening Level^{b,c}				22700	100000	790	na	5680	5680	na	1140	100000
Residential Soil Screening Level^{b,c}				1560	100000	55	na	391	391	na	78.2	23500
50-24796	MD50-06-64459	147.50–149.40	QBT2	—	0.629 (J-)	—	—	1.49 (U)	—	—	—	—
50-24797	MD50-06-64506	17.50–18.30	QBT3	—	1.17	—	—	1.54 (U)	—	—	—	—
50-24797	MD50-06-64509	37.00–38.00	QBT3	—	0.991 (J)	—	—	1.54 (U)	—	—	—	—
50-24797	MD50-06-64489	58.00–60.00	QBT3	—	—	—	—	1.49 (U)	—	—	—	—
50-24797	MD50-06-64490	117.00–120.00	QBT2	—	0.532 (J)	—	—	1.51 (U)	—	—	—	—
50-24797	MD50-06-64508	157.50–159.00	QBT2	—	—	—	—	1.54 (U)	—	—	—	—
50-24799	MD50-06-64516	13.10–15.00	QBT3	—	1.79	—	—	1.59 (U)	—	—	—	—
50-24799	MD50-06-64517	15.00–16.50	QBT3	—	1.73	—	—	1.56 (U)	—	—	—	—
50-24799	MD50-06-64531	18.00–20.00	QBT3	—	1.7	—	—	1.59 (U)	—	—	—	—
50-24799	MD50-06-64532	30.60–32.50	QBT3	—	1.42	—	—	1.53 (U)	—	—	—	—
50-24799	MD50-06-64518	34.50–36.00	QBT3	—	2.16	—	—	1.67 (U)	—	—	20.3	65
50-24799	MD50-06-64519	38.50–40.00	QBT3	—	1.35	0.000942 (J)	—	1.56 (U)	—	—	—	—
50-24799	MD50-06-64514	98.30–100.00	QBT3	—	3.32 (J-)	0.00069 (J)	—	1.54 (U)	—	—	—	—
50-24799	MD50-06-64515	118.40–120.00	QBT2	—	—	—	—	1.5 (U)	—	—	—	—
50-24799	MD50-06-64533	158.50–160.00	QBT2	—	—	—	—	1.58 (U)	—	—	—	—
50-24801	MD50-06-64863	16.80–20.00	QBT3	—	2	—	—	1.56 (U)	—	—	—	—
50-24801	MD50-06-64864	33.00–35.00	QBT3	—	0.974 (J)	—	—	1.61 (U)	—	—	—	—
50-24801	MD50-06-64846	78.00–80.00	QBT3	—	—	—	—	1.53 (U)	—	—	—	—
50-24801	MD50-06-64847	118.00–120.00	QBT2	—	—	—	—	1.07 (J)	—	—	—	—
50-24801	MD50-06-64865	148.30–150.00	QBT2	—	—	—	—	1.42 (J)	—	—	—	—

Table 6.3-1 (continued)

Location ID	Sample ID	Depth (ft)	Media	Nickel	Nitrate	Perchlorate	Potassium	Selenium	Silver	Thallium	Vanadium	Zinc
Qbt2, 3, 4 BV^a				6.58	na	na	3500	0.3	1	1.1	17	63.5
Qbt1v BV^a				2	na	na	6670	0.3	1	1.24	4.48	84.6
Qbt1g, Qct, Qbo BV^a				2	na	na	2390	0.3	1	1.22	4.59	40
Industrial Soil Screening Level^{b,c}				22700	100000	790	na	5680	5680	na	1140	100000
Residential Soil Screening Level^{b,c}				1560	100000	55	na	391	391	na	78.2	23500
50-24802	MD50-06-64888	12.50–16.10	QBT3	—	—	—	—	1.5 (U)	—	—	—	—
50-24802	MD50-06-64889	40.60–42.50	QBT3	—	1.27	—	—	1.56 (U)	—	—	—	—
50-24802	MD50-06-64871	98.20–100.00	QBT3	—	0.708 (J)	—	—	1.55 (U)	—	—	—	—
50-24802	MD50-06-64872	123.10–125.00	QBT2	—	0.795 (J)	—	—	1.51 (U)	—	—	—	—
50-24802	MD50-06-64890	157.50–159.10	QBT2	—	0.664 (J)	—	—	1.46 (U)	—	—	—	—
50-24803	MD50-06-64913	15.40–17.50	QBT3	—	1.23	0.000538 (J)	—	1.67 (U)	—	—	—	—
50-24803	MD50-06-64914	36.00–37.50	QBT3	—	0.709 (J)	—	—	1.56 (U)	—	—	—	—
50-24803	MD50-06-64896	98.70–99.80	QBT3	—	1.18	—	—	1.56 (U)	—	—	—	—
50-24803	MD50-06-64897	123.30–124.80	QBT2	—	0.619 (J)	—	—	1.51 (U)	—	—	—	—
50-24803	MD50-06-64915	150.00–153.90	QBT2	—	0.641 (J)	—	—	1.54 (U)	—	—	—	—
50-24804	MD50-06-64965	8.60–9.80	QBT3	—	—	—	—	1.19 (J)	—	—	—	101
50-24804	MD50-06-64966	10.00–11.40	QBT3	—	—	—	—	2.49	—	—	—	—
50-24804	MD50-06-64980	15.40–17.10	QBT3	—	1.14	—	—	0.75 (J)	—	—	—	—
50-24804	MD50-06-64981	32.50–34.20	QBT3	—	1.05	—	—	1 (J)	—	—	—	—
50-24804	MD50-06-64963	97.80–99.20	QBT3	—	1.13	—	—	0.695 (J)	1.53	—	—	—
50-24804	MD50-06-64964	122.50–124.10	QBT3	—	1.06	0.00735	—	1.58 (U)	1.43	—	—	—
50-24804	MD50-06-64982	147.50–149.80	QBT2	—	1 (J)	0.00668	—	1.52 (U)	—	—	—	—
50-24810	MD50-06-65005	17.50–19.00	QBT3	—	—	—	—	1.6 (U)	—	—	—	—
50-24810	MD50-06-65006	35.50–37.10	QBT3	—	—	—	—	1.59 (U)	—	—	—	—
50-24810	MD50-06-64988	97.50–99.00	QBT3	—	—	0.000538 (J)	—	1.58 (U)	—	—	—	—

Table 6.3-1 (continued)

Location ID	Sample ID	Depth (ft)	Media	Nickel	Nitrate	Perchlorate	Potassium	Selenium	Silver	Thallium	Vanadium	Zinc
Qbt2, 3, 4 BV ^a				6.58	na	na	3500	0.3	1	1.1	17	63.5
Qbt1v BV ^a				2	na	na	6670	0.3	1	1.24	4.48	84.6
Qbt1g, Qct, Qbo BV ^a				2	na	na	2390	0.3	1	1.22	4.59	40
Industrial Soil Screening Level ^{b,c}				22700	100000	790	na	5680	5680	na	1140	100000
Residential Soil Screening Level ^{b,c}				1560	100000	55	na	391	391	na	78.2	23500
50-24810	MD50-06-64989	122.50–123.90	QBT2	—	0.847 (J)	—	—	1.59 (U)	—	—	—	—
50-24810	MD50-06-65007	148.30–151.60	QBT2	—	0.787 (J-)	—	—	1.57 (U)	—	—	—	—
50-24811	MD50-06-65075	18.50–20.00	QBT3	—	0.788 (J)	—	—	1.58 (U)	—	—	—	—
50-24811	MD50-06-65076	38.50–40.00	QBT3	—	0.805 (J)	0.000666 (J)	—	1.56 (U)	—	—	—	—
50-24811	MD50-06-65058	97.50–98.70	QBT3	—	0.722 (J)	—	—	1.56 (U)	—	—	—	—
50-24811	MD50-06-65059	123.20–125.00	QBT2	—	0.703 (J)	—	—	1.51 (U)	—	—	—	—
50-24811	MD50-06-65077	147.50–150.60	QBT2	—	1.25	0.000989 (J)	—	1.5 (U)	—	—	—	—
50-24812	MD50-06-65100	8.40–10.00	QBT3	—	—	—	—	0.919 (J)	—	—	—	78.7 (J-)
50-24812	MD50-06-65101	33.50–35.00	QBT3	—	—	—	—	1.44 (J)	—	—	—	—
50-24812	MD50-06-65083	97.50–98.90	QBT3	—	0.978 (J)	—	—	1.59 (U)	—	—	—	—
50-24812	MD50-06-65084	122.50–123.70	QBT2	—	0.814 (J)	—	—	1.2 (J)	—	—	—	—
50-24812	MD50-06-65102	146.00–150.00	QBT2	—	—	—	—	3.33	—	—	—	69.7 (J-)
50-24813	MD50-06-65132	18.20–20.00	QBT3	—	0.785 (J-)	—	—	1.55 (U)	—	—	—	—
50-24813	MD50-06-65133	30.00–31.90	QBT3	—	0.798 (J-)	—	—	1.54 (U)	—	—	—	—
50-24813	MD50-06-65115	98.20–99.70	QBT3	—	0.769 (J)	—	—	1.59 (U)	—	—	—	—
50-24813	MD50-06-65116	123.50–125.00	QBT2	—	0.775 (J)	0.000558 (J)	—	1.52 (U)	—	—	—	—
50-24813	MD50-06-65134	148.00–150.00	QBT2	—	0.768 (J)	0.048	—	1.59 (U)	—	—	—	—
50-24814	MD50-06-65157	7.50–9.10	QBT3	—	0.86 (J)	0.00142 (J)	—	1.52 (U)	—	—	—	—
50-24814	MD50-06-65158	30.00–31.60	QBT3	—	0.805 (J)	—	—	1.55 (U)	—	—	—	—
50-24814	MD50-06-65140	96.80–99.90	QBT3	—	0.686 (J)	—	—	1.56 (U)	—	—	—	—

Table 6.3-1 (continued)

Location ID	Sample ID	Depth (ft)	Media	Nickel	Nitrate	Perchlorate	Potassium	Selenium	Silver	Thallium	Vanadium	Zinc
Qbt2, 3, 4 BV ^a				6.58	na	na	3500	0.3	1	1.1	17	63.5
Qbt1v BV ^a				2	na	na	6670	0.3	1	1.24	4.48	84.6
Qbt1g, Qct, Qbo BV ^a				2	na	na	2390	0.3	1	1.22	4.59	40
Industrial Soil Screening Level ^{b,c}				22700	100000	790	na	5680	5680	na	1140	100000
Residential Soil Screening Level ^{b,c}				1560	100000	55	na	391	391	na	78.2	23500
50-24814	MD50-06-65141	123.50–124.80	QBT2	—	0.807 (J)	—	—	1.5 (U)	—	—	—	—
50-24814	MD50-06-65159	147.50–149.50	QBT2	—	0.668 (J)	—	—	1.56 (U)	—	—	—	—
50-24815	MD50-06-65189	17.50–20.00	QBT3	—	1.57	—	—	1.57 (U)	—	—	—	—
50-24815	MD50-06-65190	37.80–41.50	QBT3	—	1.1	—	—	1.56 (U)	—	—	—	—
50-24815	MD50-06-65172	98.80–100.00	QBT3	—	0.871 (J)	—	—	1.54 (U)	—	—	—	—
50-24815	MD50-06-65173	123.40–125.00	QBT2	—	0.757 (J)	0.00059 (J)	—	1.55 (U)	—	—	—	—
50-24815	MD50-06-65191	147.80–149.70	QBT2	—	0.767 (J)	0.00272	—	1.58 (U)	—	—	—	—
50-24816	MD50-06-65214	23.10–24.70	QBT3	—	—	—	—	1.69 (U)	—	—	—	—
50-24816	MD50-06-65215	32.20–34.00	QBT3	—	—	—	—	1.66 (U)	—	—	—	—
50-24816	MD50-06-65197	63.80–65.00	QBT3	—	—	—	—	1.58 (U)	—	—	—	—
50-24816	MD50-06-65198	118.70–120.00	QBT2	—	—	—	—	1.5 (U)	—	—	—	—
50-24816	MD50-06-65199	198.80–200.00	QBT2	—	—	—	—	1.46 (U)	—	—	—	—
50-24816	MD50-06-65216	223.40–225.00	QBT2	—	—	—	—	1.51 (U)	—	—	—	—
50-24817	MD50-05-63837	18.40–20.00	QBT3	—	—	—	—	1.53 (U)	—	—	—	—
50-24817	MD50-05-63838	37.00–40.00	QBT3	—	0.77 (J)	—	—	1.54 (U)	—	—	—	—
50-24817	RE50-05-63810	98.80–100.00	QBT3	—	0.945 (J)	0.000739 (J)	—	1.57 (U)	—	—	—	—
50-24817	RE50-05-63811	138.00–140.00	QBT2	—	0.846 (J)	—	—	1.57 (U)	—	—	—	—
50-24817	RE50-05-63812	198.40–200.00	QBT1V	—	0.932 (J)	—	—	1.57 (U)	—	—	—	—
50-24817	MD50-05-63839	248.10–250.00	QBT1G	—	1.38	0.000975 (J)	—	1.73 (U)	—	—	—	44.8
50-24818	MD50-06-65229	8.50–10.00	QBT3	—	4.9 (J-)	—	—	1.53 (U)	—	—	—	—

Table 6.3-1 (continued)

Location ID	Sample ID	Depth (ft)	Media	Nickel	Nitrate	Perchlorate	Potassium	Selenium	Silver	Thallium	Vanadium	Zinc
Qbt2, 3, 4 BV^a				6.58	na	na	3500	0.3	1	1.1	17	63.5
Qbt1v BV^a				2	na	na	6670	0.3	1	1.24	4.48	84.6
Qbt1g, Qct, Qbo BV^a				2	na	na	2390	0.3	1	1.22	4.59	40
Industrial Soil Screening Level^{b,c}				22700	100000	790	na	5680	5680	na	1140	100000
Residential Soil Screening Level^{b,c}				1560	100000	55	na	391	391	na	78.2	23500
50-24818	MD50-06-65230	22.10–25.00	QBT3	—	2.48 (J-)	0.00056 (J)	—	1.57 (U)	—	—	—	—
50-24818	MD50-06-65261	98.50–100.00	QBT2	—	0.354 (J-)	—	—	5.57	—	—	—	—
50-24818	MD50-06-65262	147.50–149.20	QBT2	—	0.424 (J)	—	—	1.54 (U)	—	—	—	—
50-24818	MD50-06-65263	189.90–190.00	QBT1V	—	0.399 (J)	0.00095 (J)	—	1.55 (U)	—	—	—	—
50-24818	MD50-06-65264	247.70–249.20	QBT1G	—	0.658 (J-)	—	—	1.59 (U)	—	—	—	—
50-24818	MD50-06-65265	280.00–282.50	QBT1G	—	0.468 (J-)	—	—	1.61 (U)	—	—	—	—
50-24818	MD50-06-65266	313.50–315.00	QBT1G	—	0.584 (J)	—	—	1.71 (U)	—	—	—	93.1
50-24818	MD50-06-65267	396.00–402.00	QBO	2.87	1.02 (J)	—	—	2.13	—	—	—	—
50-24818	MD50-06-65268	449.00–452.00	QBO	—	0.74 (J-)	—	—	33.2 (U)	—	—	55.2	—
50-24818	MD50-06-65269	497.00–500.50	QBO	4.11 (J)	—	—	—	1.61 (U)	—	—	6.36 (J)	—
50-24818	MD50-06-65270	547.00–551.50	QBO	—	—	—	—	1.63 (U)	—	—	—	54.2
50-24818	MD50-06-65271	597.00–600.40	QBO	—	—	—	—	1.72 (U)	—	—	—	—
50-24819	RE50-05-61422	18.50–20.00	QBT3	—	1.18	—	—	1.6 (U)	—	—	—	—
50-24819	RE50-05-61423	48.00–50.00	QBT3	—	0.942 (J+)	—	—	1.53 (U)	—	—	—	—
50-24819	RE50-05-61424	97.50–100.00	QBT3	—	0.889 (J)	0.00128 (J)	—	1.53 (U)	—	—	—	—
50-24819	RE50-05-61425	138.50–140.00	QBT2	—	1.11	—	—	1.5 (U)	—	—	—	—
50-24819	RE50-05-61426	198.10–200.00	QBT1V	—	0.809 (J)	0.000663 (J-)	—	1.51 (U)	—	—	—	—
50-24819	RE50-05-61427	246.50–250.00	QBT1V	—	0.909 (J)	0.000784 (J-)	—	1.62 (U)	—	—	—	—
50-24819	RE50-05-61428	273.00–275.00	QBT1G	—	0.876 (J)	0.000589 (J-)	—	1.6 (U)	—	—	—	—
50-24820	RE50-05-61438	17.50–20.00	QBT3	—	0.898 (J)	0.000635 (J-)	—	1.52 (U)	—	—	—	—

Table 6.3-1 (continued)

Location ID	Sample ID	Depth (ft)	Media	Nickel	Nitrate	Perchlorate	Potassium	Selenium	Silver	Thallium	Vanadium	Zinc
Qbt2, 3, 4 BV ^a				6.58	na	na	3500	0.3	1	1.1	17	63.5
Qbt1v BV ^a				2	na	na	6670	0.3	1	1.24	4.48	84.6
Qbt1g, Qct, Qbo BV ^a				2	na	na	2390	0.3	1	1.22	4.59	40
Industrial Soil Screening Level ^{b,c}				22700	100000	790	na	5680	5680	na	1140	100000
Residential Soil Screening Level ^{b,c}				1560	100000	55	na	391	391	na	78.2	23500
50-24820	RE50-05-61439	48.40–50.00	QBT3	—	0.98 (J)	0.00126 (J-)	—	1.49 (U)	—	—	—	—
50-24820	RE50-05-61440	97.50–100.00	QBT3	—	0.948 (J)	—	—	1.53 (U)	—	—	—	—
50-24820	RE50-05-61441	138.70–140.00	QBT2	—	0.687 (J)	—	—	1.5 (U)	—	—	—	—
50-24820	RE50-05-61442	198.20–200.00	QBT1V	—	0.687 (J)	—	—	1.49 (U)	—	—	—	—
50-24820	RE50-05-61443	248.30–250.00	QBT1G	—	0.797 (J)	—	—	1.61 (U)	—	—	—	—
50-24821	RE50-05-61456	18.60–20.00	QBT3	—	0.692 (J)	—	—	1.54 (U)	—	—	—	—
50-24821	RE50-05-61457	48.60–50.00	QBT3	—	0.685 (J)	—	—	1.55 (U)	—	—	—	—
50-24821	RE50-05-61458	98.40–100.00	QBT3	—	—	—	—	1.58 (U)	—	—	—	—
50-24821	RE50-05-61460	137.50–140.00	QBT2	—	1.07 (J)	—	—	1.61 (U)	—	—	—	—
50-24821	RE50-05-61459	157.50–160.00	QBT2	—	0.862 (J)	—	—	1.6 (U)	—	—	—	—
50-24821	RE50-05-61461	248.60–250.00	QBT1G	—	0.708 (J)	0.00062 (J)	—	1.56 (U)	—	—	—	—
50-24822	RE50-05-61474	18.60–20.00	QBT3	—	—	0.000658 (J)	—	1.5 (U)	—	—	—	—
50-24822	RE50-05-61475	47.50–49.10	QBT3	—	—	0.00504	—	1.53 (U)	—	—	—	—
50-24822	RE50-05-61476	98.60–100.00	QBT3	—	—	—	—	1.51 (U)	—	—	—	—
50-24822	RE50-05-61477	137.50–139.20	QBT2	—	0.726 (J)	—	—	1.58 (U)	—	—	—	—
50-24822	RE50-05-61478	198.50–200.00	QBT1V	—	—	—	—	1.5 (U)	—	—	—	—
50-24822	RE50-05-61479	248.70–250.00	QBT1G	—	—	—	—	1.56 (U)	—	—	—	—
50-25451	MD50-06-66697	18.70–19.90	QBT3	—	—	—	—	2.17	—	—	—	—
50-25451	MD50-06-66698	48.10–49.90	QBT3	—	—	—	—	2.38	—	—	—	—
50-25451	MD50-06-66671	96.00–100.00	QBT2	—	—	—	—	1.45 (U)	—	—	—	—

Table 6.3-1 (continued)

Location ID	Sample ID	Depth (ft)	Media	Nickel	Nitrate	Perchlorate	Potassium	Selenium	Silver	Thallium	Vanadium	Zinc
Qbt2, 3, 4 BV^a				6.58	na	na	3500	0.3	1	1.1	17	63.5
Qbt1v BV^a				2	na	na	6670	0.3	1	1.24	4.48	84.6
Qbt1g, Qct, Qbo BV^a				2	na	na	2390	0.3	1	1.22	4.59	40
Industrial Soil Screening Level^{b,c}				22700	100000	790	na	5680	5680	na	1140	100000
Residential Soil Screening Level^{b,c}				1560	100000	55	na	391	391	na	78.2	23500
50-25451	MD50-06-66672	146.00–147.50	QBT2	—	—	—	—	1.51 (U)	—	—	—	—
50-25451	MD50-06-66673	198.90–200.00	QBT2	—	—	—	—	1.48 (U)	—	—	—	—
50-25451	MD50-06-66674	251.20–252.50	QBT1G	—	—	—	—	1.56 (U)	—	—	—	—
50-25451	MD50-06-66699	298.50–300.00	QBT1G	—	—	—	—	1.61 (U)	—	—	—	—

Note: Units are mg/kg.

^a BVs are from LANL 1998, 59730.

^b SSLs are from NMED 2006, 92513 unless otherwise indicated.

^c SSLs for chromium, mercury, and perchlorate are from EPA Region 6 (EPA 2005, 91002).

^d na = Not available.

^e — = Not detected above BV or not detected.

Table 6.3-2
Summary of Radionuclides Detected above Background/Fallout Values,
or Detected Where Fallout Values Not Available in Surface Soil and Fill at MDA C

Location ID	Sample ID	Depth (ft)	Media	Americium-241	Cesium-134	Plutonium-238	Plutonium-239	Thorium-232	Tritium	Uranium-238
Soil/Fill BV/FV^a				0.013	na^b	0.023	0.054	2.33	na	2.29
Industrial Screening Action Level^c				180	9.7	240	210	5	440000	430
Residential Screening Action Level^c				30	2.4	37	33	5	750	86
50-08010	AAA3153	0.00–0.50	Fill	0.016 (J-)	— ^d	—	—	3.9669	0.159	—
50-08062	AAA3154	0.00–0.50	Fill	—	—	—	—	—	6.231E-02	—
50-08064	AAA3155	0.00–0.50	Fill	—	—	—	—	—	5.256E-02	—
50-08086	AAA2768	0.00–0.50	Soil	0.167	—	0.219	10.687	—	1.551E-02 (J)	—
50-08088	AAA2769	0.00–0.50	Soil	0.046	—	0.052	0.441	—	2.469E-02 (J)	—
50-08102	AAA3143	0.00–0.50	Soil	0.094 (J-)	—	—	0.446 (J-)	—	—	—
50-08106	AAA3156	0.00–0.50	Fill	0.023 (J-)	—	—	—	—	4.534E-02	—
50-08110	AAA3157	0.00–0.50	Fill	0.018 (J-)	—	—	0.106 (J)	3.4961	9.051E-02	—
50-08116	AAA3158	0.00–0.50	Fill	0.069 (J-)	—	0.048	0.553 (J)	—	2.744E-02	—
50-08126	AAA2797	0.00–0.50	Fill	0.081	—	0.032 (J-)	0.39 (J-)	—	0.109 (J)	—
50-08131	AAA3242	0.00–0.50	Fill	0.054 (J-)	—	0.024 (J-)	0.417 (J-)	—	4.161E-02	—
50-08134	AAA2798	0.00–0.50	Fill	0.292	—	0.071	2.91	3.73	—	—
50-08136	AAA2770	0.00–0.50	Soil	0.048	—	0.075	1.427	3.74	6.275E-02 (J)	—
50-08137	AAA3243	0.00–0.50	Fill	0.054 (J-)	—	—	0.593 (J-)	3.3221	0.109	—
50-08138	AAA2771	0.00–0.50	Soil	1.017	—	—	0.46	3.27	1.768E-02 (J-)	—
50-08139	AAA3244	0.00–0.50	Fill	0.13 (J-)	—	0.037 (J-)	2.678 (J-)	—	4.132E-02	—
50-08140	AAA2772	0.00–0.50	Soil	0.03	—	—	0.347 (J)	4.01	1.334E-02 (J)	—
50-08142	AAA2773	0.00–0.50	Soil	0.032	—	—	0.342 (J)	—	0.013 (J)	—
50-08144	AAA2774	0.00–0.50	Soil	0.036	—	—	0.276 (J)	—	6.435E-02 (J-)	—

Table 6.3-2 (continued)

Location ID	Sample ID	Depth (ft)	Media	Americium-241	Cesium-134	Plutonium-238	Plutonium-239	Thorium-232	Tritium	Uranium-238
Soil/Fill BV/FV^a				0.013	na^b	0.023	0.054	2.33	na	2.29
Industrial Screening Action Level^c				180	9.7	240	210	5	440000	430
Residential Screening Action Level^c				30	2.4	37	33	5	750	86
50-08154	AAA3144	0.00–0.50	Soil	0.257 (J-)	—	0.035 (J-)	1.598 (J-)	—	—	—
50-08156	AAA3159	0.00–0.50	Fill	0.207	—	0.037	1.234 (J)	—	2.781E-02	—
50-08162	AAA3160	0.00–0.50	Fill	—	—	—	0.08 (J)	—	0.024	—
50-08168	AAA3189	0.00–0.50	Fill	—	—	—	0.964 (J-)	—	—	—
50-08176	AAA2799	0.00–0.50	Fill	—	—	—	—	—	5.383E-02 (J)	—
50-08180	AAA2800	0.00–0.50	Fill	—	—	—	—	—	0.125 (J)	—
50-08185	AAA3245	0.00–0.50	Fill	0.084 (J-)	—	—	0.555 (J-)	—	3.775E-02	—
50-08189	AAA3246	0.00–0.50	Fill	—	—	—	—	—	5.017E-02	—
50-08193	AAA3247	0.00–0.50	Fill	0.082 (J-)	—	0.024 (J-)	1.26 (J-)	—	7.761E-02	—
50-08194	AAA2801	0.00–0.50	Fill	0.022	—	—	0.252	—	—	2.449
50-08195	AAA3248	0.00–0.50	Fill	0.016 (J-)	—	—	0.144 (J-)	—	9.511E-02	—
50-08214	AAA3190	0.00–0.50	Fill	—	—	0.025 (J-)	0.091 (J-)	—	0.041 (J)	—
50-08216	AAA3191	0.00–0.50	Fill	—	—	—	—	3.4625	3.247E-02 (J)	—
50-08222	AAA2802	0.00–0.50	Fill	—	—	—	0.107	3.07	8.617E-02 (J)	—
50-08224	AAA2803	0.00–0.50	Fill	—	—	—	0.318	—	7.957E-02 (J)	—
50-08226	AAA2804	0.00–0.50	Fill	—	—	—	0.118	3.73	—	—
50-08228	AAA2805	0.00–0.50	Fill	—	—	—	—	—	0.087 (J)	—
50-08231	AAA3249	0.00–0.50	Fill	—	—	—	—	—	4.840E-02	—
50-08244	AAA3093	0.00–0.50	Fill	0.045 (J-)	—	—	0.314	3.3379	—	—
50-08245	AAA3250	0.00–0.50	Fill	0.09 (J-)	—	—	1.252 (J-)	—	5.756E-02	—
50-08266	AAA3192	0.00–0.50	Fill	0.034 (J-)	—	0.024 (J-)	0.232 (J-)	—	4.860E-02 (J)	—

Table 6.3-2 (continued)

Location ID	Sample ID	Depth (ft)	Media	Americium-241	Cesium-134	Plutonium-238	Plutonium-239	Thorium-232	Tritium	Uranium-238
Soil/Fill BV/FV^a				0.013	na^b	0.023	0.054	2.33	na	2.29
Industrial Screening Action Level^c				180	9.7	240	210	5	440000	430
Residential Screening Action Level^c				30	2.4	37	33	5	750	86
50-08274	AAA3094	0.00–0.50	Fill	0.017 (J-)	—	—	0.199	—	0.114 (J)	—
50-08290	AAA3096	0.00–0.50	Fill	—	—	—	0.074	—	—	—
50-08312	AAA3193	0.00–0.50	Fill	0.046 (J-)	—	0.041 (J-)	0.372 (J-)	—	0.374 (J)	—
50-08326	AAA3098	0.00–0.50	Fill	0.02 (J-)	—	—	0.139	4.7978	4.797E-02 (J)	—
50-08328	AAA3099	0.00–0.50	Fill	—	—	—	0.105	—	0.178 (J)	—
50-08336	AAA3118	0.00–0.50	Fill	0.066	—	—	—	—	4.061E-02	—
50-08340	AAA3119	0.00–0.50	Fill	—	—	—	—	—	8.950E-02	—
50-08342	AAA3120	0.00–0.50	Fill	—	—	—	—	—	3.117E-02	—
50-08346	AAA2775	0.00–0.50	Soil	0.357	—	0.032	2.082 (J)	—	0.195 (J-)	—
50-08364	AAA3145	0.00–0.50	Soil	—	—	—	0.103 (J-)	—	—	—
50-08370	AAA3121	0.00–0.50	Fill	0.244	—	0.044	2.677	2.9623	5.043E-02	—
50-08374	AAA3122	0.00–0.50	Fill	—	—	—	0.091	—	2.916E-02	—
50-08386	AAA3123	0.00–0.50	Fill	—	—	—	—	—	5.318E-02	—
50-08396	AAA2776	0.00–0.50	Soil	0.361	—	0.033	2.499 (J)	—	9.836E-02 (J)	—
50-08432	AAA3125	0.00–0.50	Fill	—	—	—	—	—	2.351E-02	—
50-08436	AAA3147	0.00–0.50	Fill	—	—	—	—	3.5565 (J-)	—	—
50-08438	AAA3148	0.00–0.50	Fill	0.018 (J-)	—	—	0.156 (J-)	—	—	—
50-08440	AAA3149	0.00–0.50	Fill	0.044 (J-)	—	—	0.34 (J-)	—	—	—
50-08446	AAA2777	0.00–0.50	Soil	0.192	—	0.027	2.132 (J)	2.75	8.482E-02 (J)	—
50-08474	AAA2778	0.00–0.50	Soil	—	—	—	0.562 (J)	—	2.876E-02 (J)	—
50-08494	AAA2779	0.00–0.50	Soil	0.454	—	0.068	8.694 (J)	—	3.501E-02 (J)	—

Table 6.3-2 (continued)

Location ID	Sample ID	Depth (ft)	Media	Americium-241	Cesium-134	Plutonium-238	Plutonium-239	Thorium-232	Tritium	Uranium-238
Soil/Fill BV/FV^a				0.013	na^b	0.023	0.054	2.33	na	2.29
Industrial Screening Action Level^c				180	9.7	240	210	5	440000	430
Residential Screening Action Level^c				30	2.4	37	33	5	750	86
50-22742	MD50-04-53250	0.00–0.50	Soil	—	0.08	—	0.36	—	—	—
50-22743	MD50-04-53251	0.00–0.50	Soil	0.05	—	0.04	1.12	—	—	—
50-22744	MD50-04-53252	0.00–0.50	Soil	—	0.08	—	0.74	—	—	—
50-22745	MD50-04-53253	0.00–0.50	Soil	0.08	0.08	0.07	0.62	—	—	—
50-22746	MD50-04-53254	0.00–0.50	Soil	—	—	—	1.84	—	—	—
50-22747	MD50-04-53255	0.00–0.50	Soil	0.1	—	0.03	3	—	—	—

Note: Units are pCi/g.

^a BVs and FVs are from LANL 1998, 59730. Soil and fill FVs apply to the 0 to 0.5 ft depth interval only.

^b na = Not available.

^c SSLs are from LANL 2005, 88493.

^d — = Not detected or not detected greater than BV/FV.

Table 6.3-3
Summary of Radionuclides Detected or Detected above Background Values in Tuff at MDA C

Location ID	Sample ID	Depth (ft)	Media	Americium-241	Cesium-134	Cesium-137	Cobalt-60	Europium-152	Plutonium-238	Plutonium-239	Ruthenium-106	Sodium-22	Strontium-90	Tritium	Uranium-234	Uranium-235	Uranium-238
Qbt2, 3 BV^a				na^b	na	na	na	na	na	na	na	na	na	na	1.98	0.09	1.93
Qbt1v BV^a				na	na	na	na	na	na	na	na	na	na	na	3.12	0.14	3.05
Qbt1g, Qbo BV^a				na	na	na	na	na	na	na	na	na	na	na	4	0.18	3.9
Industrial Screening Action Level^c				180	9.7	23	5.1	11	240	210	83	6.5	1900	440000	1500	87	430
Residential Screening Action Level^c				30	2.4	2.6	1.3	2.9	37	33	20	1.6	5.7	750	170	17	86
50-09100	0550-95-0362	10.60–12.60	QBT3	— ^d	—	—	—	—	—	—	—	—	—	0.7787	—	—	—
50-09100	0550-95-0365	26.50–28.50	QBT3	0.027	—	—	—	—	—	—	—	—	—	39.702	—	—	—
50-09100	0550-95-0368	41.50–43.50	QBT3	0.009	—	—	—	—	—	0.014	—	—	—	0.8553	—	—	—
50-09100	0550-95-0371	58.20–60.00	QBT3	0.007	—	—	—	—	0.005	—	—	—	—	0.2818	—	—	—
50-09100	0550-95-0374	71.50–73.50	QBT2	—	—	—	—	—	—	—	—	—	—	0.08105	—	—	—
50-09100	0550-95-0383	115.10–116.90	QBT2	0.016	—	—	—	—	0.02	—	—	—	—	—	—	—	—
50-09100	0550-95-0392	161.30–163.10	QBT1V	0.014	—	—	—	—	—	—	—	—	—	—	—	—	—
50-09101	0550-95-0284	15.00–17.00	QBT3	—	—	—	—	—	—	—	—	—	—	0.3463	—	—	—
50-09101	0550-95-0289	35.00–36.20	QBT3	0.018	—	—	—	—	—	—	—	—	—	0.6132	—	—	—
50-09101	0550-95-0294	55.00–55.70	QBT3	—	—	—	—	—	—	—	—	—	—	0.6701	—	—	—
50-09101	0550-95-0299	75.00–77.00	QBT3	—	—	—	—	—	—	—	—	—	—	0.678	—	—	—
50-09101	0550-95-0304	96.00–98.00	QBT3	—	—	—	—	—	—	—	—	—	—	0.498	—	—	—
50-09101	0550-95-0309	112.00–114.50	QBT3	—	—	—	—	—	—	—	—	—	—	3.6688	—	—	—
50-09102	0550-95-0004	16.00–19.00	QBT3	0.009	—	—	—	—	—	—	—	—	—	0.1071	—	—	—
50-09102	0550-95-0009	37.00–40.90	QBT3	0.011	—	—	—	—	0.011	—	—	—	—	0.7111	—	—	—
50-09102	0550-95-0014	57.00–60.00	QBT3	0.009	—	—	—	—	0.002	—	—	—	—	1799.645	—	—	—
50-09102	0550-95-0019	73.20–76.00	QBT3	0.113	—	—	—	—	—	—	—	—	—	473.3205	—	—	—
50-09102	0550-95-0024	95.00–97.00	QBT3	0.098	—	—	—	—	—	—	—	—	—	14.1481	—	—	—
50-09102	0550-95-0029	108.00–110.00	QBT3	0.136	—	—	—	—	—	—	—	—	—	19.1655	—	—	—

Table 6.3-3 (continued)

Location ID	Sample ID	Depth (ft)	Media	Americium-241	Cesium-134	Cesium-137	Cobalt-60	Europium-152	Plutonium-238	Plutonium-239	Ruthenium-106	Sodium-22	Strontium-90	Tritium	Uranium-234	Uranium-235	Uranium-238
Qbt2, 3 BV ^a				na ^b	na	na	na	na	na	na	na	na	na	na	1.98	0.09	1.93
Qbt1v BV ^a				na	na	na	na	na	na	na	na	na	na	na	3.12	0.14	3.05
Qbt1g, Qbo BV ^a				na	na	na	na	na	na	na	na	na	na	na	4	0.18	3.9
Industrial Screening Action Level ^c				180	9.7	23	5.1	11	240	210	83	6.5	1900	440000	1500	87	430
Residential Screening Action Level ^c				30	2.4	2.6	1.3	2.9	37	33	20	1.6	5.7	750	170	17	86
50-09103	0550-95-0104	18.50–20.80	QBT3	—	—	—	—	0.231	0.007	—	—	—	—	1.472	—	—	—
50-09103	0550-95-0109	36.00–38.80	QBT3	0.027	—	—	—	—	—	—	—	—	—	0.334	—	—	—
50-09103	0550-95-0114	56.00–58.80	QBT3	—	—	—	—	—	0.002	0.013	—	—	—	1.1043	—	—	—
50-09103	0550-95-0119	78.00–80.00	QBT3	0.023	—	—	—	0.297	—	—	—	—	—	0.4488	—	—	—
50-09103	0550-95-0124	94.70–98.00	QBT3	0.009	—	—	—	—	—	—	—	—	—	0.955	—	—	—
50-09103	0550-95-0129	114.80–116.80	QBT3	0.009	—	—	—	—	0.014	—	—	—	0.599	0.1178	—	—	—
50-09104	0550-95-0075	10.90–12.90	QBT3	—	0.32	—	—	—	—	—	—	0.22	—	0.2652	—	—	—
50-09104	0550-95-0079	26.30–28.00	QBT3	—	—	—	0.32	—	—	—	—	—	—	25.6185	—	—	—
50-09104	0550-95-0083	36.60–38.60	QBT3	—	—	—	—	—	—	—	—	0.22	—	35.585	—	—	—
50-09104	0550-95-0087	58.00–60.00	QBT3	—	—	—	—	—	—	—	—	—	—	2.8521	—	—	—
50-09104	0550-95-0095	79.00–81.00	QBT3	—	—	—	—	—	—	—	—	—	—	0.3028	—	—	—
50-09104	0550-95-0099	85.00–87.00	QBT3	—	—	—	—	—	—	—	—	—	—	0.1697	—	—	—
50-09105	0550-95-0135	16.10–18.50	QBT3	0.018	—	0.768	—	—	0.011	—	—	—	—	0.2753	—	—	—
50-09105	0550-95-0140	35.00–38.00	QBT3	—	—	—	—	—	—	—	—	—	—	9.30E-02	—	—	—
50-09105	0550-95-0145	57.00–59.00	QBT3	0.038	—	—	—	—	—	—	—	—	—	30.6477	—	—	—
50-09105	0550-95-0150	77.00–79.70	QBT3	0.016	—	—	—	—	—	—	—	—	—	0.3062	—	—	—
50-09105	0550-95-0155	97.00–99.80	QBT3	0.005	—	—	—	—	—	—	—	—	—	9.89E-02	—	—	—
50-09105	0550-95-0160	117.70–120.00	QBT3	0.076	—	—	—	—	—	0.08	—	—	—	—	—	—	—
50-09106	0550-95-0046	27.50–30.50	QBT3	0.02	—	—	—	—	—	—	—	—	—	8.745	—	—	—
50-09106	0550-95-0050	41.00–44.00	QBT3	0.002	—	—	—	—	—	—	—	—	—	1958.879	—	—	—
50-09106	0550-95-0054	56.50–58.50	QBT3	—	—	—	—	—	—	—	—	—	—	161.066	—	—	—

Table 6.3-3 (continued)

Location ID	Sample ID	Depth (ft)	Media	Americium-241	Cesium-134	Cesium-137	Cobalt-60	Europium-152	Plutonium-238	Plutonium-239	Ruthenium-106	Sodium-22	Strontium-90	Tritium	Uranium-234	Uranium-235	Uranium-238
Qbt2, 3 BV ^a				na ^b	na	na	na	na	na	na	na	na	na	na	1.98	0.09	1.93
Qbt1v BV ^a				na	na	na	na	na	na	na	na	na	na	na	3.12	0.14	3.05
Qbt1g, Qbo BV ^a				na	na	na	na	na	na	na	na	na	na	na	4	0.18	3.9
Industrial Screening Action Level ^c				180	9.7	23	5.1	11	240	210	83	6.5	1900	440000	1500	87	430
Residential Screening Action Level ^c				30	2.4	2.6	1.3	2.9	37	33	20	1.6	5.7	750	170	17	86
50-09106	0550-95-0058	70.50–73.00	QBT3	—	—	—	—	—	—	—	—	—	—	0.3947	—	—	—
50-09106	0550-95-0063	86.00–88.50	QBT3	0.009	—	—	—	—	—	0.002	—	—	—	0.1163	—	—	—
50-09106	0550-95-0067	102.00–104.00	QBT3	0.02	—	—	—	—	—	—	—	—	0.48	0.4838	—	—	—
50-09106	0550-95-0071	115.50–118.00	QBT3	—	—	—	—	—	—	0.009	—	—	0.767	0.133	—	—	—
50-09107	0550-95-0166	14.00–15.80	QBT3	0.012	—	—	—	—	—	—	—	—	—	0.7013	—	—	—
50-09107	0550-95-0171	36.00–39.00	QBT3	—	—	—	—	—	—	—	—	—	—	420.95	—	—	—
50-09107	0550-95-0176	57.00–59.00	QBT3	—	—	—	—	—	—	—	—	—	—	34171.63	—	—	—
50-09107	0550-95-0181	75.00–78.60	QBT3	0.007	—	—	—	—	—	—	—	—	—	12793.99	—	—	—
50-09107	0550-95-0186	95.00–97.00	QBT3	0.009	—	—	—	—	—	—	—	—	—	929.6581	—	—	—
50-09107	0550-95-0191	108.00–111.00	QBT3	0.032	—	—	—	—	—	—	—	—	—	29.963	—	—	—
50-09108	0550-95-0195	15.00–16.80	QBT3	—	—	—	—	—	—	—	—	—	—	0.179	—	—	—
50-09108	0550-96-0109	24.50–25.50	QBT3	—	0.29	—	—	—	—	—	—	—	—	—	—	—	—
50-09108	0550-95-0200	37.00–38.60	QBT3	—	—	—	—	—	—	—	—	—	—	0.863	—	—	—
50-09108	0550-95-0205	57.00–59.00	QBT3	—	—	—	—	—	—	—	—	—	—	0.2157	—	—	—
50-09108	0550-95-0210	76.60–78.60	QBT3	—	—	—	—	—	—	—	1.2	—	—	19.1763	—	—	—
50-09108	0550-95-0215	95.50–97.50	QBT3	—	—	—	—	—	0.014	—	—	—	0.44	60.519	—	—	—
50-09108	0550-95-0220	112.00–115.00	QBT3	—	—	—	—	—	—	0.005	—	—	—	106.71	—	—	—
50-09109	0550-95-0226	18.20–20.20	QBT3	0.011	—	—	—	—	—	0.005	—	—	1.44	0.3	—	—	2.36
50-09109	0550-95-0231	34.10–36.00	QBT3	0.029	—	—	—	—	0.002	—	—	—	—	0.6843	—	—	—
50-09109	0550-95-0236	57.80–60.00	QBT3	0.025	—	—	—	—	—	0.005	—	—	—	0.6544	—	—	—
50-09109	0550-95-0246	77.40–79.70	QBT3	0.018	—	—	—	—	0.005	0.005	—	—	—	0.2692	—	—	—

Table 6.3-3 (continued)

Location ID	Sample ID	Depth (ft)	Media	Americium-241	Cesium-134	Cesium-137	Cobalt-60	Europium-152	Plutonium-238	Plutonium-239	Ruthenium-106	Sodium-22	Strontium-90	Tritium	Uranium-234	Uranium-235	Uranium-238
Qbt2, 3 BV ^a				na ^b	na	na	na	na	na	na	na	na	na	na	1.98	0.09	1.93
Qbt1v BV ^a				na	na	na	na	na	na	na	na	na	na	na	3.12	0.14	3.05
Qbt1g, Qbo BV ^a				na	na	na	na	na	na	na	na	na	na	na	4	0.18	3.9
Industrial Screening Action Level ^c				180	9.7	23	5.1	11	240	210	83	6.5	1900	440000	1500	87	430
Residential Screening Action Level ^c				30	2.4	2.6	1.3	2.9	37	33	20	1.6	5.7	750	170	17	86
50-09109	0550-95-0251	88.60–88.80	QBT3	—	—	—	—	—	—	0.007	—	—	—	196.623	—	—	—
50-09109	0550-95-0241	113.00–114.70	QBT3	—	—	—	—	—	—	—	—	0.056	—	0.3577	—	—	—
50-09110	0550-95-0259	17.00–19.00	QBT3	0.088	—	—	—	—	—	—	—	—	—	13.167	—	—	—
50-09110	0550-95-0264	38.00–40.00	QBT3	0.183	—	—	—	—	—	—	—	—	—	2106.878	—	—	—
50-09110	0550-95-0269	59.00–60.80	QBT3	0.064	—	—	—	—	—	—	—	—	—	413.0435	—	—	—
50-09110	0550-95-0274	74.00–76.60	QBT3	0.093	—	—	—	—	—	—	—	—	—	3.1636	—	—	—
50-09110	0550-95-0279	88.00–89.40	QBT3	0.09	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24766	MD50-06-64587	122.50–124.60	QBT2	—	—	—	—	—	—	—	—	—	0.0688	—	—	—	—
50-24767	MD50-06-64636	28.10–30.00	QBT3	—	—	—	—	—	—	0.278	—	—	—	—	—	—	—
50-24767	MD50-06-64619	123.20–125.00	QBT2	—	—	—	—	—	—	0.0682	—	—	—	—	—	—	—
50-24768	MD50-06-64668	27.50–29.50	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	0.118	—
50-24768	MD50-06-64669	148.60–151.50	QBT2	0.0872	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24769	MD50-06-64699	18.10–20.00	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	0.0957	—
50-24771	MD50-06-64756	15.90–17.50	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	0.0945	—
50-24771	MD50-06-64757	38.00–40.00	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	0.162	—
50-24771	MD50-06-64740	123.60–125.00	QBT2	—	—	—	—	—	—	—	—	—	—	—	—	0.137	—
50-24771	MD50-06-64758	148.20–150.00	QBT2	—	—	—	—	—	—	—	—	—	—	—	—	0.105	—
50-24773	MD50-06-64782	38.00–40.00	QBT3	—	—	0.131	—	—	—	—	—	—	—	—	—	—	—
50-24782	MD50-06-64813	20.90–22.50	QBT3	—	—	—	—	—	—	0.029	—	—	—	—	—	—	—
50-24782	MD50-06-64797	123.50–125.00	QBT3	—	—	—	—	—	0.302	0.684	—	—	—	—	—	—	—
50-24782	MD50-06-64815	156.00–157.50	QBT3	—	—	—	—	—	0.0883	0.0478	—	—	—	—	—	—	—

Table 6.3-3 (continued)

Location ID	Sample ID	Depth (ft)	Media	Americium-241	Cesium-134	Cesium-137	Cobalt-60	Europium-152	Plutonium-238	Plutonium-239	Ruthenium-106	Sodium-22	Strontium-90	Tritium	Uranium-234	Uranium-235	Uranium-238
Qbt2, 3 BV ^a				na ^b	na	na	na	na	na	na	na	na	na	na	1.98	0.09	1.93
Qbt1v BV ^a				na	na	na	na	na	na	na	na	na	na	na	3.12	0.14	3.05
Qbt1g, Qbo BV ^a				na	na	na	na	na	na	na	na	na	na	na	4	0.18	3.9
Industrial Screening Action Level ^c				180	9.7	23	5.1	11	240	210	83	6.5	1900	440000	1500	87	430
Residential Screening Action Level ^c				30	2.4	2.6	1.3	2.9	37	33	20	1.6	5.7	750	170	17	86
50-24783	MD50-06-64840	150.30–152.50	QBT2	0.423	—	—	—	—	0.248	0.106	—	—	—	—	—	—	—
50-24784	MD50-06-64368	248.00–250.00	QBT1V	—	—	—	—	—	—	—	—	—	—	—	—	0.151	—
50-24784	MD50-06-64382	298.30–299.80	QBT1G	—	—	—	—	—	—	—	—	—	—	—	—	0.211	—
50-24785	MD50-06-64412	8.50–10.00	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	0.101	—
50-24785	MD50-06-64413	17.50–19.00	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	0.148	—
50-24785	MD50-06-64398	248.50–250.00	QBT1G	—	—	—	—	—	—	—	—	—	—	—	—	0.357	—
50-24785	MD50-06-64414	273.80–275.00	QBT1G	—	—	—	—	—	—	—	—	—	—	—	—	0.236	—
50-24796	MD50-06-64458	17.50–19.30	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	0.0903	—
50-24796	MD50-06-64440	37.50–39.30	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	0.116	—
50-24799	MD50-06-64515	118.40–120.00	QBT2	—	—	—	—	—	—	—	—	—	—	—	—	0.145	—
50-24799	MD50-06-64533	158.50–160.00	QBT2	—	—	—	—	—	—	—	—	—	—	—	—	0.158	—
50-24801	MD50-06-64847	118.00–120.00	QBT2	—	—	—	—	—	—	—	—	—	—	—	—	0.105	—
50-24811	MD50-06-65075	18.50–20.00	QBT3	—	—	—	—	—	—	0.0463	—	—	—	—	—	—	—
50-24811	MD50-06-65076	38.50–40.00	QBT3	—	—	—	—	—	—	0.252	—	—	—	—	—	—	—
50-24811	MD50-06-65058	97.50–98.70	QBT3	—	—	—	—	—	—	0.132	—	—	—	—	—	—	—
50-24811	MD50-06-65059	123.20–125.00	QBT2	—	—	—	—	—	—	0.0651	—	—	—	—	—	—	—
50-24812	MD50-06-65083	97.50–98.90	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	0.0913	—
50-24814	MD50-06-65157	7.50–9.10	QBT3	—	—	—	—	—	—	0.241	—	—	—	—	—	—	—
50-24816	MD50-06-65214	23.10–24.70	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	0.115	—
50-24816	MD50-06-65198	118.70–120.00	QBT2	—	—	—	—	—	—	—	—	—	—	—	—	0.113	—
50-24816	MD50-06-65199	198.80–200.00	QBT2	—	—	—	—	—	—	—	—	—	—	—	2.15	—	2.43

Table 6.3-3 (continued)

Location ID	Sample ID	Depth (ft)	Media	Americium-241	Cesium-134	Cesium-137	Cobalt-60	Europium-152	Plutonium-238	Plutonium-239	Ruthenium-106	Sodium-22	Strontium-90	Tritium	Uranium-234	Uranium-235	Uranium-238
Qbt2, 3 BV ^a				na ^b	na	na	na	na	na	na	na	na	na	na	1.98	0.09	1.93
Qbt1v BV ^a				na	na	na	na	na	na	na	na	na	na	na	3.12	0.14	3.05
Qbt1g, Qbo BV ^a				na	na	na	na	na	na	na	na	na	na	na	4	0.18	3.9
Industrial Screening Action Level ^c				180	9.7	23	5.1	11	240	210	83	6.5	1900	440000	1500	87	430
Residential Screening Action Level ^c				30	2.4	2.6	1.3	2.9	37	33	20	1.6	5.7	750	170	17	86
50-24817	RE50-05-63810	98.80–100.00	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	0.15	—
50-24817	RE50-05-63811	138.00–140.00	QBT2	—	—	—	—	—	—	—	—	—	—	—	—	0.0984	—
50-24817	MD50-05-63839	248.10–250.00	QBT1G	—	—	—	—	—	—	—	—	—	—	—	—	0.233	—
50-24818	MD50-06-65265	280.00–282.50	QBT1G	—	—	—	—	—	—	—	—	—	—	—	—	0.209	—
50-24818	MD50-06-65266	313.50–315.00	QBT1G	—	—	—	—	—	—	—	—	—	—	—	—	0.244	—
50-24819	RE50-05-61424	97.50–100.00	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	0.119	—
50-24819	RE50-05-61426	198.10–200.00	QBT1V	—	—	—	—	—	—	—	—	—	—	—	3.18	0.216	3.52
50-24819	RE50-05-61427	246.50–250.00	QBT1V	—	—	—	—	—	—	—	—	—	—	—	—	0.201	—
50-24819	RE50-05-61428	273.00–275.00	QBT1G	—	—	—	—	—	—	—	—	—	—	—	—	0.272	—
50-24820	RE50-05-61443	248.30–250.00	QBT1G	—	—	—	—	—	—	—	—	—	—	—	—	0.245	—
50-24821	RE50-05-61461	248.60–250.00	QBT1G	—	—	—	—	—	—	—	—	—	—	—	—	0.272	—
50-24822	RE50-05-61478	198.50–200.00	QBT1V	—	—	—	—	—	—	—	—	—	—	—	—	0.238	—
50-24822	RE50-05-61479	248.70–250.00	QBT1G	—	—	—	—	—	—	—	—	—	—	—	—	0.312	—
50-25451	MD50-06-66672	146.00–147.50	QBT2	—	—	—	—	—	—	0.0269	—	—	—	—	—	—	—

Note: Units are pCi/g.

^a BVs from LANL 1998, 59730.

^b na = Not available.

^c SSLs from LANL 2005, 88493.

^d — = Not detected greater than BV or not detected.

Table 6.3-4
Summary of Organic Chemicals Detected in Surface Soil and Fill at MDA C

Location ID	Sample ID	Depth (ft)	Media	Acenaphthene	Aroclor-1254	Aroclor-1260
Industrial Soil Screening Level^a				33500	8.26	8.26
Residential Soil Screening Level^a				3730	1.12	1.12
50-08064	AAA3155	0.00–0.50	Fill	— ^b	—	0.04
50-08106	AAA3156	0.00–0.50	Fill	—	—	0.03
50-08110	AAA3157	0.00–0.50	Fill	—	—	0.07
50-08116	AAA3158	0.00–0.50	Fill	—	—	0.04
50-08138	AAA2771	0.00–0.50	Soil	0.11 (J)	—	—
50-08312	AAA3193	0.00–0.50	Fill	0.96	—	—
50-08326	AAA3098	0.00–0.50	Fill	—	1	—
50-08486	AAA3151	0.00–0.50	Fill	—	0.07	—
50-08492	AAA3152	0.00–0.50	Fill	—	0.17	—

Note: Units are mg/kg.

^a SSLs from NMED 2006, 92513.

^b — = Not detected.

Table 6.3-5
Summary of Organic Chemicals Detected in Tuff at MDA C

Location ID	Sample ID	Depth (ft)	Media	Acenaphthene	Acenaphthylene	Acetone	Anthracene	Aroclor-1242	Aroclor-1254	Aroclor-1260	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene
Industrial Soil Screening Level^{a,b}				33500	30900^c	100000	100000	8.26	8.26	8.26	2.34	23.4	234
Residential Soil Screening Level^{a,b}				3730	2290^c	28100	22000	1.12	1.12	1.12	0.621	6.21	62.1
50-09101	0550-95-0289	35.00–36.20	QBT3	— ^d	—	—	—	—	—	—	—	—	—
50-09101	0550-95-0294	55.00–55.70	QBT3	—	—	—	—	—	—	—	—	—	—
50-09101	0550-95-0299	75.00–77.00	QBT3	—	—	—	—	—	—	—	—	—	—
50-09103	0550-95-0109	36.00–38.80	QBT3	—	—	—	—	—	—	—	—	—	—
50-09103	0550-95-0119	78.00–80.00	QBT3	—	—	—	—	—	—	—	—	—	—
50-09103	0550-95-0124	94.70–98.00	QBT3	—	—	0.009 (J)	—	—	—	—	—	—	—
50-09103	0550-95-0129	114.80–116.80	QBT3	—	—	0.055	—	—	—	—	—	—	—
50-09104	0550-95-0099	85.00–87.00	QBT3	—	—	—	—	—	—	—	—	—	—
50-09105	0550-95-0145	57.00–59.00	QBT3	—	—	—	—	—	—	—	—	—	—
50-09106	0550-95-0046	27.50–30.50	QBT3	—	—	0.013 (J)	—	—	—	—	—	—	—
50-09106	0550-95-0054	56.50–58.50	QBT3	—	—	0.009 (J)	—	—	—	—	—	—	—
50-09108	0550-95-0200	37.00–38.60	QBT3	—	—	0.028	—	—	—	—	—	—	—
50-09108	0550-95-0210	76.60–78.60	QBT3	—	—	—	—	—	—	—	—	—	—
50-09108	0550-95-0215	95.50–97.50	QBT3	—	—	—	—	—	—	—	—	—	—
50-09109	0550-95-0226	18.20–20.20	QBT3	—	—	0.024	—	—	—	—	—	—	—
50-09109	0550-95-0231	34.10–36.00	QBT3	—	—	0.03	—	—	—	—	—	—	—
50-09110	0550-95-0264	38.00–40.00	QBT3	—	—	—	—	—	—	—	—	—	—
50-09110	0550-95-0279	88.00–89.40	QBT3	—	—	0.003 (J)	—	—	—	—	—	—	—
50-24766	MD50-06-64603	15.60–17.10	QBT3	—	—	—	—	—	—	—	—	—	—
50-24766	MD50-06-64604	27.50–29.20	QBT3	—	—	—	—	—	—	—	—	—	—
50-24766	MD50-06-64586	97.50–99.90	QBT2	—	—	—	—	—	—	—	—	—	—
50-24767	MD50-06-66770	29.50–30.00	QBT3	—	—	0.00887	—	—	—	—	—	—	—

Table 6.3-5 (continued)

Location ID	Sample ID	Depth (ft)	Media	Acenaphthene	Acenaphthylene	Acetone	Anthracene	Aroclor-1242	Aroclor-1254	Aroclor-1260	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene
Industrial Soil Screening Level^{a,b}				33500	30900^c	100000	100000	8.26	8.26	8.26	2.34	23.4	234
Residential Soil Screening Level^{a,b}				3730	2290^c	28100	22000	1.12	1.12	1.12	0.621	6.21	62.1
50-24768	MD50-06-64651	123.20–125.00	QBT2	—	—	—	—	—	—	—	—	—	—
50-24769	MD50-06-64699	18.10–20.00	QBT3	—	—	—	—	—	—	—	—	—	—
50-24769	MD50-06-64700	37.50–39.90	QBT3	—	—	—	—	—	—	—	—	—	—
50-24769	MD50-06-64701	147.90–149.80	QBT2	—	—	—	—	—	—	—	—	—	—
50-24770	MD50-06-64731	18.10–22.50	QBT3	—	—	—	—	—	—	—	—	—	—
50-24770	MD50-06-64733	147.50–150.00	QBT2	—	—	—	—	—	—	—	—	—	—
50-24773	MD50-06-64782	38.00–40.00	QBT3	—	—	—	—	—	—	—	—	—	—
50-24773	MD50-06-64783	150.00–152.80	QBT2	—	—	—	—	0.02	0.0055	0.0032 (J)	—	—	—
50-24783	MD50-06-64838	17.50–20.00	QBT3	—	—	—	—	—	—	—	—	—	—
50-24783	MD50-06-64839	35.40–37.50	QBT3	—	—	—	—	—	—	—	—	—	—
50-24783	MD50-06-64821	98.60–100.00	QBT3	—	—	—	—	—	0.00091 (J)	—	—	—	—
50-24784	MD50-06-64381	18.00–20.00	QBT3	—	—	—	—	—	—	—	—	—	—
50-24784	MD50-06-64382	298.30–299.80	QBT1G	—	—	—	—	—	—	—	—	—	—
50-24785	MD50-06-64413	17.50–19.00	QBT3	—	—	—	—	—	—	—	—	—	—
50-24796	MD50-06-64457	8.00–10.00	QBT3	—	—	—	—	—	—	—	—	—	—
50-24796	MD50-06-64458	17.50–19.30	QBT3	—	—	—	—	—	—	—	—	—	—
50-24796	MD50-06-64442	118.70–120.00	QBT2	—	—	—	—	—	—	—	—	—	—
50-24796	MD50-06-64459	147.50–149.40	QBT2	—	—	—	—	—	—	—	—	—	—
50-24797	MD50-06-64509	37.00–38.00	QBT3	—	—	—	—	—	—	—	—	—	—
50-24799	MD50-06-64516	13.10–15.00	QBT3	—	—	—	—	—	—	—	—	—	—
50-24799	MD50-06-64517	15.00–16.50	QBT3	—	—	—	—	—	0.0021 (J)	—	—	—	—
50-24802	MD50-06-64888	12.50–16.10	QBT3	—	—	—	—	—	—	—	—	—	—
50-24802	MD50-06-64889	40.60–42.50	QBT3	—	—	—	—	—	—	—	—	—	—

Table 6.3-5 (continued)

Location ID	Sample ID	Depth (ft)	Media	Acenaphthene	Acenaphthylene	Acetone	Anthracene	Aroclor-1242	Aroclor-1254	Aroclor-1260	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene
Industrial Soil Screening Level^{a,b}				33500	30900^c	100000	100000	8.26	8.26	8.26	2.34	23.4	234
Residential Soil Screening Level^{a,b}				3730	2290^c	28100	22000	1.12	1.12	1.12	0.621	6.21	62.1
50-24802	MD50-06-64872	123.10–125.00	QBT2	—	—	—	—	—	0.0022 (J)	—	—	—	—
50-24802	MD50-06-64890	157.50–159.10	QBT2	—	—	—	—	—	—	—	—	—	—
50-24803	MD50-06-64913	15.40–17.50	QBT3	—	—	—	—	0.0134	0.0098 (J)	0.0065	—	—	—
50-24804	MD50-06-64980	15.40–17.10	QBT3	—	—	—	—	—	—	—	—	—	—
50-24804	MD50-06-64982	147.50–149.80	QBT2	—	—	—	—	—	—	—	—	—	—
50-24810	MD50-06-65005	17.50–19.00	QBT3	—	—	—	—	—	—	—	—	—	—
50-24812	MD50-06-65100	8.40–10.00	QBT3	—	—	—	—	—	—	—	—	—	—
50-24812	MD50-06-65102	146.00–150.00	QBT2	—	—	—	—	—	—	—	—	—	—
50-24813	MD50-06-65116	123.50–125.00	QBT2	—	—	—	—	—	0.007	0.0031 (J)	—	—	—
50-24814	MD50-06-65157	7.50–9.10	QBT3	—	—	—	—	—	—	—	—	—	—
50-24814	MD50-06-65158	30.00–31.60	QBT3	—	—	—	—	—	—	—	—	—	—
50-24815	MD50-06-65191	147.80–149.70	QBT2	—	—	—	—	—	—	—	—	—	—
50-24816	MD50-06-65214	23.10–24.70	QBT3	—	—	—	0.00945 (J)	—	—	—	—	—	—
50-24816	MD50-06-65198	118.70–120.00	QBT2	—	—	—	—	—	0.369	0.129	—	—	—
50-24816	MD50-06-65216	223.40–225.00	QBT2	—	—	—	—	—	—	—	—	—	—
50-24817	MD50-05-63838	37.00–40.00	QBT3	—	—	—	—	—	—	—	—	—	—
50-24818	MD50-06-65229	8.50–10.00	QBT3	—	—	—	—	—	—	—	—	—	—
50-24818	MD50-06-65230	22.10–25.00	QBT3	—	—	—	—	—	—	—	—	—	—
50-24818	MD50-06-65264	247.70–249.20	QBT1G	—	—	—	—	0.0028 (J)	0.0023 (J)	—	—	—	—
50-24818	MD50-06-66760	312.90–313.00	QBT1G	—	—	—	—	—	—	—	—	—	—
50-24818	MD50-06-66761	397.90–398.00	QBO	—	—	0.0098	—	—	—	—	—	—	—
50-24818	MD50-06-66762	498.40–498.50	QBO	—	—	0.00374 (J)	—	—	—	—	—	—	—
50-24820	RE50-05-61441	138.70–140.00	QBT2	—	—	—	—	—	—	—	—	0.113	—

Table 6.3-5 (continued)

Location ID	Sample ID	Depth (ft)	Media	Acenaphthene	Acenaphthylene	Acetone	Anthracene	Aroclor-1242	Aroclor-1254	Aroclor-1260	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene
Industrial Soil Screening Level^{a,b}				33500	30900^c	100000	100000	8.26	8.26	8.26	2.34	23.4	234
Residential Soil Screening Level^{a,b}				3730	2290^c	28100	22000	1.12	1.12	1.12	0.621	6.21	62.1
50-24820	RE50-05-61442	198.20–200.00	QBT1V	—	—	—	0.0078 (J)	—	—	—	0.103	0.112	—
50-24820	RE50-05-61443	248.30–250.00	QBT1G	—	—	—	0.0076 (J)	—	—	—	0.113	0.122	—
50-24821	RE50-05-61458	98.40–100.00	QBT3	0.0143 (J)	0.0109 (J)	—	0.0142 (J)	—	—	—	—	0.0117 (J)	0.0126 (J)
50-24822	RE50-05-61475	47.50–49.10	QBT3	—	—	—	—	—	—	—	—	—	—
50-24822	RE50-05-61477	137.50–139.20	QBT2	—	—	—	—	—	—	0.0118	—	—	—
50-25451	MD50-06-66697	18.70–19.90	QBT3	—	—	—	—	—	—	—	—	—	—

Table 6.3-5 (continued)

Location ID	Sample ID	Depth (ft)	Media	Benzoic acid	Bis(2-ethylhexyl)phthalate	Chloronaphthalene[2-]	Chrysene	Dichloroethene[1,1-]	Di-n-butylphthalate	Di-n-octylphthalate	Fluoranthene	Fluorene
Industrial Soil Screening Level				100000	1370	27800	2310	777	68400	27000	24400	26500
Residential Soil Screening Level				100000	347	3990	615	206	6110	2400	2290	2660
50-09101	0550-95-0289	35.00–36.20	QBT3	—	0.037 (J)	—	—	—	—	—	—	—
50-09101	0550-95-0294	55.00–55.70	QBT3	—	0.072 (J)	—	—	—	—	—	—	—
50-09101	0550-95-0299	75.00–77.00	QBT3	—	0.041 (J)	—	—	—	—	—	—	—
50-09103	0550-95-0109	36.00–38.80	QBT3	—	—	—	—	0.003 (J)	—	—	—	—
50-09103	0550-95-0119	78.00–80.00	QBT3	—	0.3 (J)	—	—	0.004 (J)	—	—	—	—
50-09103	0550-95-0124	94.70–98.00	QBT3	—	—	—	—	0.006	—	—	—	—
50-09103	0550-95-0129	114.80–116.80	QBT3	—	—	—	—	0.004 (J)	—	—	—	—
50-09104	0550-95-0099	85.00–87.00	QBT3	—	—	—	—	—	—	—	—	—
50-09105	0550-95-0145	57.00–59.00	QBT3	—	0.14 (J)	—	—	—	—	—	—	—
50-09106	0550-95-0046	27.50–30.50	QBT3	—	—	—	—	—	—	—	—	—
50-09106	0550-95-0054	56.50–58.50	QBT3	—	—	—	—	—	—	—	—	—
50-09108	0550-95-0200	37.00–38.60	QBT3	—	—	—	—	—	—	—	—	—
50-09108	0550-95-0210	76.60–78.60	QBT3	—	—	—	—	—	—	—	—	—
50-09108	0550-95-0215	95.50–97.50	QBT3	—	0.19 (J)	—	—	—	—	—	—	—
50-09109	0550-95-0226	18.20–20.20	QBT3	—	—	—	—	—	—	—	—	—
50-09109	0550-95-0231	34.10–36.00	QBT3	—	—	—	—	—	—	—	—	—
50-09110	0550-95-0264	38.00–40.00	QBT3	—	0.047 (J)	—	—	—	—	—	—	—
50-09110	0550-95-0279	88.00–89.40	QBT3	—	—	—	—	—	—	—	—	—
50-24766	MD50-06-64603	15.60–17.10	QBT3	—	—	—	—	—	—	—	—	—
50-24766	MD50-06-64604	27.50–29.20	QBT3	—	—	—	—	—	—	—	—	—
50-24766	MD50-06-64586	97.50–99.90	QBT2	—	—	—	—	—	—	0.308 (J)	—	—
50-24767	MD50-06-66770	29.50–30.00	QBT3	—	—	—	—	—	—	—	—	—

Table 6.3-5 (continued)

Location ID	Sample ID	Depth (ft)	Media	Benzoic acid	Bis(2-ethylhexyl)phthalate	Chloronaphthalene[2-]	Chrysene	Dichloroethene[1,1-]	Di-n-butylphthalate	Di-n-octylphthalate	Fluoranthene	Fluorene
Industrial Soil Screening Level				100000	1370	27800	2310	777	68400	27000	24400	26500
Residential Soil Screening Level				100000	347	3990	615	206	6110	2400	2290	2660
50-24768	MD50-06-64651	123.20–125.00	QBT2	—	—	—	—	—	—	—	—	—
50-24769	MD50-06-64699	18.10–20.00	QBT3	—	—	—	—	—	—	—	—	—
50-24769	MD50-06-64700	37.50–39.90	QBT3	—	—	—	—	—	—	—	—	—
50-24769	MD50-06-64701	147.90–149.80	QBT2	—	—	—	—	—	—	—	—	—
50-24770	MD50-06-64731	18.10–22.50	QBT3	—	—	—	—	—	—	—	—	—
50-24770	MD50-06-64733	147.50–150.00	QBT2	—	—	—	—	—	—	—	—	—
50-24773	MD50-06-64782	38.00–40.00	QBT3	—	—	—	—	—	—	—	—	—
50-24773	MD50-06-64783	150.00–152.80	QBT2	—	—	—	—	—	—	—	—	—
50-24783	MD50-06-64838	17.50–20.00	QBT3	—	—	—	—	—	—	—	—	—
50-24783	MD50-06-64839	35.40–37.50	QBT3	—	—	—	—	—	—	—	—	—
50-24783	MD50-06-64821	98.60–100.00	QBT3	—	—	—	—	—	—	—	—	—
50-24784	MD50-06-64381	18.00–20.00	QBT3	—	—	—	—	—	—	—	—	—
50-24784	MD50-06-64382	298.30–299.80	QBT1G	—	0.366	—	—	—	0.106 (J)	—	0.0228 (J)	—
50-24785	MD50-06-64413	17.50–19.00	QBT3	—	—	—	—	—	—	—	—	—
50-24796	MD50-06-64457	8.00–10.00	QBT3	—	—	—	—	—	—	—	—	—
50-24796	MD50-06-64458	17.50–19.30	QBT3	—	—	—	—	—	—	—	—	—
50-24796	MD50-06-64442	118.70–120.00	QBT2	0.541 (J)	—	—	—	—	—	—	—	—
50-24796	MD50-06-64459	147.50–149.40	QBT2	—	—	—	—	—	—	—	—	—
50-24797	MD50-06-64509	37.00–38.00	QBT3	—	—	—	—	—	—	—	—	—
50-24799	MD50-06-64516	13.10–15.00	QBT3	0.58 (J)	—	—	—	—	—	—	—	—
50-24799	MD50-06-64517	15.00–16.50	QBT3	—	—	—	—	—	—	—	—	—
50-24802	MD50-06-64888	12.50–16.10	QBT3	—	—	—	—	—	—	—	—	—

Table 6.3-5 (continued)

Location ID	Sample ID	Depth (ft)	Media	Benzoic acid	Bis(2-ethylhexyl)phthalate	Chloronaphthalene[2-]	Chrysene	Dichloroethene[1,1-]	Di-n-butylphthalate	Di-n-octylphthalate	Fluoranthene	Fluorene
Industrial Soil Screening Level				100000	1370	27800	2310	777	68400	27000	24400	26500
Residential Soil Screening Level				100000	347	3990	615	206	6110	2400	2290	2660
50-24802	MD50-06-64889	40.60–42.50	QBT3	—	—	—	—	—	—	—	—	—
50-24802	MD50-06-64872	123.10–125.00	QBT2	—	—	—	—	—	—	—	—	—
50-24802	MD50-06-64890	157.50–159.10	QBT2	—	—	—	—	—	—	—	—	—
50-24803	MD50-06-64913	15.40–17.50	QBT3	—	—	—	—	—	—	—	—	—
50-24804	MD50-06-64980	15.40–17.10	QBT3	—	—	—	—	—	—	—	—	—
50-24804	MD50-06-64982	147.50–149.80	QBT2	—	—	—	—	—	—	—	—	—
50-24810	MD50-06-65005	17.50–19.00	QBT3	—	—	—	—	—	—	—	—	—
50-24812	MD50-06-65100	8.40–10.00	QBT3	—	—	—	—	—	—	—	—	—
50-24812	MD50-06-65102	146.00–150.00	QBT2	—	—	—	—	—	—	—	—	—
50-24813	MD50-06-65116	123.50–125.00	QBT2	—	—	—	—	—	—	—	—	—
50-24814	MD50-06-65157	7.50–9.10	QBT3	—	—	—	—	—	—	—	—	—
50-24814	MD50-06-65158	30.00–31.60	QBT3	—	—	—	—	—	—	—	—	—
50-24815	MD50-06-65191	147.80–149.70	QBT2	—	—	—	—	—	—	—	—	—
50-24816	MD50-06-65214	23.10–24.70	QBT3	—	0.0868 (J)	—	0.0114 (J)	—	—	—	—	—
50-24816	MD50-06-65198	118.70–120.00	QBT2	—	—	—	—	—	—	—	—	—
50-24816	MD50-06-65216	223.40–225.00	QBT2	—	—	—	—	—	—	—	—	—
50-24817	MD50-05-63838	37.00–40.00	QBT3	—	—	—	—	—	—	—	—	—
50-24818	MD50-06-65229	8.50–10.00	QBT3	—	—	—	—	—	—	—	—	—
50-24818	MD50-06-65230	22.10–25.00	QBT3	—	—	—	—	—	—	—	—	—
50-24818	MD50-06-65264	247.70–249.20	QBT1G	—	—	—	—	—	—	—	—	—
50-24818	MD50-06-66760	312.90–313.00	QBT1G	—	—	—	—	—	—	—	—	—
50-24818	MD50-06-66761	397.90–398.00	QBO	—	—	—	—	—	—	—	—	—

Table 6.3-5 (continued)

Location ID	Sample ID	Depth (ft)	Media	Benzoic acid	Bis(2-ethylhexyl)phthalate	Chloronaphthalene[2-]	Chrysene	Dichloroethene[1,1-]	Di-n-butylphthalate	Di-n-octylphthalate	Fluoranthene	Fluorene
Industrial Soil Screening Level				100000	1370	27800	2310	777	68400	27000	24400	26500
Residential Soil Screening Level				100000	347	3990	615	206	6110	2400	2290	2660
50-24818	MD50-06-66762	498.40–498.50	QBO	—	—	—	—	—	—	—	—	—
50-24820	RE50-05-61441	138.70–140.00	QBT2	—	0.11 (J)	—	—	—	—	—	0.0167 (J)	—
50-24820	RE50-05-61442	198.20–200.00	QBT1V	—	0.114 (J)	—	—	—	—	0.178 (J)	—	—
50-24820	RE50-05-61443	248.30–250.00	QBT1G	0.605 (J)	0.128 (J)	—	—	—	—	—	—	—
50-24821	RE50-05-61458	98.40–100.00	QBT3	—	—	0.0134 (J)	0.0188 (J-)	—	—	—	0.0138 (J)	0.0136 (J)
50-24822	RE50-05-61475	47.50–49.10	QBT3	—	—	—	—	—	—	—	—	—
50-24822	RE50-05-61477	137.50–139.20	QBT2	—	—	—	—	—	—	—	—	—
50-25451	MD50-06-66697	18.70–19.90	QBT3	—	—	—	—	—	—	—	—	—

Table 6.3-5 (continued)

Location ID	Sample ID	Depth (ft)	Media	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Heptachlorodibenzodioxins (Total)	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	Heptachlorodibenzofurans (Total)	Hexachlorodibenzodioxins (Total)	Hexachlorodibenzofuran[1,2,3,4,7,8-]	Hexachlorodibenzofuran[2,3,4,6,7,8-]	Hexachlorodibenzofurans (Total)	Indeno(1,2,3-cd)pyrene
Industrial Soil Screening Level				na ^e	na	na	na	na	na	na	na	23.4
Residential Soil Screening Level				na	na	na	na	na	na	na	na	6.21
50-09101	0550-95-0289	35.00–36.20	QBT3	—	—	—	—	—	—	—	—	—
50-09101	0550-95-0294	55.00–55.70	QBT3	—	—	—	—	—	—	—	—	—
50-09101	0550-95-0299	75.00–77.00	QBT3	—	—	—	—	—	—	—	—	—
50-09103	0550-95-0109	36.00–38.80	QBT3	—	—	—	—	—	—	—	—	—
50-09103	0550-95-0119	78.00–80.00	QBT3	—	—	—	—	—	—	—	—	—
50-09103	0550-95-0124	94.70–98.00	QBT3	—	—	—	—	—	—	—	—	—
50-09103	0550-95-0129	114.80–116.80	QBT3	—	—	—	—	—	—	—	—	—
50-09104	0550-95-0099	85.00–87.00	QBT3	—	—	—	—	—	—	—	—	—
50-09105	0550-95-0145	57.00–59.00	QBT3	—	—	—	—	—	—	—	—	—
50-09106	0550-95-0046	27.50–30.50	QBT3	—	—	—	—	—	—	—	—	—
50-09106	0550-95-0054	56.50–58.50	QBT3	—	—	—	—	—	—	—	—	—
50-09108	0550-95-0200	37.00–38.60	QBT3	—	—	—	—	—	—	—	—	—
50-09108	0550-95-0210	76.60–78.60	QBT3	—	—	—	—	—	—	—	—	—
50-09108	0550-95-0215	95.50–97.50	QBT3	—	—	—	—	—	—	—	—	—
50-09109	0550-95-0226	18.20–20.20	QBT3	—	—	—	—	—	—	—	—	—
50-09109	0550-95-0231	34.10–36.00	QBT3	—	—	—	—	—	—	—	—	—
50-09110	0550-95-0264	38.00–40.00	QBT3	—	—	—	—	—	—	—	—	—
50-09110	0550-95-0279	88.00–89.40	QBT3	—	—	—	—	—	—	—	—	—
50-24766	MD50-06-64603	15.60–17.10	QBT3	—	—	—	—	—	—	—	—	—

Table 6.3-5 (continued)

Location ID	Sample ID	Depth (ft)	Media	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Heptachlorodibenzodioxins (Total)	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	Heptachlorodibenzofurans (Total)	Hexachlorodibenzodioxins (Total)	Hexachlorodibenzofuran[1,2,3,4,7,8-]	Hexachlorodibenzofuran[2,3,4,6,7,8-]	Hexachlorodibenzofurans (Total)	Indeno(1,2,3-cd)pyrene
Industrial Soil Screening Level				na ^e	na	na	na	na	na	na	na	23.4
Residential Soil Screening Level				na	na	na	na	na	na	na	na	6.21
50-24766	MD50-06-64604	27.50–29.20	QBT3	—	—	—	—	—	—	—	—	—
50-24766	MD50-06-64586	97.50–99.90	QBT2	—	—	—	—	—	—	—	—	—
50-24767	MD50-06-66770	29.50–30.00	QBT3	—	—	—	—	—	—	—	—	—
50-24768	MD50-06-64651	123.20–125.00	QBT2	—	—	—	—	—	—	—	—	—
50-24769	MD50-06-64699	18.10–20.00	QBT3	—	—	—	—	—	—	—	—	—
50-24769	MD50-06-64700	37.50–39.90	QBT3	—	—	—	—	—	—	—	—	—
50-24769	MD50-06-64701	147.90–149.80	QBT2	—	—	—	—	—	—	—	—	—
50-24770	MD50-06-64731	18.10–22.50	QBT3	5.65E-07 (J)	1.07E-06	5.41E-07 (J)	5.41E-07	—	1.36E-07 (J)	—	2.32E-07	—
50-24770	MD50-06-64733	147.50–150.00	QBT2	—	—	—	—	—	—	—	—	—
50-24773	MD50-06-64782	38.00–40.00	QBT3	—	—	—	—	—	—	—	—	—
50-24773	MD50-06-64783	150.00–152.80	QBT2	—	—	—	—	—	—	—	—	—
50-24783	MD50-06-64838	17.50–20.00	QBT3	—	—	—	—	—	—	—	—	—
50-24783	MD50-06-64839	35.40–37.50	QBT3	—	—	—	—	—	—	—	—	—
50-24783	MD50-06-64821	98.60–100.00	QBT3	—	—	—	—	—	—	—	—	—
50-24784	MD50-06-64381	18.00–20.00	QBT3	4.49E-07 (J)	4.49E-07	—	—	8.97E-07	—	—	1.39E-07	—
50-24784	MD50-06-64382	298.30–299.80	QBT1G	5.85E-07 (J)	1.01E-06	—	—	—	—	—	7.52E-08	—
50-24785	MD50-06-64413	17.50–19.00	QBT3	—	—	—	—	—	—	—	—	—
50-24796	MD50-06-64457	8.00–10.00	QBT3	1.3E-07 (J)	1.3E-07	—	—	—	—	—	—	—
50-24796	MD50-06-64458	17.50–19.30	QBT3	3.4E-07 (J)	6.46E-07	—	—	—	—	—	—	—

Table 6.3-5 (continued)

Location ID	Sample ID	Depth (ft)	Media	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Heptachlorodibenzodioxins (Total)	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	Heptachlorodibenzofurans (Total)	Hexachlorodibenzodioxins (Total)	Hexachlorodibenzofuran[1,2,3,4,7,8-]	Hexachlorodibenzofuran[2,3,4,6,7,8-]	Hexachlorodibenzofurans (Total)	Indeno(1,2,3-cd)pyrene
Industrial Soil Screening Level				na ^e	na	na	na	na	na	na	na	23.4
Residential Soil Screening Level				na	na	na	na	na	na	na	na	6.21
50-24796	MD50-06-64442	118.70–120.00	QBT2	—	—	—	—	—	—	—	—	—
50-24796	MD50-06-64459	147.50–149.40	QBT2	7.66E-07 (J)	0.0000017	—	—	—	—	—	—	—
50-24797	MD50-06-64509	37.00–38.00	QBT3	3.01E-07 (J)	5.7E-07	—	—	—	—	—	—	—
50-24799	MD50-06-64516	13.10–15.00	QBT3	—	—	—	—	—	—	—	—	—
50-24799	MD50-06-64517	15.00–16.50	QBT3	—	—	—	—	—	—	—	—	—
50-24802	MD50-06-64888	12.50–16.10	QBT3	5.03E-07 (J)	5.03E-07	—	3.26E-07	—	—	—	5.62E-08	—
50-24802	MD50-06-64889	40.60–42.50	QBT3	1.82E-07 (J)	3.04E-07	3.84E-07 (J)	3.84E-07	—	2.89E-07 (J)	9.89E-08 (J)	7.06E-07	—
50-24802	MD50-06-64872	123.10–125.00	QBT2	—	—	—	—	—	—	—	—	—
50-24802	MD50-06-64890	157.50–159.10	QBT2	1.92E-07 (J)	1.92E-07	—	—	—	—	—	—	—
50-24803	MD50-06-64913	15.40–17.50	QBT3	—	—	—	—	—	—	—	—	—
50-24804	MD50-06-64980	15.40–17.10	QBT3	—	—	—	—	—	—	—	—	—
50-24804	MD50-06-64982	147.50–149.80	QBT2	1.02E-07 (J)	1.02E-07	—	—	—	—	—	—	—
50-24810	MD50-06-65005	17.50–19.00	QBT3	—	—	—	—	—	—	—	—	—
50-24812	MD50-06-65100	8.40–10.00	QBT3	—	—	6.41E-07 (J)	6.41E-07	—	—	—	—	—
50-24812	MD50-06-65102	146.00–150.00	QBT2	—	—	—	—	—	—	—	—	—
50-24813	MD50-06-65116	123.50–125.00	QBT2	—	—	—	—	—	—	—	—	—
50-24814	MD50-06-65157	7.50–9.10	QBT3	8.67E-07 (J)	1.86E-06	—	—	—	—	—	—	—
50-24814	MD50-06-65158	30.00–31.60	QBT3	2.2E-07 (J)	2.2E-07	—	—	—	—	—	—	—
50-24815	MD50-06-65191	147.80–149.70	QBT2	—	—	—	—	—	—	—	—	—

Table 6.3-5 (continued)

Location ID	Sample ID	Depth (ft)	Media	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Heptachlorodibenzodioxins (Total)	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	Heptachlorodibenzofurans (Total)	Hexachlorodibenzodioxins (Total)	Hexachlorodibenzofuran[1,2,3,4,7,8-]	Hexachlorodibenzofuran[2,3,4,6,7,8-]	Hexachlorodibenzofurans (Total)	Indeno(1,2,3-cd)pyrene
Industrial Soil Screening Level				na ^e	na	na	na	na	na	na	na	23.4
Residential Soil Screening Level				na	na	na	na	na	na	na	na	6.21
50-24816	MD50-06-65214	23.10–24.70	QBT3	—	—	—	—	—	—	—	—	—
50-24816	MD50-06-65198	118.70–120.00	QBT2	—	—	—	—	—	—	—	—	—
50-24816	MD50-06-65216	223.40–225.00	QBT2	—	—	—	—	—	—	—	—	—
50-24817	MD50-05-63838	37.00–40.00	QBT3	—	—	—	—	—	—	—	—	—
50-24818	MD50-06-65229	8.50–10.00	QBT3	—	—	—	—	—	—	—	—	—
50-24818	MD50-06-65230	22.10–25.00	QBT3	—	—	—	—	—	—	—	—	—
50-24818	MD50-06-65264	247.70–249.20	QBT1G	—	—	—	—	—	—	—	—	—
50-24818	MD50-06-66760	312.90–313.00	QBT1G	—	—	—	—	—	—	—	—	—
50-24818	MD50-06-66761	397.90–398.00	QBO	—	—	—	—	—	—	—	—	—
50-24818	MD50-06-66762	498.40–498.50	QBO	—	—	—	—	—	—	—	—	—
50-24820	RE50-05-61441	138.70–140.00	QBT2	—	—	—	—	—	—	—	—	—
50-24820	RE50-05-61442	198.20–200.00	QBT1V	—	—	—	—	—	—	—	—	—
50-24820	RE50-05-61443	248.30–250.00	QBT1G	—	—	—	—	—	—	—	—	—
50-24821	RE50-05-61458	98.40–100.00	QBT3	—	—	—	—	—	—	—	—	0.149
50-24822	RE50-05-61475	47.50–49.10	QBT3	3.58E-07 (J)	6.46E-07	—	—	4.88E-07	3.97E-08 (J)	—	3.97E-08	—
50-24822	RE50-05-61477	137.50–139.20	QBT2	—	—	—	—	—	—	—	—	—
50-25451	MD50-06-66697	18.70–19.90	QBT3	—	—	—	—	—	—	—	—	—

Table 6.3-5 (continued)

Location ID	Sample ID	Depth (ft)	Media	Methylene Chloride	Methylnaphthalene[2-]	Methylphenol[2-]	Nitrotoluene[2-]	Nitrotoluene[3-]	Nitrotoluene[4-]	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	Pentachlorodibenzodioxins (Total)
Industrial Soil Screening Levels				490	300^f	100000	32.3	569	437	na	na	na
Residential Soil Screening Levels				182	79.5^f	3100	10.8	569	48.9	na	na	na
50-09101	0550-95-0289	35.00–36.20	QBT3	—	—	—	—	—	—	—	—	—
50-09101	0550-95-0294	55.00–55.70	QBT3	—	—	—	—	—	—	—	—	—
50-09101	0550-95-0299	75.00–77.00	QBT3	—	—	—	—	—	—	—	—	—
50-09103	0550-95-0109	36.00–38.80	QBT3	—	—	—	—	—	—	—	—	—
50-09103	0550-95-0119	78.00–80.00	QBT3	—	—	—	—	—	—	—	—	—
50-09103	0550-95-0124	94.70–98.00	QBT3	—	—	—	—	—	—	—	—	—
50-09103	0550-95-0129	114.80–116.80	QBT3	—	—	—	—	—	—	—	—	—
50-09104	0550-95-0099	85.00–87.00	QBT3	—	—	0.35	—	—	—	—	—	—
50-09105	0550-95-0145	57.00–59.00	QBT3	—	—	—	—	—	—	—	—	—
50-09106	0550-95-0046	27.50–30.50	QBT3	—	—	—	—	—	—	—	—	—
50-09106	0550-95-0054	56.50–58.50	QBT3	—	—	—	—	—	—	—	—	—
50-09108	0550-95-0200	37.00–38.60	QBT3	—	—	—	—	—	—	—	—	—
50-09108	0550-95-0210	76.60–78.60	QBT3	0.0063	—	—	—	—	—	—	—	—
50-09108	0550-95-0215	95.50–97.50	QBT3	—	—	—	—	—	—	—	—	—
50-09109	0550-95-0226	18.20–20.20	QBT3	—	—	—	—	—	—	—	—	—
50-09109	0550-95-0231	34.10–36.00	QBT3	—	—	—	—	—	—	—	—	—
50-09110	0550-95-0264	38.00–40.00	QBT3	—	—	—	—	—	—	—	—	—
50-09110	0550-95-0279	88.00–89.40	QBT3	—	—	—	—	—	—	—	—	—
50-24766	MD50-06-64603	15.60–17.10	QBT3	—	—	—	—	—	0.389 (J)	2.65E-07 (J)	1.35E-07 (J)	—

Table 6.3-5 (continued)

Location ID	Sample ID	Depth (ft)	Media	Methylene Chloride	Methylnaphthalene[2-]	Methylphenol[2-]	Nitrotoluene[2-]	Nitrotoluene[3-]	Nitrotoluene[4-]	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	Pentachlorodibenzodioxins (Total)
Industrial Soil Screening Levels				490	300^f	100000	32.3	569	437	na	na	na
Residential Soil Screening Levels				182	79.5^f	3100	10.8	569	48.9	na	na	na
50-24766	MD50-06-64604	27.50–29.20	QBT3	—	—	—	—	—	—	4.27E-07 (J)	—	—
50-24766	MD50-06-64586	97.50–99.90	QBT2	—	—	—	—	—	—	—	—	—
50-24767	MD50-06-66770	29.50–30.00	QBT3	—	—	—	—	—	—	—	—	—
50-24768	MD50-06-64651	123.20–125.00	QBT2	—	—	—	—	—	—	—	—	—
50-24769	MD50-06-64699	18.10–20.00	QBT3	—	—	—	—	—	—	6.98E-07 (J)	—	—
50-24769	MD50-06-64700	37.50–39.90	QBT3	—	—	—	—	—	—	3.68E-07 (J)	—	—
50-24769	MD50-06-64701	147.90–149.80	QBT2	—	—	—	—	—	—	3.52E-07 (J)	—	—
50-24770	MD50-06-64731	18.10–22.50	QBT3	—	—	—	—	—	—	—	—	—
50-24770	MD50-06-64733	147.50–150.00	QBT2	—	—	—	—	—	—	8.17E-07 (J)	—	—
50-24773	MD50-06-64782	38.00–40.00	QBT3	—	—	—	—	—	—	2.07E-07 (J)	—	—
50-24773	MD50-06-64783	150.00–152.80	QBT2	—	—	—	—	—	—	—	—	—
50-24783	MD50-06-64838	17.50–20.00	QBT3	—	—	—	—	—	—	4.49E-07 (J)	—	—
50-24783	MD50-06-64839	35.40–37.50	QBT3	—	—	—	—	—	—	6.12E-07 (J)	—	—
50-24783	MD50-06-64821	98.60–100.00	QBT3	—	—	—	—	—	—	—	—	—
50-24784	MD50-06-64381	18.00–20.00	QBT3	—	—	—	—	—	—	6.78E-07 (J)	—	—
50-24784	MD50-06-64382	298.30–299.80	QBT1G	—	—	—	—	—	—	0.0000113	5.32E-07 (J)	—
50-24785	MD50-06-64413	17.50–19.00	QBT3	—	—	—	—	—	—	5.37E-07 (J)	—	—
50-24796	MD50-06-64457	8.00–10.00	QBT3	—	—	—	—	—	—	—	—	—
50-24796	MD50-06-64458	17.50–19.30	QBT3	—	—	—	—	—	—	2.45E-06 (J)	4.65E-07 (J)	—

Table 6.3-5 (continued)

Location ID	Sample ID	Depth (ft)	Media	Methylene Chloride	Methylnaphthalene[2-]	Methylphenol[2-]	Nitrotoluene[2-]	Nitrotoluene[3-]	Nitrotoluene[4-]	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	Pentachlorodibenzodioxins (Total)
Industrial Soil Screening Levels				490	300^f	100000	32.3	569	437	na	na	na
Residential Soil Screening Levels				182	79.5^f	3100	10.8	569	48.9	na	na	na
50-24796	MD50-06-64442	118.70–120.00	QBT2	—	—	—	—	—	—	—	—	—
50-24796	MD50-06-64459	147.50–149.40	QBT2	—	—	—	—	—	—	4.52E-06 (J)	—	—
50-24797	MD50-06-64509	37.00–38.00	QBT3	—	—	—	—	—	—	—	1.69E-07 (J)	—
50-24799	MD50-06-64516	13.10–15.00	QBT3	—	—	—	—	—	—	—	—	—
50-24799	MD50-06-64517	15.00–16.50	QBT3	—	—	—	—	—	—	—	—	—
50-24802	MD50-06-64888	12.50–16.10	QBT3	—	—	—	—	—	—	5.29E-06	4.76E-07 (J)	—
50-24802	MD50-06-64889	40.60–42.50	QBT3	—	—	—	—	—	—	6.35E-07 (J)	4.01E-07 (J)	—
50-24802	MD50-06-64872	123.10–125.00	QBT2	—	—	—	—	—	—	—	—	—
50-24802	MD50-06-64890	157.50–159.10	QBT2	—	—	—	—	—	—	3.44E-06 (J)	2.51E-07 (J)	—
50-24803	MD50-06-64913	15.40–17.50	QBT3	—	—	—	—	—	—	3.77E-07 (J)	—	—
50-24804	MD50-06-64980	15.40–17.10	QBT3	—	—	—	—	—	—	3.03E-07 (J)	—	—
50-24804	MD50-06-64982	147.50–149.80	QBT2	—	—	—	—	—	—	—	—	—
50-24810	MD50-06-65005	17.50–19.00	QBT3	—	—	—	—	0.346 (J+)	—	—	—	—
50-24812	MD50-06-65100	8.40–10.00	QBT3	—	—	—	—	—	—	1.53E-06 (J)	—	—
50-24812	MD50-06-65102	146.00–150.00	QBT2	—	—	—	—	—	—	—	—	—
50-24813	MD50-06-65116	123.50–125.00	QBT2	—	—	—	—	—	—	—	—	—
50-24814	MD50-06-65157	7.50–9.10	QBT3	—	—	—	—	—	—	0.0000117 (J)	7.88E-07 (J)	—
50-24814	MD50-06-65158	30.00–31.60	QBT3	—	—	—	—	—	—	—	—	—
50-24815	MD50-06-65191	147.80–149.70	QBT2	—	—	—	—	—	—	3.36E-07 (J)	—	—

Table 6.3-5 (continued)

Location ID	Sample ID	Depth (ft)	Media	Methylene Chloride	Methylnaphthalene[2-]	Methylphenol[2-]	Nitrotoluene[2-]	Nitrotoluene[3-]	Nitrotoluene[4-]	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	Pentachlorodibenzodioxins (Total)
Industrial Soil Screening Levels				490	300^f	100000	32.3	569	437	na	na	na
Residential Soil Screening Levels				182	79.5^f	3100	10.8	569	48.9	na	na	na
50-24816	MD50-06-65214	23.10–24.70	QBT3	—	0.00903 (J)	—	—	—	—	4.58E-07 (J)	—	—
50-24816	MD50-06-65198	118.70–120.00	QBT2	—	—	—	—	—	—	—	—	—
50-24816	MD50-06-65216	223.40–225.00	QBT2	—	—	—	—	—	—	6.95E-07 (J)	—	—
50-24817	MD50-05-63838	37.00–40.00	QBT3	—	—	—	—	—	—	1.12E-06 (J)	—	—
50-24818	MD50-06-65229	8.50–10.00	QBT3	—	—	—	—	—	—	5.85E-07 (J)	—	—
50-24818	MD50-06-65230	22.10–25.00	QBT3	—	—	—	—	—	—	—	—	—
50-24818	MD50-06-65264	247.70–249.20	QBT1G	—	—	—	—	—	—	—	—	—
50-24818	MD50-06-66760	312.90–313.00	QBT1G	—	—	—	—	—	—	—	—	—
50-24818	MD50-06-66761	397.90–398.00	QBO	—	—	—	—	—	—	—	—	—
50-24818	MD50-06-66762	498.40–498.50	QBO	—	—	—	—	—	—	—	—	—
50-24820	RE50-05-61441	138.70–140.00	QBT2	—	—	—	—	—	—	—	—	—
50-24820	RE50-05-61442	198.20–200.00	QBT1V	—	—	—	—	—	—	—	—	—
50-24820	RE50-05-61443	248.30–250.00	QBT1G	—	—	—	—	—	—	—	—	—
50-24821	RE50-05-61458	98.40–100.00	QBT3	—	0.014 (J)	—	—	—	—	—	—	—
50-24822	RE50-05-61475	47.50–49.10	QBT3	—	—	—	—	—	—	0.0000129	2.65E-07 (J)	7.64E-08
50-24822	RE50-05-61477	137.50–139.20	QBT2	—	—	—	—	—	—	—	—	—
50-25451	MD50-06-66697	18.70–19.90	QBT3	—	—	—	0.135 (J)	—	—	—	—	—

Table 6.3-5 (continued)

Location ID	Sample ID	Depth (ft)	Media	Pentachlorodibenzofuran[1,2,3,7,8-]	Pentachlorodibenzofuran[2,3,4,7,8-]	Pentachlorodibenzofurans (Totals)	Phenanthrene	Pyrene	RDX	Tetrachlorodibenzofuran[2,3,7,8-]	Tetrachlorodibenzofurans (Total)	Toluene	Trichloroethene
Industrial Soil Screening Levels				na	na	na	20500	30900	174	na	na	252	1.56
Residential Soil Screening Levels				na	na	na	1830	2290	44.2	na	na	252	0.638
50-09101	0550-95-0289	35.00–36.20	QBT3	—	—	—	—	—	—	—	—	—	—
50-09101	0550-95-0294	55.00–55.70	QBT3	—	—	—	—	—	—	—	—	—	—
50-09101	0550-95-0299	75.00–77.00	QBT3	—	—	—	—	—	—	—	—	—	—
50-09103	0550-95-0109	36.00–38.80	QBT3	—	—	—	—	—	—	—	—	—	—
50-09103	0550-95-0119	78.00–80.00	QBT3	—	—	—	—	—	—	—	—	—	—
50-09103	0550-95-0124	94.70–98.00	QBT3	—	—	—	—	—	—	—	—	—	—
50-09103	0550-95-0129	114.80–116.80	QBT3	—	—	—	—	—	—	—	—	—	—
50-09104	0550-95-0099	85.00–87.00	QBT3	—	—	—	—	—	—	—	—	—	—
50-09105	0550-95-0145	57.00–59.00	QBT3	—	—	—	—	—	—	—	—	0.003 (J)	—
50-09106	0550-95-0046	27.50–30.50	QBT3	—	—	—	—	—	—	—	—	—	—
50-09106	0550-95-0054	56.50–58.50	QBT3	—	—	—	—	—	—	—	—	—	—
50-09108	0550-95-0200	37.00–38.60	QBT3	—	—	—	—	—	—	—	—	—	—
50-09108	0550-95-0210	76.60–78.60	QBT3	—	—	—	—	—	—	—	—	—	—
50-09108	0550-95-0215	95.50–97.50	QBT3	—	—	—	—	—	—	—	—	—	—
50-09109	0550-95-0226	18.20–20.20	QBT3	—	—	—	—	—	—	—	—	—	—
50-09109	0550-95-0231	34.10–36.00	QBT3	—	—	—	—	—	—	—	—	—	—
50-09110	0550-95-0264	38.00–40.00	QBT3	—	—	—	—	—	—	—	—	—	—
50-09110	0550-95-0279	88.00–89.40	QBT3	—	—	—	—	—	—	—	—	—	—
50-24766	MD50-06-64603	15.60–17.10	QBT3	—	—	—	—	—	—	—	—	—	—

Table 6.3-5 (continued)

Location ID	Sample ID	Depth (ft)	Media	Pentachlorodibenzofuran[1,2,3,7,8-]	Pentachlorodibenzofuran[2,3,4,7,8-]	Pentachlorodibenzofurans (Totals)	Phenanthrene	Pyrene	RDX	Tetrachlorodibenzofuran[2,3,7,8-]	Tetrachlorodibenzofurans (Total)	Toluene	Trichloroethene
Industrial Soil Screening Levels				na	na	na	20500	30900	174	na	na	252	1.56
Residential Soil Screening Levels				na	na	na	1830	2290	44.2	na	na	252	0.638
50-24766	MD50-06-64604	27.50–29.20	QBT3	—	—	—	—	—	0.165 (J)	—	—	—	—
50-24766	MD50-06-64586	97.50–99.90	QBT2	—	—	—	—	—	—	—	—	—	—
50-24767	MD50-06-66770	29.50–30.00	QBT3	—	—	—	—	—	—	—	—	—	—
50-24768	MD50-06-64651	123.20–125.00	QBT2	—	—	—	—	0.0119 (J)	—	—	—	—	—
50-24769	MD50-06-64699	18.10–20.00	QBT3	—	—	—	—	—	—	—	—	—	—
50-24769	MD50-06-64700	37.50–39.90	QBT3	—	—	—	—	—	—	—	—	—	—
50-24769	MD50-06-64701	147.90–149.80	QBT2	—	—	—	—	—	—	—	—	—	—
50-24770	MD50-06-64731	18.10–22.50	QBT3	—	—	—	—	—	—	—	—	—	—
50-24770	MD50-06-64733	147.50–150.00	QBT2	—	—	—	—	—	—	—	—	—	—
50-24773	MD50-06-64782	38.00–40.00	QBT3	—	—	—	—	—	—	—	—	—	—
50-24773	MD50-06-64783	150.00–152.80	QBT2	—	—	—	—	—	—	—	—	—	—
50-24783	MD50-06-64838	17.50–20.00	QBT3	—	—	—	—	—	—	—	—	—	—
50-24783	MD50-06-64839	35.40–37.50	QBT3	—	—	—	—	—	—	—	—	—	—
50-24783	MD50-06-64821	98.60–100.00	QBT3	—	—	—	—	—	—	—	—	—	—
50-24784	MD50-06-64381	18.00–20.00	QBT3	—	—	—	—	—	—	—	2.04E-07	—	—
50-24784	MD50-06-64382	298.30–299.80	QBT1G	—	—	—	—	0.0317 (J)	—	—	—	—	—
50-24785	MD50-06-64413	17.50–19.00	QBT3	—	—	—	—	—	—	1.05E-07 (J)	1.05E-07	—	—
50-24796	MD50-06-64457	8.00–10.00	QBT3	—	—	—	—	—	—	—	—	—	—
50-24796	MD50-06-64458	17.50–19.30	QBT3	—	—	—	—	—	—	—	—	—	—

Table 6.3-5 (continued)

Location ID	Sample ID	Depth (ft)	Media	Pentachlorodibenzofuran[1,2,3,7,8-]	Pentachlorodibenzofuran[2,3,4,7,8-]	Pentachlorodibenzofurans (Totals)	Phenanthrene	Pyrene	RDX	Tetrachlorodibenzofuran[2,3,7,8-]	Tetrachlorodibenzofurans (Total)	Toluene	Trichloroethene
Industrial Soil Screening Levels				na	na	na	20500	30900	174	na	na	252	1.56
Residential Soil Screening Levels				na	na	na	1830	2290	44.2	na	na	252	0.638
50-24796	MD50-06-64442	118.70–120.00	QBT2	—	—	—	—	—	—	—	—	—	—
50-24796	MD50-06-64459	147.50–149.40	QBT2	—	—	—	—	—	—	—	—	—	—
50-24797	MD50-06-64509	37.00–38.00	QBT3	—	—	—	—	—	—	—	—	—	—
50-24799	MD50-06-64516	13.10–15.00	QBT3	—	—	—	—	—	—	—	—	—	—
50-24799	MD50-06-64517	15.00–16.50	QBT3	—	—	—	—	—	—	—	—	—	—
50-24802	MD50-06-64888	12.50–16.10	QBT3	—	—	—	—	—	—	—	—	—	—
50-24802	MD50-06-64889	40.60–42.50	QBT3	1.21E-07 (J)	1.11E-07 (J)	7.17E-07	—	—	—	—	—	—	—
50-24802	MD50-06-64872	123.10–125.00	QBT2	—	—	—	—	—	—	—	—	—	—
50-24802	MD50-06-64890	157.50–159.10	QBT2	—	—	—	—	—	—	—	—	—	—
50-24803	MD50-06-64913	15.40–17.50	QBT3	—	—	—	—	—	—	—	—	—	—
50-24804	MD50-06-64980	15.40–17.10	QBT3	—	—	—	—	—	—	—	—	—	—
50-24804	MD50-06-64982	147.50–149.80	QBT2	—	—	—	—	—	—	—	—	—	—
50-24810	MD50-06-65005	17.50–19.00	QBT3	—	—	—	—	—	—	—	—	—	—
50-24812	MD50-06-65100	8.40–10.00	QBT3	—	—	—	—	—	—	—	—	—	—
50-24812	MD50-06-65102	146.00–150.00	QBT2	3.13E-07 (J)	—	3.13E-07	—	—	—	—	—	—	—
50-24813	MD50-06-65116	123.50–125.00	QBT2	—	—	—	—	—	—	—	—	—	—
50-24814	MD50-06-65157	7.50–9.10	QBT3	—	—	—	—	—	—	—	—	—	—
50-24814	MD50-06-65158	30.00–31.60	QBT3	—	—	—	—	—	—	—	—	—	—
50-24815	MD50-06-65191	147.80–149.70	QBT2	—	—	—	—	—	—	—	—	—	—

Table 6.3-5 (continued)

Location ID	Sample ID	Depth (ft)	Media	Pentachlorodibenzofuran[1,2,3,7,8-]	Pentachlorodibenzofuran[2,3,4,7,8-]	Pentachlorodibenzofurans (Totals)	Phenanthrene	Pyrene	RDX	Tetrachlorodibenzofuran[2,3,7,8-]	Tetrachlorodibenzofurans (Total)	Toluene	Trichloroethene
Industrial Soil Screening Levels				na	na	na	20500	30900	174	na	na	252	1.56
Residential Soil Screening Levels				na	na	na	1830	2290	44.2	na	na	252	0.638
50-24816	MD50-06-65214	23.10–24.70	QBT3	—	—	—	—	—	—	—	—	—	—
50-24816	MD50-06-65198	118.70–120.00	QBT2	—	—	—	—	—	—	—	—	—	—
50-24816	MD50-06-65216	223.40–225.00	QBT2	—	—	—	—	—	—	—	—	—	—
50-24817	MD50-05-63838	37.00–40.00	QBT3	—	—	—	—	—	—	—	—	—	—
50-24818	MD50-06-65229	8.50–10.00	QBT3	—	—	—	—	—	—	—	—	—	—
50-24818	MD50-06-65230	22.10–25.00	QBT3	—	—	—	—	0.0148 (J)	—	—	—	—	—
50-24818	MD50-06-65264	247.70–249.20	QBT1G	—	—	—	—	—	—	—	—	—	—
50-24818	MD50-06-66760	312.90–313.00	QBT1G	—	—	—	—	—	—	—	—	—	0.00199
50-24818	MD50-06-66761	397.90–398.00	QBO	—	—	—	—	—	—	—	—	—	—
50-24818	MD50-06-66762	498.40–498.50	QBO	—	—	—	—	—	—	—	—	—	—
50-24820	RE50-05-61441	138.70–140.00	QBT2	—	—	—	0.0113 (J)	0.0118 (J)	—	—	—	—	—
50-24820	RE50-05-61442	198.20–200.00	QBT1V	—	—	—	—	—	—	—	—	—	—
50-24820	RE50-05-61443	248.30–250.00	QBT1G	—	—	—	—	—	—	—	—	—	—
50-24821	RE50-05-61458	98.40–100.00	QBT3	—	—	—	0.0169 (J)	0.0148 (J)	—	—	—	—	—
50-24822	RE50-05-61475	47.50–49.10	QBT3	—	—	—	—	—	—	—	—	—	—

Table 6.3-5 (continued)

Location ID	Sample ID	Depth (ft)	Media	Pentachlorodibenzofuran[1,2,3,7,8-]	Pentachlorodibenzofuran[2,3,4,7,8-]	Pentachlorodibenzofurans (Totals)	Phenanthrene	Pyrene	RDX	Tetrachlorodibenzofuran[2,3,7,8-]	Tetrachlorodibenzofurans (Total)	Toluene	Trichloroethene
Industrial Soil Screening Levels				na	na	na	20500	30900	174	na	na	252	1.56
Residential Soil Screening Levels				na	na	na	1830	2290	44.2	na	na	252	0.638
50-24822	RE50-05-61477	137.50–139.20	QBT2	—	—	—	—	—	—	—	—	—	—
50-25451	MD50-06-66697	18.70–19.90	QBT3	—	—	—	—	—	—	—	—	—	—

Note: Units are mg/kg.

^a SSLs are from NMED 2006, 92513 unless otherwise indicated.

^b SSLs for benzoic acid, di-n-octyl phthalate, and 2-methylphenol are from EPA Region 6 (EPA 2005, 91002).

^c Pyrene used as a surrogate for acenaphthylene based on structural similarity.

^d — = Not detected.

^e na = No SSLs are available for individual congeners and totals except for 2,3,7,8-TCDD (dioxin).

^f Naphthalene used as a surrogate for 2-methylnaphthalene based on structural similarity.

Table 6.6-1
Summary of Organic Chemicals (VOCs) Detected in First Round of Pore Gas at MDA C

Location ID	Sample ID	Depth (ft)	Acetone	Benzene	Butadiene[1,3-]	Butanol[1-]	Butanone[2-]	Carbon Disulfide	Carbon Tetrachloride	Chlorodifluoromethane	Chloroform	Chloromethane	Cyclohexane	Dichloro-1,1,2,2-tetrafluoroethane[1,2-]	Dichlorodifluoromethane	Dichloroethane[1,1-]
50-09100	MD50-06-70880	20	—*	—	—	—	—	—	—	—	300	—	—	—	130	—
50-09100	MD50-06-70881	50	86	—	—	—	—	—	28	—	120	—	—	—	38	—
50-09100	MD50-06-70882	90	28	—	—	—	—	—	76	—	360	—	—	—	160	—
50-09100	MD50-06-70883	103	—	—	—	—	—	—	160	—	820	—	—	—	390	—
50-09100	MD50-06-70884	120	—	—	—	—	—	—	150	—	870	—	—	—	480	—
50-09100	MD50-06-70885	160	—	—	—	—	—	—	—	—	820	—	—	—	440	—
50-09100	MD50-06-70886	200	—	—	—	—	—	—	590	—	1300	—	—	—	800	—
50-09100	MD50-06-70887	233	—	—	—	—	—	—	—	—	310	—	—	—	200	—
50-09100	MD50-06-70888	260	100	—	—	—	—	—	78	—	290	—	—	—	200	—
50-10131	MD50-06-70868	25	—	—	—	—	—	—	66	—	890	—	—	—	150	—
50-10131	MD50-06-70869	50	—	—	—	—	—	—	87	—	810	—	—	—	200	—
50-10131	MD50-06-70870	75	—	—	—	—	—	—	90	—	920	—	—	—	200	—
50-10131	MD50-06-70871	100	—	—	—	—	—	—	—	—	590	—	—	—	130	—
50-10131	MD50-06-70872	125	—	—	—	—	—	—	52	—	660	—	—	—	190	—
50-10131	MD50-06-70873	150	—	—	—	—	—	—	33	—	310	—	—	61	110	—
50-10131	MD50-06-70874	175	—	—	—	—	—	—	100	—	620	—	—	—	230	—
50-10131	MD50-06-70875	200	—	—	—	—	—	—	110	—	400	—	—	110	220	—
50-10131	MD50-06-70876	225	—	—	—	—	—	—	95	—	760	—	—	67	250	—
50-10131	MD50-06-70877	250	—	—	—	—	—	—	100	—	570	—	—	—	210	—
50-24766	MD50-06-64597	17	99	—	—	—	—	—	14	—	63	—	—	38	110	—
50-24766	MD50-06-64596	29	140	—	—	—	—	—	29	—	99	—	—	89	220	—
50-24766	MD50-06-64595	99	—	—	—	—	—	—	450	—	190	—	—	—	210	—
50-24766	MD50-06-64594	124	190	—	—	—	—	—	14	—	100	—	—	43	47	7.3

Table 6.6-1 (continued)

Location ID	Sample ID	Depth (ft)	Acetone	Benzene	Butadiene[1,3-]	Butanol[1-]	Butanone[2-]	Carbon Disulfide	Carbon Tetrachloride	Chlorodifluoromethane	Chloroform	Chloromethane	Cyclohexane	Dichloro-1,1,2,2-tetrafluoroethane[1,2-]	Dichlorodifluoromethane	Dichloroethane[1,1-]
50-24766	MD50-06-64593	149	62	—	—	—	—	—	41	—	190	—	—	—	84	14
50-24767	MD50-06-64625	10	—	11	—	—	—	—	—	—	160	—	—	—	100	—
50-24767	MD50-06-64626	30	52	24	—	—	—	—	16	—	120	—	—	—	74	—
50-24767	MD50-06-64627	60	32	3	—	—	—	—	6.8	—	40	—	—	—	23	—
50-24767	MD50-06-64628	124	—	—	—	—	—	—	—	—	73	—	—	—	64	—
50-24767	MD50-06-64629	149	—	—	—	—	—	—	—	—	240	—	—	—	150	—
50-24768	MD50-06-64661	14	31	—	—	—	—	—	7.2	—	35	—	—	—	36	—
50-24768	MD50-06-64660	29	35	—	—	—	—	—	—	—	22	—	—	—	17	—
50-24768	MD50-06-64659	99	—	—	—	—	—	—	—	—	390	—	—	—	390	—
50-24768	MD50-06-64658	125	—	—	—	—	—	—	—	—	320	—	—	—	470	—
50-24768	MD50-06-64657	150	—	—	—	—	—	—	—	—	290	—	—	—	450	—
50-24769	MD50-06-64693	20	34	—	—	—	—	3.2	8	—	21	—	—	25	25	—
50-24769	MD50-06-64692	39	44	—	—	—	3	—	7.4	—	33	1.7	—	18	23	—
50-24769	MD50-06-64691	99	—	—	—	—	—	—	440	—	1900	—	—	—	2000	—
50-24769	MD50-06-64690	124	—	—	—	—	—	—	170	—	1300	—	—	—	1100	—
50-24769	MD50-06-64689	149	—	—	—	—	—	—	—	—	2300	—	—	—	2400	—
50-24770	MD50-06-64738	20	—	—	—	—	—	—	2100 (J)	—	1700	—	—	—	1700	—
50-24770	MD50-06-64725	25	—	—	—	—	—	—	2500 (J)	—	1900	—	—	—	1700	—
50-24770	MD50-06-64724	39	—	—	—	—	—	—	2700 (J)	—	2100	—	—	—	1800	—
50-24770	MD50-06-64723	100	—	—	—	—	—	—	1800 (J)	—	1900	—	—	—	1500	—
50-24770	MD50-06-64722	124	—	—	—	—	—	—	2900 (J)	—	3200	—	—	—	2400	—
50-24770	MD50-06-64721	150	—	—	—	—	—	—	720 (J)	—	1000	—	—	—	850	—
50-24771	MD50-06-64750	17	—	—	—	—	—	—	1600 (J)	—	1600	—	—	—	710	—
50-24771	MD50-06-64749	40	—	—	—	—	—	—	2500 (J)	—	2300	—	—	—	1100	—

Table 6.6-1 (continued)

Location ID	Sample ID	Depth (ft)	Acetone	Benzene	Butadiene[1,3-]	Butanol[1-]	Butanone[2-]	Carbon Disulfide	Carbon Tetrachloride	Chlorodifluoromethane	Chloroform	Chloromethane	Cyclohexane	Dichloro-1,1,2,2-tetrafluoroethane[1,2-]	Dichlorodifluoromethane	Dichloroethane[1,1-]
50-24771	MD50-06-64748	100	31	—	—	—	—	—	99	—	190	—	—	—	64	—
50-24771	MD50-06-64747	125	—	—	—	—	—	—	1200	—	2300	—	—	—	440	—
50-24771	MD50-06-64746	150	—	—	—	—	—	—	2400	—	3600	—	—	—	1200	—
50-24773	MD50-06-64775	20	—	—	—	—	—	—	350	—	940	—	—	—	340	—
50-24773	MD50-06-64774	40	—	—	—	—	—	—	450	—	1200	—	—	—	430	—
50-24773	MD50-06-64773	100	—	—	—	—	—	—	490	—	1300	—	—	—	410	—
50-24773	MD50-06-64776	125	—	—	—	—	—	—	1000	—	2300	—	—	—	870	—
50-24773	MD50-06-64772	150	—	—	—	—	—	—	1800 (J)	—	3000	—	—	—	950	—
50-24782	MD50-06-64803	20	—	—	—	—	—	—	—	—	520	—	—	—	170	—
50-24782	MD50-06-64804	40	—	—	—	—	—	—	110	—	980	—	—	—	290	—
50-24782	MD50-06-64805	100	—	—	—	—	—	—	100	—	710	—	—	—	210	—
50-24782	MD50-06-64806	125	—	—	—	—	—	—	320	—	1500	—	—	—	500	—
50-24782	MD50-06-64807	155	82	—	—	—	—	—	50	—	240	—	—	—	94	—
50-24783	MD50-06-64832	20	—	—	—	—	—	—	180	—	1100	—	—	—	360	—
50-24783	MD50-06-64831	36	—	—	—	—	—	—	—	—	200	—	—	—	85	—
50-24783	MD50-06-64830	100	—	—	—	—	—	—	—	—	140	—	—	—	42	—
50-24783	MD50-06-64829	125	—	—	—	—	—	—	360	—	830	—	—	—	240	—
50-24783	MD50-06-64828	151	—	—	—	—	—	—	410	—	1000	—	—	—	370	—
50-24784	MD50-06-64374	10	—	—	—	—	—	—	32	—	73	—	—	—	30	—
50-24784	MD50-06-64373	20	—	—	—	—	—	—	5	—	14	0.93	—	—	6.9	—
50-24784	MD50-06-64372	47	41 (J)	—	—	—	—	48	140	—	190	—	—	—	79	—
50-24784	MD50-06-64371	49	58 (J)	—	—	—	—	—	130	—	200	—	—	—	69	—
50-24784	MD50-06-64370	55	80 (J)	4.6	—	—	—	22	120	—	210	—	—	—	66	—
50-24784	MD50-06-64375	100	21 (J)	3.7	—	—	—	—	51	—	100	—	—	—	34	—

Table 6.6-1 (continued)

Location ID	Sample ID	Depth (ft)	Acetone	Benzene	Butadiene[1,3-]	Butanol[1-]	Butanone[2-]	Carbon Disulfide	Carbon Tetrachloride	Chlorodifluoromethane	Chloroform	Chloromethane	Cyclohexane	Dichloro-1,1,2,2-tetrafluoroethane[1,2-]	Dichlorodifluoromethane	Dichloroethane[1,1-]
50-24784	MD50-06-64379	168	29 (J)	—	—	—	—	—	190	—	90	—	—	—	83	—
50-24784	MD50-06-64378	199	170	9.5	—	—	4.7	3.4	63	—	46	0.94	—	—	31	1.6
50-24784	MD50-06-64377	250	140	12	—	—	—	—	170	—	58	—	—	—	78	—
50-24784	MD50-06-64376	268	—	—	—	—	—	—	300	—	70	—	—	—	210	—
50-24785	MD50-06-64402	10	20	—	—	—	—	8.7	—	—	76	—	11	—	4.8	—
50-24785	MD50-06-64403	19	19	—	3	—	3.8	—	9.2	—	350	—	—	—	13	—
50-24785	MD50-06-64408	60	—	—	—	—	—	—	130	—	3000	—	—	—	130	—
50-24785	MD50-06-64407	120	—	—	—	—	—	—	170	—	940	—	—	—	140	—
50-24785	MD50-06-64404	200	—	—	—	—	—	—	330	—	470	—	—	—	200	—
50-24785	MD50-06-64405	250	—	—	—	—	—	—	600 (J)	—	160	—	—	—	260	—
50-24785	MD50-06-64406	275	47	4.7	—	—	—	—	11	—	23	—	—	—	7.1	—
50-24796	MD50-06-64448	10	120	4.4	—	—	33	14	—	—	1.8	1.9	—	—	6	—
50-24796	MD50-06-64447	20	73	10	—	—	12	6.5	5.6	—	44	1.1	—	—	38	0.81
50-24796	MD50-06-64449	40	41	—	—	—	—	—	28	—	200	—	—	—	220	—
50-24796	MD50-06-64450	100	—	—	—	—	—	—	—	—	680	—	—	—	840	—
50-24796	MD50-06-64451	120	38	1.8	—	—	—	—	4.7	—	27	1.3	—	—	26	—
50-24796	MD50-06-64452	150	83	10	—	—	—	—	92	—	290	—	—	—	220	—
50-24797	MD50-06-64496	18.3	42 (J)	3.2	—	—	7.5	—	11 (J)	—	49	1.2	—	3.7	180 (J)	2
50-24797	MD50-06-64497	38	31 (J)	—	—	—	—	—	28 (J)	—	180	—	—	—	400 (J)	—
50-24797	MD50-06-66198	60	—	—	—	—	—	—	—	—	180	—	—	—	350	—
50-24797	MD50-06-64498	120	49	—	—	—	—	—	41	—	210	—	—	—	260	—
50-24797	MD50-06-64500	160	—	—	—	—	—	—	200	—	460	—	—	—	620	45
50-24799	MD50-06-66197	15	120	—	—	—	—	—	—	—	61	—	—	—	31	—
50-24799	MD50-06-64521	17.5	56	2.7	—	—	12	—	—	—	4	1.3	—	—	4.5	—

Table 6.6-1 (continued)

Location ID	Sample ID	Depth (ft)	Acetone	Benzene	Butadiene[1,3-]	Butanol[1-]	Butanone[2-]	Carbon Disulfide	Carbon Tetrachloride	Chlorodifluoromethane	Chloroform	Chloromethane	Cyclohexane	Dichloro-1,1,2,2-tetrafluoroethane[1,2-]	Dichlorodifluoromethane	Dichloroethane[1,1-]
50-24799	MD50-06-64522	20	89	5.1	—	—	20	—	—	—	5.1	1.4	—	—	5.4	—
50-24799	MD50-06-64523	32.5	290 (J)	27	—	—	110	—	—	—	68	—	—	—	38 (J)	—
50-24799	MD50-06-64538	37.5	390 (J)	21	—	—	160	—	8.7 (J)	—	95	—	—	—	43 (J)	5.2
50-24799	MD50-06-64524	40.5	330	—	—	32	120	3.9	5.7	—	76	—	—	—	35	3.7
50-24799	MD50-06-64525	100	26	—	13	—	—	—	—	—	11	—	—	—	—	—
50-24799	MD50-06-64526	120	60	—	1.8	65	9.7	—	5.4	—	40	—	—	—	17	—
50-24799	MD50-06-64527	160	—	—	22	—	—	—	110	61	440	—	—	—	160	18
50-24801	MD50-06-64853	20	35	—	—	—	—	—	—	—	69	—	—	—	18	—
50-24801	MD50-06-64870	35	27	—	—	—	—	—	—	—	140	—	—	—	34	—
50-24801	MD50-06-64856	80	—	—	—	—	—	—	370 (J)	—	720	—	—	—	340	—
50-24801	MD50-06-64855	120	—	—	—	—	—	—	51 (J)	—	260	—	—	—	120	—
50-24801	MD50-06-64854	150	50	—	—	—	—	—	25	—	130	—	—	—	25	—
50-24802	MD50-06-64878	15	—	—	—	—	—	—	—	—	350	—	—	—	130	—
50-24802	MD50-06-64879	42	—	—	—	—	—	—	—	—	690	—	—	—	250	—
50-24802	MD50-06-64880	99.4	—	—	—	—	—	—	—	—	360	—	—	—	130	—
50-24802	MD50-06-64881	124.4	—	—	—	—	—	—	78 (J)	—	490	—	—	—	210	—
50-24802	MD50-06-64882	156.4	—	—	—	—	—	—	85 (J)	—	480	—	—	—	210	—
50-24803	MD50-06-64904	16	28 (J)	—	—	—	—	20	16	—	36	—	—	—	12	3
50-24803	MD50-06-64903	37	19 (J)	5.1	—	—	—	—	40	—	93	—	—	—	27	2.8
50-24803	MD50-06-64905	99.5	42	—	—	—	—	—	—	—	230	—	—	—	70	—
50-24803	MD50-06-64906	124	—	—	—	—	—	—	51	—	290	—	—	—	120	—
50-24803	MD50-06-64907	151	—	—	—	—	—	—	—	—	140	—	—	—	54	—
50-24804	MD50-06-64970	10	150	2.9	—	—	—	—	22	—	49	—	—	150	47	—
50-24804	MD50-06-64971	16	70	—	—	—	—	—	64	—	230	—	—	150	160	—

Table 6.6-1 (continued)

Location ID	Sample ID	Depth (ft)	Acetone	Benzene	Butadiene[1,3-]	Butanol[1-]	Butanone[2-]	Carbon Disulfide	Carbon Tetrachloride	Chlorodifluoromethane	Chloroform	Chloromethane	Cyclohexane	Dichloro-1,1,2,2-tetrafluoroethane[1,2-]	Dichlorodifluoromethane	Dichloroethane[1,1-]
50-24804	MD50-06-64972	33	90	—	—	—	—	—	110	—	240	—	—	—	72	—
50-24804	MD50-06-64973	99	—	—	—	—	—	—	130	—	560	—	—	—	200	—
50-24804	MD50-06-64974	124	—	—	—	—	—	—	310	—	990	—	—	—	370	—
50-24804	MD50-06-64975	149	—	—	—	—	—	—	240	—	860	—	—	—	330	—
50-24810	MD50-06-64999	19	30 (J)	—	—	—	—	—	49	—	71	—	—	—	30	—
50-24810	MD50-06-64998	37	27	—	—	—	—	—	41	—	180	—	—	—	70	—
50-24810	MD50-06-64997	99	24 (J)	—	—	—	—	—	57	—	140	—	—	—	39	—
50-24810	MD50-06-64996	123	—	—	—	—	—	—	160	—	400	—	—	—	170	—
50-24810	MD50-06-64995	150	—	—	—	—	—	—	170	—	540	—	—	—	200	—
50-24811	MD50-06-65069	20	—	—	—	—	—	—	1500	—	2500	—	—	—	440	—
50-24811	MD50-06-65068	40	—	—	—	—	—	—	1700	—	2900	—	—	—	610	—
50-24811	MD50-06-65067	98	—	—	—	—	—	—	580	—	1400	—	—	—	300	—
50-24811	MD50-06-65066	125	—	—	—	—	—	—	410	—	750	—	—	—	250	—
50-24811	MD50-06-65065	150	—	—	—	—	—	—	2000	—	3900	—	—	—	1000	—
50-24812	MD50-06-65094	10	—	—	—	—	—	—	7200	—	2900	—	—	—	1400	—
50-24812	MD50-06-65093	35	—	—	—	—	—	—	1800	—	830	—	—	—	95	—
50-24812	MD50-06-65092	98	—	—	—	—	—	—	5200	—	2800	—	—	—	1200	—
50-24812	MD50-06-65091	123	—	—	—	—	—	—	2900	—	2300	—	—	—	980	—
50-24812	MD50-06-65090	150	—	—	—	—	—	—	3800	—	3800	—	—	—	2000	—
50-24813	MD50-06-65126	20	—	—	—	—	—	—	490	—	540	—	—	—	630	—
50-24813	MD50-06-65125	30	—	—	—	—	—	—	1100	—	1000	—	—	65	1000	—
50-24813	MD50-06-65124	99	—	—	—	—	—	—	1200	—	1300	—	—	—	1100	—
50-24813	MD50-06-65123	125	—	—	—	—	—	—	1900	—	2400	—	—	—	1900	—
50-24813	MD50-06-65122	150	—	—	—	—	—	—	2100	—	3700	—	—	—	2600	—

Table 6.6-1 (continued)

Location ID	Sample ID	Depth (ft)	Acetone	Benzene	Butadiene[1,3-]	Butanol[1-]	Butanone[2-]	Carbon Disulfide	Carbon Tetrachloride	Chlorodifluoromethane	Chloroform	Chloromethane	Cyclohexane	Dichloro-1,1,2,2-tetrafluoroethane[1,2-]	Dichlorodifluoromethane	Dichloroethane[1,1-]
50-24814	MD50-06-65151	10	—	—	—	—	—	—	67	—	220	—	—	51	380	—
50-24814	MD50-06-65150	30	42	—	—	—	—	—	57	—	170	—	—	45	280	—
50-24814	MD50-06-65149	99	62	—	—	—	—	—	30	—	72	—	—	38	72	—
50-24814	MD50-06-65148	124	—	—	—	—	—	—	140	—	340	—	—	—	400	—
50-24814	MD50-06-65147	149	—	—	—	—	—	—	72	—	320	—	—	—	240	—
50-24815	MD50-06-65183	30	96 (J)	—	—	—	—	—	37	—	120	—	—	33	77	—
50-24815	MD50-06-65182	40	58	—	—	—	—	—	34	—	270	—	—	28 (J)	260	—
50-24815	MD50-06-65181	100	51 (J)	—	—	—	—	—	15	—	60	—	—	14	35	—
50-24815	MD50-06-65180	125	75 (J)	—	—	—	5.2	—	4.2	—	23	0.93	—	8.9	11	—
50-24815	MD50-06-65179	149	110	—	—	—	—	—	72	—	310	—	—	24	150	—
50-24816	MD50-06-65204	25	25	—	2.2	18	6.8	3.1	—	—	—	—	5	—	—	—
50-24816	MD50-06-65205	35	30	—	4.7	21	6.7	—	—	—	12	—	2.9	—	3.9	—
50-24816	MD50-06-65209	65	—	—	—	—	—	—	320	—	270	—	—	—	170	—
50-24816	MD50-06-65206	120	43	—	—	—	—	—	40	—	140	—	—	—	34 (J)	—
50-24816	MD50-06-65208	200	67	—	—	—	—	—	250	—	92	—	—	—	130	—
50-24816	MD50-06-65207	225	—	—	—	—	—	—	440	—	130	—	—	—	200	—
50-24817	MD50-05-63841	20	96	—	14	—	11	6.9	10	—	9.8	—	14	—	64	—
50-24817	MD50-05-63842	40	65	11	16	21	9.3	10	46	—	48	—	—	—	210	—
50-24817	RE50-05-63816	100	62	—	200	—	—	21	150	—	210	—	—	—	500	28
50-24817	RE50-05-63817	140	210	—	33	—	24	13	210	—	300	—	—	—	580	36
50-24817	RE50-05-63818	200	—	—	230	—	—	89	390	—	400	—	—	—	640	50
50-24817	MD50-05-63843	250	—	—	20	—	—	—	510	—	240	—	—	—	550	34
50-24818	MD50-06-65232	10	33	9.1	—	—	6.5	8.8	1.5	—	5.7	0.82	—	—	5.4	—
50-24818	MD50-06-65233	25	56	9	—	—	—	71	35	—	180	—	—	—	68	—

Table 6.6-1 (continued)

Location ID	Sample ID	Depth (ft)	Acetone	Benzene	Butadiene[1,3-]	Butanol[1-]	Butanone[2-]	Carbon Disulfide	Carbon Tetrachloride	Chlorodifluoromethane	Chloroform	Chloromethane	Cyclohexane	Dichloro-1,1,2,2-tetrafluoroethane[1,2-]	Dichlorodifluoromethane	Dichloroethane[1,1-]
50-24818	MD50-06-65234	100	—	—	—	—	—	—	330 (J)	—	1500	—	—	—	600	—
50-24818	MD50-06-65235	150	—	—	—	—	—	—	—	—	1900	—	—	—	610	—
50-24818	MD50-06-65236	190	—	—	—	—	—	—	—	—	390	—	—	—	79	—
50-24818	MD50-06-65237	250	—	—	—	—	—	—	370	—	1000	—	—	—	500	—
50-24818	MD50-06-65238	280	—	—	—	—	—	—	390	—	830	—	—	—	480	—
50-24818	MD50-06-65239	315	—	—	—	—	—	—	290 (J)	—	430	—	—	—	310	—
50-24818	MD50-06-65240	414	160	9.9	—	—	12	7.5	2.7	—	3.2	2.1	—	—	6.2	—
50-24818	MD50-06-65242	452	65	—	—	—	—	—	26	—	8.1	—	—	—	44	—
50-24818	MD50-06-65245	500	190	1.6	—	—	18	9.2	9.4	—	11	2.3	—	—	6.4	—
50-24818	MD50-06-65244	548	70	—	—	—	8.5	—	6.9	—	3.9	—	—	—	12	—
50-24818	MD50-06-65243	591	120	—	—	—	—	9.6	9.4	—	10	—	—	—	8	—
50-24819	RE50-05-61430	20	60	—	—	—	6.2	—	8.9	—	23	—	—	—	13	—
50-24819	RE50-05-61431	50	58	—	—	—	5.6	—	25	—	77	—	—	—	34	—
50-24819	RE50-05-61432	100	54	—	—	—	5.1	—	31	—	110	—	—	—	40	—
50-24819	RE50-05-61732	138.5–140	32	—	—	—	—	—	140	—	260	—	—	—	150	—
50-24819	RE50-05-61733	200	55	—	8.9	—	13	—	160	—	250	—	—	—	160	—
50-24819	RE50-05-61734	250	—	—	—	—	—	—	190	—	220	—	—	—	180	—
50-24819	RE50-05-61735	275	—	—	9.8	—	—	—	150	—	170	—	—	—	140	—
50-24820	RE50-05-61446	20	55	—	4.4	—	9.2	—	91	—	140	—	—	—	70	—
50-24820	RE50-05-61449	50	92	—	17	—	14	—	160	—	240	—	—	—	110	—
50-24820	RE50-05-61447	100	140	15	29	—	12	7.9	85	—	180	—	—	—	74	—
50-24820	RE50-05-61448	140	300	60	19	—	29	—	470	—	670	—	—	—	340	—
50-24820	RE50-05-61450	200	—	—	—	—	—	—	720	—	920	—	—	—	500	—
50-24820	RE50-05-61736	250	—	—	—	—	—	—	760	—	890	—	—	—	510	—

Table 6.6-1 (continued)

Location ID	Sample ID	Depth (ft)	Acetone	Benzene	Butadiene[1,3-]	Butanol[1-]	Butanone[2-]	Carbon Disulfide	Carbon Tetrachloride	Chlorodifluoromethane	Chloroform	Chloromethane	Cyclohexane	Dichloro-1,1,2,2-tetrafluoroethane[1,2-]	Dichlorodifluoromethane	Dichloroethane[1,1-]
50-24821	RE50-05-61464	20	84	5.2	5.8	—	4.4	3.2	54	—	68	—	—	—	76	—
50-24821	RE50-05-61466	50	76	58	91	—	—	22	190	—	320	—	—	—	250	—
50-24821	RE50-05-61465	98.4–100	—	—	30	—	—	—	190	—	380	—	—	—	270	—
50-24821	RE50-05-61469	137.5–140	180	—	—	—	—	29	220	—	350	—	—	—	270	—
50-24821	RE50-05-61473	160	—	—	—	—	—	—	510	—	610	—	—	—	620	—
50-24821	RE50-05-61468	248.6–250	—	—	—	—	—	—	340	—	450	—	—	—	450	—
50-24822	RE50-05-61482	20	180	—	—	—	6.2	—	11	—	72	—	30	—	74	—
50-24822	RE50-05-61483	50	54	—	—	—	—	—	64	—	340	—	—	—	400	—
50-24822	RE50-05-61484	100	100	—	—	13	—	—	—	—	36	—	17	—	30	—
50-24822	RE50-05-61485	140	120	—	—	—	—	—	84	—	380	—	—	—	460	—
50-24822	RE50-05-61486	200	110	—	—	—	—	—	43	—	160	—	28	—	180	—
50-24822	RE50-05-61737	250	59	—	—	—	—	—	43	—	150	—	—	—	140	—
50-25451	MD50-06-66691	19	55	2.3	—	—	3.2	—	4.6	—	3.4	—	—	33	8.5	—
50-25451	MD50-06-66690	49	30	—	—	—	—	—	56	—	40	—	—	500	92	—
50-25451	MD50-06-66689	100	34	—	—	—	—	—	35	—	33	—	—	240	55	—
50-25451	MD50-06-66688	147	49	—	—	—	—	—	25	—	26	—	—	200	41	—
50-25451	MD50-06-66687	200	62	—	—	—	—	—	86 (J)	—	63	—	—	490	250	—
50-25451	MD50-06-66686	251	—	—	—	—	—	—	120	—	100	—	—	—	120	—
50-25451	MD50-06-66685	287	—	—	—	—	—	—	98	—	90	—	—	—	210	—

Table 6.6-1 (continued)

Location ID	Sample ID	Depth (ft)	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Dioxane[1,4-]	Ethanol	Ethylbenzene	Ethyltoluene[4-]	Hexane	Hexanone[2-]	Methanol	Methyl-2-pentanone[4-]	Methylene Chloride	n-Heptane
50-09100	MD50-06-70880	20	—	—	33	—	—	—	—	—	—	—	—	—	25	—
50-09100	MD50-06-70881	50	—	—	19	—	—	—	11	—	—	—	—	—	21	—
50-09100	MD50-06-70882	90	13	—	68	17	—	—	—	—	—	—	—	—	61	—
50-09100	MD50-06-70883	103	—	—	140	—	—	—	—	—	—	—	—	—	150	—
50-09100	MD50-06-70884	120	—	—	190	—	—	—	—	—	—	—	—	—	290	—
50-09100	MD50-06-70885	160	—	—	220	—	—	—	—	—	—	—	—	—	490	—
50-09100	MD50-06-70886	200	29	—	360	67	—	—	—	—	—	—	—	—	710	—
50-09100	MD50-06-70887	233	—	—	96	—	—	—	—	—	—	—	—	—	240	—
50-09100	MD50-06-70888	260	—	—	98	—	—	—	—	—	—	—	—	—	250	—
50-10131	MD50-06-70868	25	—	—	—	120	—	—	—	—	—	—	—	—	31	—
50-10131	MD50-06-70869	50	—	—	—	130	—	—	—	—	—	—	—	—	30	—
50-10131	MD50-06-70870	75	28	—	—	130	—	—	—	—	—	—	—	—	34	—
50-10131	MD50-06-70871	100	—	—	—	99	—	—	—	—	—	—	—	—	41	—
50-10131	MD50-06-70872	125	22	—	24	120	—	—	—	—	—	—	—	—	57	—
50-10131	MD50-06-70873	150	—	—	—	73	—	—	—	—	—	—	—	—	27	—
50-10131	MD50-06-70874	175	—	—	34	130	—	—	—	—	—	—	—	—	81	—
50-10131	MD50-06-70875	200	—	—	—	110	—	—	—	—	—	—	—	—	57	—
50-10131	MD50-06-70876	225	—	—	31	91	—	—	—	—	—	—	—	—	70	—
50-10131	MD50-06-70877	250	—	—	—	120	—	—	—	—	—	—	—	—	66	—
50-24766	MD50-06-64597	17	—	—	—	16	—	—	—	—	—	—	—	—	—	—
50-24766	MD50-06-64596	29	—	—	—	26	—	—	—	—	—	—	—	—	—	—
50-24766	MD50-06-64595	99	—	—	—	64	—	—	—	—	—	—	—	—	36	—
50-24766	MD50-06-64594	124	7.3	—	17	60	—	—	—	—	—	—	—	—	18	—
50-24766	MD50-06-64593	149	16	9.8	37	130	—	—	—	—	—	—	—	—	50	—

Table 6.6-1 (continued)

Location ID	Sample ID	Depth (ft)	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Dioxane[1,4-]	Ethanol	Ethylbenzene	Ethyltoluene[4-]	Hexane	Hexanone[2-]	Methanol	Methyl-2-pentanone[4-]	Methylene Chloride	n-Heptane
50-24767	MD50-06-64625	10	—	—	29	—	—	—	—	—	—	—	—	—	16	—
50-24767	MD50-06-64626	30	—	—	24	—	—	—	12	10	—	—	—	—	—	—
50-24767	MD50-06-64627	60	—	2.9	8.4	—	—	—	2.6	—	—	—	—	—	3.2	—
50-24767	MD50-06-64628	124	—	—	15	—	—	—	—	—	—	—	—	—	17	—
50-24767	MD50-06-64629	149	—	—	67	—	—	—	—	—	—	—	—	—	110	—
50-24768	MD50-06-64661	14	—	—	5.9	—	—	—	—	—	—	—	—	—	—	—
50-24768	MD50-06-64660	29	—	—	3.8	—	—	—	—	—	—	—	—	—	—	4.8
50-24768	MD50-06-64659	99	—	—	90	—	—	—	—	—	—	—	—	—	69	—
50-24768	MD50-06-64658	125	—	—	100	—	—	—	—	—	—	—	—	—	120	—
50-24768	MD50-06-64657	150	—	—	91	—	—	—	—	—	—	—	—	—	130	—
50-24769	MD50-06-64693	20	—	—	1.9	—	—	—	—	—	—	—	—	—	—	—
50-24769	MD50-06-64692	39	0.88	—	4.8	1	—	—	—	—	—	—	—	—	0.91	—
50-24769	MD50-06-64691	99	—	—	330	—	—	—	—	—	—	—	—	—	—	—
50-24769	MD50-06-64690	124	—	—	240	—	—	—	—	—	—	—	—	—	—	—
50-24769	MD50-06-64689	149	—	—	420	—	—	—	—	—	—	—	—	—	—	—
50-24770	MD50-06-64738	20	—	—	160	—	—	—	—	—	—	—	—	—	—	—
50-24770	MD50-06-64725	25	—	—	190	—	—	—	—	—	—	—	—	—	49	—
50-24770	MD50-06-64724	39	—	—	220	—	—	—	—	—	—	—	—	—	—	—
50-24770	MD50-06-64723	100	56	—	280	—	—	—	—	—	—	—	—	—	120	—
50-24770	MD50-06-64722	124	—	—	490	—	—	—	—	—	—	—	—	—	310	—
50-24770	MD50-06-64721	150	—	—	210	—	—	—	—	—	—	—	—	—	240	—
50-24771	MD50-06-64750	17	—	—	110	—	—	—	—	—	—	—	—	—	58	—
50-24771	MD50-06-64749	40	94	—	230	—	—	—	—	—	—	—	—	—	84	—
50-24771	MD50-06-64748	100	18	—	32	—	—	—	—	—	—	—	—	—	29	—

Table 6.6-1 (continued)

Location ID	Sample ID	Depth (ft)	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Dioxane[1,4-]	Ethanol	Ethylbenzene	Ethyltoluene[4-]	Hexane	Hexanone[2-]	Methanol	Methyl-2-pentanone[4-]	Methylene Chloride	n-Heptane
50-24771	MD50-06-64747	125	180	—	330	120	—	—	—	—	—	—	—	—	320	—
50-24771	MD50-06-64746	150	270	—	680	—	—	—	—	—	—	—	—	—	1200	—
50-24773	MD50-06-64775	20	—	—	110	—	—	—	—	—	—	—	—	—	110	—
50-24773	MD50-06-64774	40	75	—	160	—	—	—	—	—	—	—	—	—	100	—
50-24773	MD50-06-64773	100	120	—	210	—	—	—	—	—	—	—	—	—	270	—
50-24773	MD50-06-64776	125	200	—	430	160	—	—	—	—	—	—	—	—	700	—
50-24773	MD50-06-64772	150	260	—	520	—	—	—	—	—	—	—	—	—	1100	—
50-24782	MD50-06-64803	20	—	—	62	—	—	—	—	—	—	—	—	—	58	—
50-24782	MD50-06-64804	40	35	—	110	50	—	—	—	—	—	—	—	—	56	—
50-24782	MD50-06-64805	100	54	—	110	58	—	—	—	—	—	—	—	—	130	—
50-24782	MD50-06-64806	125	86	—	260	110	—	—	—	—	—	—	—	—	450	—
50-24782	MD50-06-64807	155	—	—	40	42	—	—	—	—	—	—	—	—	52	—
50-24783	MD50-06-64832	20	120	—	250	130	—	—	—	—	—	—	—	—	930	—
50-24783	MD50-06-64831	36	—	—	25	38	—	—	—	—	—	—	—	—	—	—
50-24783	MD50-06-64830	100	—	—	23	23	—	—	—	—	—	—	—	—	49	—
50-24783	MD50-06-64829	125	58	—	130	150	—	—	—	—	—	—	—	—	170	—
50-24783	MD50-06-64828	151	—	—	190	170	—	—	—	—	—	—	—	—	470	—
50-24784	MD50-06-64374	10	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24784	MD50-06-64373	20	—	—	—	—	—	—	0.96	—	—	—	—	—	—	—
50-24784	MD50-06-64372	47	—	—	—	31	—	—	—	—	—	—	—	—	11	—
50-24784	MD50-06-64371	49	—	—	—	36	—	—	—	—	—	—	—	—	11	—
50-24784	MD50-06-64370	55	4.9	—	8.5	39	—	—	7.7	—	—	—	—	—	11	—
50-24784	MD50-06-64375	100	3.5	—	4.8	22	—	—	—	—	—	—	—	—	6.9	—
50-24784	MD50-06-64379	168	—	—	12	28	—	—	—	—	—	—	—	—	18	—

Table 6.6-1 (continued)

Location ID	Sample ID	Depth (ft)	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Dioxane[1,4-]	Ethanol	Ethylbenzene	Ethyltoluene[4-]	Hexane	Hexanone[2-]	Methanol	Methyl-2-pentanone[4-]	Methylene Chloride	n-Heptane
50-24784	MD50-06-64378	199	1.5	—	6	22 (J)	—	—	8.7	2	—	1.8 (J)	—	—	9.5	—
50-24784	MD50-06-64377	250	—	—	9.1	20 (J)	—	—	9.7	—	—	—	—	—	19	—
50-24784	MD50-06-64376	268	—	—	—	—	—	—	—	—	—	—	—	—	37	—
50-24785	MD50-06-64402	10	—	—	—	—	—	—	7.2	12	49	—	—	—	—	15
50-24785	MD50-06-64403	19	5.6	—	—	7.8	—	—	19	15	4.8	—	—	—	—	13
50-24785	MD50-06-64408	60	44	—	—	110	—	—	—	—	—	—	—	—	—	—
50-24785	MD50-06-64407	120	38	—	19	150	—	—	—	—	—	—	—	—	24	—
50-24785	MD50-06-64404	200	—	—	35	160	—	—	—	—	—	—	—	—	49	—
50-24785	MD50-06-64405	250	—	—	—	86	—	—	—	—	—	—	—	—	49	—
50-24785	MD50-06-64406	275	—	—	—	6.9 (J)	—	—	—	—	—	—	—	—	7	—
50-24796	MD50-06-64448	10	—	—	—	—	—	—	2	2 (J)	—	3 (J)	—	—	—	—
50-24796	MD50-06-64447	20	—	—	2	21	—	—	5	—	—	1.7 (J)	—	—	0.8	—
50-24796	MD50-06-64449	40	—	—	9.1	110	—	—	—	—	—	—	—	—	—	—
50-24796	MD50-06-64450	100	—	—	63	420	—	—	—	—	—	—	—	—	71 (J)	—
50-24796	MD50-06-64451	120	2.5	0.91	2.4	19	—	—	—	—	—	—	—	—	2.9	—
50-24796	MD50-06-64452	150	25	15	37	280	—	—	—	—	—	—	—	—	49	—
50-24797	MD50-06-64496	18.3	—	—	2.5	18	—	—	3 (J)	19 (J)	—	—	—	—	—	—
50-24797	MD50-06-64497	38	—	—	14	99	—	—	—	—	—	—	—	—	—	—
50-24797	MD50-06-66198	60	—	—	24	160	—	—	—	—	—	—	—	—	—	—
50-24797	MD50-06-64498	120	—	—	38 (J+)	200	—	—	—	—	—	—	—	—	35	—
50-24797	MD50-06-64500	160	—	65	94 (J+)	460	—	—	—	—	—	—	—	—	120	—
50-24799	MD50-06-66197	15	—	—	8	24 (J)	—	—	—	—	—	—	—	—	4	—
50-24799	MD50-06-64521	17.5	—	—	—	—	—	—	1.7 (J)	—	—	—	—	—	—	—
50-24799	MD50-06-64522	20	—	—	—	—	—	—	2.8 (J)	2.7 (J)	—	2.1 (J)	—	—	—	—

Table 6.6-1 (continued)

Location ID	Sample ID	Depth (ft)	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Dioxane[1,4-]	Ethanol	Ethylbenzene	Ethyltoluene[4-]	Hexane	Hexanone[2-]	Methanol	Methyl-2-pentanone[4-]	Methylene Chloride	n-Heptane
50-24799	MD50-06-64523	32.5	—	—	5.7	17	—	—	11 (J)	—	—	11 (J)	—	—	—	—
50-24799	MD50-06-64538	37.5	—	—	8.9	26	—	—	7.5 (J)	—	—	18 (J)	—	—	—	—
50-24799	MD50-06-64524	40.5	—	—	—	—	—	7.2	—	—	12	—	130	7.6	—	11
50-24799	MD50-06-64525	100	—	—	—	—	2300	—	—	—	—	—	—	—	—	—
50-24799	MD50-06-64526	120	4.9	—	8.7 (J+)	16	980	—	—	—	—	—	—	—	11	—
50-24799	MD50-06-64527	160	42	—	100 (J+)	230	—	—	—	—	—	—	—	—	220	—
50-24801	MD50-06-64853	20	—	—	—	9.5 (J)	—	—	—	—	—	—	—	—	—	—
50-24801	MD50-06-64870	35	—	—	11	24 (J)	—	—	—	—	—	—	—	—	—	—
50-24801	MD50-06-64856	80	51	—	120	210	—	—	—	—	—	—	—	—	170	—
50-24801	MD50-06-64855	120	16	—	41	71	—	—	—	—	—	—	—	—	32	—
50-24801	MD50-06-64854	150	17	—	24	42 (J)	—	—	—	—	—	—	—	—	65	—
50-24802	MD50-06-64878	15	—	—	48	55	—	—	—	—	—	—	—	—	73	—
50-24802	MD50-06-64879	42	—	—	97	110	—	—	—	—	—	—	—	—	140	—
50-24802	MD50-06-64880	99.4	—	—	59	60	—	—	—	—	—	—	—	—	79	—
50-24802	MD50-06-64881	124.4	41	—	88	75	—	—	—	—	—	—	—	—	260	—
50-24802	MD50-06-64882	156.4	—	—	67	81	—	—	—	—	—	—	—	—	150	—
50-24803	MD50-06-64904	16	—	—	4.2	3.6	—	—	4.3	—	—	—	—	—	2.6	—
50-24803	MD50-06-64903	37	5.3	—	14	13	—	—	3.2	—	—	—	—	—	5.7	—
50-24803	MD50-06-64905	99.5	15	—	41	21	—	—	—	—	—	—	—	—	55	—
50-24803	MD50-06-64906	124	—	—	49	32	—	—	—	—	—	—	—	—	97	—
50-24803	MD50-06-64907	151	—	—	25	18	—	—	—	—	—	—	—	—	91	—
50-24804	MD50-06-64970	10	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24804	MD50-06-64971	16	—	—	22	—	—	—	—	—	—	—	—	—	16	—
50-24804	MD50-06-64972	33	—	—	28	23	—	—	—	—	—	—	—	—	13	—

Table 6.6-1 (continued)

Location ID	Sample ID	Depth (ft)	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Dioxane[1,4-]	Ethanol	Ethylbenzene	Ethyltoluene[4-]	Hexane	Hexanone[2-]	Methanol	Methyl-2-pentanone[4-]	Methylene Chloride	n-Heptane
50-24804	MD50-06-64973	99	—	—	88	61	—	—	—	—	—	—	—	—	86	—
50-24804	MD50-06-64974	124	48	—	160	74	—	—	—	—	—	—	—	—	250	—
50-24804	MD50-06-64975	149	67	—	150	93	—	—	—	—	—	—	—	—	480	—
50-24810	MD50-06-64999	19	—	—	6.3	—	—	—	—	—	—	—	—	—	—	—
50-24810	MD50-06-64998	37	—	—	24	—	—	—	—	—	—	—	—	—	21	—
50-24810	MD50-06-64997	99	9	—	21	13	—	—	—	—	—	—	—	—	21	—
50-24810	MD50-06-64996	123	—	—	57	34	—	—	—	—	—	—	—	—	110	—
50-24810	MD50-06-64995	150	41	—	91	46	—	—	—	—	—	—	—	—	200	—
50-24811	MD50-06-65069	20	—	—	84	—	—	—	—	—	—	—	—	—	43	—
50-24811	MD50-06-65068	40	—	—	160	—	—	—	—	—	—	—	—	—	63	—
50-24811	MD50-06-65067	98	43	—	140	—	—	—	—	—	—	—	—	—	130	—
50-24811	MD50-06-65066	125	—	—	89	—	—	—	—	—	—	—	—	—	130	—
50-24811	MD50-06-65065	150	230	—	660	—	—	—	—	—	—	—	—	—	1800	—
50-24812	MD50-06-65094	10	—	—	270	—	—	—	—	—	—	—	—	—	180	—
50-24812	MD50-06-65093	35	—	—	66	—	—	—	—	—	—	—	—	—	41	—
50-24812	MD50-06-65092	98	88	—	330	—	—	—	—	—	—	—	—	—	270	—
50-24812	MD50-06-65091	123	80	—	310	—	—	—	—	—	—	—	—	—	310	—
50-24812	MD50-06-65090	150	140	—	840	—	—	—	—	—	—	—	—	—	1900	—
50-24813	MD50-06-65126	20	—	—	76	—	—	—	—	—	—	—	—	—	32	—
50-24813	MD50-06-65125	30	—	—	170	—	—	—	—	—	—	—	—	—	40	—
50-24813	MD50-06-65124	99	—	—	240	—	—	—	—	—	—	—	—	—	110	—
50-24813	MD50-06-65123	125	57	—	470	—	—	—	—	—	—	—	—	—	220	—
50-24813	MD50-06-65122	150	120	—	820	—	—	—	—	—	—	—	—	—	960	—
50-24814	MD50-06-65151	10	—	—	38	—	—	—	—	—	—	—	—	—	17	—

Table 6.6-1 (continued)

Location ID	Sample ID	Depth (ft)	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Dioxane[1,4-]	Ethanol	Ethylbenzene	Ethyltoluene[4-]	Hexane	Hexanone[2-]	Methanol	Methyl-2-pentanone[4-]	Methylene Chloride	n-Heptane
50-24814	MD50-06-65150	30	—	—	32	—	—	—	—	—	—	—	—	—	11	—
50-24814	MD50-06-65149	99	—	—	12	—	—	—	—	—	—	—	—	—	—	—
50-24814	MD50-06-65148	124	—	—	79	—	—	—	—	—	—	—	—	—	50	—
50-24814	MD50-06-65147	149	—	—	77	—	—	—	—	—	—	—	—	—	110	—
50-24815	MD50-06-65183	30	—	—	17	—	—	—	—	—	—	—	—	—	—	—
50-24815	MD50-06-65182	40	—	—	51	—	—	—	—	—	—	—	—	—	13	—
50-24815	MD50-06-65181	100	—	—	8.8	—	—	—	—	—	—	—	—	—	—	—
50-24815	MD50-06-65180	125	1.1	—	3.4	—	—	—	—	—	—	—	—	—	1	—
50-24815	MD50-06-65179	149	20	—	61	—	—	—	—	—	—	—	—	—	28	—
50-24816	MD50-06-65204	25	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24816	MD50-06-65205	35	—	—	—	—	—	—	—	—	4.3	—	—	—	—	—
50-24816	MD50-06-65209	65	—	—	—	140	—	—	—	—	—	—	—	—	—	—
50-24816	MD50-06-65206	120	—	—	—	55	—	—	—	—	—	—	—	—	—	—
50-24816	MD50-06-65208	200	—	—	17	63	—	—	—	—	—	—	—	—	23	—
50-24816	MD50-06-65207	225	—	—	—	88	—	—	—	—	—	—	—	—	31	—
50-24817	MD50-05-63841	20	—	—	—	—	—	—	4.2	4.6	6.9	—	—	—	—	—
50-24817	MD50-05-63842	40	—	8.8	—	18	—	—	3.9	—	7.2	—	—	—	—	3.6
50-24817	RE50-05-63816	100	—	73	39	280	—	—	33	22	170	—	—	—	30	66
50-24817	RE50-05-63817	140	—	78	62 (J+)	430	—	—	—	—	13	—	—	—	59	—
50-24817	RE50-05-63818	200	—	110	120 (J+)	860	—	—	—	—	100	—	—	—	130	37
50-24817	MD50-05-63843	250	—	88	110	630	—	—	—	—	—	—	—	—	110	—
50-24818	MD50-06-65232	10	—	—	—	—	—	—	2.8	3	—	—	—	—	—	—
50-24818	MD50-06-65233	25	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24818	MD50-06-65234	100	—	—	200	—	—	—	—	—	—	—	—	—	92	—

Table 6.6-1 (continued)

Location ID	Sample ID	Depth (ft)	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Dioxane[1,4-]	Ethanol	Ethylbenzene	Ethyltoluene[4-]	Hexane	Hexanone[2-]	Methanol	Methyl-2-pentanone[4-]	Methylene Chloride	n-Heptane
50-24818	MD50-06-65235	150	—	—	340	—	—	—	—	—	—	—	—	—	270	—
50-24818	MD50-06-65236	190	—	—	90	—	—	—	—	—	—	—	—	—	240	—
50-24818	MD50-06-65237	250	—	—	270	—	—	—	—	—	—	—	—	—	760	—
50-24818	MD50-06-65238	280	—	—	220	—	—	—	—	—	—	—	—	—	760	—
50-24818	MD50-06-65239	315	—	—	120	—	—	—	—	—	—	—	—	—	370	—
50-24818	MD50-06-65240	414	—	—	—	—	—	—	—	—	—	—	—	9.2	3.9	—
50-24818	MD50-06-65242	452	—	—	—	—	—	—	—	—	—	—	—	11	4.8	—
50-24818	MD50-06-65245	500	—	—	—	—	—	—	—	—	—	4.9	—	26	1.5	—
50-24818	MD50-06-65244	548	—	—	—	—	—	—	—	—	—	—	—	8.6	—	—
50-24818	MD50-06-65243	591	—	—	—	—	—	—	—	—	—	—	—	8.1	—	—
50-24819	RE50-05-61430	20	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24819	RE50-05-61431	50	—	—	5	14	—	—	—	—	—	—	—	—	—	—
50-24819	RE50-05-61432	100	6.4	—	14	56	—	—	—	—	5.4	—	—	—	20	—
50-24819	RE50-05-61732	138.5–140	14	12	38	140	—	—	—	—	—	—	—	—	67	—
50-24819	RE50-05-61733	200	—	—	47	160	—	—	—	—	—	—	—	—	120	—
50-24819	RE50-05-61734	250	—	—	55	140	—	—	—	—	—	—	—	—	160	—
50-24819	RE50-05-61735	275	—	—	43	110	—	—	—	—	—	—	—	—	160	—
50-24820	RE50-05-61446	20	—	—	11	—	—	—	—	8.6 (J-)	—	—	—	—	—	—
50-24820	RE50-05-61449	50	—	—	29	—	—	—	—	—	9.9	—	—	—	16	—
50-24820	RE50-05-61447	100	11	—	32	—	—	—	7.7	—	15	—	—	—	43	6.6
50-24820	RE50-05-61448	140	34	—	120	—	—	—	—	—	45	—	—	—	200	—
50-24820	RE50-05-61450	200	—	—	220	—	—	—	—	—	—	—	—	—	790	—
50-24820	RE50-05-61736	250	—	—	260	—	—	—	—	—	—	—	—	—	1100	—
50-24821	RE50-05-61464	20	—	—	9.2	—	—	—	—	—	3.1	—	—	—	—	—

Table 6.6-1 (continued)

Location ID	Sample ID	Depth (ft)	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Dioxane[1,4-]	Ethanol	Ethylbenzene	Ethyltoluene[4-]	Hexane	Hexanone[2-]	Methanol	Methyl-2-pentanone[4-]	Methylene Chloride	n-Heptane
50-24821	RE50-05-61466	50	—	—	72	—	—	—	20	—	50	—	—	—	—	20
50-24821	RE50-05-61465	98.4–100	—	—	97	—	—	—	—	—	26	—	—	—	64 (J+)	—
50-24821	RE50-05-61469	137.5–140	—	—	91	—	—	—	—	—	44	—	—	—	100	—
50-24821	RE50-05-61473	160	—	—	210 (J+)	—	—	—	—	—	60	—	—	—	390	86
50-24821	RE50-05-61468	248.6–250	—	—	180	—	—	—	—	—	120	—	—	—	610	—
50-24822	RE50-05-61482	20	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24822	RE50-05-61483	50	—	—	63	—	—	—	—	—	—	—	—	—	34 (J+)	—
50-24822	RE50-05-61484	100	—	—	—	—	—	—	5	10	3.6	—	—	—	—	—
50-24822	RE50-05-61485	140	—	—	87	—	—	—	—	—	—	—	—	—	80	—
50-24822	RE50-05-61486	200	—	—	48	—	—	—	—	18	—	—	—	—	100	—
50-24822	RE50-05-61737	250	—	—	45	—	—	—	—	—	—	—	—	—	120	—
50-25451	MD50-06-66691	19	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-25451	MD50-06-66690	49	—	—	—	—	—	—	—	—	—	—	—	—	8.1	—
50-25451	MD50-06-66689	100	—	—	6.6	—	—	—	—	—	—	—	—	—	8.9	—
50-25451	MD50-06-66688	147	—	—	5.7	—	—	—	—	—	—	—	—	—	9.8	—
50-25451	MD50-06-66687	200	—	—	19	—	—	—	—	—	—	—	—	—	48	—
50-25451	MD50-06-66686	251	—	—	33	—	—	—	—	—	—	—	—	—	82	—
50-25451	MD50-06-66685	287	—	—	—	—	—	—	—	—	—	—	—	—	72	—

Table 6.6-1 (continued)

Location ID	Sample ID	Depth (ft)	Propylene	Styrene	Tetrachloroethene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene (Total)	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
50-09100	MD50-06-70880	20	—	—	210	—	500	77	—	4100	—	—	—	—	—	—
50-09100	MD50-06-70881	50	—	—	77	—	87	21	—	1800	—	—	—	1100	—	—
50-09100	MD50-06-70882	90	—	—	200	—	390	79	—	4400	—	—	—	—	—	—
50-09100	MD50-06-70883	103	—	—	600	—	1100	190	—	14000	—	—	—	—	—	—
50-09100	MD50-06-70884	120	—	—	730	—	1300	160	—	17000	—	—	—	—	—	—
50-09100	MD50-06-70885	160	—	—	730	—	960	—	—	19000	—	—	—	—	—	—
50-09100	MD50-06-70886	200	—	—	990	—	1600	250	—	29000	64	—	—	—	—	—
50-09100	MD50-06-70887	233	—	—	300	—	370	—	—	8800	—	—	—	—	—	—
50-09100	MD50-06-70888	260	—	—	240	—	280	—	—	7900	—	—	—	—	—	—
50-10131	MD50-06-70868	25	—	—	8300	—	170	89	—	6600	—	—	—	—	—	—
50-10131	MD50-06-70869	50	—	—	6000	—	210	87	—	5700	—	—	—	—	—	—
50-10131	MD50-06-70870	75	—	—	6000	—	220	90	—	5500	—	—	—	—	—	—
50-10131	MD50-06-70871	100	—	—	5400	85	160	51	—	4700	—	—	—	—	—	—
50-10131	MD50-06-70872	125	—	—	3800	130	270	70	—	3900	—	—	—	—	—	—
50-10131	MD50-06-70873	150	—	—	2700	—	130	36	—	2700	—	—	—	—	—	—
50-10131	MD50-06-70874	175	—	—	5400	80	270	83	—	5700	—	—	—	—	—	—
50-10131	MD50-06-70875	200	—	—	4800	24	190	57	—	5500	—	—	—	—	—	—
50-10131	MD50-06-70876	225	—	—	6700	—	220	83	—	6100	—	—	—	—	—	—
50-10131	MD50-06-70877	250	—	—	7500	—	180	70	—	7200	—	—	—	—	—	—
50-24766	MD50-06-64597	17	—	—	1200	—	70	28	—	1100	—	—	—	—	—	—
50-24766	MD50-06-64596	29	—	—	1500	—	140	42	—	1900	36	—	—	—	—	—
50-24766	MD50-06-64595	99	—	—	3000	—	86	62	—	5400	—	—	—	—	—	—
50-24766	MD50-06-64594	124	—	—	350	—	43	24	—	1300	—	—	—	—	—	—
50-24766	MD50-06-64593	149	—	—	580	—	130	59	—	3100	—	—	—	—	—	—

Table 6.6-1 (continued)

Location ID	Sample ID	Depth (ft)	Propylene	Styrene	Tetrachloroethene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene (Total)	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
50-24767	MD50-06-64625	10	—	—	140	29	390	62	—	1900	—	—	—	19	—	—
50-24767	MD50-06-64626	30	—	—	100	59	260	51	—	1500	—	—	—	53	13	—
50-24767	MD50-06-64627	60	—	—	26	8.4	72	18	—	490	—	—	—	13	3.3	—
50-24767	MD50-06-64628	124	—	—	55	26	450	64	—	1400	—	—	—	—	—	—
50-24767	MD50-06-64629	149	—	—	140	55	730	120	—	4300	—	30	—	63	—	—
50-24768	MD50-06-64661	14	—	—	46	—	150	38	—	930	—	—	—	11	—	—
50-24768	MD50-06-64660	29	—	—	27	4	59	16	—	480	—	—	—	—	—	11
50-24768	MD50-06-64659	99	—	—	490	—	2500	410	—	13000	—	—	—	—	—	—
50-24768	MD50-06-64658	125	—	—	260	—	2900	440	—	14000	—	—	—	—	—	—
50-24768	MD50-06-64657	150	—	—	210	—	2600	380	—	13000	—	—	—	—	—	—
50-24769	MD50-06-64693	20	—	—	19	—	9.1	1.8	1.5	320	5.1	—	—	—	—	—
50-24769	MD50-06-64692	39	—	—	19	—	7.1	1.7	3.6	460	4.4	—	—	—	—	—
50-24769	MD50-06-64691	99	—	—	1300	—	840	—	—	31000	—	—	—	—	—	—
50-24769	MD50-06-64690	124	—	—	600	—	360	—	—	18000	—	—	—	—	—	—
50-24769	MD50-06-64689	149	—	—	1100	—	940	—	—	43000	—	—	—	—	—	—
50-24770	MD50-06-64738	20	—	—	24000	—	500	—	—	15000	—	—	—	—	—	—
50-24770	MD50-06-64725	25	—	—	19000	—	540	—	—	16000	—	—	—	—	—	—
50-24770	MD50-06-64724	39	—	—	14000	—	570	120	—	19000	—	—	—	—	—	—
50-24770	MD50-06-64723	100	—	—	2600	—	450	100	75	16000	—	—	—	—	—	—
50-24770	MD50-06-64722	124	—	—	3800	—	870	190	—	37000	—	—	—	—	—	—
50-24770	MD50-06-64721	150	—	—	890	—	310	—	—	16000	—	—	—	—	—	—
50-24771	MD50-06-64750	17	—	—	840	—	260	—	—	11000	—	—	—	—	—	—
50-24771	MD50-06-64749	40	—	—	1100	—	420	—	—	16000	—	—	—	—	—	—
50-24771	MD50-06-64748	100	—	—	80	—	—	—	—	1900	—	—	—	—	—	—

Table 6.6-1 (continued)

Location ID	Sample ID	Depth (ft)	Propylene	Styrene	Tetrachloroethene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene (Total)	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
50-24771	MD50-06-64747	125	—	—	1000	—	—	—	—	21000	—	—	—	—	—	—
50-24771	MD50-06-64746	150	—	—	1800	—	—	—	—	50000	—	—	—	—	—	—
50-24773	MD50-06-64775	20	—	—	470	—	190	—	—	6500	—	—	—	—	—	—
50-24773	MD50-06-64774	40	—	—	840	—	250	—	—	12000	—	—	—	—	—	—
50-24773	MD50-06-64773	100	—	—	880	—	270	—	—	15000	—	—	—	—	—	—
50-24773	MD50-06-64776	125	—	—	1700	—	510	—	—	29000	—	—	—	—	—	—
50-24773	MD50-06-64772	150	—	—	2100	—	380	—	—	43000	—	—	—	—	—	—
50-24782	MD50-06-64803	20	—	—	770	—	100	—	—	5000	—	—	—	—	—	—
50-24782	MD50-06-64804	40	—	—	1200	—	180	49	—	7100	—	—	—	—	—	—
50-24782	MD50-06-64805	100	—	—	840	—	130	—	—	8400	—	—	—	—	—	—
50-24782	MD50-06-64806	125	—	—	1300	—	350	—	—	16000	—	—	—	—	—	—
50-24782	MD50-06-64807	155	—	—	460	40	66	35	—	3800	—	—	—	36	—	—
50-24783	MD50-06-64832	20	—	—	1500	—	—	—	—	23000	—	—	—	—	—	—
50-24783	MD50-06-64831	36	—	—	450	—	54	33	—	3100	—	—	—	—	—	—
50-24783	MD50-06-64830	100	—	—	270	—	46	—	—	2700	—	—	—	—	—	—
50-24783	MD50-06-64829	125	—	—	1300	—	180	73	—	14000	—	—	—	—	—	—
50-24783	MD50-06-64828	151	—	—	1600	—	190	—	—	19000	—	—	—	—	—	—
50-24784	MD50-06-64374	10	—	—	1100	—	40	120	—	520	—	—	—	—	—	—
50-24784	MD50-06-64373	20	—	—	190	—	6.9	19	—	77	2.4	—	—	4.9	0.91	—
50-24784	MD50-06-64372	47	—	—	1600	—	78	56	—	2300	—	—	—	—	—	—
50-24784	MD50-06-64371	49	—	—	1700	12	77	57	—	2200	—	—	—	—	—	—
50-24784	MD50-06-64370	55	—	—	1700	28	72	64	—	1500	13	—	—	37	8.9	—
50-24784	MD50-06-64375	100	—	—	680	10	43	28	—	1000	—	—	—	16	3.8	—
50-24784	MD50-06-64379	168	—	—	1400	—	65	40	—	2700	—	—	—	—	—	—

Table 6.6-1 (continued)

Location ID	Sample ID	Depth (ft)	Propylene	Styrene	Tetrachloroethene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene (Total)	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
50-24784	MD50-06-64378	199	—	—	370	33	12	17	—	760	5	—	—	27	5.4	—
50-24784	MD50-06-64377	250	—	—	850	34	29	24	—	2100	—	—	—	53	12	—
50-24784	MD50-06-64376	268	—	—	1900	—	76	40	—	3900	—	—	—	—	—	—
50-24785	MD50-06-64402	10	—	—	270	54	—	—	—	140	—	14	4.5	—	10	24
50-24785	MD50-06-64403	19	—	—	1200	120	10	13	—	610	—	15	4.5	—	20	59
50-24785	MD50-06-64408	60	—	—	7900	—	140	120	—	4900	—	—	—	—	—	—
50-24785	MD50-06-64407	120	—	—	4900	—	160	85	—	4900	—	—	—	—	—	—
50-24785	MD50-06-64404	200	—	—	5400	—	190	92	—	7600	—	—	—	—	—	—
50-24785	MD50-06-64405	250	—	—	4600	—	130	79	—	7700	—	—	—	—	—	—
50-24785	MD50-06-64406	275	—	—	130	260	—	—	—	330	—	—	—	—	—	—
50-24796	MD50-06-64448	10	—	—	180	12	—	—	—	19	—	2.1	—	4.8	1.6	—
50-24796	MD50-06-64447	20	—	2.2	300	27	19	7.9	—	420	5.4	—	—	11	3.7	—
50-24796	MD50-06-64449	40	—	—	1200	15	110	37	—	2000	25	—	—	—	—	—
50-24796	MD50-06-64450	100	—	—	3000	—	900	180	—	6000	84	—	—	—	—	—
50-24796	MD50-06-64451	120	—	—	110	5.9	13	5.3	—	270	3.9	—	—	2.7	—	—
50-24796	MD50-06-64452	150	—	—	1200	25	320	100	—	2200	—	—	—	—	—	—
50-24797	MD50-06-64496	18.3	—	—	300	34	56	20	—	550	66	29	10	26 (J)	9.6 (J)	—
50-24797	MD50-06-64497	38	—	—	1000	—	160	57	—	2400	130	—	—	—	—	—
50-24797	MD50-06-66198	60	—	—	920	—	190	66	—	3000	58	—	—	—	—	—
50-24797	MD50-06-64498	120	—	—	780	—	180	66	—	3200	35	—	—	—	—	—
50-24797	MD50-06-64500	160	—	—	2300	—	700	490	—	9600	87	—	—	—	—	—
50-24799	MD50-06-66197	15	—	—	590	—	20	11	—	920	—	—	—	13	5.4	—
50-24799	MD50-06-64521	17.5	—	—	83	8.2	—	—	—	46	—	2.2	—	6.3 (J)	2.2 (J)	—
50-24799	MD50-06-64522	20	—	—	98	15	—	—	—	62	—	2.9	—	10 (J)	2.9 (J)	—

Table 6.6-1 (continued)

Location ID	Sample ID	Depth (ft)	Propylene	Styrene	Tetrachloroethene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene (Total)	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
50-24799	MD50-06-64523	32.5	—	—	1600	54	26	14	—	1100	—	—	—	26 (J)	—	—
50-24799	MD50-06-64538	37.5	—	—	1800	34	30	19	—	1300	—	—	—	—	—	—
50-24799	MD50-06-64524	40.5	—	—	1100	15	18	12	—	960	—	—	—	—	—	6.1
50-24799	MD50-06-64525	100	—	—	43	10	—	—	—	95	—	—	—	—	—	—
50-24799	MD50-06-64526	120	13	—	80	5.7	8.3	4.8	—	450	—	—	—	—	—	—
50-24799	MD50-06-64527	160	210	—	1000	20	140	72	—	7600	—	—	—	—	—	—
50-24801	MD50-06-64853	20	—	—	250	—	—	30	—	910	—	—	—	—	—	—
50-24801	MD50-06-64870	35	—	—	440	—	—	49	—	1900	—	—	—	—	—	—
50-24801	MD50-06-64856	80	—	—	1700	—	270	93	—	14000	—	—	—	—	—	—
50-24801	MD50-06-64855	120	—	—	600	32	66	34	—	3800	12	—	—	—	—	—
50-24801	MD50-06-64854	150	—	—	160	32	—	—	—	1900	—	—	—	—	—	—
50-24802	MD50-06-64878	15	—	—	600	—	81	—	—	5500	—	—	—	—	—	—
50-24802	MD50-06-64879	42	—	—	1200	—	170	—	—	11000	—	—	—	—	—	—
50-24802	MD50-06-64880	99.4	—	—	560	—	73	—	—	5400	—	—	—	—	—	—
50-24802	MD50-06-64881	124.4	—	—	760	—	110	—	—	9400	—	—	—	—	—	—
50-24802	MD50-06-64882	156.4	—	—	770	—	130	—	—	8600	—	—	—	—	—	—
50-24803	MD50-06-64904	16	—	—	56	5.2	—	3.2	—	570	—	—	—	23	5.6	—
50-24803	MD50-06-64903	37	—	—	120	11	13	6.9	6	1100	3.5	—	—	15	3.6	—
50-24803	MD50-06-64905	99.5	—	—	160	—	26	—	—	2100	—	—	—	20	20	—
50-24803	MD50-06-64906	124	—	—	350	—	57	—	—	4600	—	—	—	33	33	—
50-24803	MD50-06-64907	151	—	—	190	—	—	—	—	2700	—	—	—	—	—	—
50-24804	MD50-06-64970	10	—	—	44	6.5	16	—	—	500	18	—	—	—	—	—
50-24804	MD50-06-64971	16	—	—	320	—	53	—	—	3300	—	—	—	—	—	—
50-24804	MD50-06-64972	33	—	—	270	—	—	—	—	4000	—	—	—	—	—	—

Table 6.6-1 (continued)

Location ID	Sample ID	Depth (ft)	Propylene	Styrene	Tetrachloroethene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene (Total)	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
50-24804	MD50-06-64973	99	—	—	600	—	81	—	—	7500	—	—	—	—	—	—
50-24804	MD50-06-64974	124	—	—	840	—	160	—	—	11000	—	—	—	—	—	—
50-24804	MD50-06-64975	149	—	—	1200	—	130	—	—	16000	—	—	—	—	—	—
50-24810	MD50-06-64999	19	—	—	92	8.5	—	—	—	1200	—	—	—	18	—	—
50-24810	MD50-06-64998	37	—	—	150	—	24	—	—	1700	—	—	—	55	17	—
50-24810	MD50-06-64997	99	—	—	120	37	—	—	—	1900	—	—	—	—	—	—
50-24810	MD50-06-64996	123	—	—	480	—	68	—	—	6200	—	—	—	—	—	—
50-24810	MD50-06-64995	150	—	—	550	—	74	—	—	8100	—	—	—	—	—	—
50-24811	MD50-06-65069	20	—	—	730	—	—	—	—	6100	—	—	—	—	—	—
50-24811	MD50-06-65068	40	—	—	750	—	—	—	—	10000	—	—	—	—	—	—
50-24811	MD50-06-65067	98	—	—	290	—	—	—	—	6300	—	—	—	—	—	—
50-24811	MD50-06-65066	125	—	—	340	—	—	—	—	7300	—	—	—	—	—	—
50-24811	MD50-06-65065	150	—	—	1400	—	—	—	—	36000	—	—	—	—	—	—
50-24812	MD50-06-65094	10	—	—	1100	—	—	—	—	23000	—	—	—	—	—	—
50-24812	MD50-06-65093	35	—	—	380	—	—	—	—	4600	—	—	—	—	—	—
50-24812	MD50-06-65092	98	—	—	810	—	—	—	—	23000	—	—	—	—	—	—
50-24812	MD50-06-65091	123	—	—	570	—	—	—	92	13000	—	—	—	—	—	—
50-24812	MD50-06-65090	150	—	—	1100	—	—	—	—	51000	—	—	—	—	—	—
50-24813	MD50-06-65126	20	—	—	150	—	—	—	—	4800	—	—	—	—	—	—
50-24813	MD50-06-65125	30	—	—	310	—	—	—	—	11000	—	—	—	—	—	—
50-24813	MD50-06-65124	99	—	—	270	—	—	—	—	11000	—	—	—	—	—	—
50-24813	MD50-06-65123	125	—	—	520	—	—	—	100	26000	—	—	—	—	—	—
50-24813	MD50-06-65122	150	—	—	900	—	—	—	190	54000	—	—	—	—	—	—
50-24814	MD50-06-65151	10	—	—	57	—	—	—	—	3700	—	—	—	—	—	—

Table 6.6-1 (continued)

Location ID	Sample ID	Depth (ft)	Propylene	Styrene	Tetrachloroethene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene (Total)	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
50-24814	MD50-06-65150	30	—	—	84	32	—	—	—	2500	—	—	—	—	—	—
50-24814	MD50-06-65149	99	—	—	14	—	—	—	—	1300	—	—	—	—	—	—
50-24814	MD50-06-65148	124	—	—	93	—	—	—	—	6000	—	—	—	—	—	—
50-24814	MD50-06-65147	149	—	—	72	39	—	—	25	4800	—	—	—	—	—	—
50-24815	MD50-06-65183	30	—	—	24	—	—	—	16	1600	—	—	—	—	—	—
50-24815	MD50-06-65182	40	—	—	41	—	25	—	12	1900	—	—	—	—	—	—
50-24815	MD50-06-65181	100	—	—	10	—	—	—	7.7	660	—	—	—	—	—	—
50-24815	MD50-06-65180	125	—	—	5.1	—	—	—	4.4	230	3	—	—	—	—	—
50-24815	MD50-06-65179	149	—	—	67	—	—	—	69	3700	—	—	—	—	—	—
50-24816	MD50-06-65204	25	—	—	26	6.1	—	—	—	18	—	—	—	—	—	3.8
50-24816	MD50-06-65205	35	—	—	62	11	—	—	—	47	—	—	—	—	—	4.6
50-24816	MD50-06-65209	65	—	—	3800	—	220	98	—	4700	—	—	—	—	—	—
50-24816	MD50-06-65206	120	—	—	860	—	46	28	—	1100	—	—	—	—	—	—
50-24816	MD50-06-65208	200	—	—	2000	—	110	45	—	3800	—	—	—	—	—	—
50-24816	MD50-06-65207	225	—	—	3900	—	170	75	—	6500	—	—	—	—	—	—
50-24817	MD50-05-63841	20	110	—	150	20	130	40	—	210	16	4.4	—	—	4.4	12
50-24817	MD50-05-63842	40	99	—	480	17	470	140	—	1000	39	—	—	—	6.7	8
50-24817	RE50-05-63816	100	—	17	1300	140	1400	390	—	4600	—	—	—	—	24	49
50-24817	RE50-05-63817	140	—	—	1700	54	1800	450	—	6700	68	—	—	—	—	33
50-24817	RE50-05-63818	200	—	—	2300	140	1900	530	—	9900	—	—	—	—	—	44
50-24817	MD50-05-63843	250	—	—	2400	41	1200	390	—	9800	62	—	—	—	—	—
50-24818	MD50-06-65232	10	—	—	11	17	11	2.2	—	81	—	3.4	—	12	3.3	—
50-24818	MD50-06-65233	25	—	—	260	360	230	51	—	3000	—	—	—	—	—	—
50-24818	MD50-06-65234	100	—	—	2000	—	2200	440	—	27000	—	—	—	—	—	—

Table 6.6-1 (continued)

Location ID	Sample ID	Depth (ft)	Propylene	Styrene	Tetrachloroethene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene (Total)	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
50-24818	MD50-06-65235	150	—	—	2100	750	1500	310	—	37000	—	—	—	—	—	—
50-24818	MD50-06-65236	190	—	—	280	530	79	—	—	7600	—	—	—	—	—	—
50-24818	MD50-06-65237	250	—	—	1700	490	640	—	—	37000	—	—	—	—	—	—
50-24818	MD50-06-65238	280	—	—	1600	190	410	—	—	36000	—	—	—	—	—	—
50-24818	MD50-06-65239	315	—	—	1000	110	220	—	—	23000	—	—	—	—	—	—
50-24818	MD50-06-65240	414	—	—	4.9	3.8	—	—	—	170	—	2.3	2.3	6.9	1.6	—
50-24818	MD50-06-65242	452	—	—	25	—	—	—	—	840	—	—	—	—	—	—
50-24818	MD50-06-65245	500	—	—	51	5.3	—	—	—	470	—	—	—	16	3	—
50-24818	MD50-06-65244	548	—	—	18	3.1	—	—	—	210	—	—	—	5.6	—	—
50-24818	MD50-06-65243	591	—	—	32	—	—	—	—	360	—	—	—	—	—	—
50-24819	RE50-05-61430	20	12	—	210	—	17	8.2	—	420	—	—	—	—	—	—
50-24819	RE50-05-61431	50	27	—	450	5.8	42	20	—	1200	—	—	—	—	—	—
50-24819	RE50-05-61432	100	50	—	430	4.1	51	22	—	1600	6.1	—	—	—	—	—
50-24819	RE50-05-61732	138.5–140	—	—	1400	—	280	85	—	5100	19	—	—	—	—	—
50-24819	RE50-05-61733	200	66	—	1400	—	250	79	—	5900	22	—	—	—	—	—
50-24819	RE50-05-61734	250	52	—	1500	—	210	70	—	7800	—	—	—	—	—	—
50-24819	RE50-05-61735	275	89	—	1200	—	120	46	—	6400	—	—	—	—	—	—
50-24820	RE50-05-61446	20	31	—	91	21	—	—	—	2000	—	9.5	—	—	—	21
50-24820	RE50-05-61449	50	170	—	140	23	—	—	—	3400	—	—	—	—	—	14
50-24820	RE50-05-61447	100	280	—	68	23	—	—	11	2200	—	—	—	—	8.3	20
50-24820	RE50-05-61448	140	180	—	360	140	—	—	—	10000	—	—	—	—	—	76
50-24820	RE50-05-61450	200	160	—	780	82	—	—	—	25000	—	—	—	—	—	—
50-24820	RE50-05-61736	250	—	—	1100	—	—	—	—	35000	—	—	—	—	—	—
50-24821	RE50-05-61464	20	50	—	33	13	—	—	—	1600	—	—	—	—	—	6.8

Table 6.6-1 (continued)

Location ID	Sample ID	Depth (ft)	Propylene	Styrene	Tetrachloroethene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene (Total)	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
50-24821	RE50-05-61466	50	760	—	120	100	—	—	—	6600	—	—	—	—	16	32
50-24821	RE50-05-61465	98.4–100	250	—	120	27	—	—	—	7200	—	—	—	—	—	—
50-24821	RE50-05-61469	137.5–140	730	—	140	54	—	—	—	7600	—	—	—	—	—	—
50-24821	RE50-05-61473	160	—	—	350	—	—	—	—	21000	—	—	—	—	—	—
50-24821	RE50-05-61468	248.6–250	—	—	310	250	—	—	—	22000	—	—	—	—	—	160
50-24822	RE50-05-61482	20	17	—	18	—	—	—	—	1700	—	—	—	—	—	—
50-24822	RE50-05-61483	50	—	—	81	—	48	—	—	9100	—	—	—	—	—	—
50-24822	RE50-05-61484	100	14	—	—	19	—	—	—	680	—	10	—	—	7.3	20
50-24822	RE50-05-61485	140	—	—	100	31	58	200	—	13000	—	—	—	—	—	—
50-24822	RE50-05-61486	200	—	—	33	33	—	—	—	7100	—	21	—	—	—	31
50-24822	RE50-05-61737	250	—	—	29	—	—	—	—	7300	—	—	—	—	—	—
50-25451	MD50-06-66691	19	—	—	2.4	3.3	—	—	—	79	6	—	—	—	—	—
50-25451	MD50-06-66690	49	—	—	19	—	—	—	—	870	65	—	—	—	—	—
50-25451	MD50-06-66689	100	—	—	14	—	—	—	—	720	33	—	—	—	—	—
50-25451	MD50-06-66688	147	—	—	12	—	13	—	—	560	29	—	—	—	—	—
50-25451	MD50-06-66687	200	—	—	41	—	40	—	—	1900	68	—	—	—	—	—
50-25451	MD50-06-66686	251	—	—	130	—	—	—	—	6400	—	—	—	—	—	—
50-25451	MD50-06-66685	287	—	—	170	—	—	—	—	7300	—	—	—	—	—	—

Note: Units are $\mu\text{g}/\text{m}^3$.

*— = Not detected.

Table 6.6-2
Summary of Tritium Detected in Pore Gas at MDA C

Location ID	1 st Round Sample ID	Depth (ft)	Concentration (pCi/L)	2 nd Round Sample ID	Depth (ft)	Concentration (pCi/L)
50-09100	MD50-06-70880	20	85500	n.c. ^a	n.c.	n.c.
50-09100	MD50-06-70881	50	216000	n.c.	n.c.	n.c.
50-09100	MD50-06-70882	90	47200	n.c.	n.c.	n.c.
50-09100	MD50-06-70883	103	27300	n.c.	n.c.	n.c.
50-09100	MD50-06-70884	120	13440	n.c.	n.c.	n.c.
50-09100	MD50-06-70885	160	4820	n.c.	n.c.	n.c.
50-09100	MD50-06-70886	200	1870	n.c.	n.c.	n.c.
50-09100	MD50-06-70887	233	2200	n.c.	n.c.	n.c.
50-09100	MD50-06-70888	260	2120	n.c.	n.c.	n.c.
50-10131	MD50-06-70868	25	5160	n.c.	n.c.	n.c.
50-10131	MD50-06-70869	50	7150	n.c.	n.c.	n.c.
50-10131	MD50-06-70870	75	6440	n.c.	n.c.	n.c.
50-10131	MD50-06-70871	100	5950	n.c.	n.c.	n.c.
50-10131	MD50-06-70872	125	9050	n.c.	n.c.	n.c.
50-10131	MD50-06-70873	150	7260	n.c.	n.c.	n.c.
50-10131	MD50-06-70874	175	6990	n.c.	n.c.	n.c.
50-10131	MD50-06-70875	200	9280	n.c.	n.c.	n.c.
50-10131	MD50-06-70876	225	6060	n.c.	n.c.	n.c.
50-10131	MD50-06-70877	250	7840	n.c.	n.c.	n.c.
50-24766	MD50-06-64597	17	1700	MD50-06-65331	17	6050
50-24766	MD50-06-64596	29	2670	MD50-06-65330	29	5150
50-24766	MD50-06-64595	99	5700	MD50-06-65329	99	8060
50-24766	MD50-06-64594	124	5020	MD50-06-65328	124	10320
50-24766	MD50-06-64593	149	1380	MD50-06-65327	149	7020
50-24767	MD50-06-64625	10	500	MD50-06-65362	10	1590
50-24767	MD50-06-64626	30	700	MD50-06-65361	30	1180
50-24767	MD50-06-64627	60	2250	MD50-06-65360	60	2140
50-24767	MD50-06-64628	124	600	MD50-06-65359	124	670
50-24767	MD50-06-64629	149	340	MD50-06-65358	149	830
50-24768	MD50-06-64661	14	538	MD50-06-65370	14	1040
50-24768	MD50-06-64660	29	1290	MD50-06-65369	29	1000
50-24768	MD50-06-64659	99	1110	MD50-06-65368	99	368
50-24768	MD50-06-64658	125	950	MD50-06-65367	125	209
50-24768	MD50-06-64657	150	1230	MD50-06-65366	150	264
50-24769	MD50-06-64693	20	24800	MD50-06-65378	20	41900
50-24769	MD50-06-64692	39	122200	MD50-06-65377	39	152600
50-24769	MD50-06-64691	99	1728000	MD50-06-65376	99	2410000

Table 6.6-2 (continued)

Location ID	1 st Round Sample ID	Depth (ft)	Concentration (pCi/L)	2 nd Round Sample ID	Depth (ft)	Concentration (pCi/L)
50-24769	MD50-06-64690	124	107200	MD50-06-65375	124	80800
50-24769	MD50-06-64689	149	64400	MD50-06-65374	149	33500
50-24770	MD50-06-64738	20	197000	MD50-06-65387	20	233000
50-24770	MD50-06-64725	25	318000	MD50-06-65386	25	325000
50-24770	MD50-06-64724	39	296000	MD50-06-65385	39	371000
50-24770	MD50-06-64723	100	10200	MD50-06-65384	100	32700
50-24770	MD50-06-64722	124	13600	MD50-06-65383	124	18300
50-24770	MD50-06-64721	150	19400	MD50-06-65382	148	24100
50-24771	MD50-06-64750	17	22100	MD50-06-65394	17	19900
50-24771	MD50-06-64749	40	40000	MD50-06-65393	40	24300
50-24771	MD50-06-64748	100	22000	MD50-06-65392	100	32600
50-24771	MD50-06-64747	125	28000	MD50-06-65391	125	29000
50-24771	MD50-06-64746	150	32000	MD50-06-65390	149	25000
50-24773	MD50-06-64775	20	132800	MD50-06-65405	20	88300
50-24773	MD50-06-64774	40	169100	MD50-06-65404	40	229000
50-24773	MD50-06-64773	100	39100	MD50-06-65403	100	65300
50-24773	MD50-06-64776	125	46200	MD50-06-65402	125	38300
50-24773	MD50-06-64772	150	137900	MD50-06-65401	149	43300
50-24782	MD50-06-64803	20	1167000	MD50-06-65413	21	943000
50-24782	MD50-06-64804	40	1500000	MD50-06-65412	40	1097000
50-24782	MD50-06-64805	100	130000	MD50-06-65411	100	76100
50-24782	MD50-06-64806	125	160000	MD50-06-65410	125	89600
50-24782	MD50-06-64807	155	590000	MD50-06-65409	151	114200
50-24783	MD50-06-64832	20	1E+08	MD50-06-65421	20	9.25E+07
50-24783	MD50-06-64831	36	5.79E+07	MD50-06-65420	36	6.02E+07
50-24783	MD50-06-64830	100	3350000	MD50-06-65419	100	4630000
50-24783	MD50-06-64829	125	1810000	MD50-06-65418	125	2780000
50-24783	MD50-06-64828	151	887000	MD50-06-65417	148	446000
50-24784	MD50-06-64374	10	2180	MD50-06-70724	10	6420
50-24784	MD50-06-64373	20	2230	MD50-06-70723	20	7350
50-24784	MD50-06-64372	47	2410	MD50-06-70722	47	7630
50-24784	MD50-06-64371	49	2640	MD50-06-70721	49	5940
50-24784	MD50-06-64370	55	2180	MD50-06-65292	55	5460
50-24784	MD50-06-64375	100	913	MD50-06-65291	100	4620
50-24784	MD50-06-64379	168	1970	MD50-06-65290	168	7260
50-24784	MD50-06-64378	199	894	MD50-06-65289	199	6820
50-24784	MD50-06-64377	250	2290	MD50-06-65288	250	5890
50-24784	MD50-06-64376	268	3170	MD50-06-65287	265	7140

Table 6.6-2 (continued)

Location ID	1 st Round Sample ID	Depth (ft)	Concentration (pCi/L)	2 nd Round Sample ID	Depth (ft)	Concentration (pCi/L)
50-24785	MD50-06-64402	10	630	MD50-06-66783	10	6750
50-24785	MD50-06-64403	19	1200	MD50-06-65300	19	8780
50-24785	MD50-06-64408	60	3530	MD50-06-65299	60	10700
50-24785	MD50-06-64407	120	4830	MD50-06-65298	120	9210
50-24785	MD50-06-64404	200	4360	MD50-06-65297	200	7250
50-24785	MD50-06-64405	250	3270	MD50-06-65296	250	8170
50-24785	MD50-06-64406	275	— ^b	MD50-06-65295	256	9520
50-24796	MD50-06-64448	10	5620	MD50-06-65308	10	6590
50-24796	MD50-06-64447	20	4140	MD50-06-65307	20	3750
50-24796	MD50-06-64449	40	20035	MD50-06-65306	40	7190
50-24796	MD50-06-64450	100	31800	MD50-06-65305	100	6760
50-24796	MD50-06-64451	120	2910	MD50-06-65304	120	8710
50-24796	MD50-06-64452	150	10900	MD50-06-65303	144	9450
50-24797	MD50-06-64496	18.3	28400	MD50-06-65315	18.3	488000
50-24797	MD50-06-64497	38	3950000	MD50-06-65314	38	3150000
50-24797	MD50-06-66198	60	168000	MD50-06-65313	60	346000
50-24797	MD50-06-64498	120	46000	MD50-06-65312	120	17100
50-24797	MD50-06-64500	160	12200	MD50-06-65311	154	11920
50-24799	MD50-06-66197	15	29300	MD50-06-65323	20	14462.38
50-24799	MD50-06-64521	17.5	1150	MD50-06-65322	32.5	19147.83
50-24799	MD50-06-64522	20	2140	MD50-06-65321	100	549330.3
50-24799	MD50-06-64523	32.5	2050	MD50-06-65320	120	193000
50-24799	MD50-06-64538	37.5	2370	MD50-06-65319	160	7260
50-24799	MD50-06-64524	40.5	2550	n.c.	n.c.	n.c.
50-24799	MD50-06-64525	100	622000	n.c.	n.c.	n.c.
50-24799	MD50-06-64526	120	397000	n.c.	n.c.	n.c.
50-24799	MD50-06-64527	160	26900	n.c.	n.c.	n.c.
50-24801	MD50-06-64853	20	1640	MD50-06-65429	20	11500
50-24801	MD50-06-64870	35	3690	MD50-06-65428	35	16160
50-24801	MD50-06-64856	80	2410	MD50-06-65427	80	10460
50-24801	MD50-06-64855	120	4930	MD50-06-65426	120	9070
50-24801	MD50-06-64854	150	—	MD50-06-65425	150	10400
50-24802	MD50-06-64878	15	18800	MD50-06-65437	15	18000
50-24802	MD50-06-64879	42	7880	MD50-06-65436	42	20800
50-24802	MD50-06-64880	99.4	2280	MD50-06-65435	99	6060
50-24802	MD50-06-64881	124.4	2760	MD50-06-65434	124	7680
50-24802	MD50-06-64882	156.4	2250	MD50-06-65433	156	7990
50-24803	MD50-06-64904	16	920	MD50-06-65445	16	6170

Table 6.6-2 (continued)

Location ID	1 st Round Sample ID	Depth (ft)	Concentration (pCi/L)	2 nd Round Sample ID	Depth (ft)	Concentration (pCi/L)
50-24803	MD50-06-64903	37	910	MD50-06-65444	37	6800
50-24803	MD50-06-64905	99.5	890	MD50-06-65443	99.5	7790
50-24803	MD50-06-64906	124	2310	MD50-06-65442	124	5810
50-24803	MD50-06-64907	151	1840	MD50-06-65441	150	5890
50-24804	MD50-06-64970	10	450	MD50-06-65454	10	1053.526
50-24804	MD50-06-64971	16	1160	MD50-06-65453	16	1280
50-24804	MD50-06-64972	33	2390	MD50-06-65452	33	1630
50-24804	MD50-06-64973	99	1060	MD50-06-65451	99	1080
50-24804	MD50-06-64974	124	1250	MD50-06-65450	124	658
50-24804	MD50-06-64975	149	1970	MD50-06-65449	149	1310
50-24810	MD50-06-64999	19	4160	MD50-06-65461	19	1980
50-24810	MD50-06-64998	37	4450	MD50-06-65460	37	1160
50-24810	MD50-06-64997	99	26200	MD50-06-65459	99	2160
50-24810	MD50-06-64996	123	2970	MD50-06-65458	123	1340
50-24810	MD50-06-64995	150	4450	MD50-06-65457	150	1460
50-24811	MD50-06-65069	20	143000	MD50-06-65469	20	177000
50-24811	MD50-06-65068	40	233000	MD50-06-65468	40	295000
50-24811	MD50-06-65067	98	9430	MD50-06-65467	98	4560
50-24811	MD50-06-65066	125	8360	MD50-06-65466	125	2150
50-24811	MD50-06-65065	150	9990	MD50-06-65465	150	1670
50-24812	MD50-06-65094	10	186000	MD50-06-65477	10	91900
50-24812	MD50-06-65093	35	184000	MD50-06-65476	35	159300
50-24812	MD50-06-65092	98	211000	MD50-06-65474	98	323000
50-24812	MD50-06-65091	123	58200	MD50-06-65475	123	82500
50-24812	MD50-06-65090	150	14080	MD50-06-65473	150	5990
50-24813	MD50-06-65126	20	9730	MD50-06-65485	20	2590
50-24813	MD50-06-65125	30	8330	MD50-06-65484	30	3870
50-24813	MD50-06-65124	99	21400	MD50-06-65483	99	12270
50-24813	MD50-06-65123	125	32700	MD50-06-65482	125	28000
50-24813	MD50-06-65122	150	123700	MD50-06-65481	150	105000
50-24814	MD50-06-65151	10	4620	MD50-06-65493	10	12520
50-24814	MD50-06-65150	30	9840	MD50-06-65492	30	26300
50-24814	MD50-06-65149	99	32800	MD50-06-65491	99	35200
50-24814	MD50-06-65148	124	255000	MD50-06-65490	124	322000
50-24814	MD50-06-65147	149	12890	MD50-06-65489	149	68100
50-24815	MD50-06-65183	30	2190 (J)	MD50-06-65501	30	9990
50-24815	MD50-06-65182	40	5300	MD50-06-65500	40	1240
50-24815	MD50-06-65181	100	45000	MD50-06-65499	100	1450

Table 6.6-2 (continued)

Location ID	1 st Round Sample ID	Depth (ft)	Concentration (pCi/L)	2 nd Round Sample ID	Depth (ft)	Concentration (pCi/L)
50-24815	MD50-06-65180	125	2310	MD50-06-65498	125	1610
50-24815	MD50-06-65179	149	2010	MD50-06-65497	149	380
50-24816	MD50-06-65204	25	3590	MD50-06-65510	25	430
50-24816	MD50-06-65205	35	520	MD50-06-65509	35	1710
50-24816	MD50-06-65209	65	3580	MD50-06-65508	65	1630
50-24816	MD50-06-65206	120	2150	MD50-06-65507	120	2380
50-24816	MD50-06-65208	200	1660	MD50-06-65506	200	1980
50-24816	MD50-06-65207	225	3070	MD50-06-65505	215.8	1780
50-24817	MD50-05-63841	20	42207.4	MD50-06-65903	20	158762.4
50-24817	MD50-05-63842	40	26379.04	MD50-06-65904	50	239224.6
50-24817	RE50-05-63816	100	594712.7	MD50-06-65905	100	144361.8
50-24817	RE50-05-63817	140	164431.9	MD50-06-65906	140	210408.2
50-24817	RE50-05-63818	200	43858.57	MD50-06-65907	200	67430.69
50-24817	MD50-05-63843	250	5775.625	MD50-06-65908	240.9	17468.42
50-24818	MD50-06-65232	10	5170 (J-)	n.c.	n.c.	n.c.
50-24818	MD50-06-65233	25	222000 (J-)	n.c.	n.c.	n.c.
50-24818	MD50-06-65234	100	18000	n.c.	n.c.	n.c.
50-24818	MD50-06-65235	150	2580	n.c.	n.c.	n.c.
50-24818	MD50-06-65236	190	830	n.c.	n.c.	n.c.
50-24818	MD50-06-65237	250	1360	n.c.	n.c.	n.c.
50-24818	MD50-06-65238	280	880	n.c.	n.c.	n.c.
50-24818	MD50-06-65239	315	—	n.c.	n.c.	n.c.
50-24818	MD50-06-65240	414	86600	n.c.	n.c.	n.c.
50-24818	MD50-06-65242	452	860	n.c.	n.c.	n.c.
50-24818	MD50-06-65245	500	17000	n.c.	n.c.	n.c.
50-24818	MD50-06-65244	548	12440	n.c.	n.c.	n.c.
50-24818	MD50-06-65243	591	19100	n.c.	n.c.	n.c.
50-24819	RE50-05-61430	20	706.6125	MD50-06-63863	20	712.3844
50-24819	RE50-05-61431	50	1065.137	MD50-06-63864	50	1665.723
50-24819	RE50-05-61432	100	1301.632	MD50-06-63865	100	1679.623
50-24819	RE50-05-61732	138.5–140	2381.198	MD50-06-63866	140	885.1116
50-24819	RE50-05-61733	200	2842.315	MD50-06-63867	200	421.4547
50-24819	RE50-05-61734	250	3588.609	MD50-06-63868	250	516.7961
50-24819	RE50-05-61735	275	1691.828	MD50-06-63869	275	1831.413
50-24820	RE50-05-61446	20	390.0208 (J-)	MD50-06-64240	20	672.7979
50-24820	RE50-05-61449	50	359.6045	MD50-06-64241	50	103578.5
50-24820	RE50-05-61447	100	—	MD50-06-64242	100	719.1368
50-24820	RE50-05-61448	140	334.2696	MD50-06-64243	140	1159.63

Table 6.6-2 (continued)

Location ID	1 st Round Sample ID	Depth (ft)	Concentration (pCi/L)	2 nd Round Sample ID	Depth (ft)	Concentration (pCi/L)
50-24820	RE50-05-61450	200	486.7444	MD50-06-64244	200	1368.229
50-24820	RE50-05-61736	250	405.2511	MD50-06-64245	225	2826.375
50-24821	RE50-05-61464	20	—	MD50-06-64248	20	782.3138
50-24821	RE50-05-61466	50	—	MD50-06-64249	50	965.7689
50-24821	RE50-05-61465	98.4–100	392.6594	MD50-06-64250	100	—
50-24821	RE50-05-61467	137.5–140	358.7596	MD50-06-64251	140	—
50-24821	RE50-05-61473	160	340.2377	MD50-06-64254	160	1611.617
50-24821	RE50-05-61468	248.6–250	—	MD50-06-64252	200	—
n.c.	n.c.	n.c.	n.c.	MD50-06-64253	238.4	1236.753
50-24822	RE50-05-61482	20	—	MD50-06-64928	20	44183.52
50-24822	RE50-05-61483	50	—	MD50-06-64929	50	—
50-24822	RE50-05-61484	100	—	MD50-06-64930	100	—
50-24822	RE50-05-61485	140	—	MD50-06-64931	140	6700.99
50-24822	RE50-05-61486	200	—	MD50-06-64932	200	—
50-24822	RE50-05-61737	250	—	MD50-06-64933	250	950.975
50-25451	MD50-06-66691	19	14690	n.c.	n.c.	n.c.
50-25451	MD50-06-66690	49	9400	n.c.	n.c.	n.c.
50-25451	MD50-06-66689	100	7330	n.c.	n.c.	n.c.
50-25451	MD50-06-66688	147	9060	n.c.	n.c.	n.c.
50-25451	MD50-06-66687	200	10940	n.c.	n.c.	n.c.
50-25451	MD50-06-66686	251	5830	n.c.	n.c.	n.c.
50-25451	MD50-06-66685	287	4380	n.c.	n.c.	n.c.

^a n.c. = Sample not collected.^b — = Not detected.

Table 6.6-3
Summary of Organic Chemicals (VOCs) Detected in Second Round of Pore Gas at MDA C

Location ID	Sample ID	Depth (ft)	Acetone	Benzene	Butanone[2-]	Carbon Tetrachloride	Chlorodibromomethane	Chlorodifluoromethane	Chloroform	Chloromethane	Dichloro-1,1,2,2-tetrafluoroethane[1,2-]	Dichlorobenzene[1,2-]	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]
50-24766	MD50-06-65331	17	34	—*	—	7.3	—	—	27	—	12	—	38	—	—	—	—	8
50-24766	MD50-06-65330	29	27	—	—	23	—	—	86	—	—	—	79	—	—	—	12	38
50-24766	MD50-06-65329	99	93	—	—	22	—	—	74	—	—	—	62	—	—	—	13	35
50-24766	MD50-06-65328	124	53	—	—	64	—	—	150	—	52	—	130	13	—	15	29	87
50-24766	MD50-06-65327	149	—	—	—	250 (J)	—	—	450	—	88	—	370	—	—	—	110	230
50-24767	MD50-06-65362	10	—	—	—	—	—	—	380	—	—	—	270	—	—	—	67	—
50-24767	MD50-06-65361	30	—	—	—	—	—	—	380	—	—	—	270	—	—	—	69	—
50-24767	MD50-06-65360	60	—	—	—	—	—	—	420	—	—	—	300	—	—	—	76	—
50-24767	MD50-06-65359	124	—	—	—	—	—	—	240	—	—	—	160	—	—	—	61	—
50-24767	MD50-06-65358	149	—	—	—	—	—	—	190	—	—	—	60	—	—	—	63	—
50-24768	MD50-06-65370	14	17	—	—	7.2	—	—	31	—	240	—	46	—	—	—	—	—
50-24768	MD50-06-65369	29	17	—	—	4.4	—	—	20	1.4	82	—	19	—	—	—	—	—
50-24768	MD50-06-65368	99	40	—	—	3.3	—	—	16	1.4	42	—	14	—	—	—	1	—
50-24768	MD50-06-65367	125	100	—	—	—	—	—	51	—	56	—	45	—	—	—	8.9	—
50-24768	MD50-06-65366	150	93	—	—	—	—	—	81	—	100	—	85	—	—	—	24	—
50-24769	MD50-06-65378	20	25	—	—	77 (J)	—	—	370	—	—	—	380	—	—	—	58	—
50-24769	MD50-06-65377	39	42	—	—	—	—	—	38	—	—	—	42	—	—	—	—	—
50-24769	MD50-06-65376	99	52	0.76	—	8.6	—	—	40	0.92	5.2	—	24	—	1.2	—	5.9	1.5
50-24769	MD50-06-65375	124	41	6.7	—	—	—	—	150	—	—	—	120	—	—	—	33	—
50-24769	MD50-06-65374	149	240	11	—	—	—	—	180	—	—	—	130	—	—	—	44	—
50-24770	MD50-06-65387	20	—	—	—	1400	—	—	1300	—	—	—	1100	—	—	—	160	—
50-24770	MD50-06-65386	25	—	—	—	1500	—	—	1300	—	—	—	1100	—	—	—	150	—
50-24770	MD50-06-65385	39	—	—	—	2000	—	—	1700	—	—	—	1300	—	—	—	210	—

Table 6.6-3 (continued)

Location ID	Sample ID	Depth (ft)	Acetone	Benzene	Butanone[2-]	Carbon Tetrachloride	Chlorodibromomethane	Chlorodifluoromethane	Chloroform	Chloromethane	Dichloro-1,1,2,2-tetrafluoroethane[1,2-]	Dichlorobenzene[1,2-]	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]
50-24770	MD50-06-65384	100	—	—	—	1900	—	—	1900	—	—	—	1500	—	—	—	280	—
50-24770	MD50-06-65383	124	—	—	—	1700	—	—	1900	—	—	—	1400	—	—	—	290	—
50-24770	MD50-06-65382	148	—	—	—	3600 (J)	—	—	4600	—	—	—	3900	—	—	—	770	—
50-24771	MD50-06-65394	17	—	—	—	1400 (J)	—	—	1200	—	—	—	640	—	—	—	71	—
50-24771	MD50-06-65393	40	—	—	—	1900 (J)	—	—	1700	—	—	—	800	—	54	—	130	52
50-24771	MD50-06-65392	100	55	—	—	200 (J)	—	—	440	—	19	—	170	—	27	—	57	17
50-24771	MD50-06-65391	125	—	—	—	1100	—	—	2300	—	—	—	640	—	160	—	370	100
50-24771	MD50-06-65390	149	—	—	—	2200	—	—	3800	—	—	—	1500	—	430	—	790	240
50-24773	MD50-06-65405	20	—	—	—	220	—	—	520	—	—	—	210	—	—	—	54	—
50-24773	MD50-06-65404	40	—	—	—	1100 (J)	—	—	1500	—	—	—	600	—	56	—	140	57
50-24773	MD50-06-65403	100	—	—	—	450 (J)	—	—	750	—	—	—	260	—	51	—	87	43
50-24773	MD50-06-65402	125	—	—	—	1100 (J)	—	—	1500	—	—	—	680	—	90	—	210	81
50-24773	MD50-06-65401	149	—	—	—	930	—	—	2400	—	—	—	730	—	200	—	440	130
50-24782	MD50-06-65413	21	67	—	—	19	—	—	310	—	—	—	120	—	—	—	29	11
50-24782	MD50-06-65412	40	160	—	—	—	—	—	310	—	—	—	98	—	—	—	33	20
50-24782	MD50-06-65411	100	40	—	—	17	—	—	240	—	—	—	79	—	14	—	41	13
50-24782	MD50-06-65410	125	100	—	—	130	—	—	640	—	—	—	210	—	40	—	110	43
50-24782	MD50-06-65409	151	—	—	—	440	—	—	1700	—	—	—	—	—	130	—	350	130
50-24783	MD50-06-65421	20	—	—	—	—	—	—	250	—	—	—	110	—	—	—	34	35
50-24783	MD50-06-65420	36	34	—	—	—	—	—	84	—	—	—	29	—	—	—	11	9.8
50-24783	MD50-06-65419	100	56	—	—	—	—	—	140	—	17	—	57	—	9.1	—	24	22
50-24783	MD50-06-65418	125	—	—	—	99	—	—	540	—	—	—	210	—	—	—	91	81
50-24783	MD50-06-65417	148	—	—	—	—	—	—	490	—	—	—	210	—	—	—	100	76
50-24784	MD50-06-70724	10	38	—	—	160	—	—	180	—	—	—	87	—	—	—	—	28
50-24784	MD50-06-70723	20	29	—	—	120	—	—	170	—	—	—	68	—	—	—	—	19

Table 6.6-3 (continued)

Location ID	Sample ID	Depth (ft)	Acetone	Benzene	Butanone[2-]	Carbon Tetrachloride	Chlorodibromomethane	Chlorodifluoromethane	Chloroform	Chloromethane	Dichloro-1,1,2,2-tetrafluoroethane[1,2-]	Dichlorobenzene[1,2-]	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]
50-24784	MD50-06-70722	47	29	6.7	—	160	—	—	160	—	—	—	49	—	—	—	—	25
50-24784	MD50-06-70721	49	—	—	—	160	—	—	210	—	—	—	89	—	—	—	—	34
50-24784	MD50-06-65292	55	62	—	—	130	—	—	290	—	—	—	78	—	—	—	9	50
50-24784	MD50-06-65291	100	11	—	—	74	—	—	200	—	—	—	48	—	5.8	—	6.7	33
50-24784	MD50-06-65290	168	39	—	—	130	—	—	140	—	—	—	75	—	—	7	11	33
50-24784	MD50-06-65289	199	—	—	—	18	—	—	21	—	—	—	14	—	—	—	—	4.3
50-24784	MD50-06-65288	250	—	—	—	140	—	—	85	—	—	—	67	—	—	—	9.6	24
50-24784	MD50-06-65287	265	—	—	—	220	—	—	82	—	—	—	110	—	—	—	13	27
50-24785	MD50-06-66783	10	—	—	—	—	—	—	1000	—	—	—	64	—	—	—	—	24
50-24785	MD50-06-65300	19	—	—	—	—	—	—	980	—	—	—	66	—	—	—	—	24
50-24785	MD50-06-65299	60	—	—	—	70	—	—	1300	—	—	—	84	—	30	—	—	70
50-24785	MD50-06-65298	120	—	—	—	190	—	—	1200	—	—	—	160	—	30	—	21	120
50-24785	MD50-06-65297	200	—	—	—	230	—	—	340	—	—	—	150	—	—	—	20	75
50-24785	MD50-06-65296	250	—	—	—	360	—	—	210	—	—	—	220	—	—	—	—	59
50-24785	MD50-06-65295	256	70	—	—	62	—	—	220	—	18	—	180	17	—	—	34	100
50-24796	MD50-06-65308	10	9.9	2.4	—	7	—	—	32	1.1	—	—	46	0.86	1.3	1.2	2.2	23
50-24796	MD50-06-65307	20	21	11	—	11	—	—	44	0.95	—	—	62	1.1	1.8	1.2	3	28
50-24796	MD50-06-65306	40	27	5.6	78	27	—	—	120	1.4	—	—	150	3.2	5.8	4.2	9.3	85
50-24796	MD50-06-65305	100	—	—	—	24	—	—	210	—	—	—	250	—	9.5	—	25	110
50-24796	MD50-06-65304	120	25	—	—	52	—	—	150	—	—	—	180	—	9.6	—	21	120
50-24796	MD50-06-65303	144	—	—	—	37	—	—	200	—	—	—	230	—	—	—	34	180
50-24797	MD50-06-65315	18.3	48	—	—	29 (J)	—	—	140	—	—	—	550	—	—	—	11	87
50-24797	MD50-06-65314	38	—	—	—	26 (J)	—	—	180	—	—	—	370	—	—	—	22	150
50-24797	MD50-06-65313	60	34	—	—	—	—	—	170	—	—	—	290	8.1	—	—	27	110
50-24797	MD50-06-65312	120	—	—	—	65	—	—	290	—	—	—	410	—	—	—	55	260

Table 6.6-3 (continued)

Location ID	Sample ID	Depth (ft)	Acetone	Benzene	Butanone[2-]	Carbon Tetrachloride	Chlorodibromomethane	Chlorodifluoromethane	Chloroform	Chloromethane	Dichloro-1,1,2,2-tetrafluoroethane[1,2-]	Dichlorobenzene[1,2-]	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]
50-24797	MD50-06-65311	154	—	—	—	98	—	—	380	—	—	—	430	—	—	—	100	460
50-24799	MD50-06-65323	20	57	—	—	—	—	—	140	—	—	—	94	—	—	—	22	39
50-24799	MD50-06-65322	32.5	—	—	—	—	—	—	310	—	—	—	190	—	—	—	47	92
50-24799	MD50-06-65321	100	—	—	—	—	—	—	73	—	—	—	45	—	—	—	12	25
50-24799	MD50-06-65320	120	—	—	—	—	—	—	88	—	—	—	44	—	—	—	—	36
50-24799	MD50-06-65319	160	—	—	—	98	—	—	220	—	—	—	130	—	—	—	53	93
50-24801	MD50-06-65429	20	50	—	—	9.6	—	—	64	—	—	—	25	—	—	—	7.2	12
50-24801	MD50-06-65428	35	—	—	—	34 (J)	—	—	310	—	—	—	140	—	—	—	45	66
50-24801	MD50-06-65427	80	—	—	—	48 (J)	—	—	370	—	—	—	160	—	—	—	57	79
50-24801	MD50-06-65426	120	—	—	—	180 (J)	—	—	510	—	—	—	220	—	—	—	88	120
50-24801	MD50-06-65425	150	—	—	—	380	—	—	760	—	—	—	310	—	—	—	160	190
50-24802	MD50-06-65437	15	54	—	—	12	—	—	35	—	—	—	13	—	—	—	3	5.2
50-24802	MD50-06-65436	42	—	—	—	53	—	—	240	—	—	—	89	—	—	—	34	31
50-24802	MD50-06-65435	99	—	—	—	73	—	—	320	—	—	—	110	—	—	—	49	41
50-24802	MD50-06-65434	124	—	—	—	150	—	—	440	—	—	—	180	—	—	—	60	53
50-24802	MD50-06-65433	156	—	—	—	100	—	—	310	—	—	—	—	—	23	—	50	47
50-24803	MD50-06-65445	16	—	—	—	20	—	—	79	—	—	—	30	—	—	—	12	—
50-24803	MD50-06-65444	37	25	—	—	57	—	—	130	—	—	—	45	—	—	—	19	13
50-24803	MD50-06-65443	99.5	36	—	—	54	—	—	140	—	—	—	38	—	8.9	—	21	15
50-24803	MD50-06-65442	124	—	—	—	58	—	—	160	—	—	—	57	—	—	—	23	18
50-24803	MD50-06-65441	150	52	—	—	56	—	—	190	—	—	—	46	—	16	—	33	23
50-24804	MD50-06-65454	10	35	1.4	—	2.2 (J)	—	—	2.5	0.98	5.9	—	3.6	—	—	—	—	—
50-24804	MD50-06-65453	16	38	—	—	66	—	—	120	—	—	—	37	—	—	—	13	—
50-24804	MD50-06-65452	33	38	—	—	24	—	—	52	—	—	—	20	—	—	—	—	—
50-24804	MD50-06-65451	99	62	—	—	56	110	—	140	—	—	—	36	—	8.7	—	22	15

Table 6.6-3 (continued)

Location ID	Sample ID	Depth (ft)	Acetone	Benzene	Butanone[2-]	Carbon Tetrachloride	Chlorodibromomethane	Chlorodifluoromethane	Chloroform	Chloromethane	Dichloro-1,1,2,2-tetrafluoroethane[1,2-]	Dichlorobenzene[1,2-]	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]
50-24804	MD50-06-65450	124	—	—	—	—	—	—	410	—	—	—	150	—	—	—	—	—
50-24804	MD50-06-65449	149	—	—	—	220	—	—	530	—	—	—	180	—	—	—	86	49
50-24810	MD50-06-65461	19	21	—	—	57	—	—	77	—	—	—	31	—	—	—	8.6	—
50-24810	MD50-06-65460	37	26	—	—	48	—	—	90	—	—	—	29	—	—	—	10	—
50-24810	MD50-06-65459	99	68	—	—	35	—	—	91	—	—	—	19	—	6.2	—	12	8.6
50-24810	MD50-06-65458	123	—	—	—	230	—	—	450	—	—	—	180	—	—	—	62	—
50-24810	MD50-06-65457	150	70	—	—	140	—	—	190	—	—	—	76	—	—	—	29	21
50-24811	MD50-06-65469	20	—	—	—	1100 (J)	—	—	1000	—	430	—	320	—	—	—	32	—
50-24811	MD50-06-65468	40	—	—	—	2100 (J)	—	—	1800	—	—	—	370	—	—	—	96	—
50-24811	MD50-06-65467	98	—	—	—	2200 (J)	—	—	2100	—	—	—	460	—	64	—	200	—
50-24811	MD50-06-65466	125	—	—	—	1900 (J)	—	—	1600	—	—	—	460	—	68	—	180	—
50-24811	MD50-06-65465	150	—	—	—	1600	—	—	2100	—	—	—	580	—	120	—	300	—
50-24812	MD50-06-65477	10	—	—	—	1300	—	—	510	—	—	—	230	—	—	—	43	—
50-24812	MD50-06-65476	35	—	—	—	2400	—	—	1100	—	—	—	450	—	—	—	110	—
50-24812	MD50-06-65474	98	—	—	—	1100	—	—	600	—	—	—	200	—	—	—	58	—
50-24812	MD50-06-65475	123	—	—	—	1000	—	—	500	—	—	—	190	—	19	—	59	11
50-24812	MD50-06-65473	150	43	—	—	460	—	—	320	—	—	—	110	—	12	—	37	—
50-24813	MD50-06-65485	20	27	—	—	150	—	—	110	—	—	—	72	—	—	—	11	—
50-24813	MD50-06-65484	30	39	—	—	130	—	—	97	—	—	—	100	—	—	—	10	—
50-24813	MD50-06-65483	99	49	—	—	170	—	—	220	—	—	—	140	—	—	—	37	—
50-24813	MD50-06-65482	125	—	—	—	2100	—	—	1800	—	—	—	1400	—	—	—	340	—
50-24813	MD50-06-65481	150	—	—	—	1800	—	—	2000	—	—	—	1300	—	—	—	440	—
50-24814	MD50-06-65493	10	—	—	—	200	—	—	350	—	—	—	440	—	—	—	69	—
50-24814	MD50-06-65492	30	54	—	—	24	—	—	50	1.1	13	—	53	—	—	—	6.6	—
50-24814	MD50-06-65491	99	74	—	—	47	—	—	140	—	—	—	150	—	—	—	30	—

Table 6.6-3 (continued)

Location ID	Sample ID	Depth (ft)	Acetone	Benzene	Butanone[2-]	Carbon Tetrachloride	Chlorodibromomethane	Chlorodifluoromethane	Chloroform	Chloromethane	Dichloro-1,1,2,2-tetrafluoroethane[1,2-]	Dichlorobenzene[1,2-]	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]
50-24814	MD50-06-65490	124	—	—	—	200	—	—	370	—	—	—	450	—	—	—	79	—
50-24814	MD50-06-65489	149	—	—	—	420	—	—	820	—	—	—	810	—	—	—	180	—
50-24815	MD50-06-65501	30	—	—	—	380	—	—	1300	—	—	—	1400	—	—	—	230	—
50-24815	MD50-06-65500	40	—	—	—	680 (J)	—	—	1700	—	—	—	2000	—	—	—	240	—
50-24815	MD50-06-65499	100	—	—	—	710 (J)	—	—	1900	—	—	—	2100	—	—	—	270	—
50-24815	MD50-06-65498	125	—	—	—	500 (J)	—	—	1400	—	—	—	1700	—	—	—	230	—
50-24815	MD50-06-65497	149	—	—	—	260 (J)	—	—	820	—	—	—	940	—	—	—	140	—
50-24816	MD50-06-65510	25	56	—	—	—	—	—	210	—	—	—	49	—	—	—	—	30
50-24816	MD50-06-65509	35	23	—	—	68	—	—	360	—	—	—	92	—	—	—	—	53
50-24816	MD50-06-65508	65	50	—	11	63	—	—	160	—	—	—	54	—	5.1	8.6	7.3	58
50-24816	MD50-06-65507	120	71	—	7.1	150	—	—	180	—	—	—	86	—	8.5	—	14	92
50-24816	MD50-06-65506	200	51	—	10	280	—	—	130	—	—	—	110	—	—	—	18	89
50-24816	MD50-06-65505	215.8	100	—	11	250	—	—	120	—	—	—	110	—	—	7.3	18	84
50-24817	MD50-06-65903	20	—	—	—	39	—	—	38	—	—	—	130	4.3	—	8.5	5	44
50-24817	MD50-06-65904	50	130 (J)	0.68	—	15	—	—	15	1.2	2.2	5.7	51	1.6	—	3	2.5	17
50-24817	MD50-06-65905	100	210 (J)	—	—	10	—	—	15	2.1	—	—	22	—	—	2.3	2.1	19
50-24817	MD50-06-65906	140	—	—	—	320	—	—	170	—	—	—	410	—	—	—	65	420
50-24817	MD50-06-65907	200	—	—	—	420	—	—	140	—	—	—	420	—	—	—	68	400
50-24817	MD50-06-65908	240.9	—	—	—	220	—	—	140	—	—	—	310	—	—	—	46	310
50-24819	MD50-06-63863	20	24 (J)	—	—	57	—	—	110	—	—	—	58	—	—	—	—	30
50-24819	MD50-06-63864	50	73 (J)	—	—	79	—	—	130	—	—	—	81	—	—	—	14	61
50-24819	MD50-06-63865	100	—	—	—	52	—	—	93	—	—	—	59	—	—	—	12	50
50-24819	MD50-06-63866	140	24 (J)	—	—	43	—	—	61	—	—	—	45	—	—	—	9	35
50-24819	MD50-06-63867	200	49	—	—	61	—	20	85	—	—	—	68	—	6.7	—	22 (J+)	57
50-24819	MD50-06-63868	250	—	—	—	100	—	—	100	—	—	—	110	—	—	—	34 (J+)	69

Table 6.6-3 (continued)

Location ID	Sample ID	Depth (ft)	Acetone	Benzene	Butanone[2-]	Carbon Tetrachloride	Chlorodibromomethane	Chlorodifluoromethane	Chloroform	Chloromethane	Dichloro-1,1,2,2-tetrafluoroethane[1,2-]	Dichlorobenzene[1,2-]	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]
50-24819	MD50-06-63869	275	71	—	—	120	—	—	140	—	—	—	120	—	—	—	42 (J+)	95
50-24820	MD50-06-64240	20	250	—	—	170	—	—	220	—	—	—	120	—	—	—	31	—
50-24820	MD50-06-64241	50	—	—	—	340	—	—	410	—	—	—	230	—	—	—	67	—
50-24820	MD50-06-64242	100	230 (J)	—	—	110	—	—	170	—	—	—	73	—	10	—	27	—
50-24820	MD50-06-64243	140	—	—	—	630	—	—	710	—	—	—	440	—	—	—	160	—
50-24820	MD50-06-64244	200	—	—	—	630	—	—	750	—	—	—	450	—	—	—	190	—
50-24820	MD50-06-64245	225	—	—	—	650	—	—	760	—	—	—	450	—	—	—	200	—
50-24821	MD50-06-64248	20	—	—	—	330	—	—	350	—	—	—	500	—	—	—	93	—
50-24821	MD50-06-64249	50	—	—	—	340	—	—	350	—	—	—	510	—	—	—	100	—
50-24821	MD50-06-64250	100	—	—	—	—	—	—	38	—	—	—	—	120	—	400	89	—
50-24821	MD50-06-64251	140	—	—	—	280	—	—	400	—	—	—	520	—	—	—	100	—
50-24821	MD50-06-64254	160	—	—	—	410	—	—	420	—	—	—	560	—	—	—	150	—
50-24821	MD50-06-64252	200	—	—	—	270	—	—	460	—	—	—	530	—	—	—	170	—
50-24821	MD50-06-64253	238.4	—	—	—	360	—	—	520	—	—	—	720	—	—	—	190	—
50-24822	MD50-06-64928	20	95 (J)	—	—	16	—	—	68	—	—	—	88	—	—	—	—	—
50-24822	MD50-06-64929	50	—	—	—	—	—	—	130	—	—	—	190	—	—	—	23	—
50-24822	MD50-06-64930	100	—	—	—	19	—	—	62	—	—	—	95	—	—	—	9.8	—
50-24822	MD50-06-64931	140	150 (J)	—	—	—	—	—	35	—	—	—	33	—	—	—	6.2	—
50-24822	MD50-06-64932	200	—	—	—	—	—	—	120	—	—	—	160	—	—	—	33	—
50-24822	MD50-06-64933	250	—	—	—	—	—	—	240	—	—	—	300	—	—	—	66	—

Table 6.6-3 (continued)

Location ID	Sample ID	Depth (ft)	Ethylbenzene	Ethyltoluene[4-]	Methylene Chloride	n-Heptane	Styrene	Tetrachloroethene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene (Total)	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
50-24766	MD50-06-65331	17	—	—	—	—	—	600	—	30	15	—	440	—	—	—	—	—	—
50-24766	MD50-06-65330	29	—	—	—	—	—	660	—	84	42	—	1400	—	—	—	—	—	—
50-24766	MD50-06-65329	99	—	—	11	—	—	340	—	76	37	—	1100	—	—	—	—	—	—
50-24766	MD50-06-65328	124	—	—	27	—	—	600	—	230	85	—	2700	—	—	—	—	—	—
50-24766	MD50-06-65327	149	—	—	160	—	—	1400	—	500	150	—	8200	—	—	—	—	—	—
50-24767	MD50-06-65362	10	—	—	40	—	—	460	—	1700	270	—	5500	—	—	—	—	—	—
50-24767	MD50-06-65361	30	—	—	39	—	—	450	—	1800	270	—	5900	—	—	—	—	—	—
50-24767	MD50-06-65360	60	—	—	48	—	—	330	—	1900	280	—	4500	—	—	—	—	—	—
50-24767	MD50-06-65359	124	—	—	76	—	—	160	—	1100	160	—	3600	—	—	—	—	—	—
50-24767	MD50-06-65358	149	—	—	120	—	—	70	—	180	33	—	2900	—	—	—	—	—	—
50-24768	MD50-06-65370	14	—	—	—	—	—	2.8	1.9	17	1.3	—	24	29	—	—	—	—	—
50-24768	MD50-06-65369	29	—	—	—	—	—	6.2	—	14	3.6	—	90	13	—	—	—	—	—
50-24768	MD50-06-65368	99	—	—	0.76	—	—	6.1	—	16	4	—	150	8.5	—	—	—	—	—
50-24768	MD50-06-65367	125	—	—	9.4	—	—	24	—	120	32	—	1100	—	—	—	—	—	—
50-24768	MD50-06-65366	150	—	—	36	—	—	27	—	190	38	—	1400	14	—	—	—	—	—
50-24769	MD50-06-65378	20	—	—	8.8	—	—	200	7.8	95	26	15	3600	—	—	—	—	—	—
50-24769	MD50-06-65377	39	240	22	—	—	76	—	610	—	—	—	430	—	29	11	240	39	—
50-24769	MD50-06-65376	99	1.3	—	1	—	—	16	1.7	6.7	2.1	4.5	510	2.7	—	—	7.4	1.7	—
50-24769	MD50-06-65375	124	—	—	—	—	—	50	12	32	—	11	1100	—	—	—	27	—	—
50-24769	MD50-06-65374	149	11	—	—	—	—	47	90	38	—	11	1600	—	—	—	32	8.9	—
50-24770	MD50-06-65387	20	—	—	—	—	—	14000	—	350	—	—	13000	—	—	—	—	—	—
50-24770	MD50-06-65386	25	—	—	—	—	—	12000	—	370	—	—	13000	—	—	—	—	—	—
50-24770	MD50-06-65385	39	—	—	—	—	—	8200	—	460	—	—	17000	—	—	—	—	—	—
50-24770	MD50-06-65384	100	—	—	130	—	—	2400	—	550	—	—	21000	—	—	—	—	—	—
50-24770	MD50-06-65383	124	—	—	250	—	—	2100	—	530	—	—	25000	—	—	—	—	—	—

Table 6.6-3 (continued)

Location ID	Sample ID	Depth (ft)	Ethylbenzene	Ethyltoluene[4-]	Methylene Chloride	n-Heptane	Styrene	Tetrachloroethene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene (Total)	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
50-24770	MD50-06-65382	148	—	—	920	—	—	3500	—	1400	300	—	57000	—	—	—	—	—	—
50-24771	MD50-06-65394	17	—	—	42	—	—	550	—	210	46 (J)	—	6700	—	—	—	—	—	—
50-24771	MD50-06-65393	40	—	—	50	—	—	730	—	280	60 (J)	—	10000	—	—	—	—	—	—
50-24771	MD50-06-65392	100	—	—	40	—	—	110	—	36	16 (J)	11	2300	—	—	—	—	—	—
50-24771	MD50-06-65391	125	—	—	460	—	—	830	—	260	—	—	16000	—	—	—	—	—	—
50-24771	MD50-06-65390	149	—	—	1600	—	—	2300	—	520	—	—	77000	—	—	—	—	—	—
50-24773	MD50-06-65405	20	—	—	44	—	—	330	—	120	—	—	4800	—	—	—	—	—	—
50-24773	MD50-06-65404	40	—	—	65	—	—	690	—	280	58 (J)	—	11000	—	—	—	—	—	—
50-24773	MD50-06-65403	100	—	—	91	—	—	310	—	97	—	—	6400	—	—	—	—	—	—
50-24773	MD50-06-65402	125	—	—	240	—	—	1200	—	390	81 (J)	—	19000	—	—	—	—	—	—
50-24773	MD50-06-65401	149	—	—	1100	—	—	1100	—	360	—	—	22000	—	—	—	—	—	—
50-24782	MD50-06-65413	21	—	—	20	—	—	310	—	65	14	—	1800	14	—	—	—	—	—
50-24782	MD50-06-65412	40	—	—	20	—	—	430	53	54	—	—	3000	—	—	—	—	—	—
50-24782	MD50-06-65411	100	—	—	55	—	—	150	—	31	—	—	1600	—	—	—	—	—	—
50-24782	MD50-06-65410	125	—	—	180	—	—	510	77	130	—	—	6100	—	—	—	—	—	—
50-24782	MD50-06-65409	151	—	—	1100	—	—	1500	—	260	—	—	22000	—	—	—	—	—	—
50-24783	MD50-06-65421	20	—	—	38	—	—	410	—	69	38	—	3100	—	—	—	—	—	—
50-24783	MD50-06-65420	36	—	—	12	—	—	120	—	16	12	—	860	—	—	—	—	—	—
50-24783	MD50-06-65419	100	—	—	31	—	—	160	—	31	—	—	1500	—	—	—	—	—	—
50-24783	MD50-06-65418	125	—	—	140	—	—	910	—	150	—	—	8300	—	—	—	—	—	—
50-24783	MD50-06-65417	148	—	—	300	—	—	720	—	120	—	—	8600	—	—	—	—	—	—
50-24784	MD50-06-70724	10	—	—	12	—	—	2000	—	88	92	—	2600	—	—	—	—	—	—
50-24784	MD50-06-70723	20	—	—	—	—	—	2000	—	79	110	—	1900	—	—	—	—	—	—
50-24784	MD50-06-70722	47	—	—	13	—	—	1500	71	69	48	—	2000	15	—	—	21	—	—
50-24784	MD50-06-70721	49	—	—	8.4	—	—	1900	—	80	59	—	2200	15	—	—	11	—	—

Table 6.6-3 (continued)

Location ID	Sample ID	Depth (ft)	Ethylbenzene	Ethyltoluene[4-]	Methylene Chloride	n-Heptane	Styrene	Tetrachloroethene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene (Total)	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
50-24784	MD50-06-65292	55	—	—	11	—	—	2500	—	110	75	—	2900	—	—	—	—	—	—
50-24784	MD50-06-65291	100	—	—	6.2	—	—	1300	3.6	70	49	—	1700	9.4	—	—	—	—	5.4
50-24784	MD50-06-65290	168	8.6	—	14	9.8	—	1200	9	70	33	—	2300	11	—	—	—	9.8	31
50-24784	MD50-06-65289	199	—	—	—	—	—	230	—	10	4.8	—	370	—	—	—	—	—	—
50-24784	MD50-06-65288	250	—	—	14	—	—	1100	—	42	30	—	2200	10	—	—	—	—	—
50-24784	MD50-06-65287	265	—	—	22	—	—	1400	—	54	27	—	3200	14	—	—	—	—	—
50-24785	MD50-06-66783	10	—	—	22	—	—	3900	—	76	49	—	2100	—	—	—	—	—	—
50-24785	MD50-06-65300	19	—	—	24	—	—	3300	—	74	39	—	1900	—	—	—	—	—	—
50-24785	MD50-06-65299	60	—	—	18	—	—	3700	—	92	59	—	2800	—	—	—	—	—	—
50-24785	MD50-06-65298	120	—	—	26	—	—	3900	—	180	100	—	3900	26	—	—	—	—	—
50-24785	MD50-06-65297	200	—	—	34	—	—	2600	—	91	59	—	4100	—	—	—	—	—	—
50-24785	MD50-06-65296	250	—	—	43	—	—	3000	—	94	62	—	5100	—	—	—	—	—	—
50-24785	MD50-06-65295	256	—	—	21	—	—	1100	—	240	120	—	3400	23	—	—	—	—	—
50-24796	MD50-06-65308	10	1.1	—	1.8	—	—	210	33	33	9.3	—	300	6.1	—	—	5.7	1.4	—
50-24796	MD50-06-65307	20	20	9.1 (J)	2.1	—	—	320	60	38	12	—	440	7.7	7.3	3	120	30	—
50-24796	MD50-06-65306	40	2.7	—	6.4	—	—	590	16	110	32	—	1300	17	—	—	14	3.1	—
50-24796	MD50-06-65305	100	—	—	39	—	—	680	—	270	52	—	1600	20	—	—	—	—	—
50-24796	MD50-06-65304	120	—	—	28	—	—	690	69	290	67	—	1900	20	—	—	14	—	—
50-24796	MD50-06-65303	144	—	—	55	—	—	970	47	420	82	—	3000	21	—	—	31	—	—
50-24797	MD50-06-65315	18.3	—	—	—	—	—	1100	—	180	66 (J)	—	1900	190	—	—	—	—	—
50-24797	MD50-06-65314	38	—	—	13	—	—	960	—	200	73 (J)	—	2600	75	—	—	—	—	—
50-24797	MD50-06-65313	60	—	—	23	—	—	620	—	200	49	—	1800	45	—	—	—	—	—
50-24797	MD50-06-65312	120	—	—	84	—	—	1400	—	640	130	—	5700	—	—	—	—	—	—
50-24797	MD50-06-65311	154	—	—	210	—	—	1600	—	470	120	—	9100	—	—	—	—	—	—
50-24799	MD50-06-65323	20	—	—	21	—	—	1100	—	87	30	—	2400	—	—	—	—	—	—

Table 6.6-3 (continued)

Location ID	Sample ID	Depth (ft)	Ethylbenzene	Ethyltoluene[4-]	Methylene Chloride	n-Heptane	Styrene	Tetrachloroethene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene (Total)	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
50-24799	MD50-06-65322	32.5	—	—	39	—	—	1700	—	180	62	—	5200	—	—	—	—	—	—
50-24799	MD50-06-65321	100	—	—	15	—	—	340	—	—	12	—	1200	—	—	—	—	—	—
50-24799	MD50-06-65320	120	—	—	22	—	—	290	—	35	—	—	1400	—	—	—	—	—	—
50-24799	MD50-06-65319	160	—	—	99	—	—	600	—	97	37	—	4800	—	—	—	—	—	—
50-24801	MD50-06-65429	20	—	—	—	—	—	160	—	—	22	—	800	—	—	—	—	—	—
50-24801	MD50-06-65428	35	—	—	31	—	—	760	—	110	40	—	3800	—	—	—	—	—	—
50-24801	MD50-06-65427	80	—	—	45	—	—	780	—	120	46	—	4100	—	—	—	—	—	—
50-24801	MD50-06-65426	120	—	—	110	—	—	1000	—	180	61	—	6700	—	—	—	—	—	—
50-24801	MD50-06-65425	150	—	—	340	—	—	1400	—	270	—	—	13000	—	—	—	—	—	—
50-24802	MD50-06-65437	15	—	—	3.4	—	—	48	—	—	9.3	—	540	—	—	—	—	—	—
50-24802	MD50-06-65436	42	—	—	31	—	—	360	32	48	—	—	3600	—	—	—	—	—	—
50-24802	MD50-06-65435	99	—	—	56	—	—	430	—	57	—	—	4600	—	—	—	—	—	—
50-24802	MD50-06-65434	124	—	—	110	—	—	630	—	110	—	—	7400	—	—	—	—	—	—
50-24802	MD50-06-65433	156	—	—	120	—	—	310	—	—	—	—	4700	—	—	—	—	—	—
50-24803	MD50-06-65445	16	—	—	—	—	—	110	—	—	—	—	1300	—	—	—	—	—	—
50-24803	MD50-06-65444	37	—	—	8.8	—	—	150	—	17	—	—	1900	—	—	—	—	—	—
50-24803	MD50-06-65443	99.5	—	—	14	—	—	120	—	—	—	—	1700	—	—	—	—	—	—
50-24803	MD50-06-65442	124	—	—	35	—	—	130	—	—	—	—	2200	—	—	—	—	—	—
50-24803	MD50-06-65441	150	—	—	75	—	—	130	—	—	—	—	2400	—	—	—	—	—	—
50-24804	MD50-06-65454	10	1.7	—	—	—	—	8.4	4.4	—	—	—	55	2.4	—	—	9.8	3.6	—
50-24804	MD50-06-65453	16	—	—	7.4	—	—	150	—	—	—	—	1900	—	—	—	—	—	—
50-24804	MD50-06-65452	33	—	—	—	—	—	53	—	—	—	—	800	—	—	—	—	—	—
50-24804	MD50-06-65451	99	—	—	18	—	—	170	—	—	—	—	1800	—	—	—	13	—	—
50-24804	MD50-06-65450	124	—	—	100	—	—	420	—	—	—	—	6500	—	—	—	—	—	—
50-24804	MD50-06-65449	149	—	—	210	—	—	460	—	70	—	—	8400	—	—	—	—	—	—

Table 6.6-3 (continued)

Location ID	Sample ID	Depth (ft)	Ethylbenzene	Ethyltoluene[4-]	Methylene Chloride	n-Heptane	Styrene	Tetrachloroethene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene (Total)	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
50-24810	MD50-06-65461	19	—	—	—	—	—	75	19	—	—	—	1100	—	—	—	—	—	—
50-24810	MD50-06-65460	37	—	—	—	—	—	90	—	—	—	—	1400	—	—	—	—	—	—
50-24810	MD50-06-65459	99	—	—	8.5	—	—	53	—	—	—	—	980	—	—	—	24	6	—
50-24810	MD50-06-65458	123	—	—	97	—	—	480	—	—	—	—	7500	—	—	—	—	—	—
50-24810	MD50-06-65457	150	—	—	48	—	—	180	—	28	—	—	3100	—	—	—	—	—	—
50-24811	MD50-06-65469	20	—	—	—	—	—	380	—	—	—	—	3000	51	—	—	—	—	—
50-24811	MD50-06-65468	40	—	—	33	—	—	520	—	—	—	—	6800	—	—	—	—	—	—
50-24811	MD50-06-65467	98	—	—	140	—	—	500	—	—	—	—	10000	—	—	—	—	—	—
50-24811	MD50-06-65466	125	—	—	190	—	—	470	—	—	—	—	10000	—	—	—	—	—	—
50-24811	MD50-06-65465	150	—	—	840	—	—	820	—	—	—	—	27000	—	—	—	—	—	—
50-24812	MD50-06-65477	10	—	—	24	—	—	230	—	—	—	—	3500	—	—	—	—	—	—
50-24812	MD50-06-65476	35	—	—	51	—	—	390	—	—	—	—	7500	—	—	—	—	—	—
50-24812	MD50-06-65474	98	—	—	24	—	—	210	—	—	—	—	3700	—	—	—	—	—	—
50-24812	MD50-06-65475	123	—	—	44	—	—	150	—	—	—	25	4000	—	—	—	—	—	—
50-24812	MD50-06-65473	150	—	25	46	—	—	86	—	—	—	17	2100	—	17	16	34	9.9	—
50-24813	MD50-06-65485	20	—	—	—	—	—	30	—	—	—	—	1300	—	—	—	9	—	—
50-24813	MD50-06-65484	30	—	—	—	—	—	28	—	—	—	—	1200	—	—	—	16	—	—
50-24813	MD50-06-65483	99	—	—	12	—	—	32	—	—	—	14	2200	—	—	—	10	—	—
50-24813	MD50-06-65482	125	—	—	140	—	—	430	—	—	—	—	25000	—	—	—	—	—	—
50-24813	MD50-06-65481	150	—	—	480	—	—	460	—	—	—	100	31000	—	—	—	—	—	—
50-24814	MD50-06-65493	10	—	—	—	—	—	73	—	—	—	—	6500	—	—	—	—	—	—
50-24814	MD50-06-65492	30	—	—	1.2	—	—	10	—	—	—	2.5	890	3.9	—	—	—	—	—
50-24814	MD50-06-65491	99	—	—	8.5	—	—	26	—	—	—	—	2000	—	—	—	—	—	—
50-24814	MD50-06-65490	124	—	—	44	—	—	78	—	—	—	—	6700	—	—	—	—	—	—
50-24814	MD50-06-65489	149	—	—	190	—	—	170	—	—	—	—	16000	—	—	—	—	—	—

Table 6.6-3 (continued)

Location ID	Sample ID	Depth (ft)	Ethylbenzene	Ethyltoluene[4-]	Methylene Chloride	n-Heptane	Styrene	Tetrachloroethene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene (Total)	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
50-24815	MD50-06-65501	30	—	—	—	—	—	340	—	—	—	—	23000	—	—	—	—	—	—
50-24815	MD50-06-65500	40	—	—	64	—	—	460	—	160	—	110	24000	—	—	—	—	—	—
50-24815	MD50-06-65499	100	—	—	78	—	—	500	—	—	—	120	29000	—	—	—	—	—	—
50-24815	MD50-06-65498	125	—	—	86	—	—	320	—	—	—	—	22000	—	—	—	—	—	—
50-24815	MD50-06-65497	149	—	—	56	—	—	180	—	—	—	—	12000	—	—	—	—	—	—
50-24816	MD50-06-65510	25	—	—	—	—	—	1900	—	54	30	—	1100	24	—	—	—	—	—
50-24816	MD50-06-65509	35	—	—	—	—	—	3500	—	120	47	—	2000	34	—	—	—	—	—
50-24816	MD50-06-65508	65	—	—	4.7	—	—	1300	—	83	27	—	1600	14	—	—	—	—	—
50-24816	MD50-06-65507	120	—	—	11	—	—	1800	—	120	58	—	2600	18	—	—	—	—	—
50-24816	MD50-06-65506	200	—	—	22	—	—	2100	—	110	62	—	3800	20	—	—	—	—	—
50-24816	MD50-06-65505	215.8	—	—	19	—	—	1600	—	98	56	—	3300	18	—	—	—	—	—
50-24817	MD50-06-65903	20	—	—	5.4	—	—	250	—	260	81	—	1000	23 (J)	—	—	—	—	—
50-24817	MD50-06-65904	50	9.8	—	2.1	—	—	96	3.1	94	32	—	370	9.6 (J)	—	—	39 (J)	13	—
50-24817	MD50-06-65905	100	6	—	3.8	—	—	61	5.6	59	22	—	300	6.9	—	—	32	—	—
50-24817	MD50-06-65906	140	—	—	94	—	—	1600	—	950	260	—	5800	49	—	—	—	—	—
50-24817	MD50-06-65907	200	—	—	84	—	—	1500	—	760	220	—	5900	51	—	—	—	—	—
50-24817	MD50-06-65908	240.9	—	—	60	—	—	1100	—	980	220	—	4400	—	—	—	—	—	—
50-24819	MD50-06-63863	20	—	—	9.9	—	—	790	—	95	42	—	2300	—	—	—	—	—	—
50-24819	MD50-06-63864	50	—	—	29	—	—	710	—	140	47	—	2800	—	—	—	—	—	—
50-24819	MD50-06-63865	100	—	—	25	—	—	430	—	92	31	—	1900	—	—	—	—	—	—
50-24819	MD50-06-63866	140	—	—	27	—	—	270	—	66	21	—	1400	—	—	—	—	—	—
50-24819	MD50-06-63867	200	9.6	—	65	220	—	400	10	57	22	—	2500	7.3	—	—	—	10	35
50-24819	MD50-06-63868	250	—	—	100	140	—	570	—	78	30	—	4000	—	—	—	—	—	20
50-24819	MD50-06-63869	275	—	—	130	—	—	860	35	87	35	—	5200	—	—	—	—	—	28
50-24820	MD50-06-64240	20	—	—	30	—	—	140	—	—	—	—	4000	—	—	—	29	—	—

Table 6.6-3 (continued)

Location ID	Sample ID	Depth (ft)	Ethylbenzene	Ethyltoluene[4-]	Methylene Chloride	n-Heptane	Styrene	Tetrachloroethene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene (Total)	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
50-24820	MD50-06-64241	50	—	—	69	—	—	240	—	—	—	—	7400	—	—	—	—	—	—
50-24820	MD50-06-64242	100	—	—	51	—	—	81	—	—	—	—	2900	—	—	—	—	—	—
50-24820	MD50-06-64243	140	—	—	370	—	—	470	—	—	—	—	18000	—	—	—	—	—	—
50-24820	MD50-06-64244	200	—	—	590	—	—	600	—	—	—	—	24000	—	—	—	—	—	—
50-24820	MD50-06-64245	225	—	—	620	—	—	690	—	—	—	—	26000	—	—	—	—	—	—
50-24821	MD50-06-64248	20	—	—	150	—	—	220	—	—	—	—	9800	—	—	—	—	—	—
50-24821	MD50-06-64249	50	—	—	180	—	—	230	—	—	—	—	10000	—	—	—	—	—	—
50-24821	MD50-06-64250	100	—	—	—	—	70	1800	—	—	11	29	8200	—	—	—	—	—	—
50-24821	MD50-06-64251	140	—	—	120	—	—	230	—	—	—	—	13000	—	—	—	—	—	—
50-24821	MD50-06-64254	160	—	—	450	—	—	360	—	—	—	—	20000	—	—	—	—	—	—
50-24821	MD50-06-64252	200	—	—	450	—	—	270	—	—	—	—	23000	—	—	—	—	—	—
50-24821	MD50-06-64253	238.4	—	—	560	—	—	370	—	—	—	—	31000	—	—	—	—	—	—
50-24822	MD50-06-64928	20	—	—	—	—	—	15	—	—	—	—	1900	—	—	—	—	—	—
50-24822	MD50-06-64929	50	—	—	—	—	—	31	—	—	—	—	4000	—	—	—	—	—	—
50-24822	MD50-06-64930	100	—	—	9.8	—	—	15	—	—	—	—	2100	—	—	—	—	—	—
50-24822	MD50-06-64931	140	—	—	11	—	—	—	5.8	—	—	—	1100	—	—	—	—	—	—
50-24822	MD50-06-64932	200	—	—	72	—	—	—	—	—	—	—	5500	—	—	—	—	—	—
50-24822	MD50-06-64933	250	—	—	140	—	—	—	—	—	—	—	12000	—	—	—	—	—	—

Note: Units are µg/m³.

* — = Not detected.

Table 6.7-1
Comparison of Pore-Gas and Core Sample VOC Concentrations

Location ID	Depth (ft)	Analyte	Pore-Gas Concentration (µg/m³)	Core Concentration (mg/kg)
50-26823	20	Acetone	170 (U)	0.0061 (UJ)
50-26823	20	Benzene	45 (U)	0.00122 (U)
50-26823	20	Butanone[2-]	210 (U)	0.0061 (U)
50-26823	20	Carbon Tetrachloride	1000	0.00122 (U)
50-26823	20	Chloroform	1200	0.000348 (U)
50-26823	20	Chloromethane	58 (UJ)	0.00122 (U)
50-26823	20	Dichlorodifluoromethane	440	0.00122 (UJ)
50-26823	20	Dichloroethane[1,2-]	57 (UJ)	0.00122 (U)
50-26823	20	Dichloroethene[cis-1,2-]	130	0.00122 (U)
50-26823	20	Dichloropropane[1,2-]	65 (U)	0.00122 (U)
50-26823	20	Ethylbenzene	61 (U)	0.00122 (U)
50-26823	20	Methylene Chloride	120	0.00592 (J)
50-26823	20	Styrene	60 (U)	0.00122 (U)
50-26823	20	Tetrachloroethene	630	0.00122 (U)
50-26823	20	Toluene	53 (U)	0.00122 (U)
50-26823	20	Trichloro-1,2,2-trifluoroethane[1,1,2-]	200	0.0061 (U)
50-26823	20	Trichloroethane[1,1,1-]	77 (U)	0.00122 (U)
50-26823	20	Trichloroethene	11000	0.00122 (U)
50-26823	20	Trichlorofluoromethane	79 (U)	0.00122 (UJ)
50-26823	20	Trimethylbenzene[1,2,4-]	69 (U)	0.00122 (U)
50-26823	20	Xylene[1,2-]	61 (U)	0.00122 (U)
50-26823	37.5	Acetone	180 (U)	0.00581 (UJ)
50-26823	37.5	Benzene	49 (U)	0.00116 (U)
50-26823	37.5	Butanone[2-]	230 (U)	0.00581 (U)
50-26823	37.5	Carbon Tetrachloride	1400	0.00116 (U)
50-26823	37.5	Chloroform	1700	0.000252 (U)
50-26823	37.5	Chloromethane	63 (UJ)	0.00116 (U)
50-26823	37.5	Dichlorodifluoromethane	540	0.00116 (UJ)
50-26823	37.5	Dichloroethane[1,2-]	63	0.00116 (U)
50-26823	37.5	Dichloroethene[cis-1,2-]	190	0.00116 (U)
50-26823	37.5	Dichloropropane[1,2-]	71 (U)	0.00116 (U)
50-26823	37.5	Ethylbenzene	66 (U)	0.00116 (U)
50-26823	37.5	Methylene Chloride	130	0.00447 (J)
50-26823	37.5	Styrene	65 (U)	0.00116 (U)
50-26823	37.5	Tetrachloroethene	760	0.00116 (U)
50-26823	37.5	Toluene	58 (U)	0.00116 (U)

Table 6.7-1 (continued)

Location ID	Depth (ft)	Analyte	Pore-Gas Concentration ($\mu\text{g}/\text{m}^3$)	Core Concentration (mg/kg)
50-26823	37.5	Trichloro-1,2,2-trifluoroethane[1,1,2-]	270	0.00581 (U)
50-26823	37.5	Trichloroethane[1,1,1-]	84 (U)	0.00116 (U)
50-26823	37.5	Trichloroethene	15000	0.00116 (U)
50-26823	37.5	Trichlorofluoromethane	86 (U)	0.00116 (UJ)
50-26823	37.5	Trimethylbenzene[1,2,4-]	75 (U)	0.00116 (U)
50-26823	37.5	Xylene[1,2-]	67 (U)	0.00116 (U)
50-26823	70	Acetone	250 (U)	0.0061 (UJ)
50-26823	70	Benzene	68 (U)	0.00122 (U)
50-26823	70	Butanone[2-]	310 (U)	0.0061 (U)
50-26823	70	Carbon Tetrachloride	850	0.00122 (U)
50-26823	70	Chloroform	1300	0.000442 (U)
50-26823	70	Chloromethane	88 (UJ)	0.00122 (U)
50-26823	70	Dichlorodifluoromethane	380	0.00122 (UJ)
50-26823	70	Dichloroethane[1,2-]	87 (U)	0.00122 (U)
50-26823	70	Dichloroethene[cis-1,2-]	190	0.00122 (U)
50-26823	70	Dichloropropane[1,2-]	99 (U)	0.00122 (U)
50-26823	70	Ethylbenzene	93 (U)	0.00122 (U)
50-26823	70	Methylene Chloride	170	0.00541 (J)
50-26823	70	Styrene	91 (U)	0.00122 (U)
50-26823	70	Tetrachloroethene	500	0.00122 (U)
50-26823	70	Toluene	81 (U)	0.00122 (U)
50-26823	70	Trichloro-1,2,2-trifluoroethane[1,1,2-]	160	0.0061 (U)
50-26823	70	Trichloroethane[1,1,1-]	120 (U)	0.00122 (U)
50-26823	70	Trichloroethene	12000	0.00122 (U)
50-26823	70	Trichlorofluoromethane	120 (U)	0.00122 (UJ)
50-26823	70	Trimethylbenzene[1,2,4-]	110 (U)	0.00122 (U)
50-26823	70	Xylene[1,2-]	93 (U)	0.00122 (U)
50-26823	99	Acetone	670 (U)	0.0051 (UJ)
50-26823	99	Benzene	180 (U)	0.00102 (U)
50-26823	99	Butanone[2-]	830 (U)	0.0051 (U)
50-26823	99	Carbon Tetrachloride	3200	0.00102 (U)
50-26823	99	Chloroform	3200	0.00102 (U)
50-26823	99	Chloromethane	230 (U)	0.00102 (U)
50-26823	99	Dichlorodifluoromethane	1000 (J)	0.00102 (UJ)
50-26823	99	Dichloroethane[1,2-]	230 (UJ)	0.00102 (U)
50-26823	99	Dichloroethene[cis-1,2-]	500	0.00102 (U)
50-26823	99	Dichloropropane[1,2-]	260 (U)	0.00102 (U)
50-26823	99	Ethylbenzene	240 (U)	0.00102 (U)

Table 6.7-1 (continued)

Location ID	Depth (ft)	Analyte	Pore-Gas Concentration ($\mu\text{g}/\text{m}^3$)	Core Concentration (mg/kg)
50-26823	99	Methylene Chloride	470	0.0051 (UJ)
50-26823	99	Styrene	240 (U)	0.00102 (U)
50-26823	99	Tetrachloroethene	1800	0.00102 (U)
50-26823	99	Toluene	210 (U)	0.00102 (U)
50-26823	99	Trichloro-1,2,2-trifluoroethane[1,1,2-]	540	0.0051 (U)
50-26823	99	Trichloroethane[1,1,1-]	310 (U)	0.00102 (U)
50-26823	99	Trichloroethene	38000	0.00102 (U)
50-26823	99	Trichlorofluoromethane	310 (U)	0.00102 (UJ)
50-26823	99	Trimethylbenzene[1,2,4-]	280 (U)	0.00102 (U)
50-26823	99	Xylene[1,2-]	240 (U)	0.00102 (U)
50-26823	148.5	Acetone	890 (U)	0.005 (UJ)
50-26823	148.5	Benzene	240 (U)	0.001 (U)
50-26823	148.5	Butanone[2-]	1100 (U)	0.005 (U)
50-26823	148.5	Carbon Tetrachloride	2300	0.001 (U)
50-26823	148.5	Chloroform	3200	0.001 (U)
50-26823	148.5	Chloromethane	310 (U)	0.001 (U)
50-26823	148.5	Dichlorodifluoromethane	1100 (J)	0.001 (UJ)
50-26823	148.5	Dichloroethane[1,2-]	300 (UJ)	0.001 (U)
50-26823	148.5	Dichloroethene[cis-1,2-]	680	0.001 (U)
50-26823	148.5	Dichloropropane[1,2-]	350 (U)	0.001 (U)
50-26823	148.5	Ethylbenzene	320 (U)	0.001 (U)
50-26823	148.5	Methylene Chloride	1400	0.005 (UJ)
50-26823	148.5	Styrene	320 (U)	0.001 (U)
50-26823	148.5	Tetrachloroethene	1800	0.001 (U)
50-26823	148.5	Toluene	280 (U)	0.001 (U)
50-26823	148.5	Trichloro-1,2,2-trifluoroethane[1,1,2-]	570 (U)	0.005 (U)
50-26823	148.5	Trichloroethane[1,1,1-]	410 (U)	0.001 (U)
50-26823	148.5	Trichloroethene	51000	0.001 (U)
50-26823	148.5	Trichlorofluoromethane	420 (U)	0.001 (UJ)
50-26823	148.5	Trimethylbenzene[1,2,4-]	370 (U)	0.001 (U)
50-26823	148.5	Xylene[1,2-]	330 (U)	0.001 (U)
50-26823	200	Acetone	1000 (U)	0.00543 (UJ)
50-26823	200	Benzene	280 (U)	0.00109 (U)
50-26823	200	Butanone[2-]	1300 (U)	0.00543 (U)
50-26823	200	Carbon Tetrachloride	1800	0.00109 (U)
50-26823	200	Chloroform	2700	0.00109 (U)
50-26823	200	Chloromethane	360 (UJ)	0.00109 (U)
50-26823	200	Dichlorodifluoromethane	1200	0.00109 (UJ)

Table 6.7-1 (continued)

Location ID	Depth (ft)	Analyte	Pore-Gas Concentration ($\mu\text{g}/\text{m}^3$)	Core Concentration (mg/kg)
50-26823	200	Dichloroethane[1,2-]	360 (UJ)	0.00109 (U)
50-26823	200	Dichloroethene[cis-1,2-]	700	0.00109 (U)
50-26823	200	Dichloropropane[1,2-]	410 (U)	0.00109 (U)
50-26823	200	Ethylbenzene	380 (U)	0.00109 (U)
50-26823	200	Methylene Chloride	2200	0.00543 (UJ)
50-26823	200	Styrene	380 (U)	0.00109 (U)
50-26823	200	Tetrachloroethene	1700	0.00109 (U)
50-26823	200	Toluene	330 (U)	0.00109 (U)
50-26823	200	Trichloro-1,2,2-trifluoroethane[1,1,2-]	680 (U)	0.00543 (U)
50-26823	200	Trichloroethane[1,1,1-]	480 (U)	0.00109 (U)
50-26823	200	Trichloroethene	64000	0.00109 (U)
50-26823	200	Trichlorofluoromethane	500 (U)	0.00109 (UJ)
50-26823	200	Trimethylbenzene[1,2,4-]	430 (U)	0.00109 (U)
50-26823	200	Xylene[1,2-]	390 (U)	0.00109 (U)
50-26823	250	Acetone	850 (U)	0.00781 (UJ)
50-26823	250	Benzene	230 (U)	0.00156 (U)
50-26823	250	Butanone[2-]	1100 (U)	0.00781 (U)
50-26823	250	Carbon Tetrachloride	1300	0.00156 (U)
50-26823	250	Chloroform	2200	0.00156 (U)
50-26823	250	Chloromethane	300 (UJ)	0.00156 (U)
50-26823	250	Dichlorodifluoromethane	950	0.00156 (UJ)
50-26823	250	Dichloroethane[1,2-]	290 (UJ)	0.00156 (U)
50-26823	250	Dichloroethene[cis-1,2-]	580	0.00156 (U)
50-26823	250	Dichloropropane[1,2-]	330 (U)	0.00156 (U)
50-26823	250	Ethylbenzene	310 (U)	0.00156 (U)
50-26823	250	Methylene Chloride	2200	0.00781 (UJ)
50-26823	250	Styrene	310 (U)	0.00156 (U)
50-26823	250	Tetrachloroethene	1400	0.00156 (U)
50-26823	250	Toluene	270 (U)	0.00156 (U)
50-26823	250	Trichloro-1,2,2-trifluoroethane[1,1,2-]	550 (U)	0.00781 (U)
50-26823	250	Trichloroethane[1,1,1-]	390 (U)	0.00156 (U)
50-26823	250	Trichloroethene	56000	0.00156 (U)
50-26823	250	Trichlorofluoromethane	400 (U)	0.00156 (UJ)
50-26823	250	Trimethylbenzene[1,2,4-]	350 (U)	0.00156 (U)
50-26823	250	Xylene[1,2-]	310 (U)	0.00156 (U)
50-26823	300	Acetone	670 (U)	0.00658 (UJ)
50-26823	300	Benzene	180 (U)	0.00132 (U)
50-26823	300	Butanone[2-]	830 (U)	0.00658 (U)

Table 6.7-1 (continued)

Location ID	Depth (ft)	Analyte	Pore-Gas Concentration ($\mu\text{g}/\text{m}^3$)	Core Concentration (mg/kg)
50-26823	300	Carbon Tetrachloride	1300	0.00132 (U)
50-26823	300	Chloroform	1900	0.000381 (J)
50-26823	300	Chloromethane	230 (UJ)	0.00132 (U)
50-26823	300	Dichlorodifluoromethane	900	0.00132 (UJ)
50-26823	300	Dichloroethane[1,2-]	230 (UJ)	0.00132 (U)
50-26823	300	Dichloroethene[cis-1,2-]	510	0.00132 (U)
50-26823	300	Dichloropropane[1,2-]	260 (U)	0.00132 (U)
50-26823	300	Ethylbenzene	250 (U)	0.00132 (U)
50-26823	300	Methylene Chloride	2100	0.00658 (UJ)
50-26823	300	Styrene	240 (U)	0.00132 (U)
50-26823	300	Tetrachloroethene	1500	0.00132 (U)
50-26823	300	Toluene	210 (U)	0.00132 (U)
50-26823	300	Trichloro-1,2,2-trifluoroethane[1,1,2-]	430 (U)	0.00658 (U)
50-26823	300	Trichloroethane[1,1,1-]	310 (U)	0.00132 (U)
50-26823	300	Trichloroethene	54000	0.00235
50-26823	300	Trichlorofluoromethane	320 (U)	0.00132 (UJ)
50-26823	300	Trimethylbenzene[1,2,4-]	280 (U)	0.00132 (U)
50-26823	300	Xylene[1,2-]	250 (U)	0.00132 (U)
50-26824	20	Acetone	26	0.0051 (U)
50-26824	20	Benzene	6.4 (U)	0.00102 (U)
50-26824	20	Butanone[2-]	29 (U)	0.0051 (U)
50-26824	20	Carbon Tetrachloride	28	0.00102 (U)
50-26824	20	Chloroform	180	0.000524 (J)
50-26824	20	Chloromethane	8.2 (U)	0.00102 (U)
50-26824	20	Dichlorodifluoromethane	54 (J)	0.00102 (UJ)
50-26824	20	Dichloroethane[1,2-]	8.1 (UJ)	0.00102 (U)
50-26824	20	Dichloroethene[cis-1,2-]	21	0.00102 (U)
50-26824	20	Dichloropropane[1,2-]	20 (J)	0.00102 (U)
50-26824	20	Ethylbenzene	8.7 (U)	0.00102 (U)
50-26824	20	Methylene Chloride	10	0.0051 (UJ)
50-26824	20	Styrene	8.5 (U)	0.00102 (U)
50-26824	20	Tetrachloroethene	390	0.00102 (U)
50-26824	20	Toluene	7.5 (U)	0.00102 (U)
50-26824	20	Trichloro-1,2,2-trifluoroethane[1,1,2-]	40	0.0051 (U)
50-26824	20	Trichloroethane[1,1,1-]	66	0.00102 (U)
50-26824	20	Trichloroethene	2500	0.00182
50-26824	20	Trichlorofluoromethane	11 (UJ)	0.00102 (UJ)
50-26824	20	Trimethylbenzene[1,2,4-]	9.8 (U)	0.00102 (U)

Table 6.7-1 (continued)

Location ID	Depth (ft)	Analyte	Pore-Gas Concentration ($\mu\text{g}/\text{m}^3$)	Core Concentration (mg/kg)
50-26824	20	Xylene[1,2-]	8.7 (U)	0.00102 (U)
50-26824	37.5	Acetone	97 (U)	0.00532 (U)
50-26824	37.5	Benzene	26 (U)	0.00106 (U)
50-26824	37.5	Butanone[2-]	120 (U)	0.00532 (U)
50-26824	37.5	Carbon Tetrachloride	51 (U)	0.00106 (U)
50-26824	37.5	Chloroform	460	0.00106 (U)
50-26824	37.5	Chloromethane	34 (U)	0.00106 (U)
50-26824	37.5	Dichlorodifluoromethane	140 (J)	0.00106 (UJ)
50-26824	37.5	Dichloroethane[1,2-]	33 (UJ)	0.00106 (U)
50-26824	37.5	Dichloroethene[cis-1,2-]	55	0.00106 (U)
50-26824	37.5	Dichloropropane[1,2-]	58 (J)	0.00106 (U)
50-26824	37.5	Ethylbenzene	35 (U)	0.00106 (U)
50-26824	37.5	Methylene Chloride	28 (U)	0.00532 (UJ)
50-26824	37.5	Styrene	35 (U)	0.00106 (U)
50-26824	37.5	Tetrachloroethene	980	0.00106 (U)
50-26824	37.5	Toluene	31 (U)	0.00106 (U)
50-26824	37.5	Trichloro-1,2,2-trifluoroethane[1,1,2-]	110	0.00532 (U)
50-26824	37.5	Trichloroethane[1,1,1-]	120	0.00106 (U)
50-26824	37.5	Trichloroethene	6500	0.00106 (U)
50-26824	37.5	Trichlorofluoromethane	46 (UJ)	0.00106 (UJ)
50-26824	37.5	Trimethylbenzene[1,2,4-]	40 (U)	0.00106 (U)
50-26824	37.5	Xylene[1,2-]	35 (U)	0.00106 (U)
50-26824	70	Acetone	120 (U)	0.00532 (U)
50-26824	70	Benzene	33 (U)	0.00106 (U)
50-26824	70	Butanone[2-]	150 (U)	0.00532 (U)
50-26824	70	Carbon Tetrachloride	66 (U)	0.00106 (U)
50-26824	70	Chloroform	550	0.00106 (U)
50-26824	70	Chloromethane	43 (U)	0.00106 (U)
50-26824	70	Dichlorodifluoromethane	150 (J)	0.00106 (UJ)
50-26824	70	Dichloroethane[1,2-]	42 (UJ)	0.00106 (U)
50-26824	70	Dichloroethene[cis-1,2-]	82	0.00106 (U)
50-26824	70	Dichloropropane[1,2-]	79 (J)	0.00106 (U)
50-26824	70	Ethylbenzene	45 (U)	0.00106 (U)
50-26824	70	Methylene Chloride	53	0.00532 (UJ)
50-26824	70	Styrene	44 (U)	0.00106 (U)
50-26824	70	Tetrachloroethene	970	0.00106 (U)
50-26824	70	Toluene	39 (U)	0.00106 (U)
50-26824	70	Trichloro-1,2,2-trifluoroethane[1,1,2-]	130	0.00532 (U)

Table 6.7-1 (continued)

Location ID	Depth (ft)	Analyte	Pore-Gas Concentration ($\mu\text{g}/\text{m}^3$)	Core Concentration (mg/kg)
50-26824	70	Trichloroethane[1,1,1-]	59	0.00106 (U)
50-26824	70	Trichloroethene	7600	0.00106 (U)
50-26824	70	Trichlorofluoromethane	59 (UJ)	0.00106 (UJ)
50-26824	70	Trimethylbenzene[1,2,4-]	51 (U)	0.00106 (U)
50-26824	70	Xylene[1,2-]	46 (U)	0.00106 (U)
50-26824	100	Acetone	120 (U)	0.00568 (U)
50-26824	100	Benzene	31 (U)	0.00114 (U)
50-26824	100	Butanone[2-]	140 (U)	0.00568 (U)
50-26824	100	Carbon Tetrachloride	78	0.00114 (U)
50-26824	100	Chloroform	500	0.00114 (U)
50-26824	100	Chloromethane	41 (U)	0.00114 (U)
50-26824	100	Dichlorodifluoromethane	150 (J)	0.00114 (UJ)
50-26824	100	Dichloroethane[1,2-]	40 (UJ)	0.00114 (U)
50-26824	100	Dichloroethene[cis-1,2-]	77	0.00114 (U)
50-26824	100	Dichloropropane[1,2-]	76 (J)	0.00114 (U)
50-26824	100	Ethylbenzene	43 (U)	0.00114 (U)
50-26824	100	Methylene Chloride	87	0.00568 (UJ)
50-26824	100	Styrene	42 (U)	0.00114 (U)
50-26824	100	Tetrachloroethene	850	0.00114 (U)
50-26824	100	Toluene	37 (U)	0.00114 (U)
50-26824	100	Trichloro-1,2,2-trifluoroethane[1,1,2-]	120	0.00568 (U)
50-26824	100	Trichloroethane[1,1,1-]	54 (U)	0.00114 (U)
50-26824	100	Trichloroethene	7500	0.00114 (U)
50-26824	100	Trichlorofluoromethane	55 (UJ)	0.00114 (UJ)
50-26824	100	Trimethylbenzene[1,2,4-]	48 (U)	0.00114 (U)
50-26824	100	Xylene[1,2-]	43 (U)	0.00114 (U)
50-26824	150	Acetone	130 (U)	0.00639 (U)
50-26824	150	Benzene	35 (U)	0.00122 (U)
50-26824	150	Butanone[2-]	160 (U)	0.0061 (U)
50-26824	150	Carbon Tetrachloride	120	0.00122 (U)
50-26824	150	Chloroform	440	0.00122 (U)
50-26824	150	Chloromethane	45 (U)	0.00122 (U)
50-26824	150	Dichlorodifluoromethane	150 (J)	0.00122 (UJ)
50-26824	150	Dichloroethane[1,2-]	44 (UJ)	0.00122 (U)
50-26824	150	Dichloroethene[cis-1,2-]	91	0.00122 (U)
50-26824	150	Dichloropropane[1,2-]	68 (J)	0.00122 (U)
50-26824	150	Ethylbenzene	48 (U)	0.00122 (U)
50-26824	150	Methylene Chloride	200	0.0061 (UJ)

Table 6.7-1 (continued)

Location ID	Depth (ft)	Analyte	Pore-Gas Concentration ($\mu\text{g}/\text{m}^3$)	Core Concentration (mg/kg)
50-26824	150	Styrene	47 (U)	0.00122 (U)
50-26824	150	Tetrachloroethene	700	0.00122 (U)
50-26824	150	Toluene	41 (U)	0.00122 (U)
50-26824	150	Trichloro-1,2,2-trifluoroethane[1,1,2-]	120	0.0061 (U)
50-26824	150	Trichloroethane[1,1,1-]	60 (U)	0.00122 (U)
50-26824	150	Trichloroethene	59 (U)	0.00122 (U)
50-26824	150	Trichlorofluoromethane	61 (UJ)	0.00122 (UJ)
50-26824	150	Trimethylbenzene[1,2,4-]	54 (U)	0.00122 (U)
50-26824	150	Xylene[1,2-]	48 (U)	0.00122 (U)
50-26824	200	Acetone	280 (U)	0.00641 (U)
50-26824	200	Benzene	75 (U)	0.00128 (U)
50-26824	200	Butanone[2-]	350 (U)	0.00641 (U)
50-26824	200	Carbon Tetrachloride	180	0.00128 (U)
50-26824	200	Chloroform	600	0.00128 (U)
50-26824	200	Chloromethane	97 (U)	0.00128 (U)
50-26824	200	Dichlorodifluoromethane	260 (J)	0.00128 (UJ)
50-26824	200	Dichloroethane[1,2-]	95 (UJ)	0.00128 (U)
50-26824	200	Dichloroethene[cis-1,2-]	170	0.00128 (U)
50-26824	200	Dichloropropane[1,2-]	110 (UJ)	0.00128 (U)
50-26824	200	Ethylbenzene	100 (U)	0.00128 (U)
50-26824	200	Methylene Chloride	580	0.00641 (UJ)
50-26824	200	Styrene	100 (U)	0.00128 (U)
50-26824	200	Tetrachloroethene	1100	0.00128 (U)
50-26824	200	Toluene	88 (U)	0.00128 (U)
50-26824	200	Trichloro-1,2,2-trifluoroethane[1,1,2-]	180 (U)	0.00641 (U)
50-26824	200	Trichloroethane[1,1,1-]	130 (U)	0.00128 (U)
50-26824	200	Trichloroethene	16000	0.00128 (U)
50-26824	200	Trichlorofluoromethane	130 (UJ)	0.00128 (UJ)
50-26824	200	Trimethylbenzene[1,2,4-]	120 (U)	0.00128 (U)
50-26824	200	Xylene[1,2-]	100 (U)	0.00128 (U)
50-26825	20	Acetone	44 (U)	0.00521 (U)
50-26825	20	Benzene	6.2 (U)	0.00104 (U)
50-26825	20	Butanone[2-]	28 (U)	0.00521 (U)
50-26825	20	Carbon Tetrachloride	48	0.00104 (U)
50-26825	20	Chloroform	100	0.00104 (U)
50-26825	20	Chloromethane	8 (U)	0.00104 (U)
50-26825	20	Dichlorodifluoromethane	470	0.00104 (U)
50-26825	20	Dichloroethane[1,2-]	7.9 (U)	0.00104 (U)

Table 6.7-1 (continued)

Location ID	Depth (ft)	Analyte	Pore-Gas Concentration (µg/m³)	Core Concentration (mg/kg)
50-26825	20	Dichloroethene[cis-1,2-]	8	0.00104 (U)
50-26825	20	Dichloropropane[1,2-]	120	0.00104 (U)
50-26825	20	Ethylbenzene	8.4 (U)	0.00104 (U)
50-26825	20	Methylene Chloride	6.7 (U)	0.00521 (U)
50-26825	20	Styrene	8.2 (U)	0.00104 (U)
50-26825	20	Tetrachloroethene	610	0.00104 (U)
50-26825	20	Toluene	11 (U)	0.00104 (U)
50-26825	20	Trichloro-1,2,2-trifluoroethane[1,1,2-]	210	0.00521 (U)
50-26825	20	Trichloroethane[1,1,1-]	63	0.00104 (U)
50-26825	20	Trichloroethene	1900	0.00104 (U)
50-26825	20	Trichlorofluoromethane	49	0.00104 (U)
50-26825	20	Trimethylbenzene[1,2,4-]	19 (U)	0.00104 (U)
50-26825	20	Xylene[1,2-]	8.4 (U)	0.00104 (U)
50-26825	37.5	Acetone	50	0.00595 (U)
50-26825	37.5	Benzene	6.4 (U)	0.00119 (U)
50-26825	37.5	Butanone[2-]	29 (U)	0.00595 (U)
50-26825	37.5	Carbon Tetrachloride	43	0.00119 (U)
50-26825	37.5	Chloroform	120	0.00119 (U)
50-26825	37.5	Chloromethane	8.2 (UJ)	0.00119 (U)
50-26825	37.5	Dichlorodifluoromethane	450	0.00119 (U)
50-26825	37.5	Dichloroethane[1,2-]	8.1 (UJ)	0.00119 (U)
50-26825	37.5	Dichloroethene[cis-1,2-]	17	0.00119 (U)
50-26825	37.5	Dichloropropane[1,2-]	120 (J)	0.00119 (U)
50-26825	37.5	Ethylbenzene	8.7 (U)	0.00119 (U)
50-26825	37.5	Methylene Chloride	7	0.00595 (U)
50-26825	37.5	Styrene	8.5 (U)	0.00119 (U)
50-26825	37.5	Tetrachloroethene	650	0.00119 (U)
50-26825	37.5	Toluene	7.5 (U)	0.00119 (U)
50-26825	37.5	Trichloro-1,2,2-trifluoroethane[1,1,2-]	250	0.00595 (U)
50-26825	37.5	Trichloroethane[1,1,1-]	56	0.00119 (U)
50-26825	37.5	Trichloroethene	2100	0.00119 (U)
50-26825	37.5	Trichlorofluoromethane	37 (J)	0.00119 (U)
50-26825	37.5	Trimethylbenzene[1,2,4-]	9.8 (U)	0.00119 (U)
50-26825	37.5	Xylene[1,2-]	8.7 (U)	0.00119 (U)
50-26825	69	Acetone	78	0.00422 (J)
50-26825	69	Benzene	2.3	0.00104 (U)
50-26825	69	Butanone[2-]	6.3	0.00521 (U)
50-26825	69	Carbon Tetrachloride	1.9	0.00104 (U)

Table 6.7-1 (continued)

Location ID	Depth (ft)	Analyte	Pore-Gas Concentration ($\mu\text{g}/\text{m}^3$)	Core Concentration (mg/kg)
50-26825	69	Chloroform	0.97 (U)	0.00104 (U)
50-26825	69	Chloromethane	2.3	0.00104 (UJ)
50-26825	69	Dichlorodifluoromethane	8.3	0.00104 (U)
50-26825	69	Dichloroethane[1,2-]	0.81 (U)	0.00104 (U)
50-26825	69	Dichloroethene[cis-1,2-]	0.79 (U)	0.00104 (U)
50-26825	69	Dichloropropane[1,2-]	0.92 (U)	0.00104 (U)
50-26825	69	Ethylbenzene	1.6	0.00104 (U)
50-26825	69	Methylene Chloride	11	0.00521 (UJ)
50-26825	69	Styrene	5.8	0.00104 (U)
50-26825	69	Tetrachloroethene	2.9	0.00104 (U)
50-26825	69	Toluene	14	0.00104 (U)
50-26825	69	Trichloro-1,2,2-trifluoroethane[1,1,2-]	3.1 (U)	0.00521 (UJ)
50-26825	69	Trichloroethane[1,1,1-]	1.1 (U)	0.00104 (U)
50-26825	69	Trichloroethene	6.9	0.00104 (U)
50-26825	69	Trichlorofluoromethane	4.1	0.00104 (U)
50-26825	69	Trimethylbenzene[1,2,4-]	2	0.00104 (U)
50-26825	69	Xylene[1,2-]	2.1	0.00104 (U)
50-26825	99.5	Acetone	57 (U)	0.00302 (J)
50-26825	99.5	Benzene	15 (U)	0.00114 (U)
50-26825	99.5	Butanone[2-]	71 (U)	0.00568 (U)
50-26825	99.5	Carbon Tetrachloride	43	0.00114 (U)
50-26825	99.5	Chloroform	200	0.00114 (U)
50-26825	99.5	Chloromethane	20 (UJ)	0.00114 (UJ)
50-26825	99.5	Dichlorodifluoromethane	370	0.00114 (U)
50-26825	99.5	Dichloroethane[1,2-]	19 (UJ)	0.00114 (U)
50-26825	99.5	Dichloroethene[cis-1,2-]	35	0.00114 (U)
50-26825	99.5	Dichloropropane[1,2-]	190 (J)	0.00114 (U)
50-26825	99.5	Ethylbenzene	21 (U)	0.00114 (U)
50-26825	99.5	Methylene Chloride	38	0.00568 (UJ)
50-26825	99.5	Styrene	20 (U)	0.00114 (U)
50-26825	99.5	Tetrachloroethene	870	0.00114 (U)
50-26825	99.5	Toluene	18 (U)	0.00114 (U)
50-26825	99.5	Trichloro-1,2,2-trifluoroethane[1,1,2-]	470	0.00568 (UJ)
50-26825	99.5	Trichloroethane[1,1,1-]	90	0.00114 (U)
50-26825	99.5	Trichloroethene	3400	0.00114 (U)
50-26825	99.5	Trichlorofluoromethane	32 (J)	0.00114 (U)
50-26825	99.5	Trimethylbenzene[1,2,4-]	24 (U)	0.00114 (U)
50-26825	99.5	Xylene[1,2-]	21 (U)	0.00114 (U)

Table 6.7-1 (continued)

Location ID	Depth (ft)	Analyte	Pore-Gas Concentration (µg/m³)	Core Concentration (mg/kg)
50-26825	149	Acetone	88 (U)	0.00329 (J)
50-26825	149	Benzene	24 (U)	0.00109 (U)
50-26825	149	Butanone[2-]	110 (U)	0.00543 (U)
50-26825	149	Carbon Tetrachloride	110	0.00109 (U)
50-26825	149	Chloroform	200	0.00109 (U)
50-26825	149	Chloromethane	31 (UJ)	0.00109 (UJ)
50-26825	149	Dichlorodifluoromethane	290	0.00109 (U)
50-26825	149	Dichloroethane[1,2-]	30 (UJ)	0.00109 (U)
50-26825	149	Dichloroethene[cis-1,2-]	57	0.00109 (U)
50-26825	149	Dichloropropane[1,2-]	210 (J)	0.00109 (U)
50-26825	149	Ethylbenzene	32 (U)	0.00109 (U)
50-26825	149	Methylene Chloride	88	0.00543 (UJ)
50-26825	149	Styrene	32 (U)	0.00109 (U)
50-26825	149	Tetrachloroethene	1100	0.00109 (U)
50-26825	149	Toluene	28 (U)	0.00109 (U)
50-26825	149	Trichloro-1,2,2-trifluoroethane[1,1,2-]	440	0.00543 (UJ)
50-26825	149	Trichloroethane[1,1,1-]	91	0.00109 (U)
50-26825	149	Trichloroethene	5300	0.00109 (U)
50-26825	149	Trichlorofluoromethane	42 (UJ)	0.00109 (U)
50-26825	149	Trimethylbenzene[1,2,4-]	36 (U)	0.00109 (U)
50-26825	149	Xylene[1,2-]	32 (U)	0.00109 (U)
50-26825	200	Acetone	130 (U)	0.00322 (J)
50-26825	200	Benzene	35 (U)	0.00116 (U)
50-26825	200	Butanone[2-]	160 (U)	0.00581 (UJ)
50-26825	200	Carbon Tetrachloride	170	0.00116 (U)
50-26825	200	Chloroform	220	0.00116 (U)
50-26825	200	Chloromethane	45 (UJ)	0.00116 (UJ)
50-26825	200	Dichlorodifluoromethane	340	0.00116 (U)
50-26825	200	Dichloroethane[1,2-]	44 (UJ)	0.00116 (U)
50-26825	200	Dichloroethene[cis-1,2-]	80	0.00116 (U)
50-26825	200	Dichloropropane[1,2-]	250 (J)	0.00116 (U)
50-26825	200	Ethylbenzene	47 (U)	0.00116 (U)
50-26825	200	Methylene Chloride	130	0.00581 (UJ)
50-26825	200	Styrene	46 (U)	0.00116 (U)
50-26825	200	Tetrachloroethene	1400	0.00116 (U)
50-26825	200	Toluene	41 (U)	0.00116 (U)
50-26825	200	Trichloro-1,2,2-trifluoroethane[1,1,2-]	450	0.00581 (UJ)
50-26825	200	Trichloroethane[1,1,1-]	100	0.00116 (U)

Table 6.7-1 (continued)

Location ID	Depth (ft)	Analyte	Pore-Gas Concentration ($\mu\text{g}/\text{m}^3$)	Core Concentration (mg/kg)
50-26825	200	Trichloroethene	7600	0.00116 (U)
50-26825	200	Trichlorofluoromethane	61 (UJ)	0.00116 (UJ)
50-26825	200	Trimethylbenzene[1,2,4-]	53 (U)	0.00116 (U)
50-26825	200	Xylene[1,2-]	47 (U)	0.00116 (U)

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Appendix A

*Acronyms, Glossary, and
Metric Conversion and Data Qualifier Definition Tables*

A-1.0 ACRONYMS

AES	atomic emission spectroscopy
AOC	area of concern
ARS	American Radiation Services
ASTM	American Society for Testing and Materials
ATSDR	Agency for Toxic Substances and Disease Registry
bgs	below ground surface
BMP	Best Management Practice
BV	background value
CCV	continuing calibration verification
CFAA	cold vapor atomic absorption
CME	corrective measures evaluation
CMS	corrective measures study
COC	chain of custody
COPEC	chemical of potential ecological concern
COPC	chemical of potential concern
Cpm	Counts per minute
CST	Chemical Sciences and Technology (a former Laboratory division)
CWDR	chemical waste disposal request
%D	percent difference
DGPS	differential global-positioning system
DL	detection limit
DPM	disintegrations per minute
DOE	Department of Energy (U.S.)
DU	depleted uranium
EDL	estimated detection limit
EP	Environmental Programs
EPA	Environmental Protection Agency (U.S.)
EPC	exposure point concentration
EQL	estimated quantitation limits
ERDB	Environmental Restoration Database
ESL	ecological screening level
FV	fallout value
GFAA	graphite furnace atomic absorption
GPR	ground-penetrating radar

GPS	global-positioning system
HE	high explosive
HEPA	high-efficiency particulate air (filter)
HI	hazard index
HQ	hazard quotient
HRL	Health Research Laboratory
HSA	Hollow-stem auger
HSR	Health, Safety, and Radiation Protection (a Laboratory division)
IA	Information Architecture
IC	ion chromatography
ICPES	inductively coupled plasma emission spectroscopy
ICV	initial calibration verification
I.D.	inner diameter
IDW	investigation-derived waste
IM	Information Management (a former Laboratory division)
INEL	Idaho National Engineering Laboratory
IS	internal standard
LAL	lower acceptance limit
LAMPRE	Los Alamos molten plutonium reactor experiment
LANL	Los Alamos National Laboratory
LASL	Los Alamos Scientific Laboratory
LCS	laboratory control sample
LD ₅₀	lethal dose 50
LIR	Laboratory implementation requirement
LLW	low-level waste
LOAEL	lowest observed adverse effect level
MAP	mixed activation products
MASW	multichannel analysis of surface waves
MCL	maximum contaminant level
MDA	material disposal area
MDC	minimum detectable concentration
MDL	method detection limit
MFP	mixed fission product
MSW	municipal solid waste
NES	nuclear environmental site
NMHTWA	New Mexico Hazardous Waste Act

NMSA	New Mexico Statues Annotated
NMWQCC	New Mexico Water Quality Control Commission
NOAEL	No observed adverse effect level
NRX	Navy experiment
O.D.	outer diameter
ORNL	Oak Ridge National Laboratory
OU	operable unit
OWR	Omega West Reactor
PCB	polychlorinated biphenyl
PID	photoionization detector
PPE	personal protective equipment
PRG	preliminary remediation goal
QA	quality assurance
QC	quality control
QP	quality procedure
RAIS	Risk Assessment Information System
RCRA	Resource Conservation and Recovery Act
RCT	radiation control technician
RDX	research department explosive (also hexahydro-1,3,5-trinitro-1,3,5-triazine)
RfD	reference dose
RFI	Resource Conservation and Recovery Act facility investigation
RL	reporting limit
RLWTF	radioactive liquid waste treatment facility
RPD	relative percent difference
RPF	Records Processing Facility
RPP	radiation protection program
RRF	relative response factor
%RSD	percent relative standard deviation
SAA	satellite accumulation area
SAL	screening action level
SCDM	Superfund Chemical Data Matrix
SCL	sample collection log
SL	screening level
SMO	sample management office
SOP	standard operating procedure
SOW	statement of work

SSL	soil screening level
SSO	site safety officer
SV	screening value
SVOC	semivolatile organic compound
SWMU	solid waste management unit
TA	technical area
TAL	target analyte list
TCDD	2,3,7,8-tetrachlorodibenzo-p-dioxin or dioxin
TCE	trichloroethene
TCLP	toxicity characteristic leaching procedure
TD	total depth
T&E	threatened and endangered
TEF	toxic equivalency factor
TNT	trinitrotoluene
TRU	transuranic
TRV	toxicity reference value
TSDF	Treatment, storage, and disposal facility
UAL	upper acceptance level
UCL	upper confidence limit
USGS	U.S. Geological Survey
VOC	volatile organic compound
WCSF	waste characterization strategy form
WPF	waste profile form

A-2.0 GLOSSARY

abandonment—The plugging of a well or borehole in a manner that precludes the migration of surface runoff or groundwater along the length of the well or borehole.

absorption—The uptake of water, other fluids, or dissolved chemicals by a cell or organism (e.g., tree roots absorb dissolved nutrients in soil).

accuracy—A measure of the closeness of measurements to the true value of the parameter being measured.

action level—(1) A numerical value that has been established by statistical analysis or has been set according to regulatory limits and is used as a criterion for action. Contamination found in a particular medium below an appropriate action level is not generally subject to remediation or further study.
(2) A health- and environment-based concentration derived using chemical-specific toxicity information and standardized exposure assumptions. An action level can be developed on a facility-specific basis or can be taken from standardized lists.

administrative authority—For Los Alamos National Laboratory, one or more regulatory agencies, such as the New Mexico Environment Department, the U.S. Environmental Protection Agency, or the U.S. Department of Energy, as appropriate.

adsorption—The surface retention of solid, liquid, or gas molecules, atoms, or ions by a solid.

alluvial—Pertaining to geologic deposits or features formed by running water.

alpha radiation—A form of particle radiation that is highly ionizing and has low penetration. Alpha radiation consists of two protons and two neutrons bound together into a particle that is identical to a helium nucleus and can be written as He^{2+} .

analysis—A critical evaluation, usually made by breaking a subject (either material or intellectual) down into its constituent parts, then describing the parts and their relationship to the whole. Analyses may include physical analysis, chemical analysis, toxicological analysis, and knowledge-of-process determinations.

analyte—The element, nuclide, or ion a chemical analysis seeks to identify and/or quantify; the chemical constituent of interest.

analytical method—A procedure or technique for systematically performing an activity.

aquifer—An underground geological formation (or group of formations) containing water that is the source of groundwater for wells and springs.

area of concern—(1) A release that may warrant investigation or remediation and is not a solid waste management unit (SWMU). (2) An area at Los Alamos National Laboratory that may have had a release of a hazardous waste or a hazardous constituent but is not a SWMU.

artificial fill—A material that has been imported and typically consists of disturbed soils mixed with crushed Bandelier Tuff or other rock types.

ash-flow tuff—A tuff deposited by a hot, dense volcanic current. Ash-flow tuff can be either welded tuff or nonwelded tuff.

assessment—(1) The act of reviewing, inspecting, testing, checking, conducting surveillance, auditing, or otherwise determining and documenting whether items, processes, or services meet specified requirements. (2) An evaluation process used to measure the performance or effectiveness of a system and its elements. In this glossary, assessment is an all-inclusive term used to denote any one of the following: audit, performance evaluation, management system review, peer review, inspection, or surveillance.

assessment endpoint—In an ecological risk assessment, the expression of an environmental value to be protected (e.g., fish biomass or reproduction of avian populations).

background concentration—Naturally occurring concentrations of an inorganic chemical or radionuclide in soil, sediment, or tuff.

background data—Data that represent naturally occurring concentrations of inorganic and radionuclide constituents in a geologic medium. Los Alamos National Laboratory's (the Laboratory's) background data are derived from samples collected at locations that are either within, or adjacent to, the Laboratory. These locations (1) are representative of geological media found within Laboratory boundaries, and (2) have not been affected by Laboratory operations.

background radiation—The amount of radioactivity naturally present in the environment, including cosmic rays from space and natural radiation from soils and rock.

background value (BV)—A statistically derived concentration (i.e., the upper tolerance limit [UTL]) of a chemical used to represent the background data set. If a UTL cannot be derived, either the detection limit or maximum reported value in the background data set is used.

basalt—A fine-grained, dark volcanic rock composed chiefly of plagioclase, augite, olivine, and magnetite.

baseline risk assessment—A site-specific analysis of the potential adverse effects of hazardous constituents that have been released from a site in the absence of any controls or mitigating actions. A baseline risk assessment consists of the following four steps: data collection and analysis, exposure assessment, toxicity assessment, and risk characterization.

best management practices—Methods that have been determined to be the most effective, practical means of preventing or reducing pollution from nonpoint sources.

beta radiation—High-energy electrons emitted by certain types of radioactive nuclei, such as potassium-40. The beta particles emitted are a form of ionizing radiation also known as beta rays.

bias—The systematic deviation from a true value that remains constant over replicated measurements within the statistical precision of the measurement process.

blank—A sample that is expected to have a negligible or unmeasurable amount of an analyte. Results of blank sample analyses indicate whether field samples might have been contaminated during the sample collection, transport, storage, preparation, or analysis processes.

borehole—(1) A hole drilled or bored into the ground, usually for exploratory or economic purposes.
(2) A hole into which casing, screen, and other materials may be installed to construct a well.

borehole logging—The process of making remote measurements of physical, chemical, or other parameters at multiple depths in a borehole.

calibration—A process used to identify the relationship between the true analyte concentration or other variable and the response of a measurement instrument, chemical analysis method, or other measurement system.

calibration blank—A calibration standard prepared to contain negligible or unmeasurable amounts of analytes. A calibration blank is used to establish the zero concentration point for analytical measurement calibrations.

calibration standard—A sample prepared to contain known amounts of analytes of interest and other constituents required for an analysis.

canopy—The cover formed by the leafy upper branches of surrounding trees and shrubs.

canyon—A stream-cut chasm or gorge, the sides of which are composed of cliffs or a series of cliffs rising from the chasm's bed. Canyons are characteristic of arid or semiarid regions where downcutting by streams greatly exceeds weathering.

casing—A solid piece of pipe, typically steel, stainless steel, or polyvinyl chloride plastic, used to keep a well open in either unconsolidated material or unstable rock and as a means to contain zone-isolation materials, such as cement grout.

chain of custody—An unbroken, documented trail of accountability that is designed to ensure the uncompromised physical integrity of samples, data, and records.

chemical—Any naturally occurring or human-made substance characterized by a definite molecular composition.

chemical analysis—A process used to measure one or more attributes of a sample in a clearly defined, controlled, and systematic manner. Chemical analysis often requires treating a sample chemically or physically before measurement.

chemical interference—A chemical or physical entity whose influence results in a decrease or increase in the response of an analytical method or other measurement system relative to the response obtained in the absence of the entity.

chemical of potential concern (COPC)—A detected chemical compound or element that has the potential to adversely affect human receptors as a result of its concentration, distribution, and toxicity.

chemical of potential ecological concern—A detected chemical compound or element that has the potential to adversely affect ecological receptors as a result of its concentration, distribution, and toxicity.

cleanup—A series of actions taken to deal with the release, or threat of a release, of a hazardous substance that could affect humans and/or the environment. The term cleanup is sometimes used interchangeably with the terms remedial action, removal action, or corrective action.

cleanup levels—Media-specific contaminant concentration levels that must be met by a selected corrective action. Cleanup levels are established by using criteria such as the protection of human health and the environment; compliance with regulatory requirements; reduction of toxicity, mobility, or volume through treatment; long- and short-term effectiveness; implementability; and cost.

cold vapor atomic absorption—An analytical technique used for measuring mercury that is described in U.S. Environmental Protection Agency Methods 7470A ("Mercury in Liquid Waste") and 7471A ("Mercury in Solid or Semisolid Waste"). The technique is based on the absorption of nonionizing radiation at 253.7 nanometers (nm) by mercury vapor. The mercury is reduced to the elemental state and aerated from solution in a closed system. The mercury vapor passes through a cell positioned in the light path of an atomic absorption spectrophotometer. Absorbance (peak height) is measured as a function of mercury concentration.

community—In ecology, an assemblage of populations of different species within a specified location in space and time. Sometimes, a particular subgrouping may be specified, such as the fish community in a lake or the soil arthropod community in a forest.

Compliance Order on Consent (Consent Order)—For the Environmental Remediation and Surveillance Program, an enforcement document signed by the New Mexico Environment Department, the U.S. Department of Energy, and the Regents of the University of California on March 1, 2005, which prescribes the requirements for corrective action at Los Alamos National Laboratory. The purposes of the Consent Order are (1) to define the nature and extent of releases of contaminants at, or from, the facility; (2) to identify and evaluate, where needed, alternatives for corrective measures to clean up contaminants in the environment and prevent or mitigate the migration of contaminants at, or from, the facility; and (3) to implement such corrective measures. The Consent Order supersedes the corrective action requirements previously specified in Module VIII of the Laboratory's Hazardous Waste Facility Permit.

conceptual model—See site conceptual model.

Consent Order—See Compliance Order on Consent.

consolidated unit—A group of solid waste management units (SWMUs), or SWMUs and areas of concern, which generally are geographically proximate and have been combined for the purposes of investigation, reporting, or remediation.

contaminant—(1) Chemicals and radionuclides present in environmental media or on debris above background levels. (2) According to the March 1, 2005, Compliance Order on Consent (Consent Order), any hazardous waste listed or identified as characteristic in 40 Code of Federal Regulations (CFR) 261 (incorporated by 20.4.1.200 New Mexico Administrative Code [NMAC]); any hazardous constituent listed in 40 CFR 261 Appendix VIII (incorporated by 20.4.1.200 NMAC) or 40 CFR 264 Appendix IX (incorporated by 20.4.1.500 NMAC); any groundwater contaminant listed in the Water Quality Control Commission (WQCC) Regulations at 20.6.3.3103 NMAC; any toxic pollutant listed in the WQCC Regulations at 20.6.2.7 NMAC; explosive compounds; nitrate; and perchlorate. (Note: Under the Consent Order, the term “contaminant” does not include radionuclides or the radioactive portion of mixed waste.)

continuing calibration—A combination of calibration blank and check standards used to determine if an instrument’s response to an analyte concentration is within acceptable bounds relative to its initial calibration. A continuing calibration is performed every 12 h of operation or every 10 injections, depending on the analytical test method, thus verifying the satisfactory performance of an instrument on a day-to-day basis. The continuing-calibration 12-h period assumes that the instrument has not been shut down since the initial calibration.

contract analytical laboratory—An analytical laboratory under contract to the University of California to analyze samples from work performed at Los Alamos National Laboratory.

contract-required detection limit (CRDL)—The minimum reporting limits required under a contract between Los Alamos National Laboratory and a contract laboratory. The CRDLs are not necessarily intrinsically tied to instrument sensitivity; rather they are reporting limits.

corrective action—(1) In the Resource Conservation and Recovery Act, an action taken to rectify conditions potentially adverse to human health or the environment. (2) In the quality assurance field, the process of rectifying and preventing nonconformances.

corrective measure—An action taken at a solid waste management unit or area of concern to protect human health or the environment in the event of a release of contaminants into the environment, or to prevent a release of contaminants into the environment.

corrective measure evaluation—An evaluation of potential remedial alternatives undertaken to identify a preferred remedy that will be protective of human health and the environment and that will attain appropriate cleanup goals.

Curie—A unit of radioactivity defined as the quantity of any radioactive nuclide that has an activity of 3.7×10^{10} disintegrations per second (dps).

daily calibration—The combination of a calibration blank and calibration standard used to determine if the instrument response to an analyte concentration is within acceptable bounds relative to the initial calibration. A daily calibration establishes the instrument response factors on which quantitations are based, thus verifying the satisfactory performance of an instrument on a day-to-day basis.

data package—The hard copy deliverable for each sample delivery group produced by a contract analytical laboratory in accordance with the statement of work for analytical services.

data-quality assessment—The statistical and/or scientific evaluation of a data set that establishes whether the data set is adequate for its intended use.

data validation—A systematic process that applies a defined set of performance-based criteria to a body of data and that may result in the qualification of the data. The data-validation process is performed independently of the analytical laboratory that generates the data set and occurs before conclusions are drawn from the data. The process may include a standardized data review (routine data validation) and/or a problem-specific data review (focused data validation).

data verification—The process of evaluating the completeness, correctness, consistency, and compliance of a laboratory data package against a specified standard or contract.

- Completeness: All required information is present—in both hard copy and electronic forms.
- Correctness: The reported results are based on properly documented and correctly applied algorithms.
- Consistency: The values are the same when they appear in different reports or are transcribed from one report to another.
- Compliance: The data pass numerical quality-control tests based on parameters or limits specified in a contract or in an auxiliary document.

decontamination—The removal of unwanted material from the surface of, or from within, another material.

detect (detection)—An analytical result, as reported by an analytical laboratory, that denotes a chemical or radionuclide to be present in a sample at a given concentration.

detection limit—The minimum concentration that can be determined by a single measurement of an instrument. A detection limit implies a specified statistical confidence that the analytical concentration is greater than zero.

discharge—The accidental or intentional spilling, leaking, pumping, pouring, emitting, emptying, or dumping of hazardous waste into, or on, any land or water.

disposal—The discharge, deposit, injection, dumping, spilling, leaking, or placing of any solid waste or hazardous waste into, or on, any land or water so that such solid waste or hazardous waste or any constituent thereof may enter the environment or be emitted into the air or discharged into any waters, including groundwaters.

dose (dosage)—(1) The actual quantity of a chemical that is administered to an organism or to which it is exposed. (2) The amount of a substance that reaches a specific tissue (e.g., the liver). (3) The amount of a substance that is available for interaction with metabolic processes after it has crossed an organism's outer boundary.

dose equivalent—The product of the absorbed dose from ionizing radiation and factors that account for biological differences as a result of the radiation type and its distribution in the body.

drill bit—The cutting tool attached to the bottom of a drill stem.

drill rod (drill pipe)—Special pipe used to transmit rotation and energy from the drill rig to the bit. This conduit conveys circulation fluids such as air, water, or other mixtures to cool the bit and evacuate the borehole cuttings.

duplicate analysis—An analysis performed on one member of a pair of identically prepared subsamples taken from the same sample.

duplicate measurement—An additional measurement performed on a prepared sample under identical conditions to evaluate any variance in measurement.

ecological screening levels—Soil, sediment, or water concentrations that are used to screen for potential ecological effects. The concentrations are based on a chemical's no-observed-adverse-effect level for a receptor, below which no risk is indicated.

Environmental Restoration (ER) Project—A Los Alamos National Laboratory project established in 1989 as part of a U.S. Department of Energy nationwide program, and precursor of today's Environmental Remediation and Surveillance (ERS) Program. This program is designed (1) to investigate hazardous and/or radioactive materials that may be present in the environment as a

result of past Laboratory operations, (2) to determine if the materials currently pose an unacceptable risk to human health or the environment, and (3) to remediate (clean up, stabilize, or restore) those sites where unacceptable risk is still present.

environmental samples—Air, soil, water, or other media samples that have been collected from streams, wells, and soils, or other locations, and that are not expected to exhibit properties classified as hazardous by the U.S. Department of Transportation.

equipment blank (rinstate blank)—A sample used to rinse sample-collection equipment and expected to have negligible or unmeasurable amounts of analytes. The equipment blank is collected after the equipment decontamination is completed but before the collection of another field sample.

ER database (ERDB)—A database housing analytical and other programmatic information for the Environmental Remediation and Surveillance Program. The ERDB currently contains about 3 million analyses in 300 tables.

ER identification (ER ID) number—A unique identifier assigned by the Environmental Remediation and Surveillance Program's Records Processing Facility to each document when it is submitted as a final record.

error—The quantifiable difference between an observed value and the true value of a parameter being measured.

estimated detection limit—A reporting limit required by a Los Alamos National Laboratory statement of work for analytical services.

estimated quantitation limit (EQL)—The lowest concentration that can be reliably achieved within specified limits of precision and accuracy during routine analytical laboratory operating conditions. The low point on a calibration curve should reflect this quantitation limit. The EQL is not used to establish detection status. Sample EQLs are highly matrix dependent, and the specified EQLs might not always be achievable.

evapotranspiration—(1) The discharge of water from the earth's surface to the atmosphere by evaporation from lakes, streams, and soil surfaces and by transpiration from plants. (2) The loss of water from the soil by evaporation and/or by transpiration from the plants growing in the soil.

exposure pathway—Any path from the sources of contaminants to humans and other species or settings through air, soil, water, or food.

external standard calibration—A comparison of instrument responses from a sample to the responses from target compounds in the calibration standards. The sample's peak areas (or peak heights) are compared to the standards' peak areas (or peak heights).

facility—All contiguous land (and structures, other appurtenances, and improvements on the land) used for treating, storing, or disposing of hazardous waste. A facility may consist of several treatment, storage, or disposal operational units. For the purpose of implementing a corrective action, a facility is all the contiguous property that is under the control of the owner or operator seeking a permit under Subtitle C of the Resource Conservation and Recovery Act.

fallout radionuclides—Radionuclides that are present at globally elevated levels in the environment as a result of fallout from world-wide atomic weapons tests. The Los Alamos National Laboratory (the Laboratory) background data sets consist of environmental surveillance samples taken from marginal and regional locations for the following radionuclides associated with fallout: tritium, cesium-137, americium-241, plutonium-238, plutonium-239/240, and strontium-90. Samples were collected from regional and marginal locations in the Laboratory's vicinity that were (1) representative of geological media found within Laboratory boundaries, and (2) were not impacted by Laboratory operations.

field blank (field reagent blank)—A blank sample prepared in the field or carried to the sampling site, exposed to sampling conditions (e.g., by removing bottle caps), and returned to a laboratory to be analyzed in the same manner in which environmental samples are being analyzed. Field blanks are used to identify the presence of any contamination that may have been added during the sampling and analysis process.

field duplicate (replicate) samples—Two separate, independent samples taken from the same source, which are collected as collocated samples (i.e., equally representative of a sample matrix at a given location and time).

field matrix spike—A known amount of a field sample to which a known amount of a target analyte has been added and used to compute the proportion of the added analyte that is recovered upon analysis.

field notebook—A record of activities performed in the field or a compilation of field data.

field reagent blank—See field blank.

field sample—See sample.

focused data validation—A technically based analyte-, sample-, and data-use-specific process that extends the qualification of data beyond the method or contractual compliance and provides a higher level of confidence that an analyte is present or absent. If an analyte is present, the quality of the quantitation may be obtained through focused validation.

gamma radiation—A form of electromagnetic, high-energy ionizing radiation emitted from a nucleus. Gamma rays are essentially the same as x-rays (though at higher energy) and require heavy shielding, such as concrete or steel, to be blocked.

geohydrology—The science that applies hydrologic methods to the understanding of geologic phenomena.

grab sample—A specimen collected by a single application of a field sampling procedure to a target population (e.g., the surface soil from a single hole collected after the spade-and-scoop sampling procedure, or a single air filter left in the field for three months).

gravimetric moisture content—See water content.

ground cover—Natural or human-made materials (e.g., grasses, pine needles, asphalt, or concrete) which overlay soils.

groundwater—Interstitial water that occurs in saturated earth material and is capable of entering a well in sufficient amounts to be used as a water supply.

half-life—(1) The time required for a pollutant to lose one-half of its original concentration (for example, the biochemical half-life of DDT [dichlorodiphenyltrichloroethane] in the environment is 15 yr). (2) The time required for one half of the atoms in a radioactive element to undergo self-transmutation or decay (the half-life of radium is 1620 yr). (3) The time required for the elimination of one half of a total dose from the body.

hazard index—The sum of hazard quotients for multiple contaminants to which a receptor may have been exposed.

Hazardous and Solid Waste Amendments (HSWA)—Public Law No. 98-616, 98 Stat. 3221, enacted in 1984, which amended the Resource Conservation and Recovery Act of 1976 (42 United States Code § 6901 et seq).

hazardous constituent (hazardous waste constituent)—According to the March 1, 2005, Compliance Order of Consent (Consent Order), any constituent identified in Appendix VIII of Part 261, Title 40

Code of Federal Regulations (CFR) (incorporated by 20.4.1.200 New Mexico Administrative Code [NMAC]) or any constituent identified in 40 CFR 264, Appendix IX (incorporated by 20.4.1.500 NMAC).

hazardous waste—(1) Solid waste that is listed as a hazardous waste, or exhibits any of the characteristics of hazardous waste (i.e., ignitability, corrosivity, reactivity, or toxicity, as provided in 40 CFR, Subpart C). (2) According to the March 1, 2005, Compliance Order of Consent (Consent Order), any solid waste or combination of solid wastes that, because of its quantity, concentration, or physical, chemical, or infectious characteristics, meets the description set forth in New Mexico Statutes Annotated 1978, § 74-4-3(K) and is listed as a hazardous waste or exhibits a hazardous waste characteristic under 40 CFR 261 (incorporated by 20.4.1.200 New Mexico Administrative Code).

Hazardous Waste Bureau—The New Mexico Environment Department bureau charged with providing regulatory oversight and technical guidance to New Mexico hazardous waste generators and to treatment, storage, and disposal facilities, as required by the New Mexico Hazardous Waste Act.

Hazardous Waste Facility Permit—The authorization issued to Los Alamos National Laboratory (the Laboratory) by the New Mexico Environment Department that allows the Laboratory to operate as a hazardous waste treatment, storage, and disposal facility.

hazard quotient (HQ)—The ratio of the estimated site-specific exposure concentration of a single chemical from a site to the estimated daily exposure level at which no adverse health effects are likely to occur.

holding time—The maximum elapsed time a sample can be stored without unacceptable changes in analyte concentrations. Holding times apply under prescribed conditions, and deviations from these conditions may affect the holding times. Extraction holding time refers to the time lapsed between sample collection and sample preparation. Analytical holding time refers to the time lapsed between sample preparation and analysis.

hydraulic conductivity—(1) A coefficient of proportionality that describes the rate at which a fluid can move through a permeable medium. The rate is a function of both the medium and the fluid flowing through it. (2) The quantity of water that will flow through a unit of cross-sectional area of a porous material per unit time under a hydraulic gradient of 1.00 (measured at right angles to the direction of flow) at a specified temperature.

hydraulic gradient—The rate of change in hydraulic head per unit of distance in the direction of groundwater flow.

hydrogen-ion activity (pH)—The effective concentration (activity) of dissociated hydrogen ions (H⁺); a measure of the acidity or alkalinity of a solution that is numerically equal to 7 for neutral solutions, increases with alkalinity, and decreases as acidity increases.

“Hydrogeologic Workplan”—The document that describes the activities planned by Los Alamos National Laboratory (the Laboratory) to characterize the hydrologic setting beneath the Laboratory and to enhance the Laboratory’s groundwater monitoring program.

hydrogeology—The science dealing with the occurrence of surface water and groundwater, their uses, and their functions in modifying the earth, primarily by erosion and deposition.

inductively coupled plasma emission spectroscopy—A method that detects trace elements (including metals) in solutions by measuring characteristic emission spectra through optical spectrometry. Samples are nebulized, and the resulting aerosol is transported to a plasma torch. Element-specific emission spectra are produced by a radio-frequency, inductively coupled plasma. The spectra are

dispersed by a grating spectrometer, and photosensitive devices are used to monitor the emission lines' intensities.

inductively coupled plasma mass spectrometry—A method that detects submicrogram/liter concentrations of a large number of elements in water samples and in waste extracts or digests. When dissolved constituents are required, samples must be filtered and acid-preserved before analysis. No digestion is required before analysis for dissolved elements in water samples. The method measures ions produced by a radio-frequency, inductively coupled plasma. Analyte species originating in a liquid are nebulized, and the resulting aerosol is transported by argon gas into a plasma torch. The ions produced in the plasma gas are introduced into a mass spectrometer by means of an interface. The ions produced in the plasma are sorted according to their mass-to-charge ratios and quantified with a channel electron multiplier or Faraday cup.

industrial scenario—A land-use condition in which current Los Alamos National Laboratory operations or industrial/commercial operations within Los Alamos County are continued or planned. Any necessary remediation involves cleanup to standards designed to ensure a safe and healthy work environment for workers.

infiltration—(1) The penetration of water through the ground surface into subsurface soil. (2) The technique of applying large volumes of wastewater to land to penetrate the surface and percolate through the underlying soil.

initial calibration—The process used to establish the relationship between instrument response and analyte concentration at several analyte concentration values in order to demonstrate that an instrument is capable of acceptable analytical performance.

instrument detection limit (IDL)—A measure of instrument sensitivity without any consideration for contributions to the signal from reagents. The IDL is calculated as follows: Three times the average of the standard deviations obtained on three nonconsecutive days from the analysis of a standard solution, with seven consecutive measurements of that solution per day. The standard solution must be prepared at a concentration of three to five times the instrument manufacturer's estimated IDL.

instrument performance check—The analysis of a chemical of known relative mass abundances to indicate how well a mass spectrometer is performing over a specified mass range.

internal standards—Compounds added to a sample after the sample has been prepared for qualitative and quantitative instrument analysis. The compounds serve as a standard of retention time and response that is invariant from run to run.

investigation-derived waste—Solid waste or hazardous waste that was generated as a result of corrective action investigation or remediation field activities. Investigation-derived waste may include drilling muds, cuttings, and purge water from the installation of test pits or wells; purge water, soil, and other materials from the collection of samples; residues from the testing of treatment technologies and pump-and-treat systems; contaminated personal protective equipment; and solutions (aqueous or otherwise) used to decontaminate nondisposable protective clothing and equipment.

laboratory control sample (LCS)—A known matrix that has been spiked with compound(s) representative of target analytes. LCSs are used to document laboratory performance, and the acceptance criteria for LCSs are method-specific.

laboratory qualifier (laboratory flag)—Codes applied to data by a contract analytical laboratory to indicate, on a gross scale, a verifiable or potential data deficiency. These flags are applied according to the U.S. Environmental Protection Agency contract-laboratory program guidelines.

LANL (Los Alamos National Laboratory) data validation qualifiers—The Los Alamos National Laboratory data qualifiers which are defined by, and used, in the Environmental Remediation and Surveillance (ERS) Program validation process. The qualifiers describe the general usability (or quality) of data. For a complete list of data qualifiers applicable to any particular analytical suite, consult the appropriate ERS standard operating procedure.

LANL (Los Alamos National Laboratory) data validation reason codes—The Los Alamos National Laboratory designations applied to sample data by data validators who are independent of the contract laboratory that performed a given sample analysis. Reason codes provide an analysis-specific explanation for applying a qualifier, with some description of the qualifier's potential impact on data use. For a complete list of data qualifiers applicable to any particular analytical suite, consult the appropriate Environmental Remediation and Surveillance Program standard operating procedure.

log book—A notebook used to record tabulated data (e.g., the history of calibrations, sample tracking, numerical data, or other technical data).

lower acceptance limit (LAL)—The lowest limit that is acceptable according to quality control (QC) criteria for a specific QC sample and for a specific method. Any results lower than the LAL are qualified following the routine validation procedure.

material disposal area (MDA)—A subset of the solid waste management units at Los Alamos National Laboratory (the Laboratory) that include disposal units such as trenches, pits, and shafts. Historically, various disposal areas (but not all) were designated by the Laboratory as MDAs.

matrix—Relatively fine material in which coarser fragments or crystals are embedded; also called “ground mass” in the case of igneous rocks.

matrix spike—An aliquot of a sample to which a known concentration of target analyte has been added. Matrix spike samples are used to measure the ability to recover prescribed analytes from a native sample matrix. The spiking typically occurs before sample preparation and analysis.

matrix spike duplicate—An intralaboratory duplicate sample to which a known amount of target analyte has been added. Spiking typically occurs before sample preparation and analysis.

maximum contaminant level (MCL)—Under the Safe Drinking Water Act, the maximum permissible level of a contaminant in water that is delivered to any user of a public water system serving 15 or more connections and 25 or more people. MCLs are enforceable standards and take into account the feasibility and cost of attaining the standards.

medium (environmental)—Any material capable of absorbing or transporting constituents. Examples of media include tuffs, soils and sediments derived from these tuffs, surface water, soil water, groundwater, air, structural surfaces, and debris.

medium (geological)—The solid part of the hydrogeological system; may be unsaturated or saturated.

method blank—An analyte-free matrix to which all reagents are added in the same volumes or proportions as those used in the environmental sample processing, and which is prepared and analyzed in the same manner as the corresponding environmental samples. The method blank is used to assess the potential for sample contamination during preparation and analysis.

method detection limit (MDL)—The minimum concentration of a substance that can be measured and reported with a known statistical confidence that the analyte concentration is greater than zero. After subjecting samples to the usual preparation, the MDL is determined by analyzing those samples of a given matrix type that contain the analyte. The MDL is used to establish detection status.

migration—The movement of inorganic and organic chemical species through unsaturated or saturated materials.

migration pathway—A route (e.g., a stream or subsurface flow path) for the potential movement of contaminants to environmental receptors (plants, humans, or other animals).

mixed waste—Waste containing both hazardous and source, special nuclear, or byproduct materials subject to the Atomic Energy Act of 1954.

model—A schematic description of a physical, biological, or social system, theory, or phenomenon that accounts for its known or inferred properties and may be used for the further study of its characteristics.

Module VIII—Module VIII of the Los Alamos National Laboratory (the Laboratory) Hazardous Waste Facility Permit. This permit allows the Laboratory to operate as a hazardous-waste treatment, storage, and disposal facility. From 1990 to 2005, Module VIII included requirements from the Hazardous and Solid Waste Amendments. These requirements have been superseded by the March 1, 2005, Compliance Order on Consent (Consent Order).

monitoring well—(1) A well used to obtain water-quality samples or to measure groundwater levels, (2) A well drilled at a hazardous waste management facility or Superfund site to collect groundwater samples for the purpose of physical, chemical, or biological analysis and to determine the amounts, types, and distribution of contaminants in the groundwater beneath the site.

National Pollutant Discharge Elimination System—The national program for issuing, modifying, revoking and reissuing, terminating, monitoring, and enforcing permits to discharge wastewater or storm water, and for imposing and enforcing pretreatment requirements under the Clean Water Act.

nondetect—A result that is less than the method detection limit.

notices of approval, of approval with modification, or of disapproval—Notices issued by the New Mexico Environment Department (NMED). Upon receipt of a work plan, schedule, report, or other deliverable document, NMED reviews the document and approves the document as submitted, modifies the document and approves it as modified, or disapproves the document. A notice of approval means that the document is approved as submitted. A notice of approval with modifications means that the document is approved but with modifications specified by NMED. A notice of disapproval means that the document is disapproved and it states the deficiencies and other reasons for disapproval.

operable units (OUs)—At Los Alamos National Laboratory, 24 areas originally established for administering the Environmental Remediation and Surveillance Program. Set up as groups of potential release sites, the OUs were aggregated according to geographic proximity for the purposes of planning and conducting Resource Conservation and Recovery Act (RCRA) facility assessments and RCRA facility investigations. As the project matured, it became apparent that there were too many areas to allow efficient communication and to ensure consistency in approach. In 1994, the 24 OUs were reduced to 6 administrative field units.

outfall—A place where effluent is discharged into receiving waters.

percent recovery (%R)—The amount of material detected in a sample (less any amount already in the sample) divided by the amount added to the sample, expressed as a percentage.

perched water—A zone of unpressurized water held above the water table by impermeable rock or sediment.

percolation—Gravity flow of soil water through the pore spaces in soil or rock below the ground surface.

permit—An authorization, license, or equivalent control document issued by the U.S. Environmental Protection Agency or an approved state agency to implement the requirements of an environmental regulation.

polychlorinated biphenyls (PCBs)—Any chemical substance limited to the biphenyl molecule that has been chlorinated to varying degrees, or any combination that contains such substances. PCBs are colorless, odorless compounds that are chemically, electrically, and thermally stable and have proven to be toxic to both humans and other animals.

population—(1) A group of interbreeding organisms occupying a particular space. (2) The number of humans or other living creatures in a designated area.

porosity—The degree to which soil, gravel, sediment, or rock is permeated with pores or cavities through which water or air can move.

precision—The degree of mutual agreement among a series of individual measurements, values, or results.

preliminary remediation goals—Acceptable exposure levels (protective of human health and the environment) that are used as a risk-based tool for evaluating remedial alternatives.

quality assurance/quality control—A system of procedures, checks, audits, and corrective actions set up to ensure that all U.S. Environmental Protection Agency research design and performance, environmental monitoring and sampling, and other technical and reporting activities are of the highest achievable quality.

quality control—See quality assurance/quality control.

quality procedure—A document that describes the process, method, and responsibilities for performing, controlling, and documenting any quality-affecting activity governed by a quality management plan.

Quaternary—The second period of the Cenozoic Era, following the Tertiary, and including the last two to three million years of earth history.

radiation—A stream of particles or electromagnetic waves emitted by atoms and molecules of a radioactive substance as a result of nuclear decay. The particles or waves emitted can consist of neutrons, positrons, alpha particles, beta particles, or gamma radiation.

radioactive material—For purposes of complying with U.S. Department of Transportation regulations, any material having a specific activity (activity per unit mass of the material) greater than 2 nanocuries per gram (nCi/g) and in which the radioactivity is evenly distributed.

radioactive waste—Waste that, by either monitoring and analysis, or acceptable knowledge, or both, has been determined to contain added (or concentrated and naturally occurring) radioactive material or activation products, or that does not meet radiological release criteria.

radioactivity (radioactive decay; radioactive disintegration)—The spontaneous change in an atom by the emission of charged particles and/or gamma rays.

radionuclide—Radioactive particle (human-made or natural) with a distinct atomic weight number.

RCRA facility investigation (RFI)—A Resource Conservation and Recovery Act (RCRA) investigation that determines if a release has occurred and characterizes the nature and extent of contamination at a hazardous waste facility. The RFI is generally equivalent to the remedial investigation portion of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process.

receptor—A person, other animal, plant, or geographical location that is exposed to a chemical or physical agent released to the environment by human activities.

reference set—A hard-copy compilation of reference items cited in Environmental Remediation and Surveillance Program documents.

regional aquifer—Geologic material(s) or unit(s) of regional extent whose saturated portion yields significant quantities of water to wells, contains the regional zone of saturation, and is characterized by the regional water table or potentiometric surface.

regulatory standard—Media-specific contaminant concentration levels of potential concern that are mandated by federal or state legislation or regulation (e.g., the Safe Drinking Water Act, New Mexico Water Quality Control Commission regulations).

relative percent difference (RPD)—The measure used to assess the precision between parent results and their associated duplicate results. The RPD is calculated as follows:

$$|RPD| = \frac{S - R}{\left(\frac{S + R}{2} \right)} 100 ,$$

where RPD = relative percent difference,

S = parent sample result, and

R = duplicate sample result.

The Environmental Remediation and Surveillance Program criteria for the RPD are less than 20% for aqueous samples and less than 35% for soil samples when the sample concentrations are greater than, or equal to, five times the method detection limit (MDL). For samples with concentrations less than five times the MDL, but greater than the MDL, the control is +/-MDL. No precision criterion applies to samples with concentrations less than the MDL.

release—Any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing of hazardous waste or hazardous constituents into the environment.

remediation—(1) The process of reducing the concentration of a contaminant (or contaminants) in air, water, or soil media to a level that poses an acceptable risk to human health and the environment.
(2) The act of restoring a contaminated area to a usable condition based on specified standards.

remediation waste—All solid wastes and hazardous wastes, and all media (including groundwater, surface water, soils, and sediments) and debris, that are managed for implementing cleanup.

reporting limit (RL)—The numerical value that an analytical laboratory (in conjunction with its client) selects for determining if a target analyte has been detected. Results below the RL are considered to be undetected, but results above the RL are considered to be detected. The RLs are not necessarily based on instrument sensitivity. RLs can be established at the instrument detection limit, method detection limit, estimated quantitation limit, or contract-required detection limit.

representativeness—The degree to which data accurately and precisely represent a characteristic of a population or an environmental condition.

request number—An identifying number assigned by the Environmental Remediation and Surveillance Program to a group of samples submitted for analysis.

residential scenario—The land use condition under which individuals may be exposed to contaminants as a result of living on or near contaminated sites.

Resource Conservation and Recovery Act—The Solid Waste Disposal Act as amended by the Resource Conservation and Recovery Act of 1976 (Public Law [PL] 94-580, as amended by PL 95-609 and PL 96-482, United States Code 6901 et seq.).

retention time window criteria—The x-axis on a chromatogram represents retention time. A retention time window is a specified time range on this axis. If a target analyte is detected within its retention time window, it is considered detected. The retention time window criteria are the exact time windows on the chromatogram defining a given target analyte and are method-specific.

rinsate blank—See equipment blank.

risk—A measure of the probability that damage to life, health, property, and/or the environment will occur as a result of a given hazard.

risk assessment—See baseline risk assessment.

routine analysis—The analysis categories of inorganic compounds, organic compounds, metals, radiochemistry, and high explosives, as defined in a contract laboratory's statement of work.

routine data—Data generated using analytical methods that are identified as routine methods in the current Environmental Remediation and Surveillance Program statement of work for analytical services.

routine data validation—The process of reviewing analytical data relative to quantitative routine acceptance criteria. The objective of routine data validation is two-fold—

- to estimate the technical quality of the data relative to minimum national standards adopted by the Environmental Remediation and Surveillance Program, and
- to indicate to data users the technical data quality at a gross level by assigning laboratory qualifiers to environmental data whose quality indicators do not meet acceptance criteria.

runoff—The portion of the precipitation on a drainage area that is discharged from the area.

run-on—Surface water that flows onto an area as a result of runoff occurring higher up on a slope.

sample—A portion of a material (e.g., rock, soil, water, or air), which, alone or in combination with other portions, is expected to be representative of the material or area from which it is taken. Samples are typically either sent to a laboratory for analysis or inspection or are analyzed in the field. When referring to samples of environmental media, the term field sample may be used.

sample matrix—In chemical analysis, that portion of a sample that is exclusive of the analytes of interest. Together, the matrix and the analytes of interest form the sample.

screening action level (SAL)—A radionuclide's medium-specific concentration level; it is calculated by using conservative criteria below which it is generally assumed that no potential exists for a dose that is unacceptable to human health. The derivation of a SAL is based on conservative exposure and on land-use assumptions. However, if an applicable regulatory standard exists that is less than the value derived, it is used in place of the SAL.

screening risk assessment—A risk assessment that is performed with few data and many assumptions in order to identify exposures that should be evaluated more carefully for potential risk.

serial dilution sample—A requirement of the U.S. Environmental Protection Agency (EPA) Method 6010B (Inductively Coupled Plasma-Atomic Emission Spectroscopy). Serial dilutions are made by performing a series of dilutions on an aliquot taken from a stock solution for a target analyte. The first dilution of the original stock solution serves as the stock solution for the second dilution, and the second dilution serves as the stock solution for the third dilution, and so on. To meet the requirement of EPA Method 6010B, one serial dilution analysis must be performed for each matrix in every sample batch, with a minimum of 1 serial dilution sample per 20 samples.

Shelby tube sampler—A thin-wall tube sampler that is latched onto a lead auger while hollow-stem augering or pushed/driven ahead of the auger.

site characterization—Defining the pathways and methods of migration of hazardous waste or constituents, including the media affected; the extent, direction and speed of the contaminants; complicating factors influencing movement; or concentration profiles.

site conceptual model—A qualitative or quantitative description of sources of contamination, environmental transport pathways for contamination, and receptors that may be impacted by contamination and whose relationships describe qualitatively or quantitatively the release of contamination from the sources, the movement of contamination along the pathways to the exposure points, and the uptake of contaminants by the receptors.

site-specific health and safety plan (SSHASP)—A health and safety plan that has been tailored to a site or to an Environmental Remediation and Surveillance (ERS) Program field activity and that has been approved by an ERS health and safety representative. A SSHASP contains information specific to the project, including the scope of work, relevant history, descriptions of hazards from activity associated with the project site(s), and techniques for exposure mitigation (e.g., personal protective equipment and hazard mitigation).

slope—A ratio of units of elevation change to units of horizontal change, usually expressed in degrees.

soil—(1) A material that overlies bedrock and has been subject to soil-forming processes. (2) A sample media group that includes naturally occurring and artificial fill materials.

soil gas—Gaseous elements and compounds in the small spaces between particles of the earth and soil. Such gases can be moved or driven out under pressure.

soil moisture—The water contained in the pore space of the unsaturated zone.

soil screening level (SSL)—The concentration of a chemical (inorganic or organic) below which no potential for unacceptable risk to human health exists. The derivation of an SSL is based on conservative exposure and land-use assumptions, and on target levels of either a hazard quotient of 1.0 for a noncarcinogenic chemical or a cancer risk of 10^{-5} for a carcinogenic chemical.

solid waste—Any garbage, refuse, or sludge from a waste treatment plant, water-supply treatment plant, or air-pollution control facility, and other discarded material, including solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations and from community activities. Solid waste does not include solid or dissolved materials in domestic sewage; solid or dissolved materials in irrigation return flows; industrial discharges that are point sources subject to permits under section 402 of the Federal Water Pollution Control Act, as amended; or source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954, as amended.

solid waste management unit (SWMU)—(1) Any discernible site at which solid wastes have been placed at any time, whether or not the site use was intended to be the management of solid or hazardous waste. SWMUs include any site at a facility at which solid wastes have been routinely and systematically released. This definition includes regulated sites (i.e., landfills, surface impoundments, waste piles, and land treatment sites), but does not include passive leakage or one-time spills from production areas and sites in which wastes have not been managed (e.g., product storage areas). (2) According to the March 1, 2005, Compliance Order on Consent (Consent Order), any discernible site at which solid waste has been placed at any time, and from which the New Mexico Environment Department determines there may be a risk of a release of hazardous waste or hazardous waste constituents (hazardous constituents), whether or not the site use was intended to be the management of solid or hazardous waste. Such sites include any area in Los Alamos National Laboratory at which solid wastes have been routinely and systematically released; they do not include one-time spills.

split-spoon sampler—A hollow, tubular sampling device below a drill stem that is driven by a weight to retrieve soil samples. The core barrel can be opened to remove samples. This is a sampling method commonly used with auger drilling. The split-spoon sampler can be driven into the ground or can be advanced inside hollow-stem augers.

spring—Groundwater seeping out of the earth where the water table intersects the ground surface.

standard operating procedure—A document that details the officially approved method(s) for an operation, analysis, or action, with thoroughly prescribed techniques and steps.

stratigraphy—The study of the formation, composition, and sequence of sediments, whether consolidated or not.

surface sample—A sample taken at a collection depth that is (or was) representative of the medium's surface during the period of investigative interest. A typical depth interval for a surface sample is 0 to 6 in. for mesa-top locations, but may be up to several feet in sediment-deposition areas within canyons.

surrogate (surrogate compound)—An organic compound used in the analyses of organic target analytes that is similar in composition and behavior to the target analytes but is not normally found in field samples. Surrogates are added to every blank and spike sample to evaluate the efficiency with which analytes are being recovered during extraction and analysis.

target analyte—A chemical or parameter, the concentration, mass, or magnitude of which is designed to be quantified by a particular test method.

technical area (TA)—At Los Alamos National Laboratory, an administrative unit of operational organization (e.g., TA-21).

topography—The physical or natural features of an object or entity and their structural relationships.

total propagated uncertainty (TPU)—The range of concentrations (expressed as \pm the measured concentration) that includes the theoretical or true concentration of an analyte with a specific degree of confidence. Radiochemical results are required to be accompanied by sample-specific uncertainty bounds that reflect the 67% confidence level (1-sigma TPU). The TPU includes not only the measurement or counting error but the technique-specific error term that includes uncertainty values for each contributing measurement process and a sample-specific contribution reflecting the specific chemical recoveries or detectors used. All radiochemical result uncertainties incorporate terms for technique-related and sample-specific measurement errors.

transport (transportation)—(1) The movement of a hazardous waste by air, rail, highway, or water.
(2) The movement of a contaminant from a source through a medium to a receptor.

treatment, storage, and disposal facility—An interim-status or permitted facility in which hazardous waste is treated, stored, or disposed.

trip blank—A sample of analyte-free medium taken from a sampling site and returned to an analytical laboratory unopened, along with samples taken in the field; used to monitor cross contamination of samples during handling and storage both in the field and in the analytical laboratory.

tuff—Consolidated volcanic ash, composed largely of fragments produced by volcanic eruptions.

unsaturated zone—The area above the water table where soil pores are not fully saturated, although some water may be present.

upper acceptance limit (UAL)—The highest limit that is acceptable, based on the quality control (QC) criteria for a specific QC sample for a specific method. Any results greater than the UAL are qualified.

upper confidence limit—The statistic that represents the upper bound of the arithmetic mean (usually 95%) of the measured data and that is used in a risk assessment as the reasonable maximum exposure point concentration.

upper tolerance limit—A statistical measure of the upper end of a distribution. The 95th percentile upper tolerance limit, which is the 95% upper percentile of the 95th percentile of the data distribution, is the background value used to represent the background data distribution for an inorganic chemical or naturally occurring radionuclide.

U.S. Department of Energy—The federal agency that sponsors energy research and regulates nuclear materials for weapons production.

U.S. Environmental Protection Agency (EPA)—The federal agency responsible for enforcing environmental laws. Although state regulatory agencies may be authorized to administer some of this responsibility, EPA retains oversight authority to ensure the protection of human health and the environment.

vadose zone—The zone between the land surface and the water table within which the moisture content is less than saturation (except in the capillary fringe) and pressure is less than atmospheric. Soil pore space also typically contains air or other gases. The capillary fringe is included in the vadose zone.

verification—A test or tests, generally performed before and after logging in lieu of a calibration, to ascertain whether the logging system is operating properly. Verification differs from calibration in that it does not provide updated system-calibration values.

water content—The amount of water in an unsaturated medium, expressed as the ratio of the weight of water in a sample to the weight of the oven-dried sample (often expressed as a percentage).

water table—The top of the regional saturated zone; the piezometric surface associated with an unconfined aquifer.

welded tuff—A volcanic deposit hardened by the action of heat, pressures from overlying material, and hot gases.

well casing—A solid piece of pipe, typically steel or polyvinyl chloride (PVC) plastic, used to keep a well open in either unconsolidated materials or unstable rock and as a means to contain zone-isolation materials such as cement grout or bentonite.

well screen—A perforated wire-wrapped casing that allows fluids, but not solid material, to enter a well.

work plan—A document that specifies the activities to be performed when implementing an investigation or remedy. At a minimum, the work plan should identify the scope of the work to be performed, specify the procedures to be used to perform the work, and present a schedule for performing the work. The work plan may also present the technical basis for performing the work.

A-3.0 TABLES**Metric to US Customary Unit Conversions**

Multiply SI (Metric) Unit	by	To Obtain US Customary Unit
kilometers (km)	0.622	miles (mi)
kilometers (km)	3281	feet (ft)
meters (m)	3.281	feet (ft)
meters (m)	39.37	inches (in.)
centimeters (cm)	0.03281	feet (ft)
centimeters (cm)	0.394	inches (in.)
millimeters (mm)	0.0394	inches (in.)
micrometers or microns (μm)	0.0000394	inches (in.)
square kilometers (km^2)	0.3861	square miles (mi^2)
hectares (ha)	2.5	acres
square meters (m^2)	10.764	square feet (ft^2)
cubic meters (m^3)	35.31	cubic feet (ft^3)
kilograms (kg)	2.2046	pounds (lb)
grams (g)	0.0353	ounces (oz)
grams per cubic centimeter (g/cm^3)	62.422	pounds per cubic foot (lb/ft^3)
milligrams per kilogram (mg/kg)	1	parts per million (ppm)
micrograms per gram ($\mu\text{g/g}$)	1	parts per million (ppm)
liters (L)	0.26	gallons (gal.)
milligrams per liter (mg/L)	1	parts per million (ppm)
degrees Celsius ($^{\circ}\text{C}$)	$9/5 + 32$	degrees Fahrenheit ($^{\circ}\text{F}$)

Data Qualifier Definitions

Data Qualifier	Definition
U	The analyte was analyzed for but not detected.
J	The analyte was positively identified, and the associated numerical value is estimated to be more uncertain than would normally be expected for that analysis.
J+	The analyte was positively identified, and the result is likely to be biased high.
J-	The analyte was positively identified, and the result is likely to be biased low.
UJ	The analyte was not positively identified in the sample, and the associated value is an estimate of the sample-specific detection or quantitation limit.
R	The data are rejected as a result of major problems with quality assurance/quality control (QA/QC) parameters.

Appendix B

Field Methods

B-1.0 INTRODUCTION

This appendix summarizes field methods used for the 2005–2006 investigation at Material Disposal Area (MDA) C at Technical Area (TA) 50, also referred to as Solid Waste Management Unit (SWMU) 50-009. Table B-1.0-1 provides general method information, and the following sections provide more detailed descriptions of field methods used in the characterization activities at MDA C. All activities were conducted in accordance with the most current versions of applicable Environmental Programs (EP) standard operating procedures (SOPs) and quality procedures (QPs), available at the following URL: <http://erproject.lanl.gov/documents/VL/procedures>. The QPs and SOPs used during the 2005–2006 field activities are listed in Table B-1.0-2.

B-2.0 EXPLORATORY DRILLING CHARACTERIZATION

No exploratory drilling characterization was conducted during the 2005–2006 investigation activities. All drilling was conducted for the purpose of collecting investigation samples.

B-3.0 FIELD-SCREENING METHODS

This section summarizes the field-screening methods used during the 2005–2006 drilling and sampling activities at MDA C. The field-screening results are presented in section 6 of the investigation report. Field screening for volatile organic compounds (VOCs) and radioactivity was performed continuously on core samples from each borehole. The field-screening results for 2005–2006 drilling are presented in Table 6.1-1 of this investigation report.

B-3.1 Field Screening for VOCs

Pore-gas screening was conducted using a photoionization detector (PID) equipped with an 11.7 eV lamp. Screening was performed every 10 ft for the first 60 ft of drilling below ground surface (bgs), at 20 ft intervals to depths of 200 ft bgs, and at 30 ft intervals to total depth (TD) to determine the depths of the core samples to be submitted for analysis. A core sample could have been collected at each pore-gas screening interval that produced a PID reading greater than zero. The core sample from the depth interval having the highest PID reading within each depth interval (20, 20 to 50, 50 to 100, 100 to 150, etc.) was submitted for laboratory analysis. For every core sample submitted for analysis, a pore-gas sample was also collected. In addition, the VOC pore-gas screening was also used to determine the TD of each borehole because each borehole was to be advanced 25 ft beyond the last nonzero field-screening detection.

B-3.2 Field Screening for Radioactivity

Immediately upon separating the split-spoon core barrel, each core was screened for radioactivity, targeting alpha and beta/gamma emitters. Screening was conducted by a Laboratory radiological control technician (RCT) using an Eberline E-600 radiation meter with an SHP-380AB alpha/beta scintillation detector held within 1-in. of the core barrel. The Eberline E-600 with attachment SHP-380AB consists of a dual phosphor plate covered by two mylar windows housed in a light-excluding metal body. The phosphor plate is a plastic scintillator for the detection of beta emissions and is thinly coated with zinc sulfide for the detection of alpha emissions. The operational range varies from trace emissions to 1 mil disintegrations per minute (dpm).

Local background levels for radioactivity were measured in ambient air. However, local background levels of radioactivity in ambient air are not directly applicable to background levels in subsurface material.

Minerals in the soil, rock, and fill underlying MDA C contain naturally occurring radionuclides that result in screening measurements consistently in the range of 1000 to 3000 dpm and that do not necessarily indicate the presence of contamination.

Local background levels in air were calculated daily. Minimum detectable activity describes the instrument's lower detection limit. A background reading using the SHP-380AB attachment was taken in the field to determine the minimum detectable activity. The minimum detectable activity was calculated as follows:

$$\text{minimum detectable activity} = \frac{2.71 + 4.65/(R_b \times 0.2)}{0.2}$$

where R_b is the background rate in counts per minute (cpm). Minimum detectable activity was then converted from cpm to dose per minute as follows:

$$\text{dose per minute} = \frac{\text{corrected cpm}}{\text{efficiency}}$$

where efficiency was assumed to be 20% for the SHP-380AB attachment, based on the manufacturer's specifications. All field-screening results for radioactivity were recorded in dose per minute.

Swipe samples were collected and analyzed by a Laboratory RCT before characterization sample containers were removed from the site. Samples were transported to the Sample Management Office (SMO) in sealed coolers before they were shipped to the analytical laboratory. Personnel at the SMO reviewed and approved the sample collection logs (SCLs) and the chain-of-custody (COC) forms and accepted custody of the samples, after which the samples were shipped to the laboratory for analysis.

B-3.3 Borehole Logging

Continuous boring logs were completed for all boreholes drilled at MDA C in 2005–2006. All boreholes were continuously cored and logged in 2.5-ft intervals in accordance with SOP-12.01, Field Logging, Handling, and Documentation of Borehole Materials. Information recorded on field boring logs included footage and percent recovery, rock-quality designation, lithology, depth of samples collected, field-screening results for radioactivity and organic vapors, core description time, and other relevant observations.

The lithologic description for each core interval included

- color (using a Munsell Soil Color Chart)
- ash matrix integrity
- degree of welding of matrix
- presence and size of phenocrysts
- presence of pumice clasts (in tuff) with color, size, alteration, and color, size, and nature of phenocrysts
- staining and/or presence of clay-filled fracture zones
- qualitative description of moisture presence
- any other information pertinent to the geology of the core recovered

B-3.4 Borehole Abandonment

Borehole abandonment activities were not conducted during the 2005–2006 investigation activities; however, all boreholes at MDA C were overreamed for the upper 10 ft of each borehole and installed with a 10-in.-inside-diameter (I.D.) steel-surface casing fitted with a locking steel cover. The surface casing was lowered into each borehole to provide structure for the steel cap and was not grouted or cemented in place.

B-4.0 FIELD INSTRUMENT CALIBRATION

All instruments were calibrated before they were used. Several environmental factors affected the instruments' integrity, including air temperature, atmospheric pressure, wind speed, and humidity. Calibration of the PID was conducted by the site safety officer (SSO). Calibration of the Eberline E-600 was conducted by the RCT. All calibrations were performed according to the manufacturers' specifications and requirements.

B-4.1 PID Calibration

The PID was calibrated both to ambient air and a standard reference gas (100 parts per million [ppm] isobutylene). The ambient-air calibration determined the zero point of the instrument sensor calibration curve in ambient air. Calibration with the standard reference gas determined a second point of the sensor calibration curve. Each calibration was within 3% of 100 ppm isobutylene, qualifying the instrument for use.

The following calibration information was recorded daily:

- instrument ID number
- initial and final span settings
- date and time
- concentration and type of calibration gas used (isobutylene at 100 ppm)
- name of the SSO performing the calibration

All daily calibration procedures for the MiniRAE 2000 PID met the manufacturer's specifications for standard reference gas calibration and the requirements of QP 5.2, Control of Measuring and Test Equipment.

B-4.2 Eberline E-600 Instrument Calibration

The Eberline E-600 was calibrated daily by the RCT before local background levels for radioactivity were measured and recorded by the RCT on independent field documentation. The instrument was calibrated using plutonium-239 and chloride-36 sources for alpha and beta/gamma emissions, respectively. The following five checks were performed as part of the calibration procedures: date of calibration, signs of physical damage, battery function, response to a source of radioactivity, and background level. All calibrations performed for the Eberline E-600 met the manufacturer's specifications, the requirements of QP-5.2, and the applicable radiation-detection instrument manual.

B-5.0 SURFACE AND SUBSURFACE SAMPLING

This section summarizes the methods used for collecting samples for laboratory analysis, including surface soil and fill, subsurface rock, and subsurface pore-gas samples. The samples were collected according to the approved MDA C investigation work plan (LANL 2005, 91547; NMED 2005, 90165; NMED 2005, 91695).

B-5.1 Surface Soil and Fill Sampling Methods

A total of six discrete surface samples were collected in 2004 for fixed laboratory analysis. These samples were collected from 0 to 0.5 ft bgs at each of six locations in accordance with SOP-06.09, "Spade and Scoop Method for Collection of Soil Samples." Table F-2.0-1 in Appendix F of this investigation report lists the surface samples collected.

The surface samples were screened immediately for radioactivity using an Eberline E-600 radiation meter held within 1 in. of the sample. A stainless-steel scoop and bowl were used to homogenize the samples, which were then transferred to sterile sample collection jars for transport to the SMO.

B-5.2 Subsurface Rock Sampling Methods

The subsurface rock samples were collected in accordance with SOP-06.26, Core Barrel Sampling for Subsurface Earth Materials. Borehole samples were collected in a stainless-steel split-spoon core-barrel sampler that retrieved core in 2.5-ft intervals. The samples collected, listed by borehole and depth, are presented in Table F-2.0-2 in Appendix F of this investigation report.

Core retrieved from the subsurface was field screened and visually inspected to determine the specific 2.5-ft section of core to be sampled. Once this determination was made, VOC samples were collected from undisturbed core.

Samples for VOC analysis were collected using EnCore samplers to minimize the loss of subsurface VOCs during the sample-collection process. EnCore samplers consist of a coring device that also serves as the shipping container. A clean coring tool was carefully inserted into the fresh core surface for sample collection to avoid trapping air behind the sample to maximize accuracy for VOC analysis. Following extraction of a core sample, the exterior of the EnCore barrel was immediately wiped with a clean disposable towel, allowing for a tight seal with the cap on the open end of the sampler. The sample was then labeled, inserted into a sealable pouch, cooled immediately to 4 ± 2 °C, and prepared for transfer to the SMO. All EnCore sampling followed the manufacturer's instructions.

Following VOC sampling, the 2.5-ft core section to be sampled was then removed from the core barrel and placed in a stainless-steel bowl and homogenized. The material was crushed with a decontaminated rock hammer and stainless-steel spoon to allow enough core material to fit into sample containers. The samples were placed in sterile sample containers, sealed, and labeled with the borehole location number, date, time, depth interval, analyses requested, and sample identification number.

B-5.3 Subsurface Pore-Gas Sampling Methods

Subsurface pore-gas samples were collected at MDA C during the 2005–2006 investigation activities. The sampling was performed using an inflatable packer and a sample-train apparatus to pull subatmospheric air from the rock formation at the desired depth, as described in SOP 6.31, Sampling of Subatmospheric Air. Leak checks on the sample train were conducted before each sampling or screening activity, and checks were also performed daily on the teflon tubing and packer connections. A separate roll of teflon tubing

was used at each borehole to connect the sample train to the vapor inlet in order to prevent cross-contamination. The packer was lowered down the borehole and inflated with nitrogen to seal off a vapor inlet at the desired depth. The sample train purged the sealed volume of air in the borehole and the teflon tubing to assure the sampling/screening results was formation air and not ambient air. Based on calculations of the packed off borehole and tubing volume and the air flow discharged by the sample-train pumps, ambient air in the packed off borehole and sample tubing was evacuated after several minutes. The indicated purge time was then multiplied by 2 to ensure a conservative estimate to evacuate ambient air from the system. During the purge, percent oxygen, percent carbon dioxide, and percent methane readings from the sample-train exhaust was collected every few minutes using a LANDTEC GEM-500 gas-extraction meter to ensure all ambient air was cleared from the system. At the end of every purge cycle, a PID reading was taken from the air in the sample-train apparatus. Subsurface pore-gas samples were collected in SUMMA canisters and submitted to the SMO for shipment to the analytical laboratory for VOC analysis using U.S. Environmental Protection Agency (EPA) Method TO-15. Samples were also collected in silica gel sample tubes for tritium analysis using EPA Method 906.0.

B-5.4 Quality Assurance/Quality Control Samples

Quality assurance (QA)/quality control (QC) samples for soils and tuff were collected in accordance with SOP-01.05, Field Quality Control Samples. Field duplicate samples were collected at a frequency of at least 1 duplicate sample for every 10 samples. Field rinsate samples were collected from sampling equipment at a frequency of at least 1 rinsate sample for every 10 samples. Field trip blanks also were collected at a frequency of 1 per 10 samples or 1 per borehole.

The QA/QC samples for VOCs in pore gas consisted of one equipment blank and one field duplicate for each of the two pore-gas sampling events. The equipment blank was collected by pulling zero gas (99.9% ultrahigh-purity nitrogen) through the packer sampling apparatus. The equipment blank was used to evaluate field decontamination procedures. The field duplicate sample was collected to evaluate the reproducibility of field sampling techniques. The QA/QC samples were collected in accordance with SOP-01.05, Field Quality Control Samples.

B-5.5 Sample Documentation and Handling

Field personnel completed an SCL and associated COC form for each sample set. The sample containers were sealed with signed COC seals and placed in coolers at approximately 4 °C. The samples were packaged with preservatives, as necessary, depending upon the analytical method to be used, packed, handled, and shipped in accordance with SOP-01.03, Handling, Packaging, and Transporting Field Samples, and SOP-01.02, Sample Containers and Preservation.

Swipe samples were collected and analyzed by the RCT before the characterization sample containers were removed from the site. Samples were transported to the SMO where personnel reviewed and approved the SCLs and COC forms and accepted custody of the samples. The samples were then packaged and shipped to the laboratory for analysis.

B-5.6 Decontamination of Sampling Equipment

The split-spoon, core-barrel, and all other sampling equipment that came into, or may have come into, contact with sample materials were decontaminated after each 2.5-ft core was retrieved and logged. Decontamination included wiping the equipment with a household-strength cleaning spray and paper towels. Dry decontamination of the drilling equipment was done with wire brushes before the drill rig was mobilized to another borehole to avoid cross-contamination between samples and borehole locations.

Decontamination activities were performed in accordance with SOP-01.08, Field Decontamination of Drilling and Sampling Equipment, and SOP-01.05, Field Quality Control Samples.

B-6.0 GEOPHYSICAL LOGGING

Geotechnical characterization was performed in 2006 at deep borehole location 50-24818 to determine the geotechnical properties of the bedrock underlying MDA C. Eight geotechnical samples were collected at depths ranging from 71.5 to 329 ft bgs. Geotechnical samples were analyzed for moisture content, bulk density, porosity, saturated hydraulic conductivity, and pH. Additional samples were analyzed for pH. The geotechnical analytical results are discussed in section 4.9 of the investigation report. Volumetric water-content profiles were measured using neutron thermalization (neutron probe) for 19 of the MDA C boreholes (Appendix L). Measurements were made in April and May 2006. A Mount Sopris logging system with a CPN neutron source was used for the measurements. One-time measurements were taken at 0.5-ft increments over the entire depth of each borehole. All field neutron-probe measurements were converted to volumetric water content using a calibration regression derived from comparing neutron-probe measurements to corresponding core sample laboratory-determined volumetric moisture content. The results of the neutron probe measurements are presented in section 4.9 and in Appendix L of this investigation report.

B-7.0 GEODETIC SURVEYING

Geodetic surveys of all boreholes and sampled locations were performed by a certified surveyor using a Trimble RTK 5700 differential global positioning system (DGPS) referenced from published and monumented external Laboratory survey control points in the vicinity. All borehole and sample locations were surveyed according to SOP-03.11, Coordinating and Evaluating Geodetic Surveys. Horizontal accuracy of the monumented control points is within 0.1 ft. The DGPS instrument referenced from Laboratory control points is accurate within 0.2 ft.

B-8.0 INVESTIGATION-DERIVED WASTE STORAGE AND DISPOSAL

Investigation-derived waste (IDW) generated during this investigation consisted of drill cuttings, personal protective equipment (PPE), and sampling supplies and plastics. All IDW generated during the MDA C field investigation was managed in accordance with the procedures described in Appendix F of the approved MDA C work plan (LANL 2005, 91547; NMED 2005, 90165; NMED 2005, 91695) and applicable SOPs. These SOPs incorporate the requirements of all applicable U.S. Environmental Protection Agency and New Mexico Environment Department (NMED) regulations, U.S. Department of Energy (DOE) orders, and Laboratory implementation requirements (LIRs). The SOPs applicable to the characterization and management of IDW at MDA C are

- SOP-01.06, Management of Environmental Restoration Project Waste and
- SOP-01.10, Waste Characterization.

Before field investigation activities were undertaken, a waste characterization strategy form (WCSF) was prepared and approved per the requirements of SOP-01.10. The WCSF provided information on IDW characterization, management, containerization, and estimated volumes. The IDW characterization was completed by reviewing existing data and documentation, reviewing analytical data from samples collected from the media being investigated (subsurface soil/tuff), and/or directly sampling containerized

waste. The WCSF and related waste management documentation, such as the waste profile form and chemical waste disposal requests, are included in Appendix I of this investigation report.

The selection of waste containers was based on appropriate U.S. Department of Transportation requirements, waste types, and estimated volumes of IDW to be generated. Immediately following containerization, each waste container was individually labeled with a unique identification number and with information regarding waste classification, contents, radioactivity, and date generated. The wastes were staged in clearly marked and appropriately constructed waste accumulation areas. Waste accumulation area postings, regulated storage duration, and inspection requirements were based on the type of IDW and its classification. Container and storage requirements were detailed in the WCSF and approved before any waste was generated.

B-9.0 DEVIATIONS FROM WORK PLAN

B-9.1 Borehole Numbers and Depths

The work plan proposed drilling 42 vertical boreholes inside and outside the MDA C boundary, including 11 boreholes between Pits 1–4. The boreholes between the pits (numbers 28–38 in the work plan) were not drilled because of the uncertainty in the pit boundaries (LANL 2006, 93581), worker safety considerations, and the large number of samples collected near the outside margins of Pits 1–4. In a letter dated August 18, 2006, the Laboratory submitted a modification to the scope of work for MDA C requesting the 11 boreholes between pits be eliminated and three additional vertical boreholes be drilled as requested by NMED to evaluate the correlation between pore-gas and core VOC concentrations (LANL 2006, 93581). NMED responded on September 25, 2006, requesting the Laboratory drill 4 of the 11 boreholes between Pits 2-3 (NMED 2006, 94192). The Laboratory submitted a letter on November 30, 2006, requesting additional time to complete the four boreholes (LANL 2006, 94194). A response from NMED was pending at the time this report was published.

During the investigation, a total of 36 vertical boreholes were drilled. Two boreholes not included in the investigation work plan were also drilled: a 90-ft borehole (50-25621), located 12 ft west of borehole 50-24818, was drilled to collect EnCore VOC samples, and an additional borehole (50-25451) was drilled south of MDA C to aid in defining nature and extent. In addition, borehole locations 50-26823, 50-26824, and 50-26825 were not proposed in the work plan but were drilled to aid in correlating data from pore-gas samples collected using SUMMA canisters with samples collected using EnCore samplers from core. Borehole location 50-26823 was drilled to 300 ft between Pits 4 and 5, and borehole locations 50-26824 and 50-26825 were each drilled to 200 ft.

The approved investigation work plan specified drilling a single, vertical borehole (BH-09) to a depth of approximately 800 ft bgs. Instead, borehole 50-24818 was drilled to 620 ft bgs, where refusal occurred. It was drilled through the Cerro Toledo interval, as required in the work plan, and perched groundwater was not encountered. Although this borehole was not reach 800 ft, it met the objectives of drilling through the Cerro Toledo interval and determining that no perched groundwater exists beneath MDA C.

B-9.2 Field Screening

The approved investigation work plan called for collecting subsurface vapor samples for field screening of VOCs every 10 ft for the first 60 ft of drilling, at 20-ft intervals to depths of 200 ft bgs, and at 30-ft intervals to TD. Field screening for subsurface vapor samples using a PID was discontinued on February 23, 2006, after the New Mexico Environment Department (NMED) acknowledged in an email that the PID was not an effective tool for guiding drilling activities (Chamberlain 2006, 94162). Subsequently, subsurface air

samples were collected after drilling was completed to allow equilibration of borehole conditions (e.g., heating of the tuff matrix and possible pressure differentials induced by the drilling process). Field screening for VOCs to guide drilling beyond the target depth was also discontinued after February 23, 2006.

B-9.3 Organic Chemical Sampling and Analyses

The SUMMA canisters collected for pore-gas organic chemicals were shipped to two different off-site analytical laboratories: Air Toxics and Severn Trent. Severn Trent did not analyze the samples for the organic chemicals 1,3-butadiene; 1-butanol; chlorodifluoromethane; cyclohexane; 1,4-dioxane; ethanol, hexane; methanol; methyl tert-butyl ether; n-heptane; 2-propanol; propylene; tetrahydrofuran; and 1,3-xylene+1,4-xylene. Air Toxics did not analyze the samples for vinyl acetate or total xylene.

B-9.4 Dioxins/Furans Sampling and Analyses

Sample RE50-05-61422, collected on August 10, 2005, from borehole location 50-24819 (18.5–20 ft), was submitted to an off-site analytical laboratory for analysis of dioxins/furans, but it was not analyzed. Sample RE50-05-61461, collected on September 12, 2005, from borehole 50-24821 (248.6–250 ft) was submitted to an off-site analytical laboratory for dioxins/furans, but it also was not analyzed.

Dioxins/furans were not collected at the bottom of borehole 50-24818. After the last sample was collected, the drilling ceased at 620 ft bgs, and no material could be recovered for sample analysis.

B-9.5 Field Screening for Explosive Compounds

The approved work plan stated that tuff samples collected at depths less than 60 ft that were submitted for laboratory analysis would be field screened for high explosives (HE). Instead, samples were collected every 10 ft for the first 60 ft of the boreholes and field screened for HE. No HE samples were collected from borehole 50-24819. One HE sample each was collected from boreholes 50-24820 and 50-24822. Two HE samples were collected from all other boreholes and analyzed by an off-site laboratory.

B-9.6 Collection of Pore-Gas Samples

The approved work plan stated that an additional two rounds of pore-gas sampling would be conducted at boreholes 50-09100 and 50-10131. The second-round pore-gas samples were not collected from borehole locations 50-09100 and 50-10131 because those boreholes were drilled before 2005 and only re-sampled during 2005–2006. Second-round samples would not have measured impacts from drilling that could affect pore-gas concentrations. Only nine ports were available at location 50-09100 because slough from the hole prohibited sampling at the bottom depth.

Second-round pore-gas samples were not collected from borehole location 50-24818 because it had been fitted with casing during drilling to extend it as deep as possible. The casing precluded collecting second-round samples. Second-round samples were also not collected from borehole location 50-25451 because sampling at that location was interrupted by a Laboratory safety stand-down of all drilling, hoisting, and rigging operations. When sampling resumed, any drilling effects would have dissipated, thus eliminating the need for second-round sampling.

B-9.7 Collection of Tuff Samples

The approved work plan called for subsurface tuff samples to be collected from the split-spoon core barrel and placed into sealed sleeves or core-protect bags to preserve core moisture. The samples were not collected into sealed sleeves or core-protect bags. Instead, the samples collected for moisture were placed immediately into jars or into core-protect bags.

B-10.0 REFERENCES

The following list includes all documents cited in this appendix. Parenthetical information following each reference provides the author(s), publication date, and ER ID number. This information is also included in text citations. ER ID numbers are assigned by the Environmental Programs Directorate's Records Processing Facility (RPF) and are used to locate the document at the RPF and, where applicable, in the master reference set.

Copies of the master reference set are maintained at the NMED Hazardous Waste Bureau; the U.S. Department of Energy—Los Alamos Site Office; the U.S. Environmental Protection Agency, Region 6; and the Directorate. The set was developed to ensure that the administrative authority has all material needed to review this document, and it is updated with every document submitted to the administrative authority. Documents previously submitted to the administrative authority are not included.

LANL (Los Alamos National Laboratory), October 2005. "Investigation Work Plan for Material Disposal Area C, Solid Waste Management Unit 50-009, at Technical Area 50, Revision 2," Los Alamos National Laboratory document LA-UR-05-7363, Los Alamos, New Mexico. (LANL 2005, 91547)

LANL (Los Alamos National Laboratory), November 30, 2006. "Request for Extension to Implement Additional Scope for Material Disposal Area C, Solid Waste Management Unit 50-009," Los Alamos National Laboratory letter (EP2006-0941) from A. Phelps (LANL) and D. Gregory (DOE-LASO) to J. Bearzi (NMED), Los Alamos, New Mexico. (LANL 2006, 94194)

NMED (New Mexico Environment Department), October 12, 2005. "Material Disposal Area C Boreholes Required by Approval with Modifications Letter," Los Alamos National Laboratory, EPA ID #NM0890010515, HWB-LANL-03-005," New Mexico Environment Department letter to D. Gregory (DOE) and D. McInroy (LANL) from J. Bearzi (NMED-HWB), Santa Fe, New Mexico. (NMED 2005, 91695)

NMED (New Mexico Environment Department), September 25, 2006. "Modification to Scope of the Investigation Work Plan for Material Disposal Area C, Solid Waste Management Unit 50-009, Los Alamos National Laboratory, ERPA ID #0890010515 HWB-LANL-03-005," New Mexico Environment Department letter to D. Gregory (DOE) and D. McInroy (LANL), from J. Bearzi (NMED-HWB), Santa Fe, New Mexico. (NMED 2006, 94192)

Chamberlain, K., February 23, 2006. MDA C. Email message to K. Rich (LANL) from K. Chamberlain (NMED), Santa Fe, New Mexico. (Chamberlain 2006, 94162)

NMED (New Mexico Environment Department), June 2006. "Technical Background Document for Development of Soil Screening Levels, Revision 4.0," New Mexico Environment Department Hazardous Waste Bureau, Ground Water Quality Bureau, and Voluntary Remediation Program, Santa Fe, New Mexico. (NMED 2006, 92513)

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Table B-1.0-1
Brief Description of Field Investigation Methods

Method	Summary
Spade-and-Scoop Collection of Soil Samples	This method was used for collection of surface (i.e., 0–6 in.) soil or fill samples. A hole was dug to the desired depth, as prescribed in the work plan, and a discrete grab sample was collected. The sample was homogenized in a decontaminated stainless-steel bowl before it was transferred to the appropriate sample containers.
Split-Spoon Core-Barrel Sampling	The split-spoon core barrel is a cylindrical barrel split lengthwise so that the two halves can be separated to expose the core sample. The stainless-steel core barrel (3-in.-I.D. and 5-ft long) is pushed directly into the subsurface media using a hollow-stem auger drilling rig. A continuous length of core is extracted with the core barrel. Once it was extracted, the section of core was screened for radioactivity and organic vapors, photographed, and described in a lithologic log. If it was located within a targeted sample interval, a portion of the core was collected for fixed laboratory analysis.
Field Logging, Handling, and Documentation of Borehole Materials	After they reached the surface, the core barrels were immediately opened for field screening, logging, and sampling. Logging of borehole materials included run number, core recovery in feet, depth interval (in 5-ft increments), field-screening results, lithological and structural description, and a photograph. Once the core material was logged, selected samples were taken from discrete intervals of the core. All borehole material not sampled was then disposed of as waste. No material from the boreholes at MDA C was archived.
Handling, Packaging, and Shipping of Samples	Samples were sealed and labeled before being packed in ice, and sample and transport containers were examined to ensure they were free of external contamination. Samples were packaged to minimize the possibility of breakage during transport. After environmental samples were collected, packaged, and preserved, they were transported to the SMO. A split of each sample was sent to an SMO-approved radiation-screening laboratory under COC. Once radiation-screening results were received, the SMO sent the corresponding analytical samples to fixed laboratories for full analysis.
Sample Control and Field Documentation	The collection, screening, and transport of samples were documented on standard forms generated by the SMO. These forms included SCLs, COC forms, and sample container labels. Collection logs were completed at the time the samples were collected and were signed by the sampler and a reviewer who verified that the logs were complete and accurate. Corresponding labels were initialed and applied to each sample container, and custody seals were placed around container lids or openings. The COC forms were completed and assigned to verify that the samples were not left unattended.
Coordinating and Evaluating Geodetic Surveys	Geodetic surveys focused on obtaining survey data of acceptable quality to use during project investigations. Geodetic surveys were conducted with a Trimble 5700 DGPS. The survey data conformed to Laboratory Information Architecture (IA) project standards IA-CB02, GIS Horizontal Spatial Reference System, and IA-D802, Geospatial Positioning Accuracy Standard for A/E/C/ and Facility Management. All coordinates are expressed as State Plane Coordinate System, North American Datum 83, New Mexico Central Zone, U.S. survey ft. All elevation data are reported relative to the National Geodetic Vertical Datum of 1983.
Field Decontamination of Drilling and Sampling Equipment	Dry decontamination was the preferred method at MDA C to minimize generating liquid waste. Dry decontamination included the using a wire brush or other tool to remove soil or other material adhering to the sampling equipment, followed by applying a commercial cleaning agent (nonacid, waxless cleaners) and paper wipes.

Table B-1.0-1 (continued)

Method	Summary
Field Quality Control Samples	<p>Field QC samples were collected as directed in the March 1, 2005, Compliance Order on Consent as follows:</p> <p><i>Field Duplicate:</i> At a frequency of 10%; collected at the same time as a regular sample and submitted for the same analyses.</p> <p><i>Equipment Rinsate Blank:</i> At a frequency of 5%; collected by rinsing sampling equipment with deionized water that is collected in a sample container and submitted for laboratory analysis.</p> <p><i>Trip Blanks:</i> Required for all field events that include collecting samples for VOC analysis. Trip-blank containers consist of certified clean sand that are opened and kept with the other sample containers during the sampling process.</p>
Containers and Preservation of Samples	Specific requirements/processes for sample containers, preservation techniques, and holding times were based on EPA guidance for environmental sampling, preservation, and QA. Specific requirements for each sample were printed in the SCLs provided by the SMO (size and type of container, preservatives, etc.). All samples were preserved by placing them in insulated containers with ice to maintain a temperature of 4°C.
Subsurface Moisture Measurements Using a Neutron Probe	Moisture measurements were collected with a CPN 503 DR run through the Laboratory-owned borehole logging system. Moisture measurements were taken at approximately 0.5-in. intervals for the entire open length of the borehole, and the data were recorded on a laptop computer connected to the probe. Calibration and operation of the neutron probe were conducted according to the manufacturer's specifications.
Management, Characterization, and Storage of Investigation-Derived Waste (IDW)	The IDW was managed, characterized, and stored in accordance with an approved WCSF that documents site history, field activities, and the characterization approach for each waste stream managed. Waste characterization complied with on-site or off-site waste acceptance criteria, as appropriate. All stored IDW was marked with appropriate signs and labels. Drums containing IDW were stored on pallets to prevent the containers from deteriorating. The means to store, control, and transport each potential waste type and classification of the waste were determined before field operations began. A waste storage area was established before waste was generated. Each waste generated container was individually labeled with waste classification, item identification, and radioactivity (if applicable) immediately following containerization. All waste was segregated by classification and compatibility to prevent cross-contamination.
Sampling of Subatmospheric Air	<p>Subsurface pore-gas samples were collected from discrete zones within each borehole. The process for collecting subsurface pore gas samples was performed using an inflatable packer and a sample-train apparatus to pull subatmospheric air from the rock formation at desired sampling intervals. Leak checks on the sample train were performed before each sampling or screening activity, and checks were performed daily on the teflon tubing and packer connections. A separate roll of teflon tubing was used at each borehole to connect the sample train to the vapor inlet in order to prevent cross-contamination. The packer was lowered down the borehole and inflated with nitrogen to seal off a vapor inlet at the desired depth. The sample train was then purged to ensure formation air was being collected. The purge time was calculated based on borehole and tubing volumes and was multiplied by 2 to ensure a conservative estimate to evacuate ambient air from the system. During the purge, percent oxygen, percent carbon dioxide, and percent methane readings from the sample train exhaust were collected every few minutes using a LANDTEC GEM-500 gas extraction meter. At the end of every purge cycle, a PID reading was collected from the air in the sample-train apparatus. Vapor samples were collected using a SUMMA canister and analyzed by EPA Method TO-15. Samples were also collected in silica gel sample tubes for tritium analysis using EPA Method 906.0. All instruments used during field screening were calibrated daily following the manufacturers' specifications.</p>

Table B-1.0-2
Quality Procedures and Standard Operating
Procedures Used for the Investigation Activities at MDA C

QP-2.1, Personnel Qualification and Selection Process
QP-2.2, Personnel Training Management
QP-3.4, Corrective Action Process
QP-3.5, Peer Review Process
QP-4.3, Records Management
QP-4.4, Record Transmittal to the Record Processing Facility
QP-4.5, Document Control
QP-4.9, Document Development and Approval Process: Peer Review Required
QP-5.2, Control of Measuring and Test Equipment
QP-5.3, Readiness Planning and Review
QP-5.7, Notebook Documentation for Environmental Restoration Technical Activities
QP-7.1, Procurement
QP-8.1, Inspection and Acceptance Testing
QP-10.3, Stop Work and Restart
SOP-01.01, General Instructions for Field Investigations
SOP-01.02, Sample Containers and Preservation
SOP-01.03, Handling, Packaging, and Transporting Field Samples
SOP-01.04, Sample Control and Field Documentation
SOP-01.05, Field Quality Control Samples
SOP-01.06, Management of Environmental Restoration Project Waste
SOP-01.08, Field Decontamination of Drilling and Sampling Equipment
SOP-01.10, Waste Characterization
SOP-01.12, Field Site Closeout Checklist
SOP-01.13, Initiating and Managing Data Set Requests
SOP-02.01, Surface Water Site Assessments
SOP-03.11, Coordinating and Evaluating Geodetic Surveys
SOP-04.01, Drilling Methods and Drill Site Management
SOP-04.04, Contract Geophysical Logging
SOP-05.02, Well Development
SOP-05.03, Monitoring Well and RFI Borehole Abandonment
SOP-05.08, Operation of Borehole Logging Equipment
SOP-06.09, Spade and Scoop Method for Collection of Soil Samples
SOP-06.10, Hand Auger and Thin-Wall Tube Sampler
SOP-06.24, Sample Collection from Split-Spoon Samplers and Shelby Tube Samplers
SOP-06.26, Core Barrel Sampling for Subsurface Earth Materials
SOP-06.31, Sampling of Subatmospheric Air
SOP-06.33, Headspace Vapor Screening with a Photoionization Detector
SOP-09.10, Field Sampling of Core and Cuttings for Geological Analysis
SOP-10.14, Performing and Documenting Gross Gamma Radiation Scoping Surveys
SOP-12.01, Field Logging, Handling, and Documentation of Borehole Materials

Note: These procedures are available at <http://erproject.lanl.gov/documents/procedures/sops.html>.

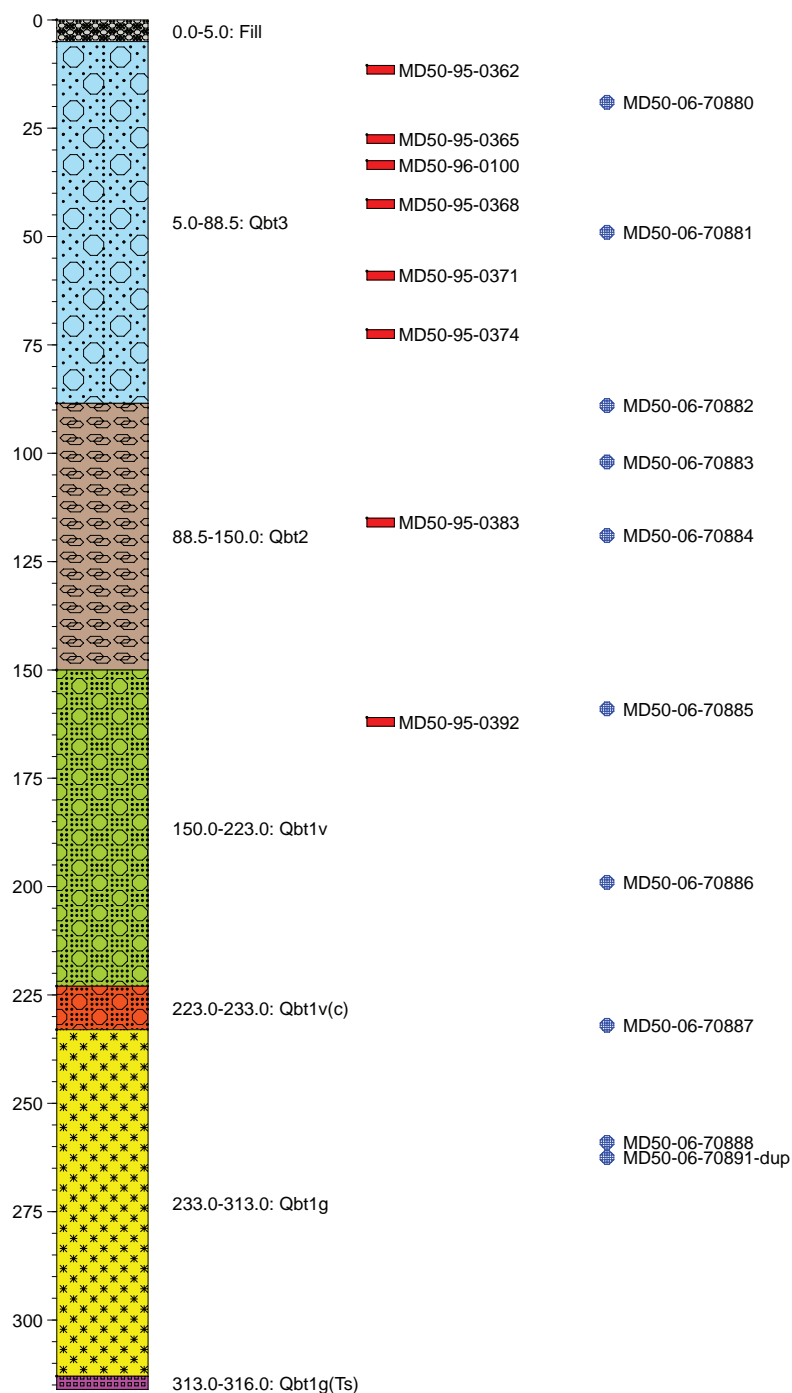
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Appendix C

Borehole Logs

50-09100

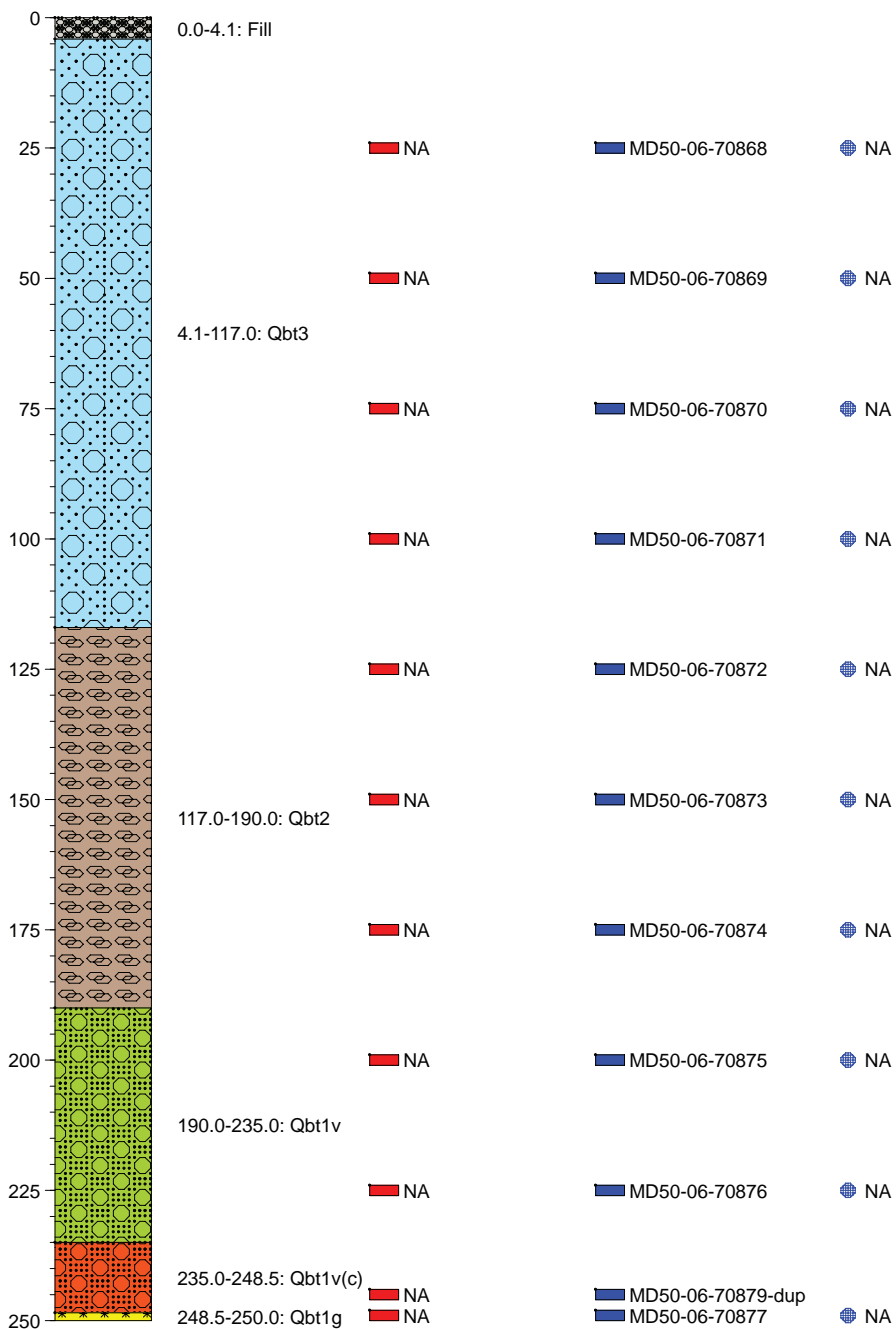
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Fracture %



50-10131

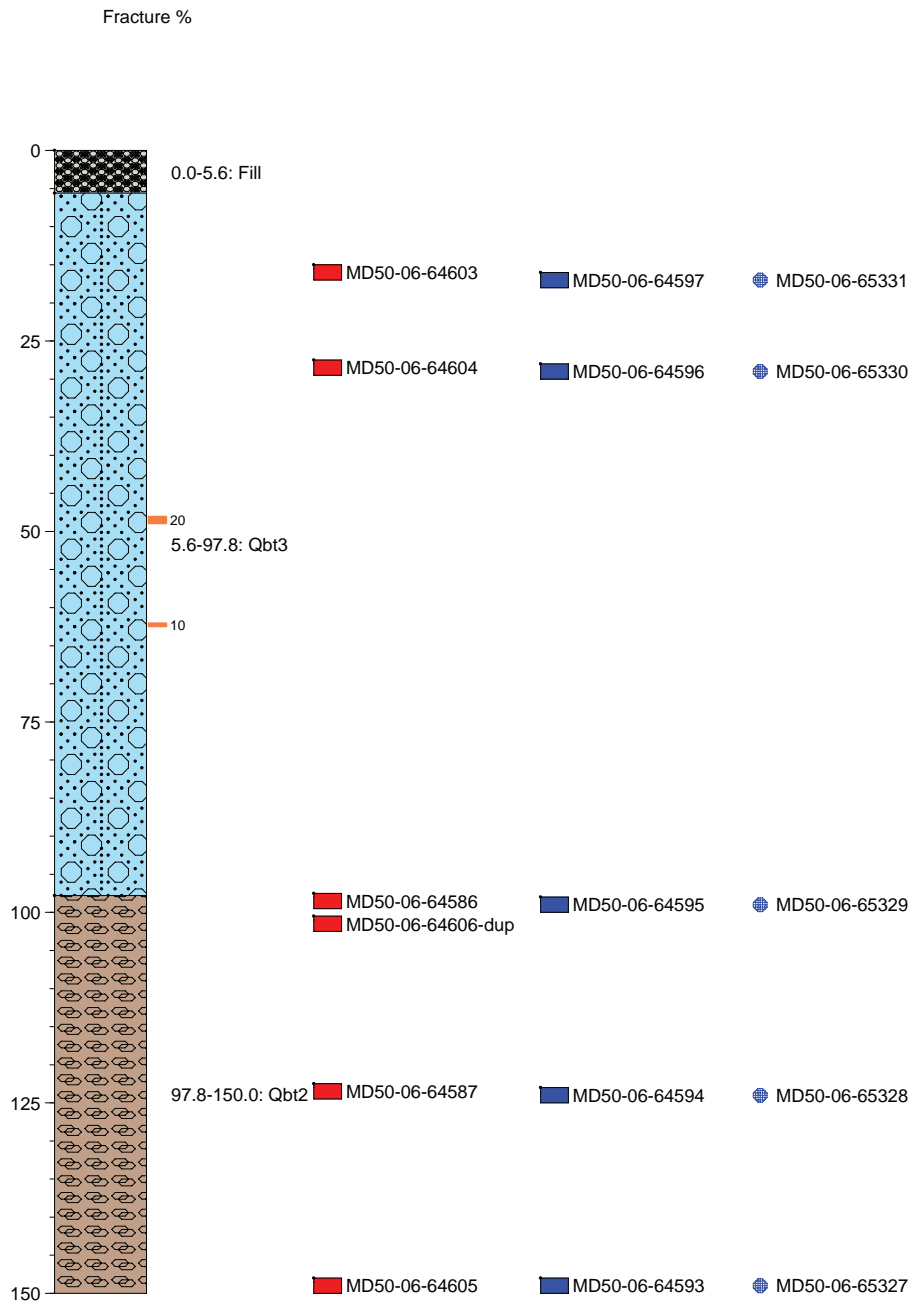
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Fracture %



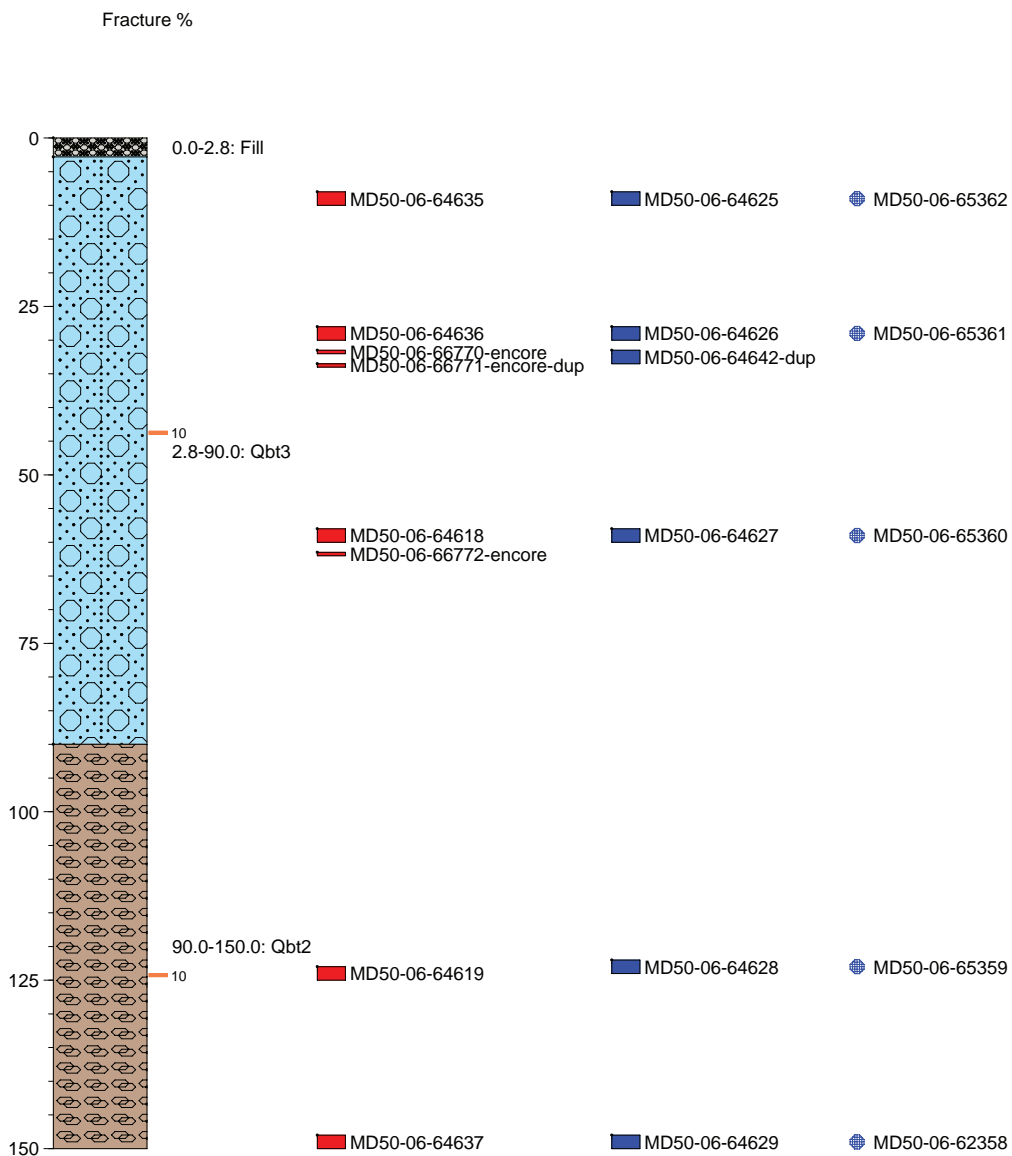
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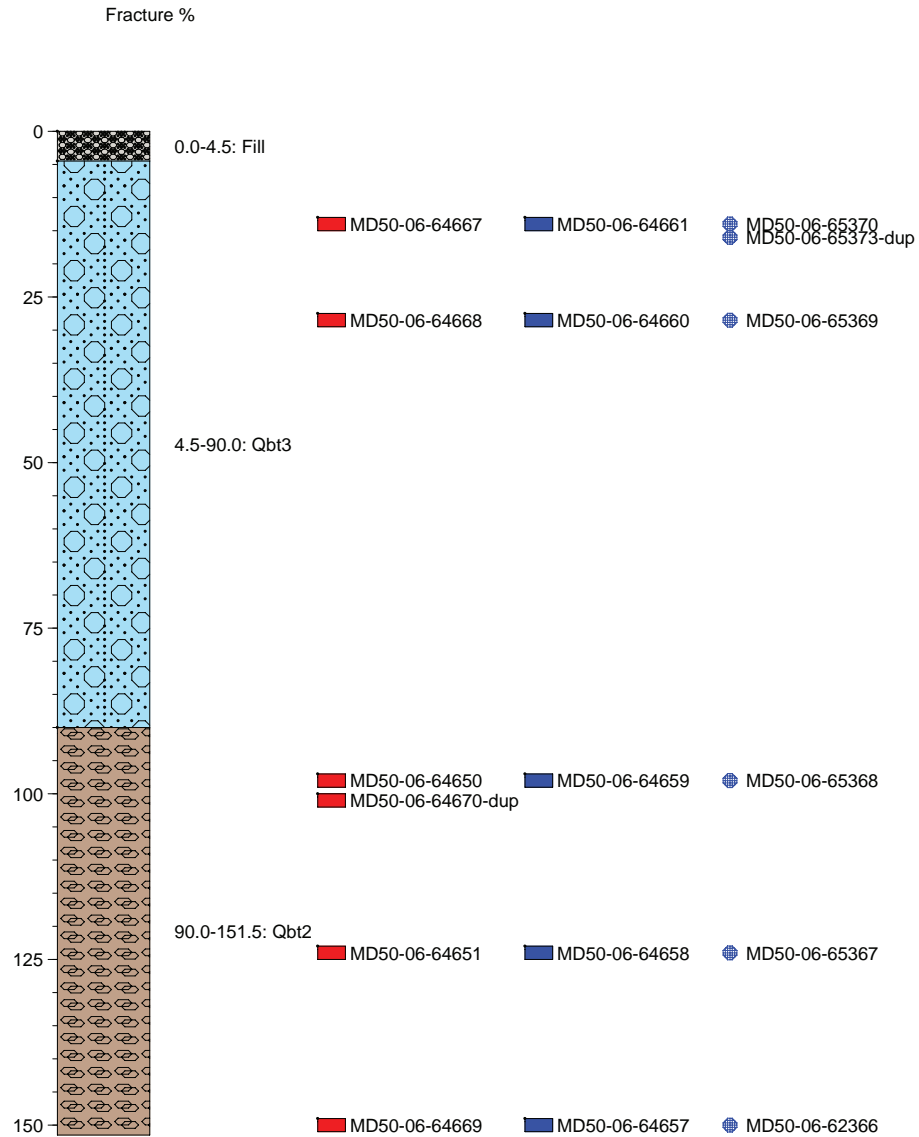
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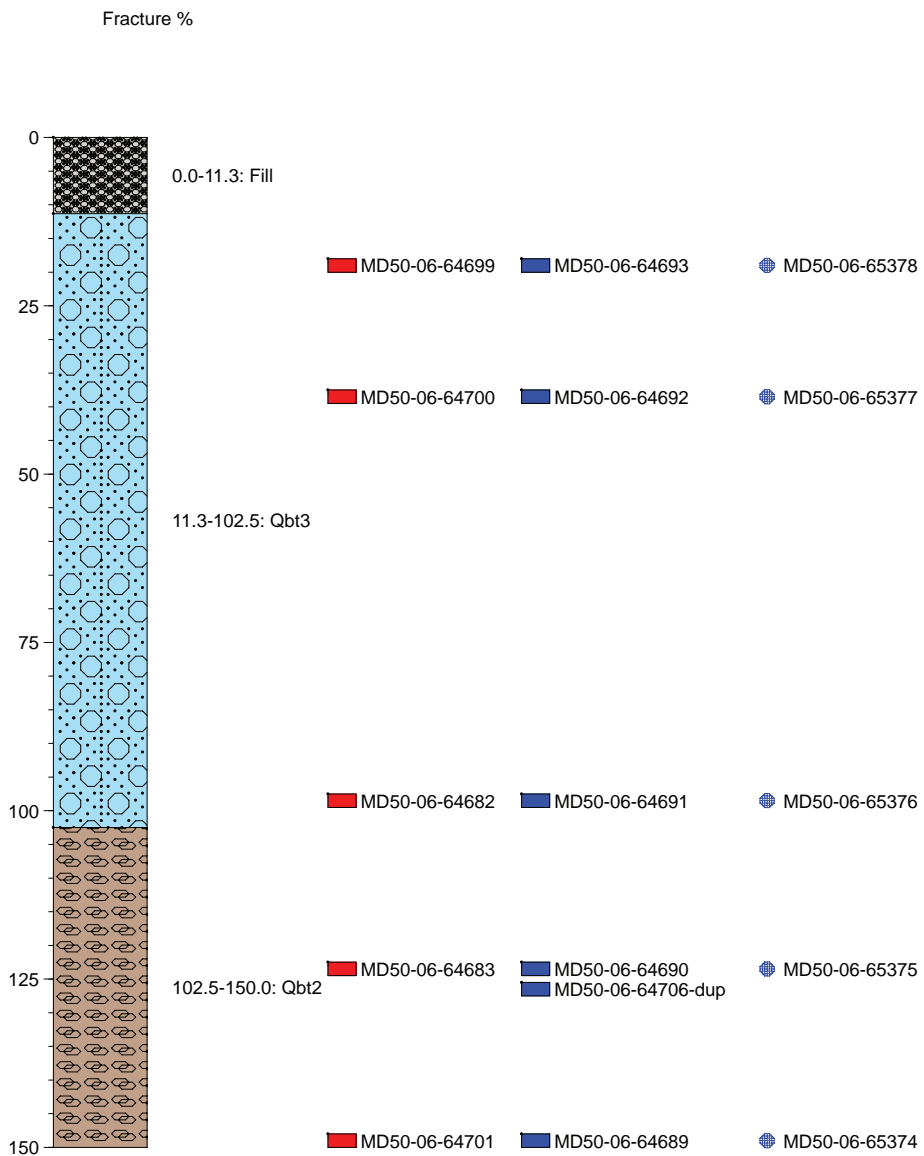
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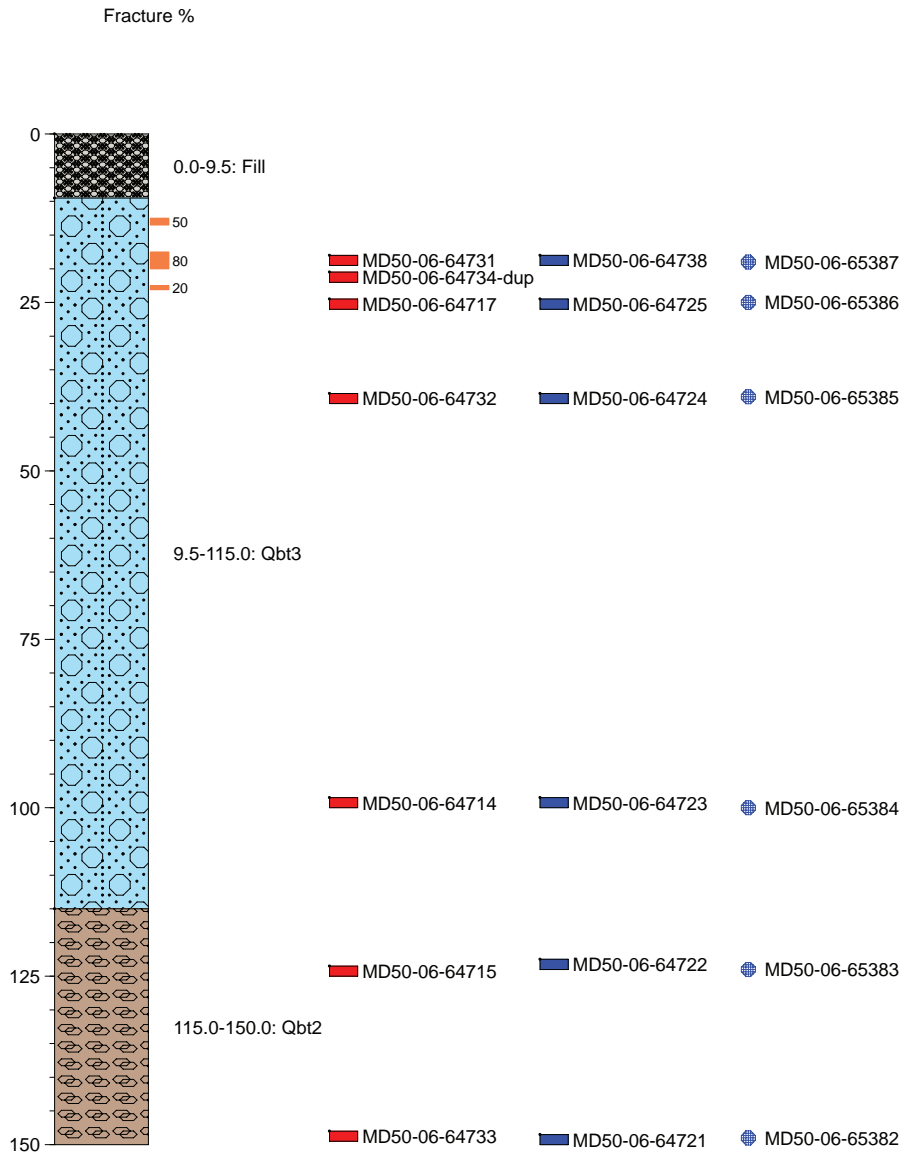
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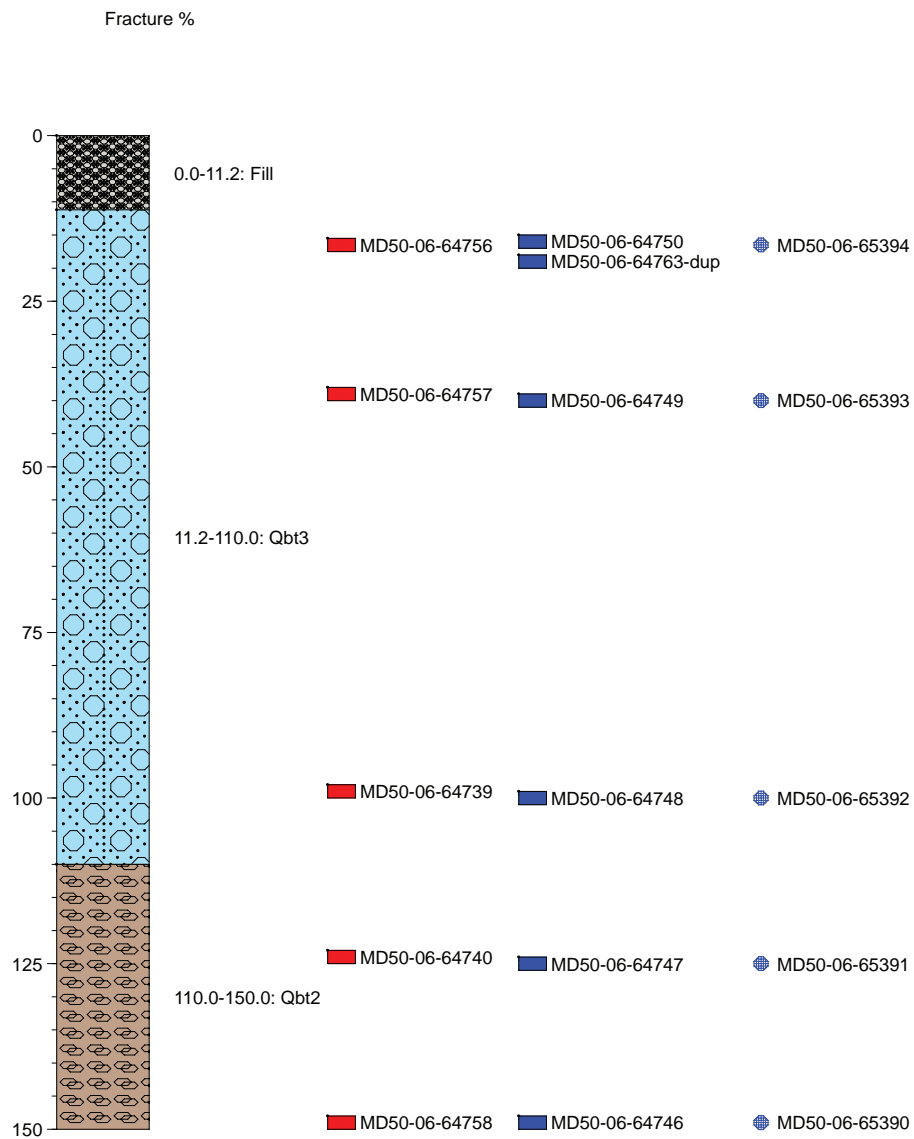
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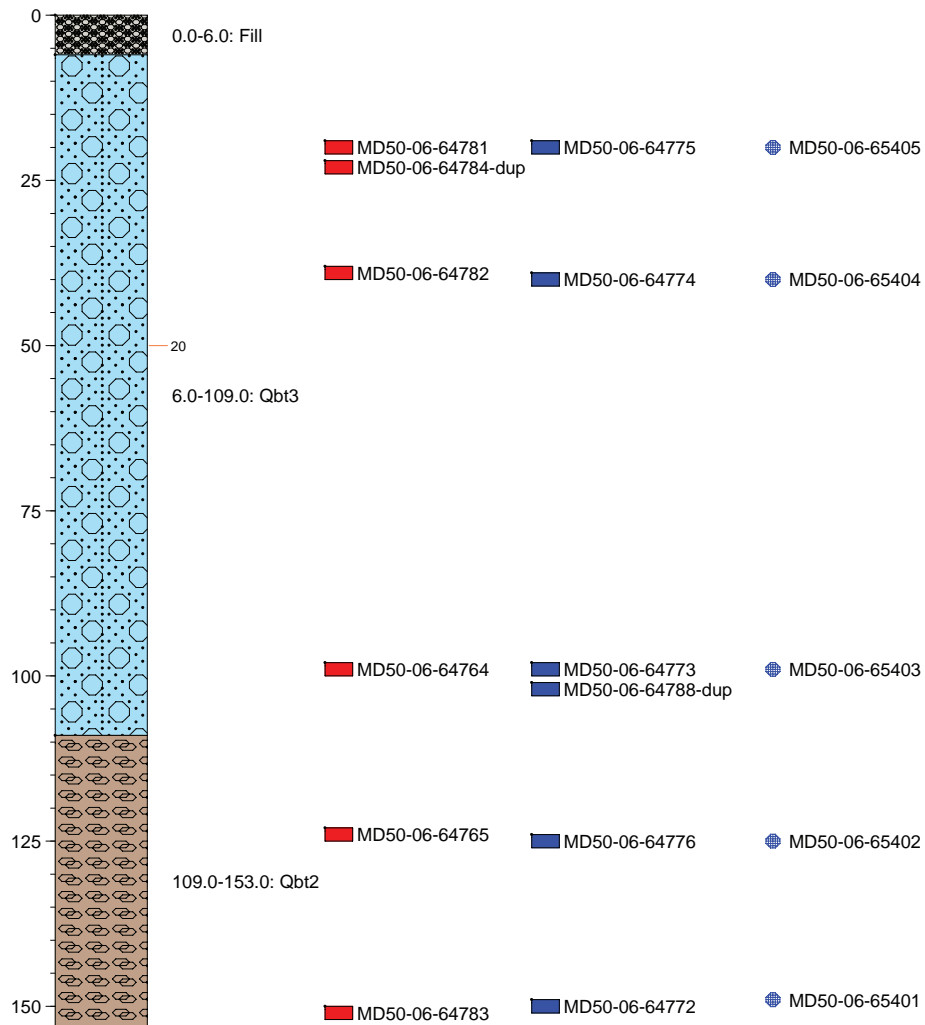
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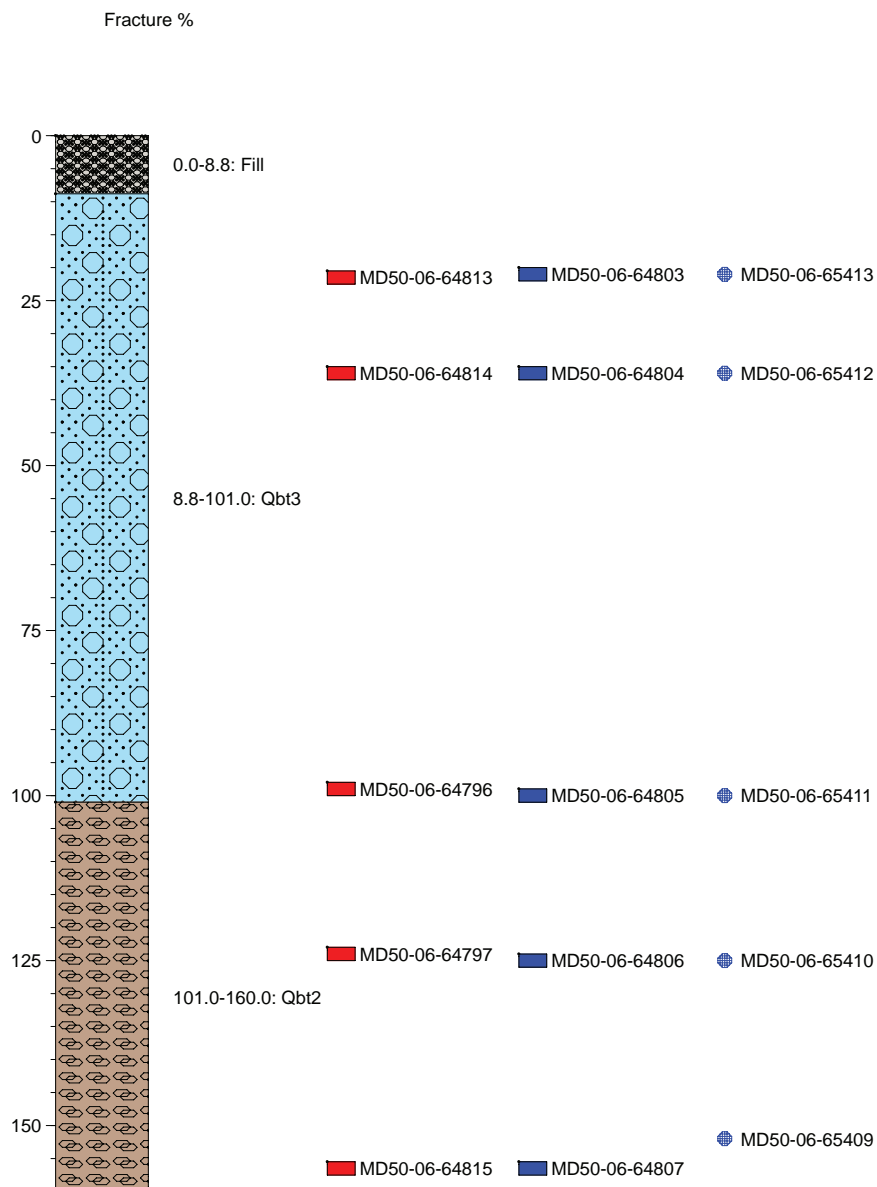
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Fracture %



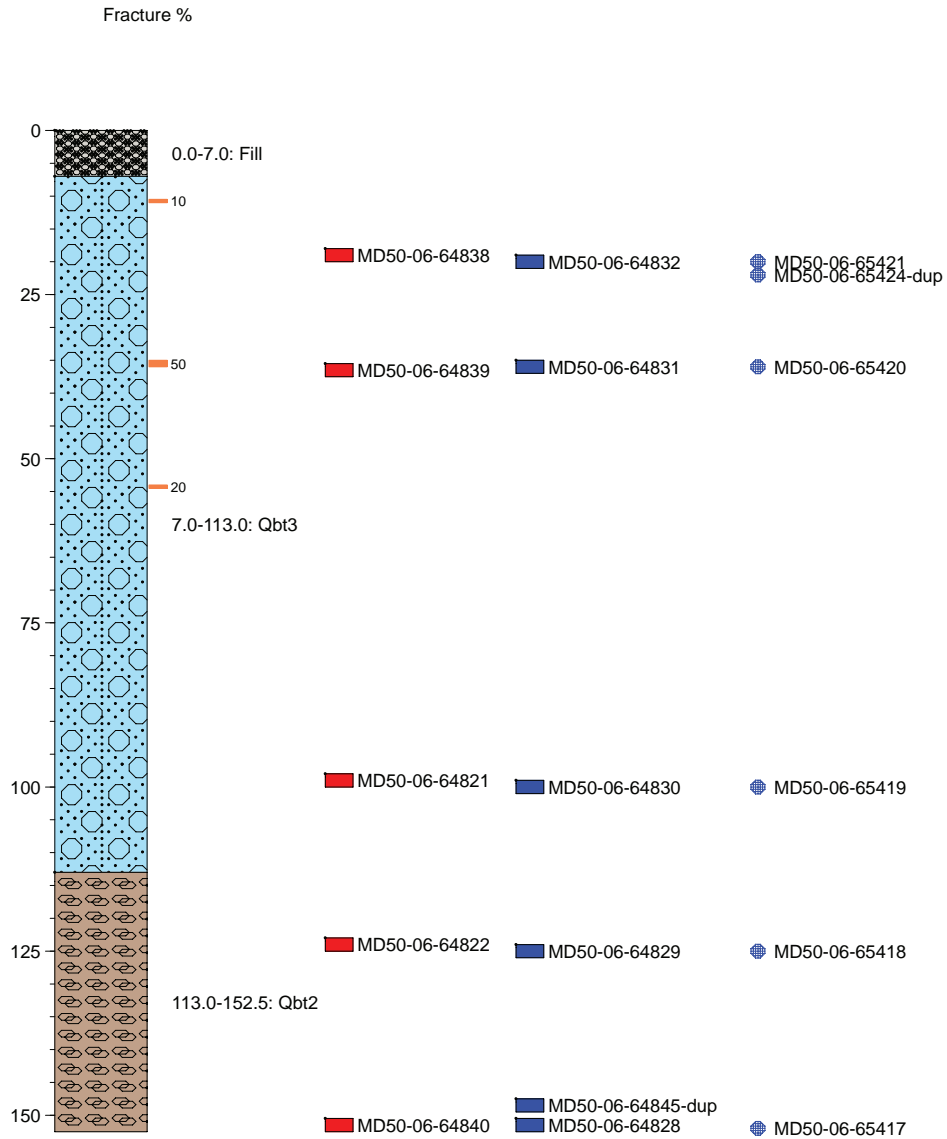
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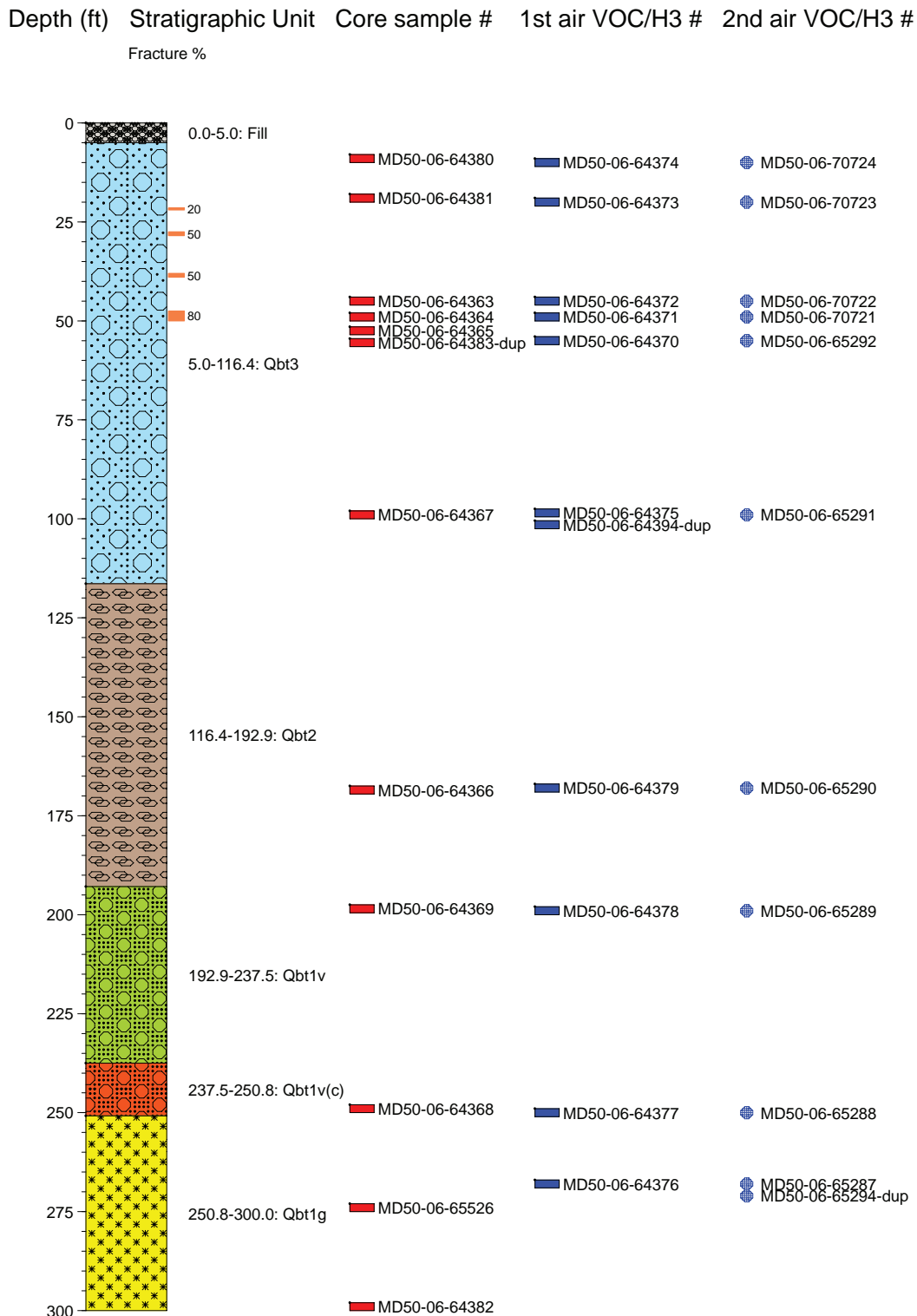


50-24783

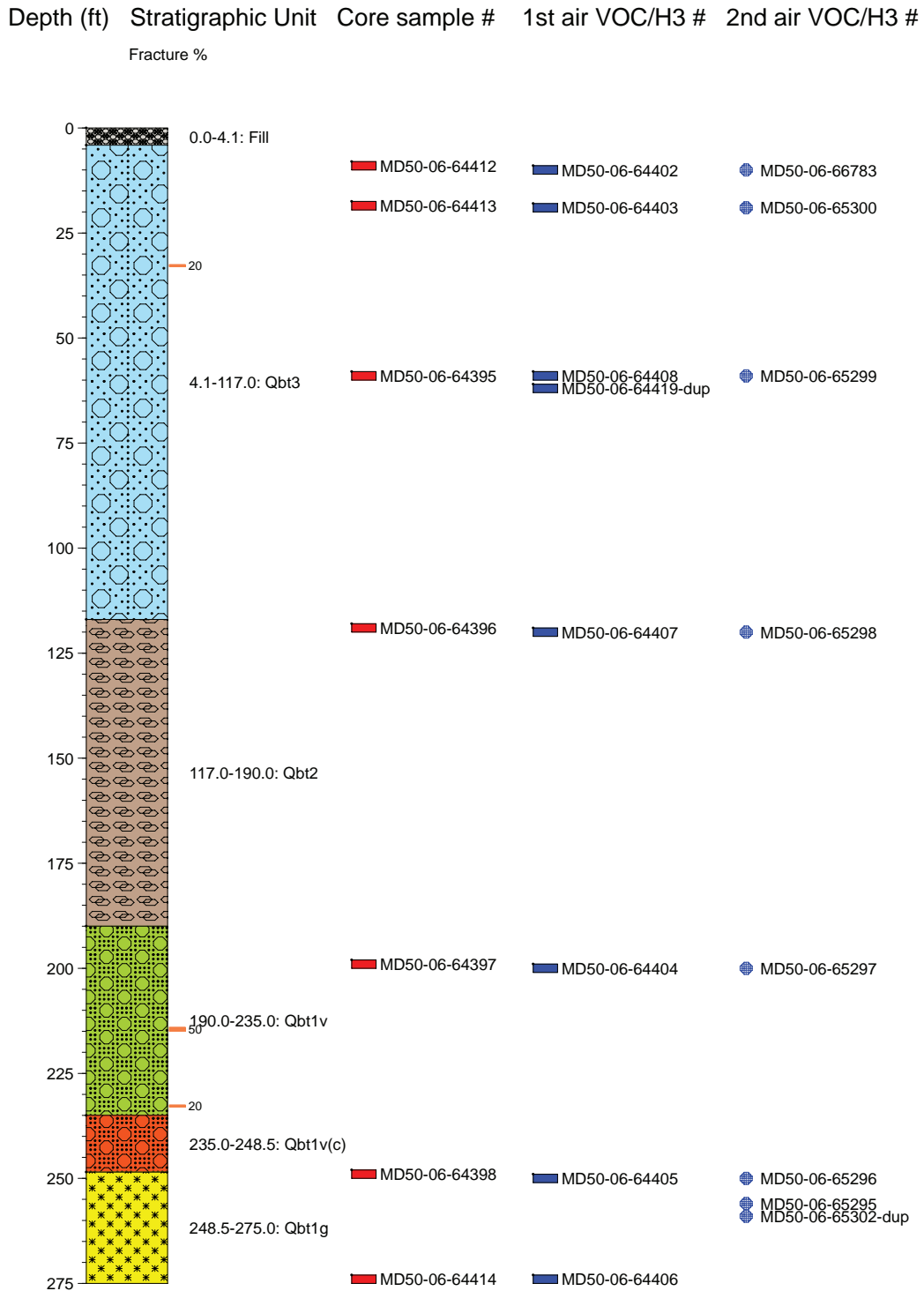
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50-24784



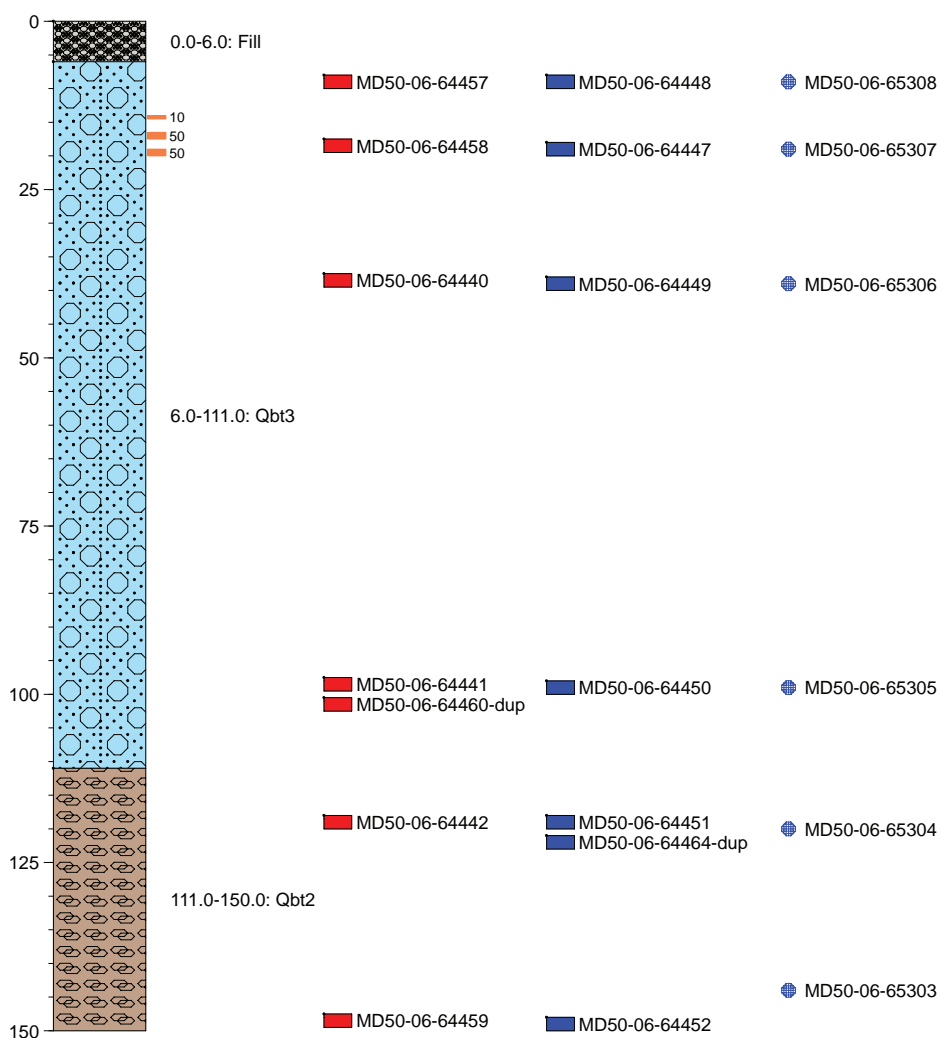
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50-24796

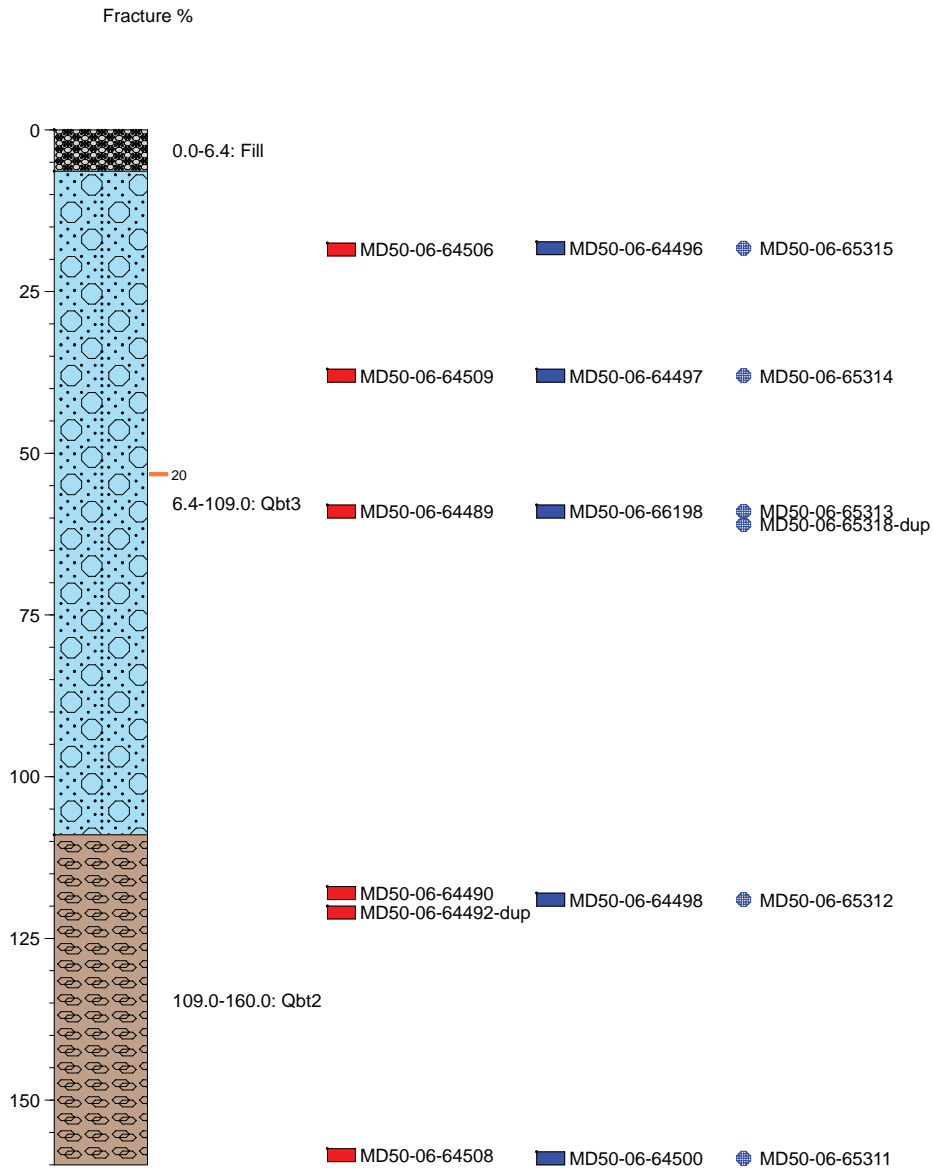
Depth (ft) Stratigraphic Unit Core sample # 1st air VOC/H3 # 2nd air VOC/H3 #

Fracture %



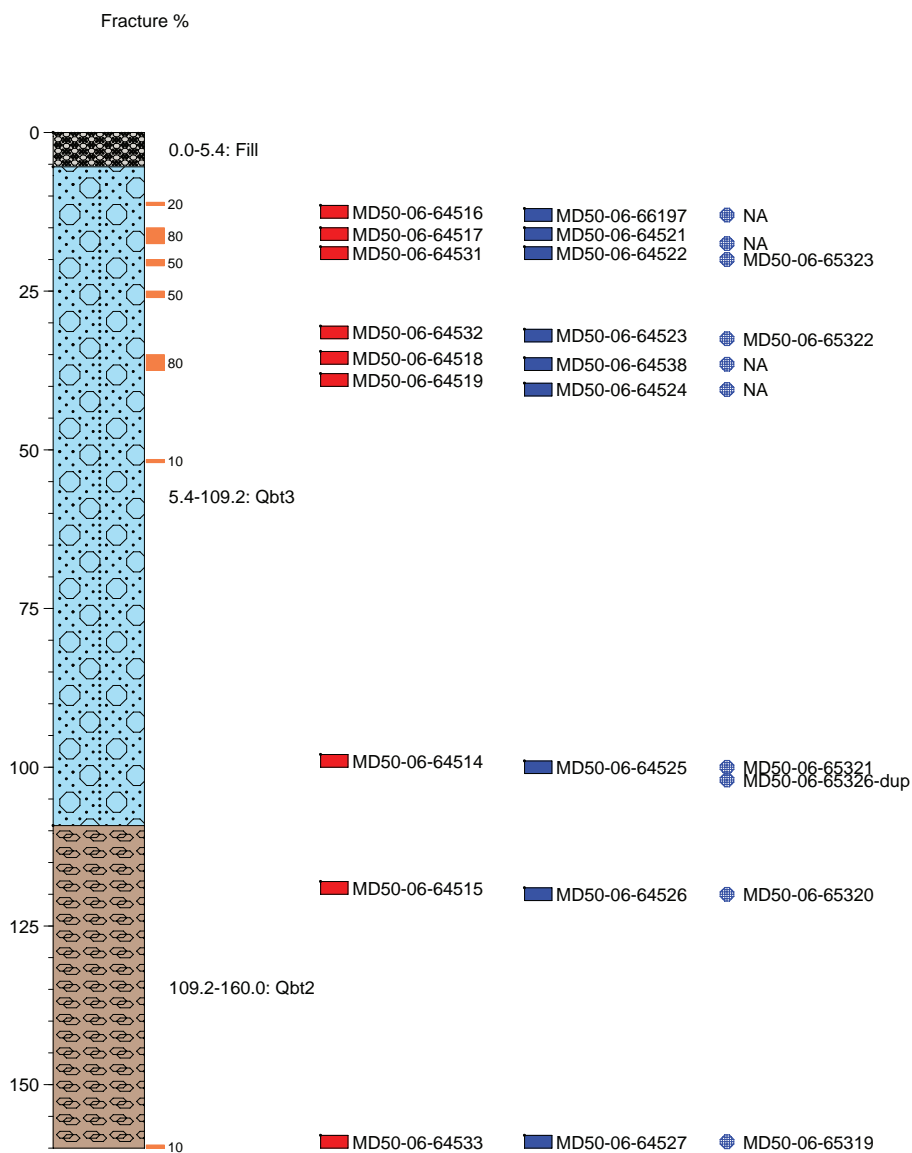
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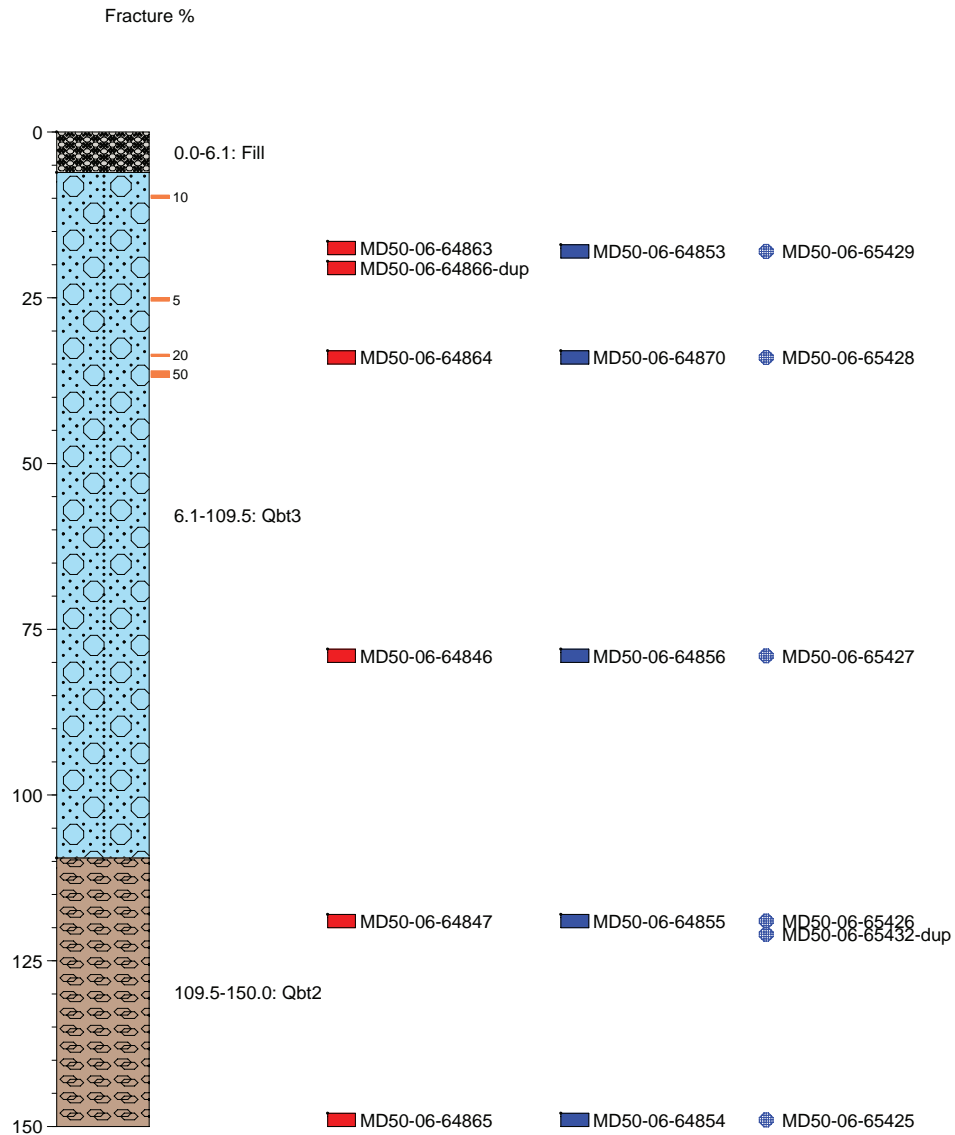
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50-24801

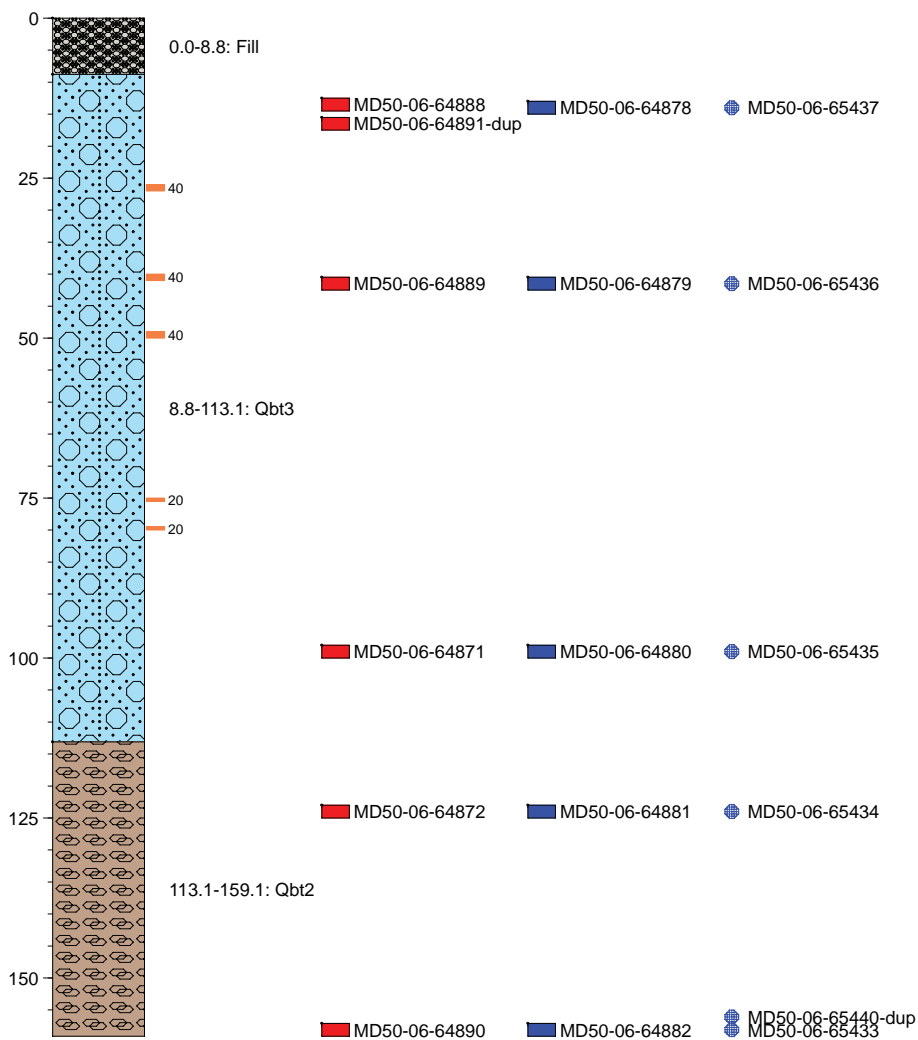
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50-24802

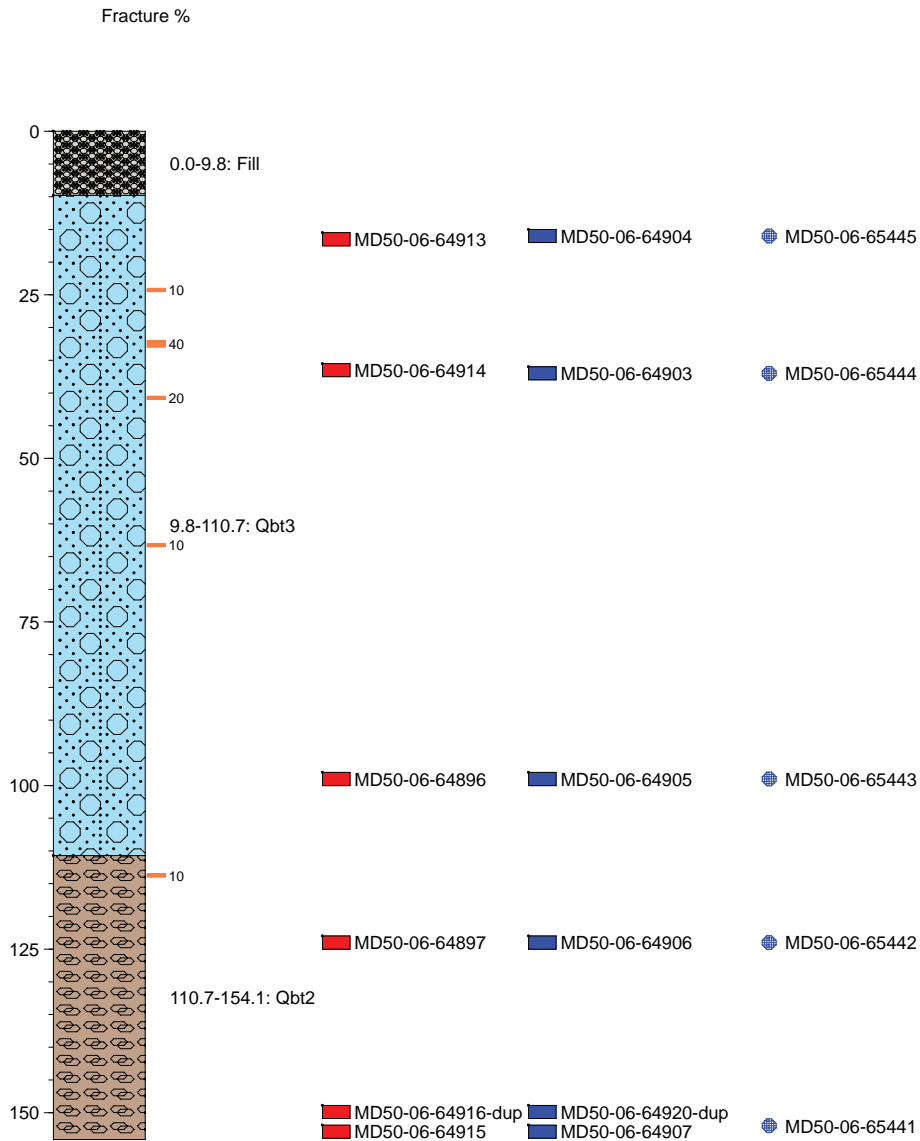
Depth (ft) Stratigraphic Unit Core sample # 1st air VOC/H3 # 2nd air VOC/H3 #

Fracture %



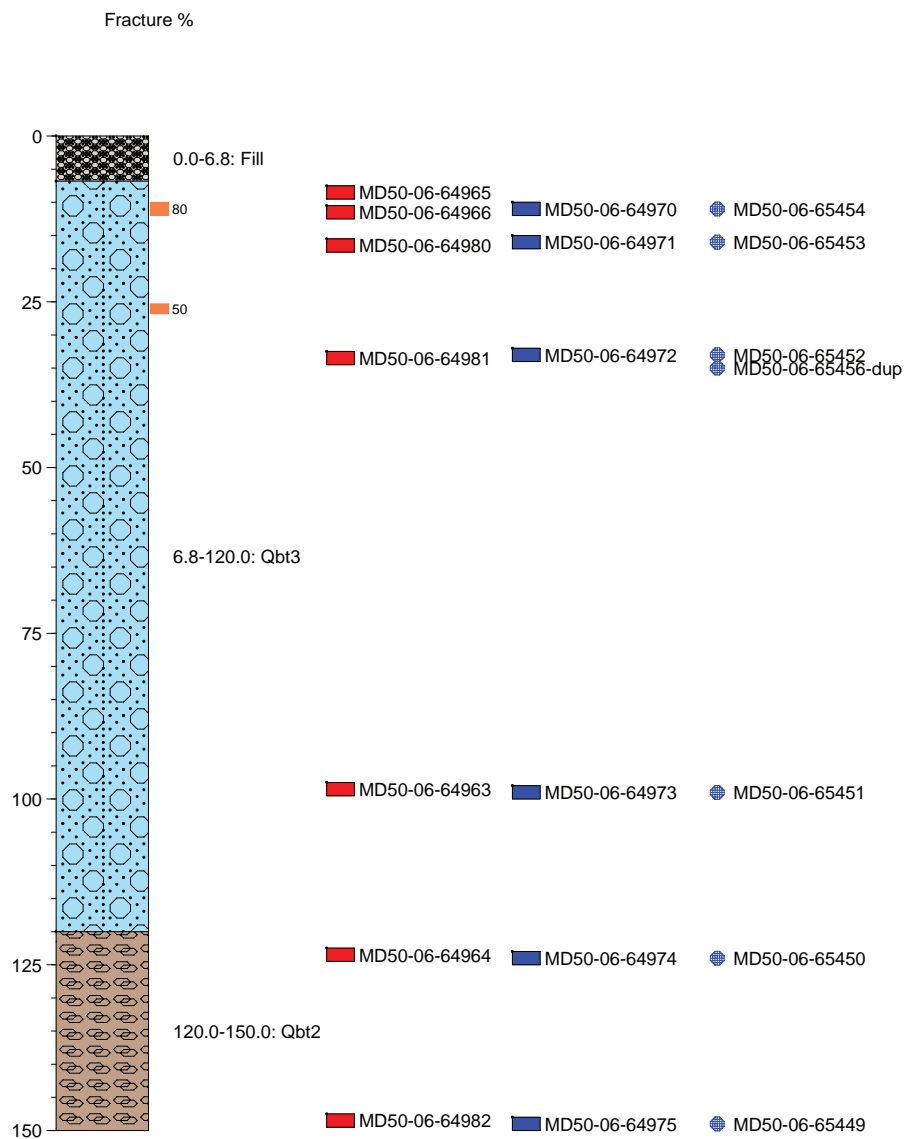
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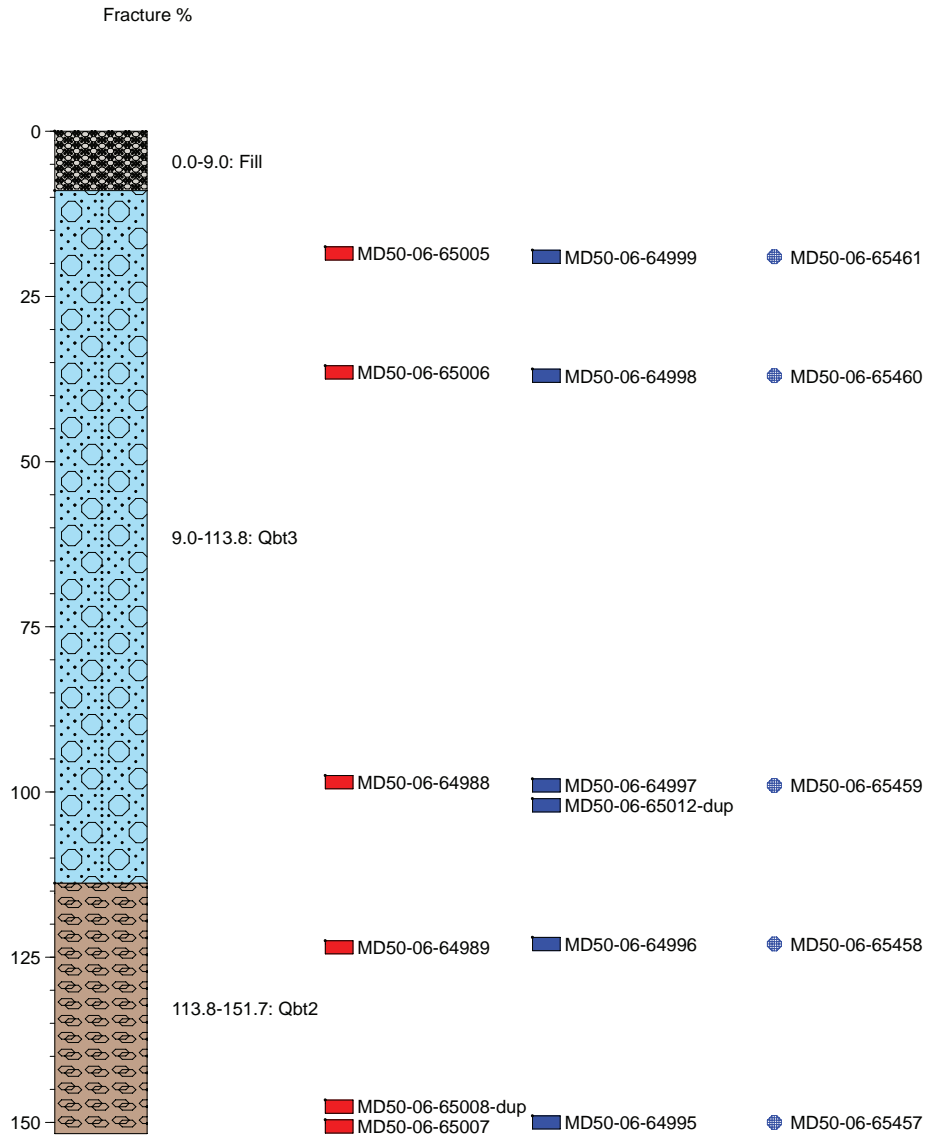
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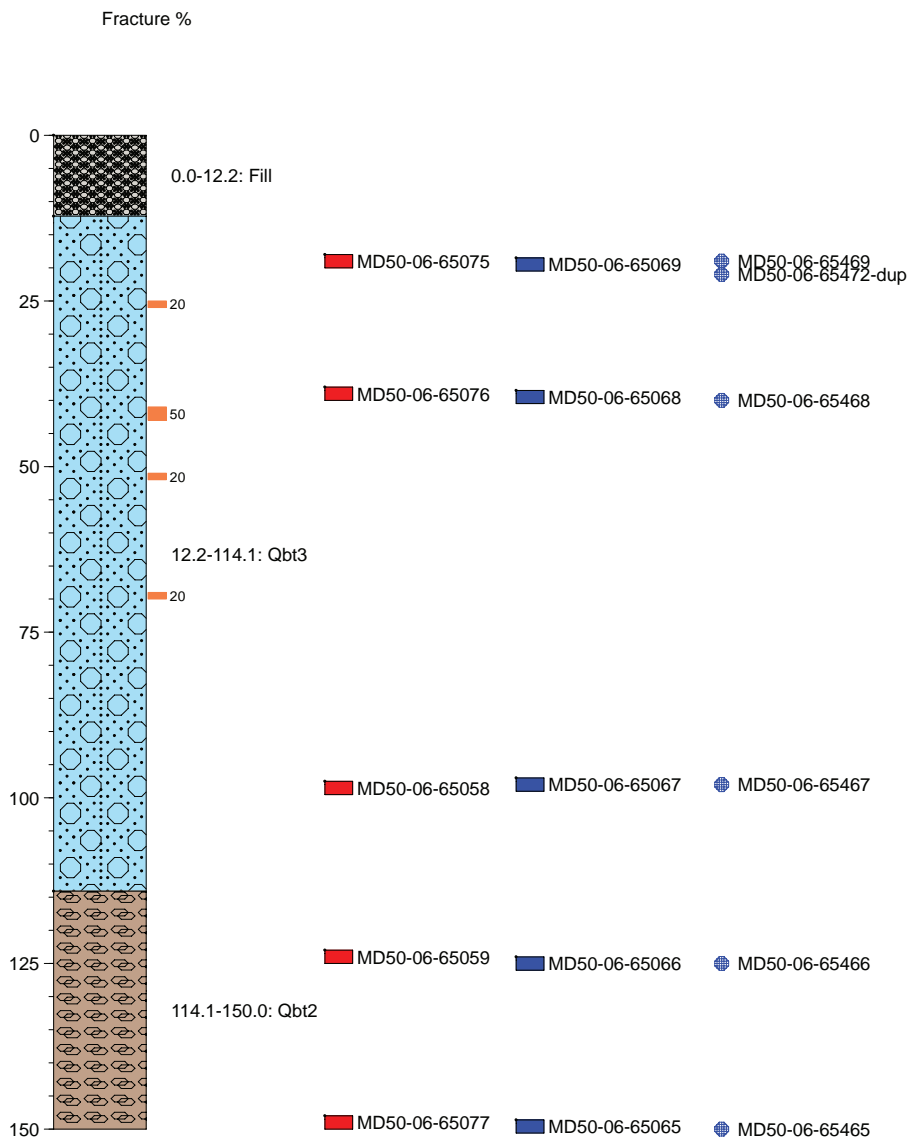
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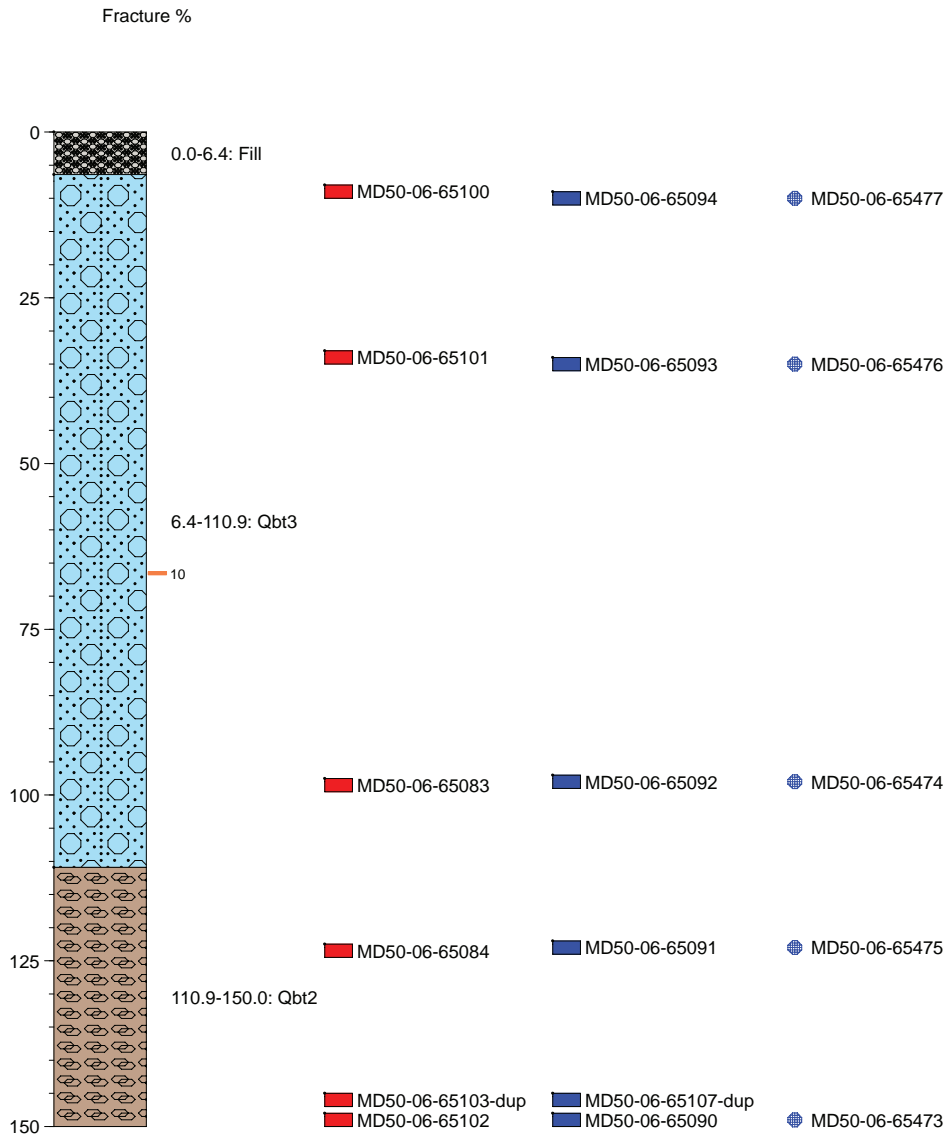
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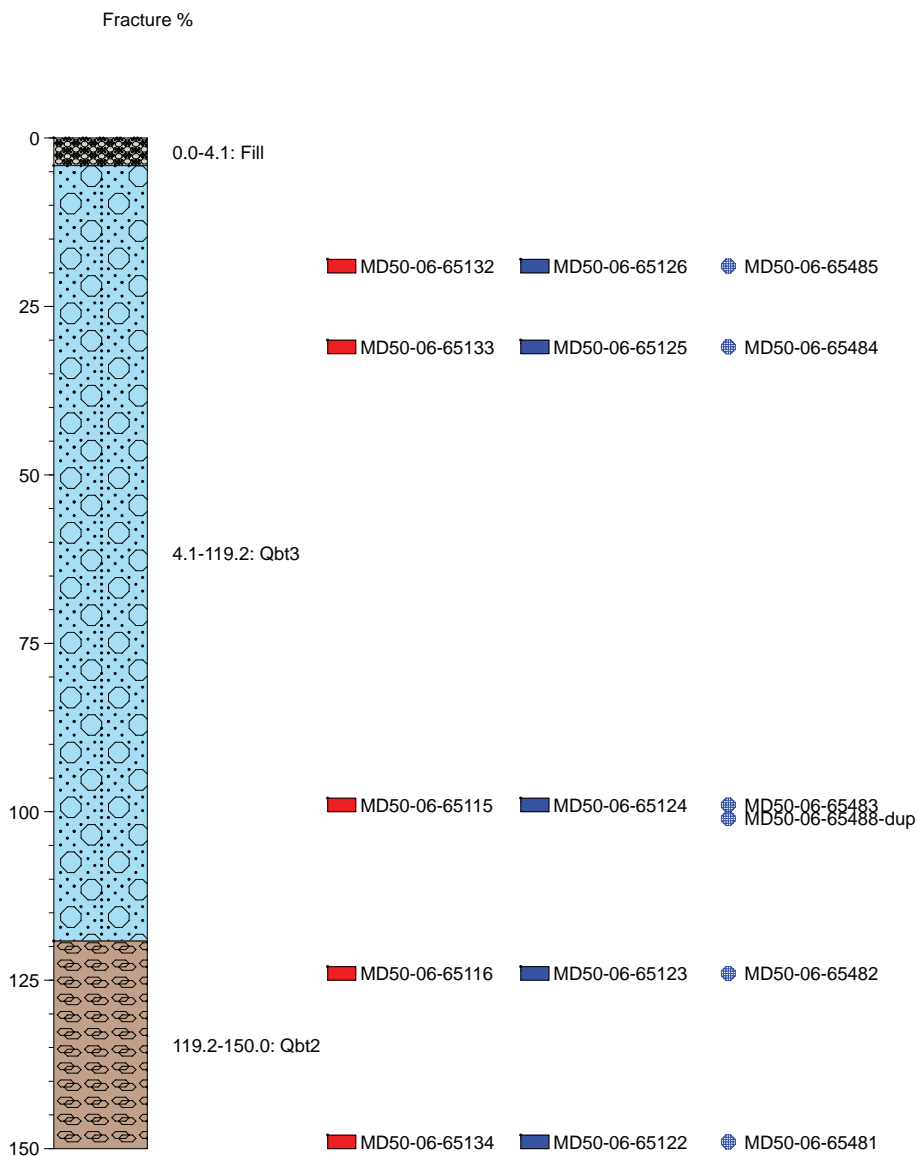
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Depth (ft) Stratigraphic Unit Core sample # 1st air VOC/H3 # 2nd air VOC/H3 #



50-24813

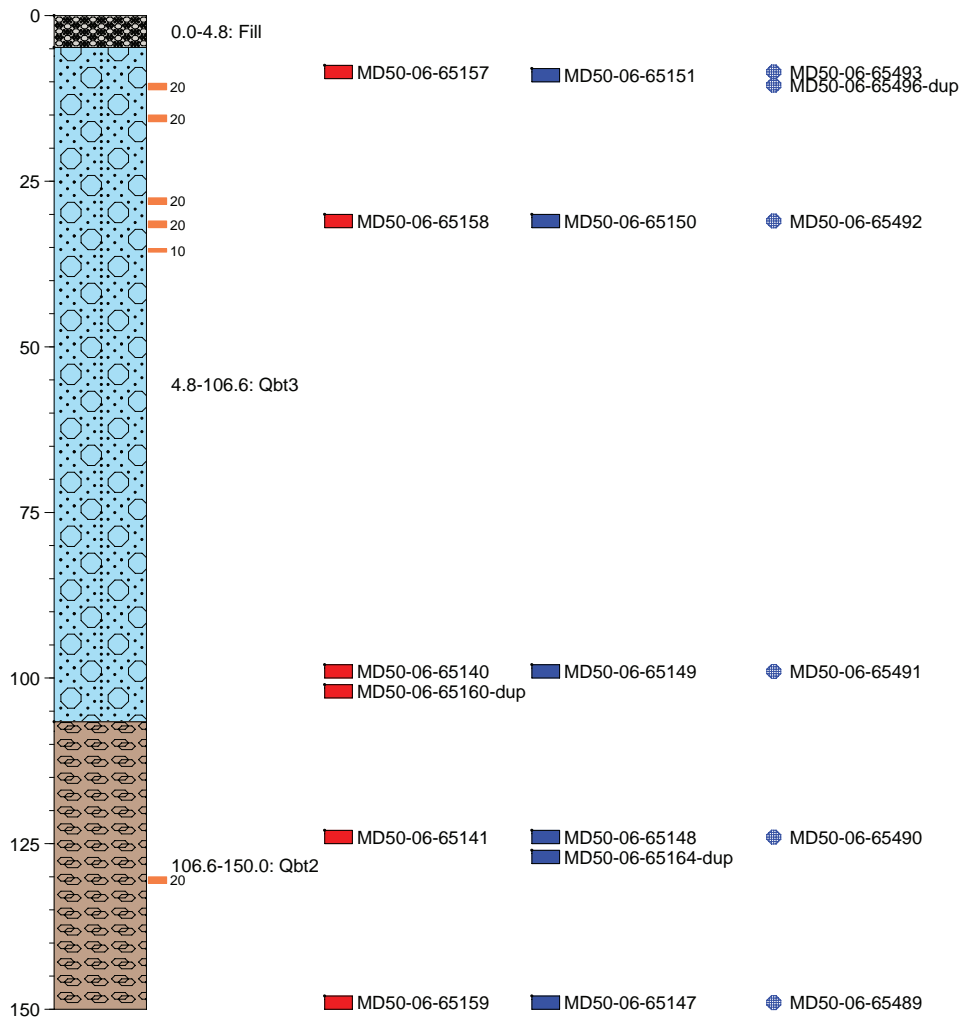
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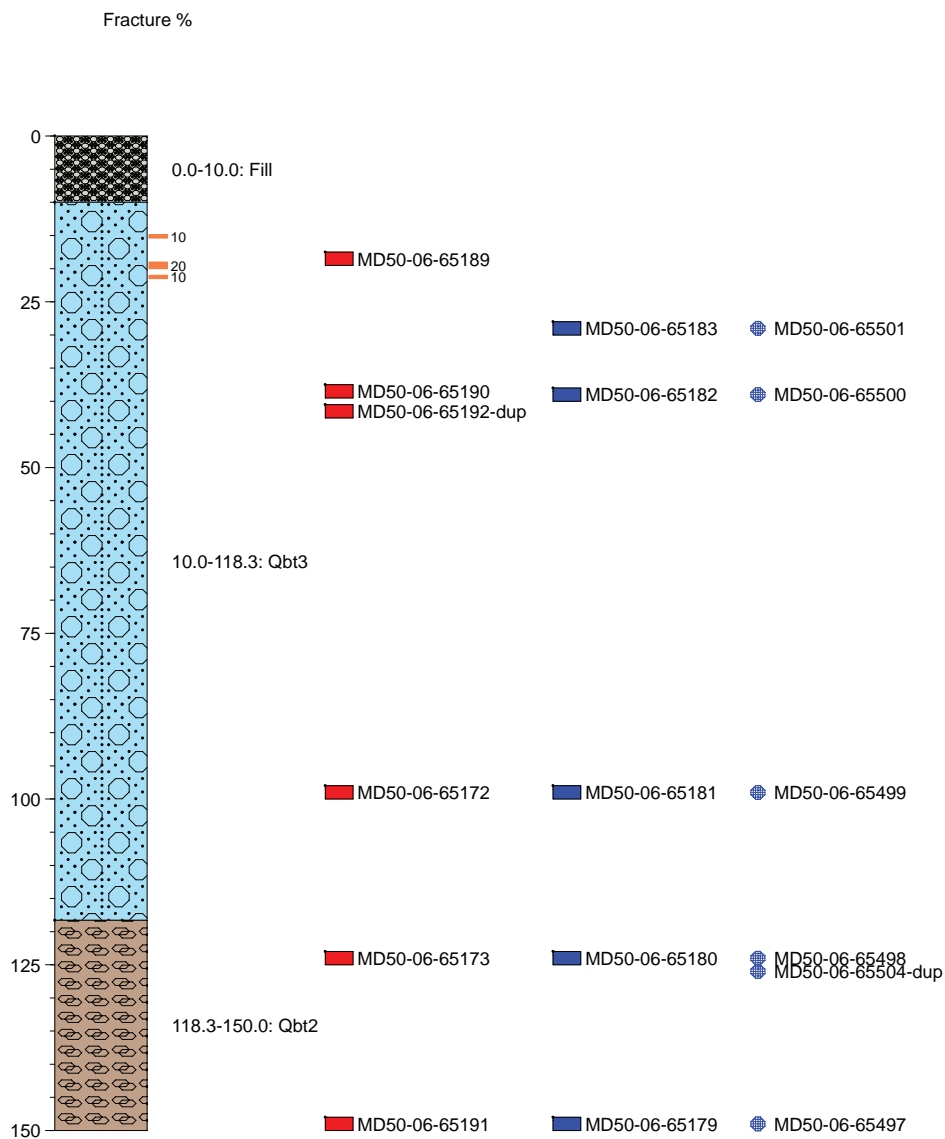
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Fracture %



50-24815

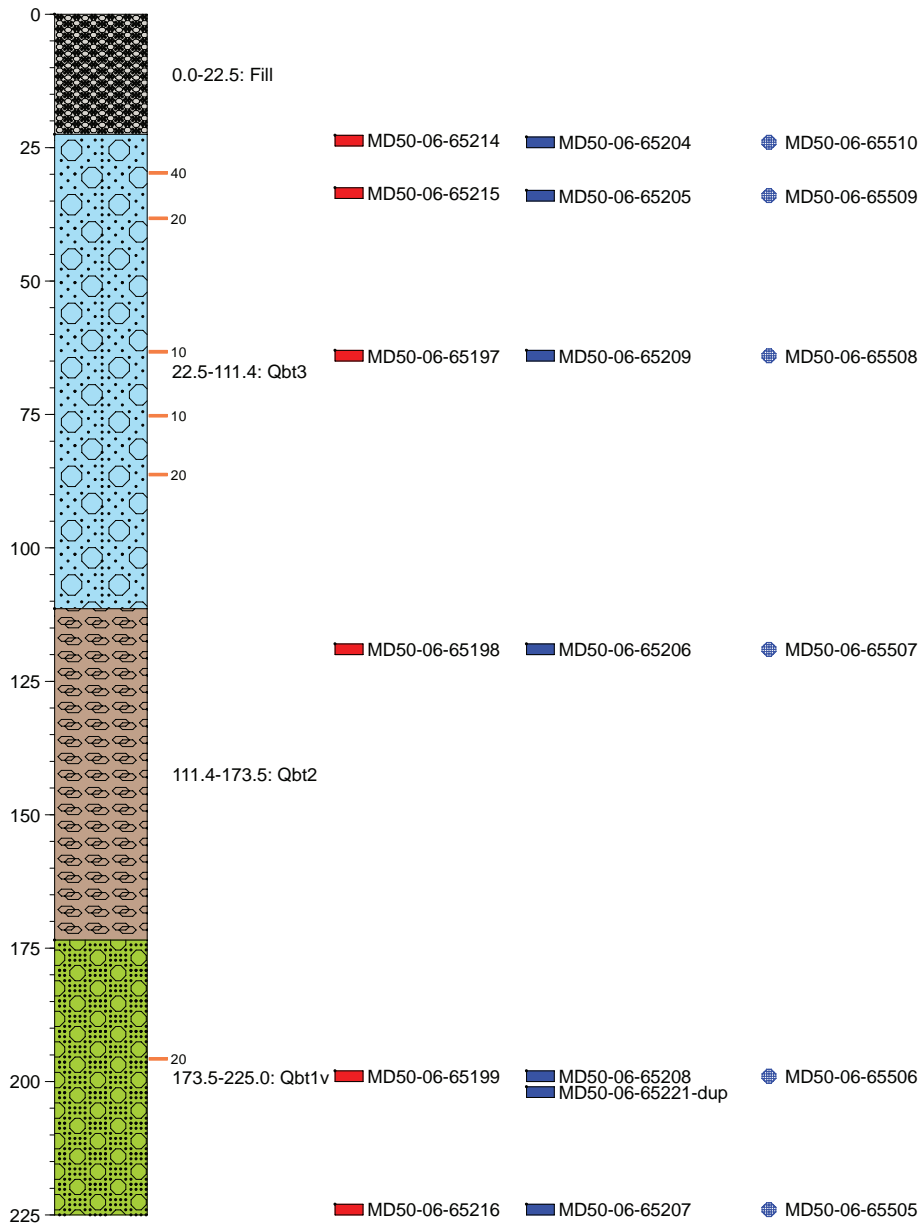
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50-24816

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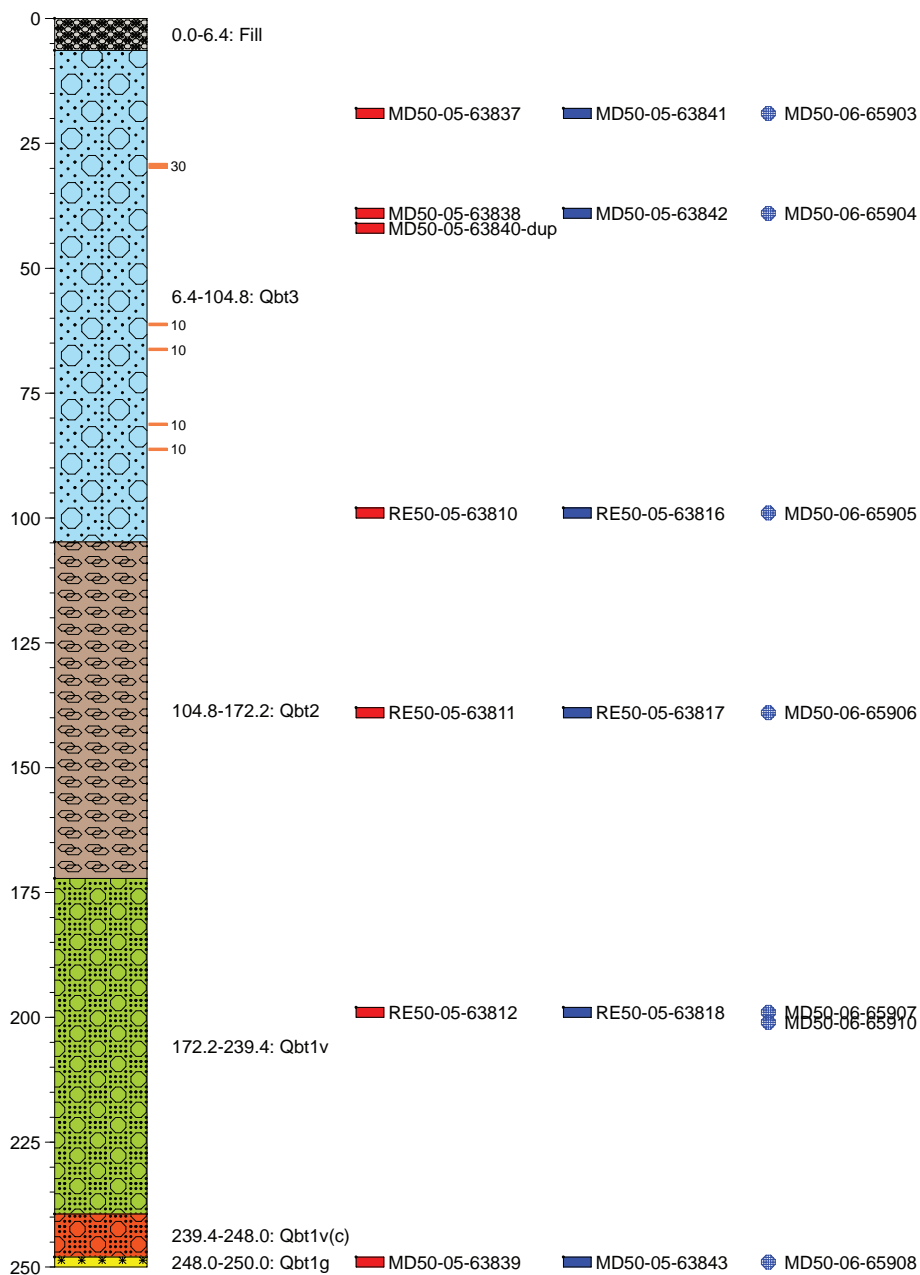
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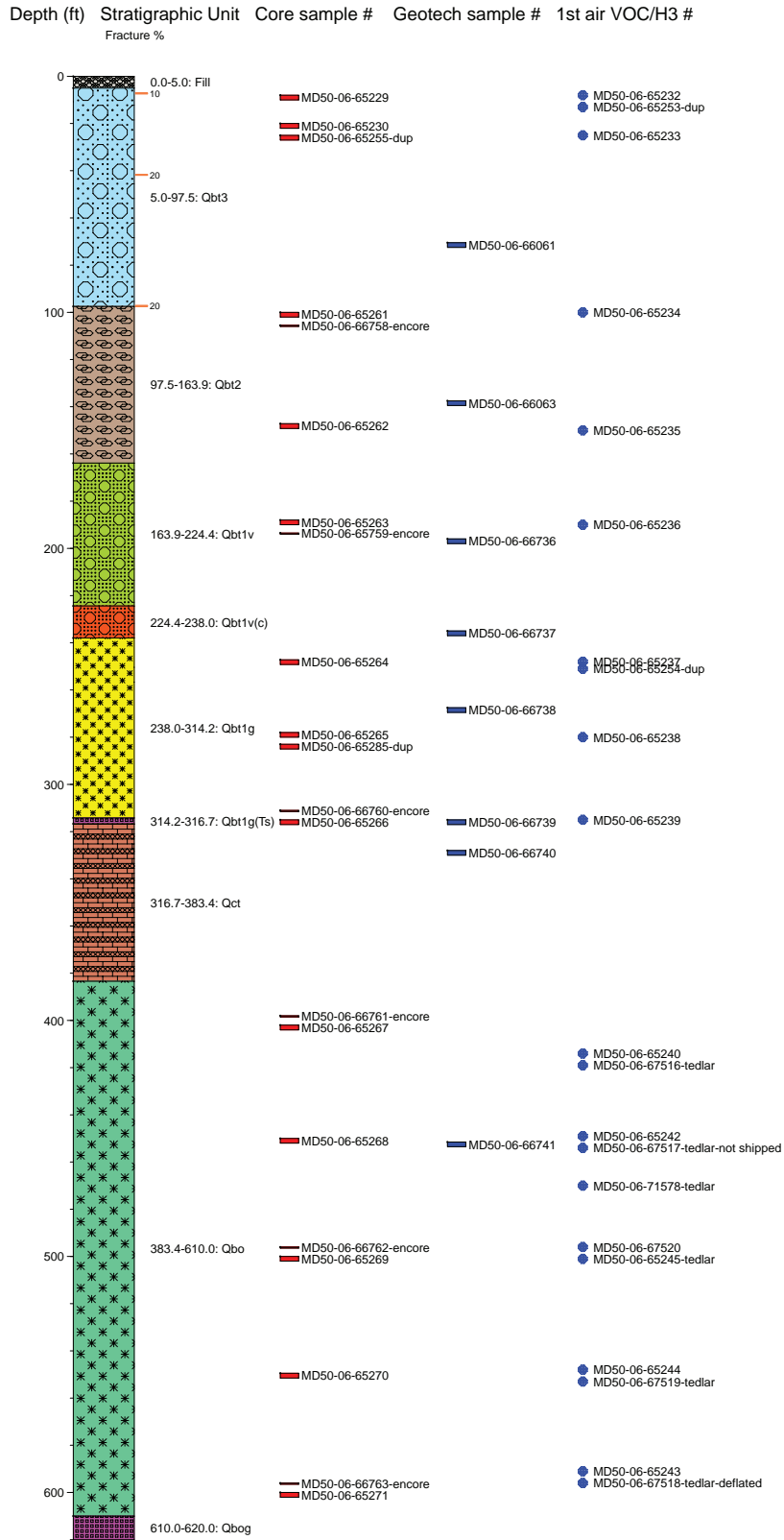
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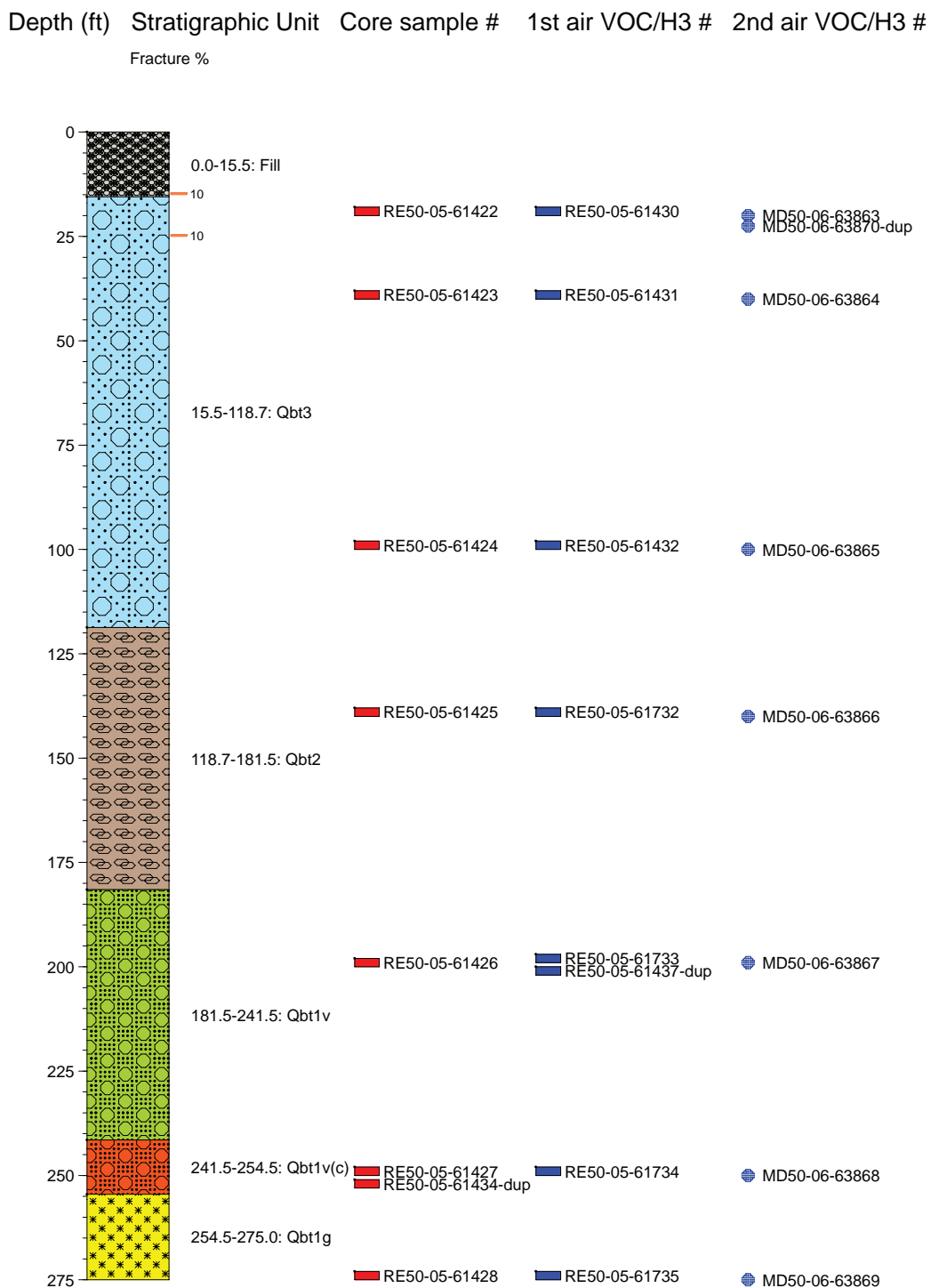
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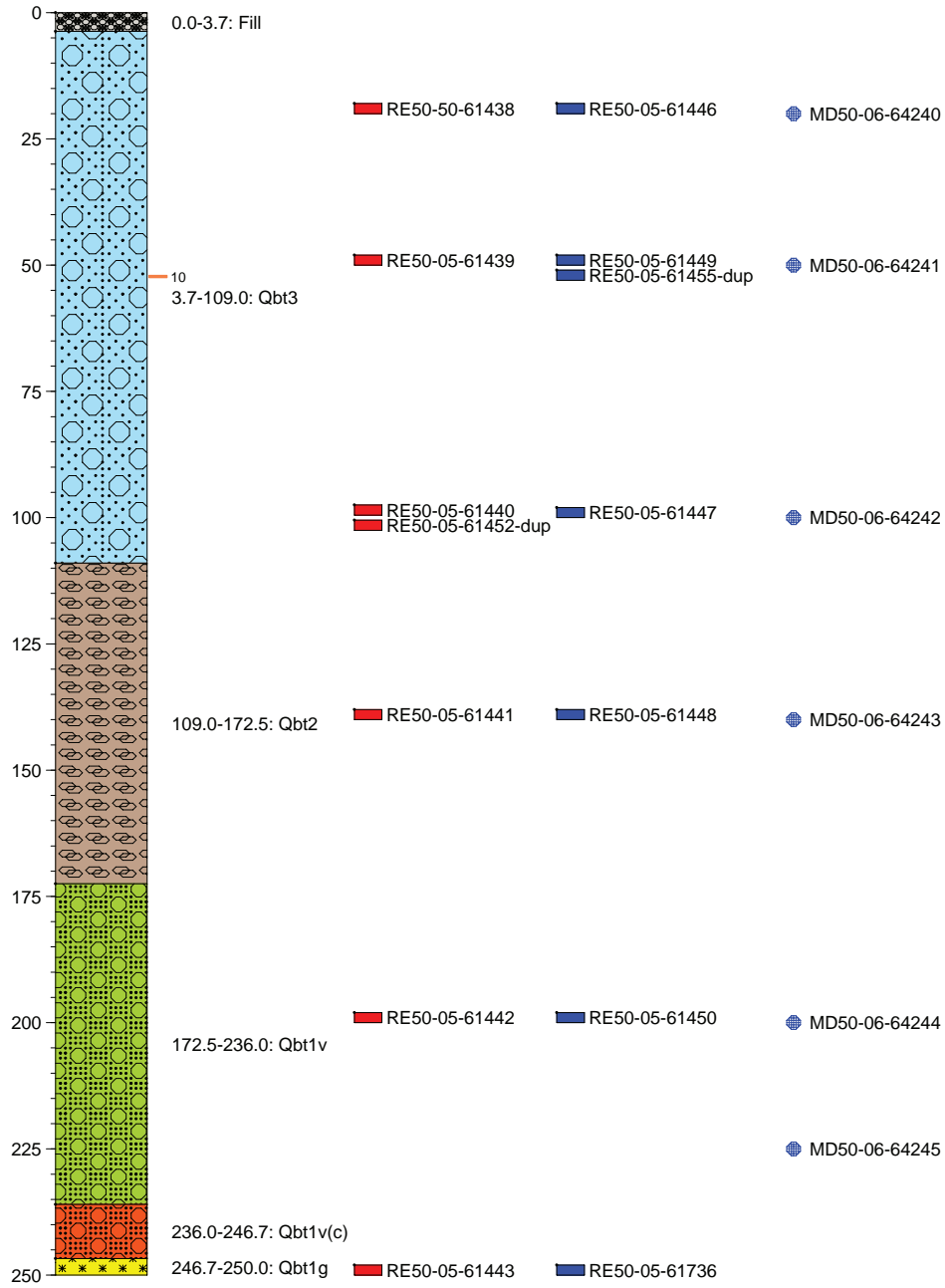


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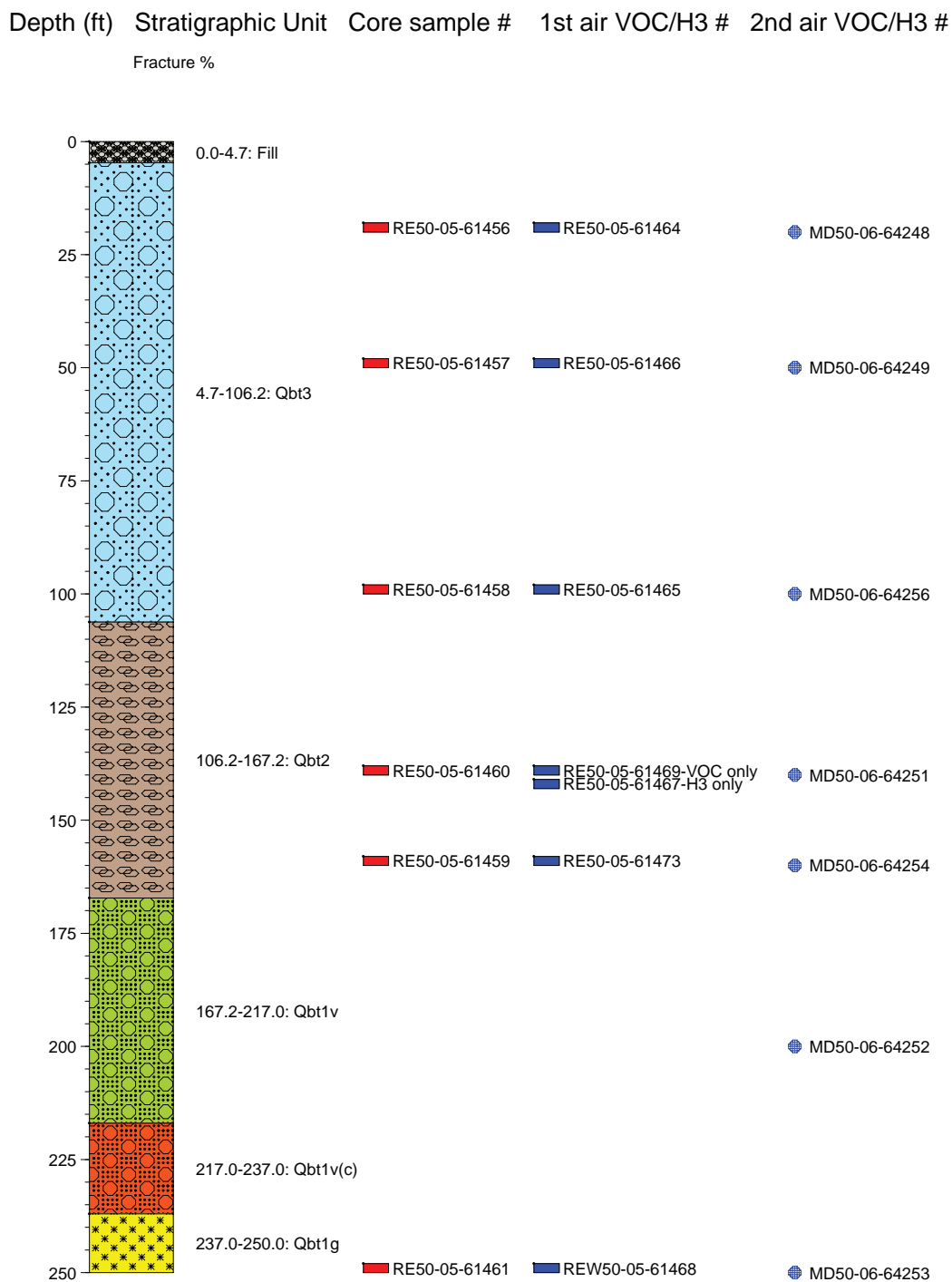


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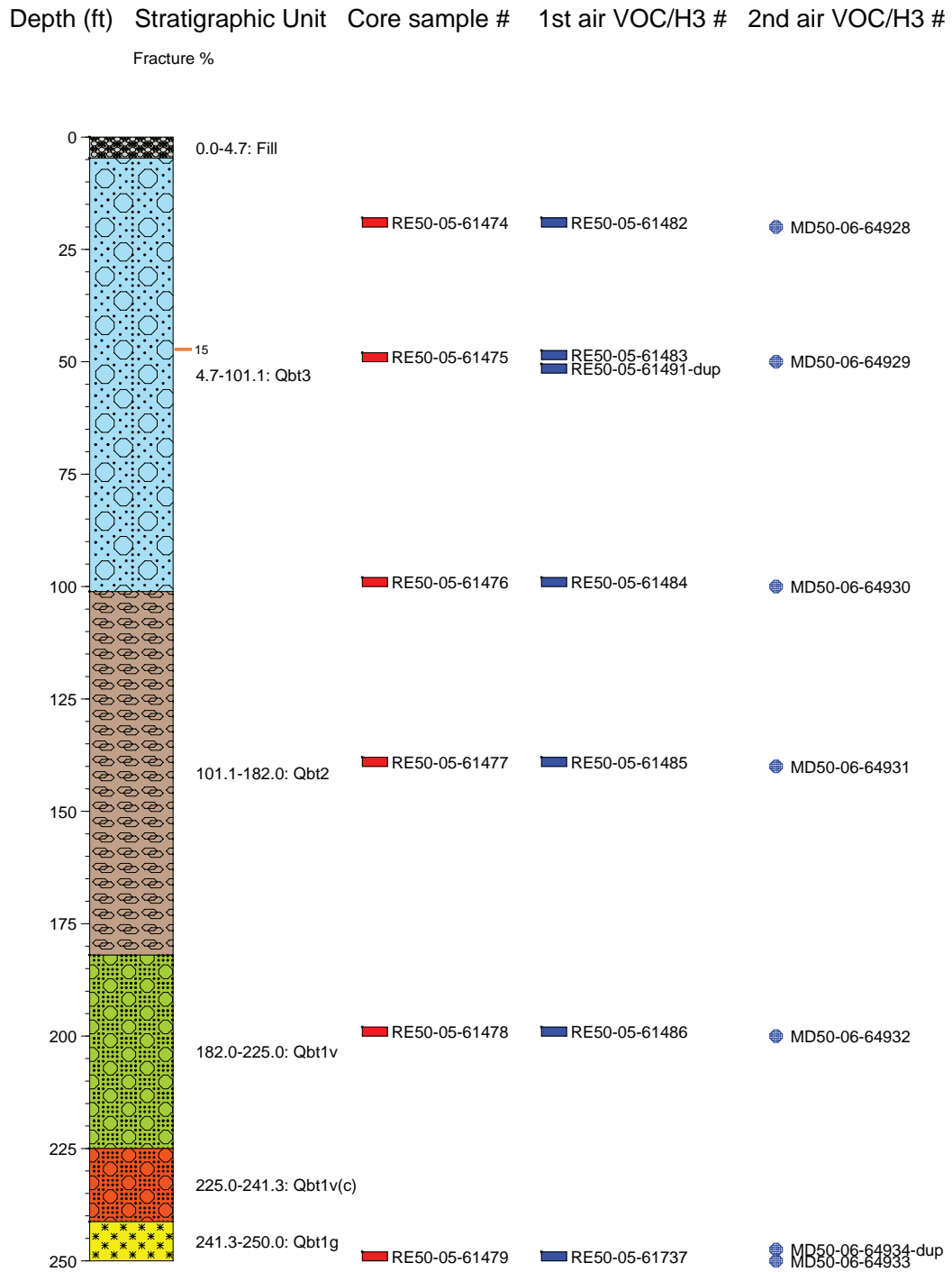
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Fracture %



50-24821

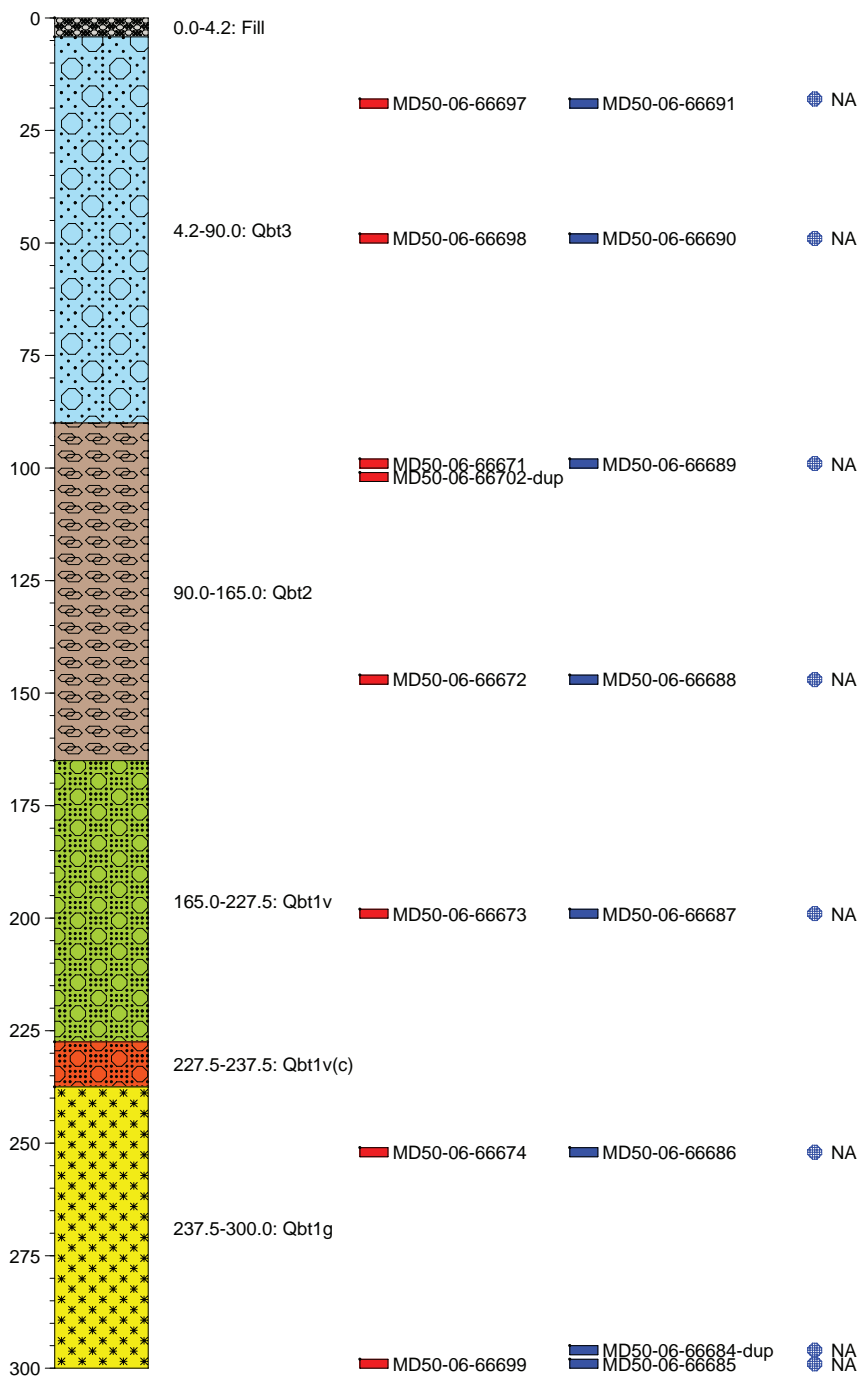


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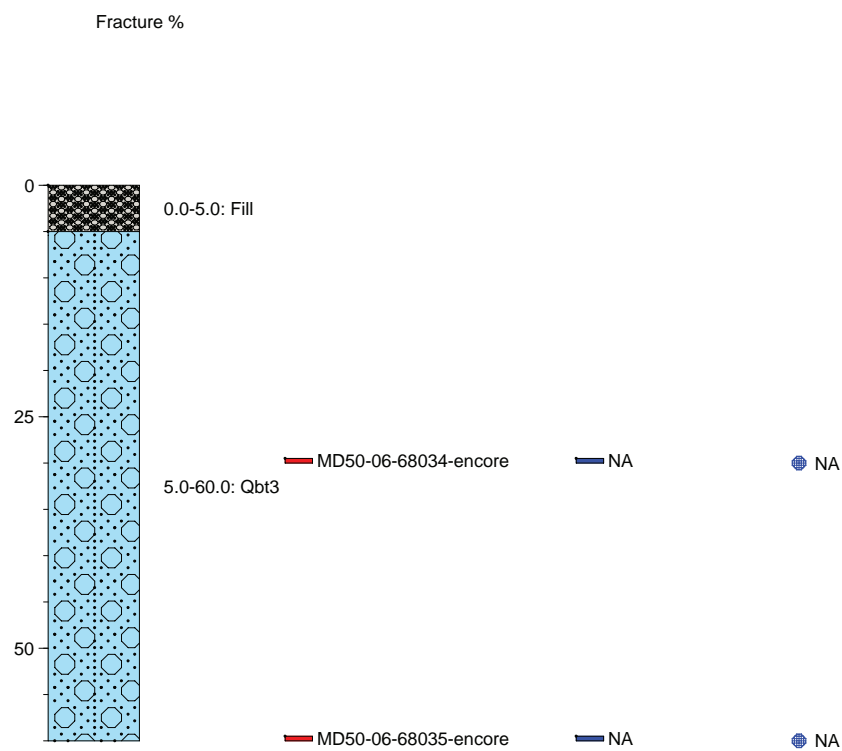
50-25451

Depth (ft) Stratigraphic Unit Core sample # 1st air VOC/H3 # 2nd air VOC/H3 #
Fracture %



50-25621

Depth (ft) Stratigraphic Unit Core sample # 1st air VOC/H3 # 2nd air VOC/H3 #



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Appendix D

Analytical Program

D-1.0 INTRODUCTION

This appendix discusses analytical methods and the data quality review for the samples collected and analyzed in the investigations conducted from 1995 to 2006 at Material Disposal Area (MDA) C at Los Alamos National Laboratory (the Laboratory).

The analytical program used for this investigation includes submission of samples to approved contract laboratories, with specific requirements for analytical methods, data quality, and reporting. Quality assurance (QA), quality control (QC), and data validation procedures were implemented in accordance with the requirements of the "Quality Assurance Project Plan Requirements for Sampling and Analysis" (LANL 1996, 54609), and the analytical services statements of work (SOWs) for contract laboratories (LANL 1995, 49738; LANL 2000, 71233). The results of the QA/QC activities were used to estimate accuracy, bias, and precision of the analytical measurements. QC samples included method blanks, blank spikes, matrix spikes, and laboratory control samples (LCSs) to assess accuracy and bias. Internal standards, surrogates, and tracers were also used to assess accuracy.

The type and frequency of QC analyses are described in the analytical services SOWs (LANL 1995, 49738; LANL 2000, 71233), along with the applicable analytical methods. Other QC factors such as sample preservation and holding times were also assessed in accordance with the requirements outlined in the most current version of standard operating procedure (SOP) SOP-01.02, Sample Containers and Preservation. Evaluating these QC indicators allows estimates to be made of the accuracy, bias, and precision of the analytical suites. A focused data validation was also performed for all the data packages (also referred to as request numbers).

The most current versions of the following SOPs were used for data validation:

- SOP-15.01, Routine Validation of Volatile Organic Data
- SOP-15.02, Routine Validation of Semivolatile Organic Data
- SOP-15.04, Routine Validation of High Explosives Data
- SOP-15.05, Routine Validation of Inorganic Data
- SOP-15.06, Routine Validation of Gamma Spectroscopy Data
- SOP-15.07, Routine Validation of Chemical Separation Alpha Spectrometry, Gas Proportional Counting, and Liquid Scintillation Data

The focused validation included a more detailed review of the data generated by the analytical laboratory. The analytical data packages used for focused validation are provided in Appendix E.

Analytical data were reviewed and evaluated based on U.S. Environmental Protection Agency (EPA) National Functional Guidelines for inorganic and organic chemical data review, where applicable (EPA 1999, 66649; EPA 1994, 48639). As a result of the data validation and assessment efforts, qualifiers are assigned to the analytical records as appropriate. The data qualifiers used in the data validation procedures are defined in a table in Appendix A of this investigation report.

Samples collected in 1995 were analyzed either at a Chemical Science and Technology (CST) Division laboratory or shipped from CST to one of several off-site contract laboratories. Samples analyzed at CST Division laboratories are identified by the vintage code "CST Onsite." Samples shipped by CST Division to offsite laboratories are identified by the vintage code "CST Offsite." From late 1995 until the present, samples have been shipped through the Laboratory's Sample Management Office (SMO) to offsite contract laboratories. These samples are identified by the vintage code "SMO."

Because samples analyzed at CST Division laboratories were not accompanied by full chain-of-custody and quality-control documentation, sample results with a vintage code of "CST Onsite" are screening-level quality data. As a result, "CST Onsite" sampling data are not included in this appendix.

D-2.0 SUMMARY OF INORGANIC CHEMICAL ANALYSES

Samples collected at MDA C in 1995, 1996, 2005, and 2006 were analyzed for inorganic chemicals. A total of 275 samples (plus 20 field duplicates) were analyzed for target analyte list (TAL) metals; 193 samples (plus 20 field duplicates) were analyzed for nitrate; 156 samples (plus 16 field duplicates) were analyzed for perchlorate; and 254 samples (plus 20 field duplicates) were analyzed for total cyanide. The methods used for analyzing inorganic chemicals are listed in Table D-2.0-1.

D-2.1 Inorganic Chemical QA/QC Summary

All procedures were followed as required by the analytical services SOWs (LANL 1995, 49738; LANL 2000, 71233) and applicable corresponding EPA SW-846 methodologies. Some inorganic chemical results were qualified as estimated (J) because the results were less than the estimated detection limit (EDL) but greater than the method detection limit (MDL).

D-2.1.1 Maintenance of Chain of Custody

Chain-of-custody forms were maintained properly for all samples (see Appendix E).

D-2.2.2 Sample Documentation

Samples were properly documented on sample collection logs (SCLs) in the field (see Appendix E).

D-2.2.3 Sample Dilutions

Some samples were diluted for inorganic chemical analyses. No qualifiers were applied to any inorganic chemical sample results because of dilutions.

D-2.2.4 Sample Preservation

Preservation criteria were met for all samples analyzed for inorganic chemicals.

D-2.2.5 Holding Times

One nitrate result (plus one field duplicate nitrate result) was qualified as estimated and biased low (J-) because the sample was analyzed after a period less than or equal to twice the holding time had elapsed.

One nitrate result and two cyanide results (plus two field duplicate cyanide results) were qualified as estimated not detected (UJ) because the samples were analyzed after a period less than or equal to twice the holding time had elapsed..

D-2.2.6 Initial and Continuing Calibration Verifications

Initial calibration verification (ICV) and continuing calibration verification (CCV) criteria were met for all samples analyzed for inorganic chemicals, except for 15 field duplicate samples.

Fifteen field duplicate TAL metal results were qualified as estimated and potentially biased high (J+) because the associated ICV or CCV was recovered above the upper acceptable limit. One field duplicate cyanide result was qualified as estimated not detected (UJ) because the associated ICV or CCV was recovered above the upper warning limit but was less than or equal to the upper acceptable limit.

D-2.2.7 Analyte Identification

Analyte identification criteria were met for all samples analyzed for inorganic chemicals.

D-2.2.8 Interference Check Sample and/or Serial Dilutions

Twelve TAL metal results were qualified as estimated and biased high (J+) because the associated interference check sample was recovered above the upper acceptable limit (UAL).

Eleven TAL metal results were qualified as estimated (J) because the serial dilution sample relative percent difference (RPD) was greater than 10% and the sample result was greater than 50 times the MDL.

D-2.2.9 Laboratory Duplicates

A total of 163 TAL metal results (plus 16 field duplicate results) were qualified as estimated (J) because both the sample and duplicate sample results were greater than or equal to 5 times the reporting limit (RL) and the duplicate RPD was greater than 35%. Sixteen TAL metal results (plus 1 field duplicate result) were qualified as estimated (J) because either the sample or duplicate sample results or both were greater than or equal to 5 times the RL, and the difference between the samples was greater than 2 times the RL. One cyanide result was qualified as estimated (J) because the duplicate sample was analyzed on a non-Laboratory sample.

Twelve TAL metal results and one cyanide result (plus one field duplicate cyanide result) were qualified as estimated not detected (UJ) because both the sample and duplicate sample results were greater than or equal to 5 times the RL, and the duplicate RPD was greater than 35%. Two TAL metal results (plus one field duplicate result) and two cyanide results were qualified as estimated not detected (UJ) because either the sample or duplicate sample results or both were greater than or equal to 5 times the RL, and the difference between the samples was greater than 2 times the RL. One cyanide result was qualified as estimated not detected because the duplicate sample was analyzed on a non-Laboratory sample.

D-2.2.10 Method or Preparation Blanks

A total of 189 TAL metal results (plus 1 field duplicate result), 13 nitrate results (plus 2 field duplicate results), and 6 cyanide results (plus 1 field duplicate result) were qualified as not detected (U) because the results were less than 5 times the amount in the preparation blank.

D-2.2.11 Matrix Spikes

A total of 129 TAL metal results (plus 8 field duplicate results) were qualified as estimated and biased high (J+) because the spike recoveries were above 150%.

A total of 175 TAL metal results (plus 16 field duplicate results) were qualified as estimated and biased high (J+) because the spike recoveries were above the UAL but less than 150.

A total of 123 TAL metal results (plus 10 field duplicate results), 6 nitrate results (plus 2 field duplicate results), and 5 cyanide results were qualified as estimated and biased low (J-) because the spike recoveries were below the lower acceptance level (LAL) but greater than 30.

Eight cyanide results were qualified as estimated not detected (UJ) because the matrix spike was analyzed on a non-Laboratory sample.

Two TAL metal results were qualified as estimated not detected (UJ) because the spike recoveries were above 150%.

Eighty-six TAL metal results (plus 5 field duplicate results), 3 nitrate results, and 13 cyanide results were qualified as estimated not detected (UJ) because the spike recoveries were below the LAL but greater than 30%.

Forty-three TAL metal results (9 antimony, 5 chromium, 4 barium, 3 magnesium, 3 manganese, and 2 each of arsenic, cadmium, cobalt, copper, iron, lead, selenium, vanadium, and zinc) and 16 cyanide results were rejected (R) because the associated matrix spike recoveries were less than 30%. Despite these rejected results, 6282 metal results and 254 cyanide results are available for site characterization.

One field duplicate TAL metal result was rejected (R) because the associated spike sample recovery was less than 30%.

D-2.2.12 Laboratory Control Sample Recoveries

A total of 143 TAL metal results were qualified as estimated and biased high (J+) because the associated LCS was recovered above the upper warning limit.

One cyanide result was qualified as estimated and biased high (J+) because the associated LCS was recovered above the upper warning limit.

One TAL metal result and three cyanide results were qualified as estimated not detected (UJ) because the associated LCS was recovered below the lower warning limit but greater than or equal to the LAL.

D-3.0 SUMMARY OF ORGANIC CHEMICAL ANALYSES

Samples collected at MDA C in 1995, 1996, 2005, and 2006 were analyzed for organic chemicals. A total of 274 samples (plus 22 field duplicates) were analyzed for volatile organic chemicals (VOCs); 259 samples (plus 27 field duplicates) were analyzed for semivolatile organic chemicals (SVOCs); 193 samples (plus 27 field duplicates) were analyzed for polychlorinated biphenyls (PCBs); 54 samples were analyzed for pesticides and PCBs; 88 samples (plus 10 field duplicates) were analyzed for dioxins and furans; and 60 samples (plus 7 field duplicates) were analyzed for high explosive (HE) compounds. The methods used for analyzing organic chemicals are listed in Table D-3.0-1.

Pore-gas VOC samples were submitted by the Laboratory's SMO to multiple contract analytical laboratories. A deviation from the analytical services SOW occurred when one laboratory returned analytical results with fewer reported analytes than required. Therefore, some pore-gas samples included in this report were analyzed for fewer VOCs than other samples. The analytes not reported for those samples are 1,3-butadiene, 1-butanol, chlorodifluoromethane, cyclohexane, 1,4-dioxane, ethanol, hexane, methanol, methyl tert-butyl ether, n-heptane, 2-propanol, propylene, tetrahydrofuran, 1,3-xylene + 1,4-xylene, vinyl acetate, and total xylene.

D-3.1 Organic QA/QC Summary

All QC procedures were followed as required in the analytical services SOWs (LANL 1995, 49738; LANL 2000, 71233) and applicable corresponding EPA SW-846 methodologies.

Eight SVOC results were rejected (R) because the associated relative response factor (RRF) was less than 0.05. One field duplicate SVOC result was rejected (R) because the associated RRF was less than 0.05. Despite the rejected results, 17,810 SVOC results are available for site characterization.

D-3.1.1 Maintenance of Chain of Custody

Chain-of-custody forms were maintained properly for all samples analyzed for organic chemicals (see Appendix E).

D-3.1.2 Sample Documentation

Samples were properly documented on SCLs in the field (see Appendix E).

D-3.1.3 Sample Dilutions

Some samples were diluted for organic chemical analyses. No qualifiers were applied to any inorganic chemical sample results because of dilutions.

D-3.1.4 Sample Preservation

Preservation criteria were met for all samples analyzed for organic chemicals.

D-3.1.5 Holding Times

Sixty-nine SVOC results were qualified as estimated not detected (UJ) because the extraction holding time was exceeded by less than 2 times the published holding time.

Seven field duplicate PCB results were qualified as estimated not detected (UJ) because the extraction holding time was exceeded by less than 2 times the published holding time.

D-3.1.6 Initial and Continuing Calibration Verifications

Five SVOC results (plus 2 field duplicate SVOC results) and 69 VOC results (plus 5 field duplicate VOC results) were qualified as estimated (J) because the associated percent relative standard deviation (%RSD) or percent difference (%D) exceeded the criteria in the initial or continuing calibration standards.

A total of 876 SVOC results (plus 151 field duplicate SVOC results) were qualified as estimated not detected (UJ) because the associated %RSD or %D exceeded the criteria in the initial or continuing calibration standards.

A total of 446 VOC results (plus 38 field duplicate VOC results) and 91 HE results (plus 18 field duplicate HE results) were qualified as estimated not detected (UJ) because the associated %RSD or %D exceeded the criteria in the initial or continuing calibration standards.

Seven PCB results were qualified as estimated not detected (UJ) because the associated %RSD or %D exceeded criteria in the ICV or CCV.

D-3.1.7 Analyte Identification

Eight SVOC results and 61 VOC results (plus 3 field duplicate VOC results) were qualified as not detected (U) because the associated mass spectrum did not meet method specifications.

D-3.1.8 Method Blanks

Fourteen SVOC results (plus 1 field duplicate SVOC result), 25 VOC results, and 26 dioxin/furan results (plus 1 field duplicate dioxin/furan result) were qualified as not detected (U) because the associated sample concentration was less than 5 or 10 times the amount in the method blank.

One PCB result, one VOC result, and three dioxin/furan results were qualified as estimated (J) because the associated sample concentration was greater than 5 or 10 times the amount in the method blank.

D-3.1.9 Surrogate Recoveries and Internal Standard Responses

Twenty-seven SVOC results (plus 19 field duplicate SVOC results) were qualified as estimated not detected (UJ) because the associated internal standard (IS) area counts were less than 50% but greater than 10% recovery when compared to the area counts in the applicable continuing calibration standard.

Twelve field duplicate SVOC results were qualified as estimated not detected (UJ) because at least one surrogate recovery was greater than the UAL, and at least one surrogate recovery was less than the LAL.

Seven field duplicate SVOC results were rejected (R) because the associated IS area counts showed less than 10% recovery when compared to the area counts in the applicable continuing calibration standard.

D-3.1.10 Laboratory Control Sample Recoveries

One SVOC result and one VOC result were qualified as estimated and potentially biased low (J-) because the associated LCS recovery was less than the LAL but greater than 10%.

Nine VOC results and one HE result were qualified as estimated and potentially biased high (J+) because the associated LCS recovery was greater than the UAL.

Forty SVOC results (plus 2 field duplicate SVOC results), 42 VOC results (plus 2 field duplicate VOC results), and 1 HE result were qualified as estimated not detected (UJ) because the associated LCS recovery was less than the LAL but greater than 10%.

D-3.1.11 Laboratory and Field Duplicates

Laboratory and field duplicates collected for organic chemical analyses indicated acceptable precision for all samples.

D-4.0 SUMMARY OF RADIOCHEMICAL ANALYSES

Samples collected at MDA C in 1995, 1996, 2004, 2005, and 2006 were analyzed for radionuclides. A total of 275 (plus 28 field duplicates) samples from MDA C were analyzed for gamma-emitting radionuclides; 275 samples (plus 28 field duplicates) were analyzed for americium-241; 277 samples (plus 28 field duplicates) were analyzed for tritium; 275 samples (plus 28 field duplicates) were analyzed for isotopic plutonium; 82 samples were analyzed for isotopic thorium; 260 samples (plus 28 field

duplicates) were analyzed for isotopic uranium; and 275 samples (plus 28 field duplicates) were analyzed for strontium-90. The methods used for analyzing radionuclides are listed in Table D-4.0-1.

D-4.1 Radionuclide QA/QC Summary

All procedures were followed as required by the analytical services SOWs (LANL 1995, 49738; LANL 2000, 71233). Some sample results were qualified as not detected (U) because the associated sample concentration was less than or equal to the minimum detectable concentration (MDC). Some sample results were qualified as not detected (U) because the associated sample concentration was less than or equal to 3 times the total propagated uncertainty.

Thirteen field duplicate gamma spectroscopy results were rejected because MDC documentation was missing. Three plutonium-238 results and 45 isotopic uranium results (15 each of uranium-234, uranium-235, and uranium-238) were rejected (R) because MDC documentation was missing. Despite these rejected results, 272 plutonium-238 and 780 isotopic uranium (260 for each) results are available for site characterization.

A total of 111 field duplicate gamma spectroscopy results were rejected (R) because spectral interference prevented positive identification of the analytes.

D-4.1.1 Maintenance of Chain of Custody

Chain-of-custody forms were maintained properly for all samples (see Appendix E).

D-4.1.2 Sample Documentation

All samples were properly documented on SCLs in the field (see Appendix E).

D-4.1.3 Sample Dilutions

Samples were not diluted for radionuclide analyses.

D-4.1.4 Sample Preservation

Preservation criteria were met for all samples analyzed for radionuclides.

D-4.1.5 Holding Times

Holding-time criteria were met for all samples analyzed for radionuclides, except for four field duplicate samples. Four field duplicate americium-241 results, two field duplicate gamma spectroscopy results, five field duplicate isotopic plutonium results, and two field duplicate isotopic uranium results were qualified as estimated and potentially biased low (J-) because the extraction holding time was exceeded by less than 2 times the published holding time.

D-4.1.6 Analyte Identification

A total of 143 gamma spectroscopy results (1 cobalt-60, 139 cesium-134, 2 cesium-137, and 1 ruthenium-106) were rejected (R) because spectral interference prevented positive identification of the analytes. Despite these rejected results, 920 gamma spectroscopy results for these four radionuclides (274 cobalt-60, 99 cesium-134, 273 cesium-137, and 274 ruthenium-106) are available for site characterization.

D-4.1.7 Method Blanks

One tritium result, one isotopic plutonium result, five isotopic thorium results, and ten isotopic uranium results (plus one field duplicate isotopic uranium result) were qualified as not detected (U) because the associated sample concentration was less than 5 times the amount in the method blank.

D-4.1.8 Matrix Spikes

The matrix spike recoveries were within acceptable limits for all radionuclide analyses.

D-4.1.9 Carrier and Tracer Recoveries

Seven isotopic uranium results (plus two field duplicate isotopic uranium results) were qualified as estimated and potentially biased low (J-) because the associated tracer recovery was less than 30% but greater than 10%.

Two americium-241 results, six isotopic plutonium results, and two isotopic uranium results (plus one field duplicate isotopic uranium result) were qualified as estimated not detected (UJ) because the associated tracer recovery was less than 30% but greater than 10%.

D-4.1.10 Laboratory Control Sample Recoveries

Five of 275 americium-241 results were qualified as estimated not detected (UJ) because the associated LCS recovery was less than 80% but greater than or equal to 10%.

Five of 780 isotopic uranium results and 3 of 277 tritium results (plus 1 field duplicate tritium result) were qualified as estimated and potentially biased low (J-) because the associated LCS recovery was less than 80% but greater than or equal to 10%.

D-4.1.11 Laboratory and Field Duplicates

Three isotopic thorium results and two isotopic uranium results (plus one field duplicate isotopic uranium result and two isotopic plutonium results) were qualified as estimated (J) because the associated duplicate samples had a duplicate error ratio greater than or equal to 2 but less than or equal to 4.

One tritium results (plus four field duplicate tritium results) was qualified as estimated (J) because the associated duplicate sample was not prepared separately for the initial analysis.

Two field duplicate isotopic uranium results were qualified as estimated (J) because the duplicate documentation was missing.

D-5.0 REFERENCES

The following list includes all documents cited in this appendix. Parenthetical information following each reference provides the author(s), publication date, and ER ID number. This information is also included in text citations. ER ID numbers are assigned by the Environmental Programs Directorate's Records Processing Facility (RPF) and are used to locate the document at the RPF and, where applicable, in the master reference set.

Copies of the master reference set are maintained at the NMED Hazardous Waste Bureau; the U.S. Department of Energy—Los Alamos Site Office; the U.S. Environmental Protection Agency, Region 6;

and the Directorate. The set was developed to ensure that the administrative authority has all material needed to review this document, and it is updated with every document submitted to the administrative authority. Documents previously submitted to the administrative authority are not included.

EPA (U.S. Environmental Protection Agency), February 1994. "U.S. EPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review," EPA 540/R-94-013, Office of Solid Waste and Emergency Response, Washington, D.C. (EPA 1994, 48639)

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LANL (Los Alamos National Laboratory), July 1995. "Statement of Work—Analytical Support," Revision 2, RFP No. 9-XS1-Q4257, Los Alamos, New Mexico. (LANL 1995, 49738)

LANL (Los Alamos National Laboratory), March 1996. "Quality Assurance Project Plan Requirements for Sampling and Analysis," Los Alamos National Laboratory document LA-UR-96-441, Los Alamos, New Mexico. (LANL 1996, 54609)

LANL (Los Alamos National Laboratory), December 2000. "Statement of Work for Analytical Laboratories, I8980SOW0-8s, Revision 1," Los Alamos National Laboratory document, Los Alamos, New Mexico. (LANL 2000, 71233)

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Table D-2.0-1
Methods for Inorganic Chemical Analyses

Analytical Method	Analytical Description	Analytical Suite
EPA Method 300	Ion chromatography	Nitrate
SW-846: 8321A	High-performance liquid chromatography/mass spectrometry	Nitrate, perchlorate
SW-846:6850	High-performance liquid chromatography/mass spectrometry	Perchlorate
SW-846: 6010/6010A/6010B	ICPES—atomic emission spectroscopy (AES)	Aluminum, antimony, arsenic, barium, beryllium, boron, calcium, cadmium, cobalt, chromium, copper, iron, lead, lithium, magnesium, manganese, mercury, nickel, potassium, selenium, silicon, sodium, silver, thallium, titanium, uranium, vanadium, and zinc (TAL metals)
SW-846:6020	ICPES	Aluminum, antimony, arsenic, barium, beryllium, boron, calcium, cadmium, cobalt, chromium, copper, iron, lead, magnesium, manganese, nickel, potassium, selenium, sodium, silicon, silver, thallium, titanium, vanadium, and zinc (TAL metals)
SW-846:7060	Graphite furnace atomic absorption (GFAA)	Arsenic
SW-846:9010	Distillation method	Cyanide (total)
SW-846:9012a	Colorimetric method	Cyanide (total)
SW-846:7470	Cold vapor atomic absorption (CVAA)	Mercury
SW-846:7470A	CVAA	Mercury
SW-846:7471	CVAA	Mercury
SW-846:7471A	GFAA	Mercury (TAL metal)
SW-846:7740	GFAA	Selenium
CLP:ILM03.0-200.7	ICPES—AES	Aluminum, antimony, arsenic, barium, beryllium, boron, calcium, cadmium, cobalt, chromium, copper, iron, lead, magnesium, manganese, nickel, potassium, selenium, sodium, silver, thallium, titanium, vanadium, and zinc (TAL metals)
CLP:ILM03.0-245.1	CVAA	Mercury

Table D-3.0-1
Methods for Organic Chemical Analyses

Analytical Method	Analytical Description	Target Compound List
EPA SW-846:8330	Explosives	HEXP
EPA SW-846:8270B EPA SW-846:8270C	SVOCs	Analytical services SOW (LANL 1995, 49738; LANL 2000, 71233)
EPA Method 3540--Extraction EPA SW-846:8270--Analysis	SVOCs	Analytical services SOW (LANL 1995, 49738; LANL 2000, 71233)
EPA Method TO-15	VOCs (pore gas only)	Analytical services SOW (LANL 1995, 49738; LANL 2000, 71233)
EPA SW-846:8240--Analysis	VOCs	Analytical services SOW (LANL 1995, 49738; LANL 2000, 71233)
EPA Method 5035--Sampling EPA Method 5035--Extraction EPA SW-846:8260--Analysis	VOCs	Analytical services SOW (LANL 1995, 49738; LANL 2000, 71233)
EPA SW-846:8260B--Analysis	VOCs	Analytical services SOW (LANL 1995, 49738; LANL 2000, 71233)
SW-846:8290--Analysis	Dioxins, furans	Analytical services SOW (LANL 2000, 71233)
EPA Method 3540--Extraction EPA SW-846:8082--Analysis	PCBs	Analytical services SOW (LANL 1995, 49738; LANL 2000, 71233)
EPA SW-846:8080--Analysis	PESTPCB	Analytical services SOW (LANL 1995, 49738; LANL 2000, 71233)

Table D-4.0-1
Methods for Radiochemical Analyses

Analytical Method	Analytical Description	Target Compound List
HASL-300: Am-241	Alpha spectroscopy	Americium-241
EPA Method: 901.1 Generic: Gamma Spec	Gamma Spectroscopy	Americium-241, cesium-137, cesium-134, cobalt-60, europium-152, ruthenium-106, sodium-22, uranium-235
EPA Method: 906.0 LA-10300-M, Vol. 1:R230	Liquid scintillation	Tritium
HASL-300: ISOPU	Alpha spectroscopy	Isotopic plutonium
HASL-300: ISOTH	Alpha spectroscopy	Isotopic thorium
HASL-300: ISOU	Alpha spectroscopy	Isotopic uranium
EPA Method: 905.0 ASTM:D5811-95M	Gas proportional counting	Strontium-90

Appendix E

*Field and Analytical Records
(on CD and DVDs included with this document)*

The CD included with this appendix contains the field and analytical data in the form of data tables. This CD is labeled "Appendix E, CD 1 of 1."

All available reports from the contract laboratories are included in this appendix. These reports are provided on two DVDs labeled "Appendix E, DVD 1 of 2" and "Appendix E, DVD 2 of 2."

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Appendix F

Data Review

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F-1.0 OVERVIEW OF DATA

The data collected during the investigation of Material Disposal Area C (MDA C) and discussed in this report are of varying quality. In the Environmental Restoration Database (ERDB), all data records include a vintage code field denoting how and where samples were submitted for analyses. Some samples were submitted to Los Alamos National Laboratory's (LANL or the Laboratory) Chemical Science and Technology (CST) Division and were analyzed either at a CST Division laboratory or shipped from CST to one of several off-site contract laboratories. Samples analyzed at CST Division laboratories are identified by the vintage code "CST Onsite." Because samples analyzed at CST Division laboratories were not accompanied by full chain-of-custody and quality-control documentation, the resulting data from "CST Onsite" samples are screening-level data. As a result, "CST Onsite" data are not included in this data review. Samples shipped by CST Division to off-site laboratories are identified by the vintage code "CST Offsite." From late 1995 to the present, samples have been shipped through the Sample Management Office (SMO) to off-site contract laboratories. These samples are identified by the vintage code "SMO." Samples discussed in this data review are identified by the vintage code "SMO" or "CST Offsite," and the resulting data are decision-level data. These data have been used in identifying chemicals of potential concern (COPCs), in determining nature and extent, in calculating 95% upper confidence limits (UCLs), and in conducting the risk screening assessments.

F-1.1 Overview of COPC Identification

The purpose of the data review is to identify COPCs for MDA C. The data are evaluated by sample media to facilitate the comparison with media-specific background data. Background data are available for certain inorganic chemicals and radionuclides (LANL 1998, 59730) for soil (all soil horizons, designated by the media code ALLH) and for Bandelier Tuff (media codes Qbt3, Qbt2, Qbt1v, Qbt1g, and Qbo). Fill material is undifferentiated and may include soil and crushed tuff in varying proportions. Because soil background values (BVs) are used for fill, soil and fill samples are evaluated together. Inorganic chemical and radionuclide data were compared with media-specific background data where available. For background comparisons, the first step was to compare the site data with a BV. A BV may be a calculated value for the background data set (upper tolerance limit or the 95% upper confidence bound on the 95th quantile), a detection limit (DL), a fallout value (FV), or it may be calculated based on secular equilibrium or a total analysis. Fallout values apply only to fallout radionuclides in surface samples, generally from depths of 0 to 0.5 ft. In some cases, background data and/or a BV or FV are unavailable. If no BV or FV is available and no background data are available, the constituent is identified as a COPC based on its detection status. Organic chemical data were evaluated according to their detection status.

If one or more site-specific sample result exceeds its BV, an additional evaluation (e.g., box plots) may be performed by comparing the range of concentrations in the site data set for that chemical with the range of concentrations in the background data set. If the site concentrations are within the range of background concentrations, the analyte is not retained as a COPC.

Box plots provide a visual representation of the data and may identify outliers or other anomalous data that might affect statistical results and interpretations. The plots allow a visual comparison between site and background concentration distributions. A box plot consists of a box, a line across the box, whiskers (lines extended beyond the box and terminated with a short perpendicular line), and points outside the whiskers. The box area of the plot is the region between the 25th percentile and the 75th percentile of the data, the interquartile range or middle half of the data. The horizontal line within the box represents the median (50th percentile) of the data. The whiskers give an interval of 1.5 times the interquartile range, outside of which data may be evaluated for their potential to be outliers. The concentrations of individual samples are plotted as points overlaying the box plot. When a data set contains both detected and

nondetected concentrations reported as DLs, the detected concentrations are plotted as Xs, and the nondetected concentrations are plotted as Os.

F-1.2 Summary of COPCs at MDA C

The following 21 inorganic chemicals are identified as COPCs at MDA C: aluminum, antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, cyanide, iron, lead, manganese, mercury, nickel, nitrate, perchlorate, selenium, silver, vanadium, and zinc.

The following 15 radionuclides are identified as COPCs at MDA C: americium-241, cesium-134, cesium-137, cobalt-60, europium-152, plutonium-238, plutonium-239, ruthenium-106, sodium-22, strontium-90, thorium-232, tritium, uranium-234, uranium-235, and uranium-238.

The following 86 organic chemicals are identified as COPCs at MDA C: acenaphthene; acenaphthylene; acetone; anthracene; Aroclor-1242; Aroclor-1254; Aroclor-1260; benzene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(k)fluoranthene; benzoic acid; bis(2-ethylhexyl)phthalate; 1,3-butadiene; 1-butanol; 2-butanone; carbon disulfide; carbon tetrachloride; chlorodibromomethane; chlorodifluoromethane; chloroform; chloromethane; 2-chloronaphthalene; chrysene; cyclohexane; 1,2-dichloro-1,1,2,2-tetrafluoroethane; 1,2-dichlorobenzene; dichlorodifluoromethane; 1,1-dichloroethane; 1,2-dichloroethane; 1,1-dichloroethene; cis-1,2-dichloroethene; 1,2-dichloropropane; di-n-butylphthalate; di-n-octylphthalate; 1,4-dioxane; ethanol; ethylbenzene; 4-ethyltoluene; fluoranthene; fluorene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; total heptachlorodibenzofurans; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; hexane; 2-hexanone; indeno(1,2,3-cd)pyrene; methanol; 4-methyl-2-pentanone; 2-methylphenol; methylene chloride; 2-methylnaphthalene; n-heptane; 2-nitrotoluene; 3-nitrotoluene; 4-nitrotoluene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; total pentachlorodibenzodioxins; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; propylene; pyrene; research department explosive (RDX) also hexahydro-1,3,5-trinitro-1,3,5-triazine); styrene; 2,3,7,8-tetrachlorodibenzofuran; total tetrachlorodibenzofurans; tetrachloroethene; toluene; 1,1,2-trichloro-1,2,2-trifluoroethane; 1,1,1-trichloroethane; 1,1,2-trichloroethane; trichloroethene; trichlorofluoromethane; 1,2,4-trimethylbenzene; 1,3,5-trimethylbenzene; total xylene; 1,2-xylene; and 1,3-xylene+1,4-xylene.

Chemicals are COPCs for the entire site if they are identified as a COPC for any medium. The media-specific identification of COPCs is discussed in Section F-2. A summary of COPCs by media is provided in Table F-1.2-1.

F-2.0 MDA C DATA

A total of 74 surface (0 to 0.5 ft) soil and fill samples were collected at MDA C in 1993 and 2004. In 1993, 68 surface samples were collected across MDA C. In 2004, six surface soil samples were collected at the east boundary of MDA C. The results of inorganic chemical analyses of the samples collected in 1993 were determined to be "CST Onsite" data and were excluded from the data tables in this report. Table F-2.0-1 summarizes the surface samples collected in both 1993 and 2004, along with the requested organic chemical and radionuclide analyses for each sample. Figure 3.3-1 shows the surface sampling locations for MDA C.

In 1995, 1996, 2005, and 2006, 291 tuff samples were collected from 44 boreholes at MDA C. In 1995 and 1996, 82 tuff samples were collected from nine angled boreholes and two vertical boreholes (79 from tuff

unit Qbt 3, 2 from Qbt 2, 1 from Qbt 1v). In 2005 and 2006, 209 tuff samples were collected from 33 boreholes (115 from Qbt 3, 61 from Qbt 2, 10 from Qbt 1v, 15 from Qbt 1g, and 8 from Qbo). Table F-2.0-2 summarizes the subsurface tuff samples collected from 1995 to 2006, along with the requested inorganic chemical, organic chemical, and radionuclide analyses for each sample. Figure 3.4-1 in the investigation report shows all the borehole locations for MDA C.

Pore-gas samples were collected from 2000 to 2003 and in two rounds of sampling in 2005 and 2006. The results of the pore-gas samples collected from two boreholes (locations 50-09100 and 50-10131) from 2000 to 2003 consisted largely of screening-level data, and only four pore-gas samples from 2000 are included in the data set provided with this report (Table F-2.0-3). In 2005 and 2006, 378 pore-gas samples were collected from boreholes during two rounds of pore-gas sampling at MDA C. During the first-round pore-gas sampling, 210 pore-gas samples were collected from 34 boreholes; 168 pore-gas samples were collected from 30 boreholes during second-round pore-gas sampling. Second-round pore-gas samples were not collected from four boreholes; this deviation from the approved work plan is discussed in Appendix B. Table F-2.0-3 summarizes the pore-gas samples collected in 2005 and 2006 and the requested volatile organic chemicals (VOCs) and/or tritium analyses for each sample.

F-2.1 Inorganic Chemicals in Surface Soil and Fill

Surface soil and fill samples were collected in 1993 and analyzed for inorganic chemicals. During the evaluation of data for this report, it was determined that the 1993 inorganic chemical data are of screening-level quality (i.e., CST-Onsite vintage data). As discussed in the approved investigation work plan, the inorganic chemical surface data indicated that only lead and silver were detected above background. The CST Onsite inorganic chemical data are summarized in Tables F-2.1-1 and F-2.1-2, and the entire data set is provided in Appendix E.

F-2.2 Inorganic Chemicals in Subsurface Tuff

The inorganic chemical analyses for subsurface tuff samples included nitrate, cyanide, target analyte list (TAL) metals, and perchlorate. Of the 291 tuff samples collected at MDA C, 193 samples were analyzed for nitrate, 254 samples were analyzed for cyanide, 275 samples were analyzed for TAL metals, and 168 samples were analyzed for perchlorate. Table F-2.0-2 summarizes the tuff samples collected in 1995, 1996, 2005, and 2006 and the requested inorganic chemical analyses for each sample.

Table F-2.2-1 presents the frequency of inorganic chemicals detected or detected above BVs in tuff at MDA C. Table F-2.2-2 presents the inorganic chemicals detected or detected above BVs in tuff at MDA C. The locations and analytical results for inorganic chemicals detected above BVs or detected with no BVs available in subsurface samples are shown in Figures F-2.2-1 (western portion of MDA C) and F-2.2-2 (eastern portion of MDA C).

The inorganic chemical results of the 291 tuff samples collected in 1995, 1996, 2005, and 2006 are discussed below. Some inorganic chemicals had detected concentrations that exceeded their BVs but were within the range of background data. The distributions of potassium and thallium concentrations in tuff are compared to background data in Figures F-2.2-3 and F-2.2-4, respectively.

- Aluminum, antimony, arsenic, barium, beryllium, chromium, cobalt, copper, cyanide, iron, lead, magnesium, nickel, selenium, vanadium, and zinc were detected above BVs and above the maximum concentration in their respective background data sets in at least one tuff sample. Therefore, these inorganic chemicals are retained as COPCs in tuff.

- Cadmium, mercury, and silver were not detected above their BVs but had DLs above the BVs and/or above the maximum background concentration. Therefore, cadmium, mercury, and silver are retained as COPCs in tuff.
- Calcium was detected above BV in 10 Qbt 2/Qbt 3 samples. Concentrations in eight samples are approximately or less than 2 times the maximum background concentration (2230 mg/kg). The concentration in one sample is less than 3 times the maximum background concentration. The concentration in the remaining sample is more than 30 times the maximum background concentration. The detected concentrations are at depths of 10 ft below ground surface (bgs) or more and decrease to background in deeper samples, except at one borehole location (50-24812); the maximum concentration (73,900 mg/kg) is at 67 ft. In addition, calcium is an essential nutrient (EPA 1989, 08021) and is not retained as a COPC.
- Magnesium was detected above BV in 10 Qbt 2/Qbt 3 samples and 2 Qbo samples. Concentrations in six samples are within the range of background data. Concentrations in five samples are less than 2 times the maximum background concentration (2820 mg/kg in Qbt 2/Qbt 3 and 739 mg/kg in Qbo). The concentration in the remaining sample (7720 mg/kg) is less than 33 times the maximum background concentration (2820 mg/kg). The detected concentrations are at depths of 10 ft or more and decrease to background in deeper samples, except at one borehole location (50-24812). In addition, magnesium is an essential nutrient (EPA 1989, 08021) and is not retained as a COPC.
- Nitrate and perchlorate were detected in tuff samples. No BVs are available for nitrate and perchlorate in tuff. Therefore, nitrate and perchlorate are retained as COPCs in tuff.
- Potassium was detected above BV in one sample. The concentration (6770 mg/kg) is within the range of background data, as shown in Figure F-2.2-3. It was detected at 50 ft bgs and concentrations decreases to background in deeper samples. In addition, potassium is an essential nutrient (EPA 1989, 08021) and is not retained as a COPC.
- Thallium was detected above BV in three samples. Concentrations of all three detections are within the range of background data, as shown in Figure F-2.2-4. Therefore, thallium is not retained as a COPC.

F-2.3 Summary of Inorganic COPCs

The inorganic COPCs identified in subsurface tuff at MDA C are aluminum, antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, cyanide, iron, lead, manganese, mercury, nickel, nitrate, perchlorate, selenium, silver, vanadium, and zinc.

F-2.4 Radionuclides in Surface Soil and Fill

The radionuclide analyses for surface soil and fill samples included americium-241, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, strontium-90, and tritium. All 74 surface samples collected were analyzed for americium-241, isotopic plutonium, isotopic uranium, and strontium-90; 58 samples were analyzed for gamma-emitting radionuclides; and 59 samples were analyzed for tritium. Table F-2.0-1 summarizes the surface samples collected in 1993 and 2004 and the requested radionuclide analyses for each sample.

Table F-2.4-1 presents the frequency of radionuclides detected or detected above BVs or FVs in surface samples at MDA C. Table F-2.4-2 presents the concentrations of radionuclide COPCs detected or

detected above BVs or FVs in surface samples. The locations and analytical results for radionuclides detected or detected above BVs or FVs in surface samples are presented in Figure F-2.4-1.

The radionuclide results for surface samples collected in 1993 and 2004 are discussed below.

- Americium-241, plutonium-238, and plutonium-239 were detected at activities above their respective FVs and also above the range of the fallout data set in at least one surface sample. Therefore, these radionuclides are retained as COPCs in surface material at MDA C.
- Cesium-134 and tritium were detected in at least one surface sample. No FV is available for cesium-134 in surface soil/fill. Tritium was evaluated based on detection status because the FV for tritium in surface soil is in units of pCi/mL, while sample results are in units of pCi/g. Therefore, cesium-134 and tritium are retained as COPCs in surface material at MDA C.
- Thorium-232 and uranium-238 were detected at activities above their respective BVs. Therefore, thorium-232 and uranium-238 are retained as COPCs in surface material at MDA C.

F-2.5 Radionuclides in Subsurface Tuff

The radionuclide analyses for subsurface tuff included americium-241, gamma-emitting radionuclides, isotopic plutonium, isotopic thorium, isotopic uranium, strontium-90, and tritium. Of the 291 tuff samples collected at MDA C, 275 samples were analyzed for americium-241, gamma-emitting radionuclides, isotopic plutonium, and strontium-90; 83 samples were analyzed for isotopic thorium; 260 samples were analyzed for isotopic uranium; and 68 samples were analyzed for tritium. Table F-2.0-2 summarizes the tuff samples collected in 1995, 1996, 2005, and 2006 and the requested radionuclide analyses for each sample.

Table F-2.5-1 presents the frequency of radionuclides detected or detected above BVs in tuff samples at MDA C. Table F-2.5-2 presents the radionuclides detected or detected above BVs in tuff samples. The locations and analytical results of radionuclides detected or detected above BVs in the subsurface tuff samples are shown in Figure F-2.5-1.

The radionuclide results of tuff samples collected in 1995, 1996, 2005, and 2006 are discussed below.

- Americium-241, cesium-134, cesium-137, cobalt-60, europium-152, plutonium-238, plutonium-239, ruthenium-106, sodium-22, strontium-90, and tritium were detected in at least one tuff sample. Therefore, these radionuclides are retained as COPCs in tuff.
- Uranium-234, uranium-235, and uranium-238 were detected above BVs. Therefore, these radionuclides are retained as COPCs in tuff.

F-2.6 Tritium in Pore Gas

Of the 378 pore-gas samples collected at MDA C in 2005 and 2006, all but one sample (RE50-05-61469 at location 50-24821) were analyzed for tritium. Table F-2.0-3 summarizes the pore-gas samples collected and the requested tritium analysis for each sample.

Table F-2.6-1 presents the frequency of tritium detected in the two rounds of pore-gas samples at MDA C. Table F-2.6-2 presents the tritium detected in the two rounds of pore-gas samples. The locations and analytical results of tritium detected in pore-gas samples are shown in Figures F-2.6-1 (western portion of MDA C) and F-2.6-2 (eastern portion of MDA C).

The tritium results for the first-round and the second-round pore-gas samples collected in 2005 and 2006 are summarized below.

- Tritium was detected in at least one pore-gas sample in each borehole during first- and second-round sampling (if second-round samples were collected).
- Tritium was detected at the deepest sampling depth in most boreholes during first- and second-round sampling (if second-round samples were collected).
- The maximum concentration of tritium was detected at the same borehole location (depth of 20 ft at 50-24783) during the two rounds of sampling (Table F-2.6-1).

The relative spatial distribution of tritium concentrations in the first-round pore gas samples are shown in a three-dimensional plot (Figure F-2.6-3). The highest and the second highest concentrations of tritium during the first-round sampling are at depths of 20 ft and 36 ft, respectively, at location 50-24783. Because these concentrations are several orders of magnitude larger than the other tritium concentrations, they are represented as disks in Figure F-2.6-3, and the other concentrations are presented as dots. The tritium concentrations of the first-round and the second-round pore-gas samples (if second-round tritium samples were collected) are shown for all borehole locations in Figures F-2.6-4 through F-2.6-37. Tritium is retained as a COPC in pore gas at MDA C.

F-2.7 Radionuclide COPC Summary

The radionuclide COPCs identified for all media at MDA C are americium-241, cesium-134, cesium-137, cobalt-60, europium-152, plutonium-238, plutonium-239, ruthenium-106, sodium-22, strontium-90, thorium-232, tritium, uranium-234, uranium-235, and uranium-238.

F-2.8 Organic Chemicals in Surface Soil and Fill

The organic chemical analyses for surface soil and fill samples included polychlorinated biphenyls (PCBs) and semivolatile organic chemicals (SVOCs). In 1993, 59 surface samples collected were analyzed for PCBs and SVOCs. Table F-2.0-1 summarizes the surface samples and the requested organic chemical analyses for each sample.

Table F-2.8-1 presents the frequency of organic chemicals detected in surface samples at MDA C. Table F-2.8-2 presents the organic chemicals detected in surface samples. The locations and analytical results of organic chemicals detected in surface samples are shown in Figure F-2.8-1.

The following organic chemicals were identified as COPCs in surface soil and fill at MDA C: acenaphthene, Aroclor-1254, Aroclor-1260, bis(2-ethylhexyl)phthalate, and pentachlorophenol. However, the results of bis(2-ethylhexyl)phthalate and pentachlorophenol were screening-quality data and are not reported in Tables F-2.8-1 and F-2.8-2.

The six surface soil samples collected in 2004 were not analyzed for organic chemicals per the approved MDA C investigation work plan (LANL 2005, 91547).

F-2.9 Organic Chemicals in Subsurface Tuff

The organic chemical analyses for subsurface tuff samples included dioxins and furans, explosive compounds, PCBs, pesticides, SVOCs, and VOCs. Of the 291 tuff samples collected at MDA C, 88 samples were analyzed for dioxins and furans, 61 samples were analyzed for explosive compounds, 193 samples were analyzed for PCBs, 55 samples were analyzed for pesticides and PCBs (as a

combined suite), 247 samples were analyzed for SVOCs, and 65 samples were analyzed for VOCs. Table F-2.0-2 summarizes the tuff samples collected in 1995, 1996, 2005, and 2006 and the requested organic chemical analyses for each sample.

Table F-2.9-1 presents the frequency of organic chemicals detected in tuff samples at MDA C. Table F-2.9-2 present the organic chemicals detected in tuff samples. The locations and analytical results of organic chemicals detected in subsurface tuff samples are shown in Figures F-2.9-1 (western portion of MDA C) and F-2.9-2 (eastern portion of MDA C).

The results in Table F-2.9-2 show that 47 organic chemicals were detected in at least one tuff sample. All are retained as COPCs in tuff at MDA C: acenaphthene; acenaphthylene; acetone; anthracene; Aroclor-1242; Aroclor-1254; Aroclor-1260; benzo(a)pyrene; benzo(b)fluoranthene; benzo(k)fluoranthene; benzoic acid; bis(2-ethylhexyl)phthalate; 2-chloronaphthalene; chrysene; 1,1-dichloroethene; di-n-butylphthalate; di-n-octylphthalate; fluoranthene; fluorene, 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; total heptachlorodibenzofurans; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; methylene chloride; 2-methylnaphthalene; 2-methylphenol; 2-nitrotoluene; 3-nitrotoluene; 4-nitrotoluene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; total pentachlorodibenzodioxins; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; RDX; 2,3,7,8-tetrachlorodibenzofuran; total tetrachlorodibenzofurans; toluene; and trichloroethene.

F-2.10 Organic Chemicals in Pore Gas

Of the 378 pore-gas samples collected in 2005 and 2006 at MDA C, all but one (sample RE50-05-61467 at borehole location 50-24821) were analyzed for VOCs. Table F-2.0-3 summarizes the pore-gas samples collected in 2000, 2005, and 2006 and the requested VOC analyses for each sample.

Tables F-2.10-1 and F-2.10-2 present the frequency of VOCs detected for the first-round and the second-round pore-gas samples at MDA C, respectively. Table F-2.10-3 presents the VOCs detected in the first-round pore-gas samples, and Table F-2.10-4 presents the VOCs detected in the second-round pore-gas samples. Because the VOC results for the second-round pore-gas samples are not significantly different from the results in the first-round pore-gas samples, only the locations and VOC results in the first-round pore-gas samples are presented in Plates 1 (western portion of MDA C) and 2 (eastern portion of MDA C).

The VOC results of the 378 pore-gas samples collected in 2000, 2005, and 2006 are summarized below.

First-Round Pore-Gas Samples. Table F-2.10-3 presents the organic chemicals detected in the first-round pore-gas samples at MDA C. The following 42 organic chemicals were detected in at least one first-round pore-gas sample: acetone; benzene; 1,3-butadiene; 1-butanol; 2-butanone; carbon disulfide; carbon tetrachloride; chlorodifluoromethane; chloroform; chloromethane; cyclohexane; 1,2-dichloro-1,1,2,2-tetrafluoroethane; dichlorodifluoromethane; 1,1-dichloroethane; 1,2-dichloroethane; 1,1-dichloroethene; cis-1,2-dichloroethene; 1,2-dichloropropane; 1,4-dioxane; ethanol; ethylbenzene; 4-ethyltoluene; n-heptane; hexane; 2-hexanone; methanol; 4-methyl-2-pentanone; methylene chloride; propylene; styrene; tetrachloroethene; toluene; 1,1,2-trichloro-1,2,2-trifluoroethane; 1,1,1-trichloroethane; 1,1,2-trichloroethane; trichloroethene; trichlorofluoromethane; 1,2,4-trimethylbenzene; 1,3,5-trimethylbenzene; xylene (total); 1,2-xylene; and 1,3-xylene+1,4-xylene.

Second-Round Pore-Gas Samples. Table F-2.10-4 presents the organic chemicals detected in the second-round pore-gas samples at MDA C. The following 33 organic chemicals were detected in at least one second-round pore-gas sample: acetone; benzene; 2-butanone; carbon tetrachloride; chlorodibromomethane; chlorodifluoromethane; chloroform; chloromethane; 1,2-dichlorobenzene; 1,2-dichloro-1,1,2,2-tetrafluoroethane; dichlorodifluoromethane; 1,1-dichloroethane; 1,2-dichloroethane; 1,1-dichloroethene; cis-1,2-dichloroethene; 1,2-dichloropropane; ethylbenzene; 4-ethyltoluene; n-heptane; methylene chloride; styrene; tetrachloroethene; toluene; 1,1,2-trichloro-1,2,2-trifluoroethane; 1,1,1-trichloroethane; 1,1,2-trichloroethane; trichloroethene; trichlorofluoromethane; 1,2,4-trimethylbenzene; 1,3,5-trimethylbenzene; xylene (total); 1,2-xylene; and 1,3-xylene+1,4-xylene. Of the 33 organic chemicals detected in the second-round pore-gas samples, all but two of them, chlorodibromomethane and 1,2-dichlorobenzene, were detected in the first-round pore-gas samples.

F-2.11 Summary of Organic COPCs

The organic COPCs (86 in total) identified for all media at MDA C are as follows: acenaphthene; acenaphthylene; acetone; anthracene; Aroclor-1242; Aroclor-1254; Aroclor-1260; benzene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(k)fluoranthene; benzoic acid; bis(2-ethylhexyl)phthalate; 1,3-butadiene; 1-butanol; 2-butanone; carbon disulfide; carbon tetrachloride; chlorodibromomethane; chlorodifluoromethane; chloroform; chloromethane; 2-chloronaphthalene; chrysene; cyclohexane; 1,2-dichloro-1,1,2,2-tetrafluoroethane; 1,2-dichlorobenzene; dichlorodifluoromethane; 1,1-dichloroethane; 1,2-dichloroethane; 1,1-dichloroethene; cis-1,2-dichloroethene; 1,2-dichloropropane; di-n-butylphthalate; di-n-octylphthalate; 1,4-dioxane; ethanol; ethylbenzene; 4-ethyltoluene; fluoranthene; fluorene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; total heptachlorodibenzofurans; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; hexane; 2-hexanone; indeno(1,2,3-cd)pyrene; methanol; 2-methylnaphthalene; 4-methyl-2-pentanone; 2-methylphenol; methylene chloride; n-heptane; 2-nitrotoluene; 3-nitrotoluene; 4-nitrotoluene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; total pentachlorodibenzodioxins; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; propylene; pyrene; RDX; styrene; 2,3,7,8-tetrachlorodibenzofuran; total tetrachlorodibenzofurans; tetrachloroethene; toluene; 1,1,2-trichloro-1,2,2-trifluoroethane; 1,1,1-trichloroethane; 1,1,2-trichloroethane; trichloroethene; trichlorofluoromethane; 1,2,4-trimethylbenzene; 1,3,5-trimethylbenzene; xylene (total); 1,2-xylene; and 1,3-xylene+1,4-xylene.

F-2.12 Organic Chemicals and Tritium Detected at Borehole Locations 50-26823, 50-26824, and 50-26825

Twenty tuff samples and 20 pore-gas samples were collected from three vertical boreholes (locations 50-26823, 50-26824, and 50-26825) drilled to identify and evaluate the correlation between the distribution of VOCs in tuff and pore-gas in the subsurface. Table F-2.12-1 lists the 20 tuff samples and the 20 pore-gas samples collected along with the requested analyses for each sample. The tuff samples were analyzed for VOCs, and the pore-gas samples were analyzed for VOCs and tritium.

F-2.12.1 Correlation of VOC Distribution in Tuff and Pore-Gas

Table F-2.12-2 presents the frequency of VOCs detected in tuff, and Table F-2.12-3 presents the VOCs detected in tuff at locations 50-26823, 50-26824, and 50-26825. Table F-2.12-4 presents the frequency of

VOCs detected in pore gas and Table F-2.12-5 presents the VOCs detected in pore gas at locations 50-26823, 50-26824, and 50-26825.

The distribution of VOCs in tuff and pore gas in these three boreholes is discussed below.

- Acetone, chloroform, methylene chloride, and trichloroethene were detected in at least one tuff sample collected from the three boreholes. Acetone was detected only in borehole location 50-26825. Chloroform and trichloroethene were detected in the deepest sample in borehole location 50-26823 and in the shallowest sample in borehole location 50-26824. Methylene chloride was detected only in borehole location 50-26823.
- The following 22 VOCs were detected in at least one pore-gas sample collected from the three boreholes: acetone; benzene; 2-butanone; carbon tetrachloride; chloroform; chloromethane; dichlorodifluoromethane; 1,2-dichloroethane; cis-1,2-dichloroethene; 1,2-dichloropropane; ethylbenzene; methylene chloride; styrene; tetrachloroethene; toluene; 1,1,2-trichloro-1,2,2-trifluoroethane; 1,1,1-trichloroethane; trichloroethene; trichlorofluoromethane; 1,2,4-trimethylbenzene; xylene (total), and 1,2-xylene.
- The commonly detected VOCs in tuff and in pore gas are acetone, chloroform, methylene chloride, and trichloroethene. Acetone was detected at four depths in tuff at borehole location 50-26825; however, it was not detected in the corresponding pore-gas samples collected at the same depths, except at 69 ft. Chloroform, methylene chloride, and trichloroethene were detected at only a few depths in tuff; they were detected in corresponding pore-gas samples collected at the same depths; however, they were also detected in pore gas at multiple other depths.

The concentrations of the four VOCs detected in paired samples of tuff and pore gas are presented in Table F-2.11-6. Because only four VOCs are colocated in these boreholes and because the results are inconsistent, no correlation can be made between the distribution of VOCs in tuff and in pore gas at MDA C.

F-2.12.2 Tritium Detected in Pore Gas

Table F-2.12-7 presents the frequency of tritium detected in pore gas, and Table F-2.12-8 presents the tritium concentrations detected in pore gas in borehole locations 50-26823, 50-26824, and 50-26825. Tritium concentrations in pore gas in these borehole locations are shown in Figures F-2.12-1 through F-2.12-3. Tritium was detected in all 20 samples collected. Overall, tritium concentrations decreased with depth in borehole locations 50-26823 and 50-26824; generally, the concentrations did not change with depth in borehole location 50-26825.

F-3.0 NATURE AND EXTENT

The nature and extent of surface soil and fill contamination at MDA C were discussed in the approved MDA C investigation work plan (LANL 2005, 91547, p. 9). No data needs were identified to define the nature and extent of surface contamination within the MDA C boundary. Elevated concentrations of radionuclides in the northeast portion of MDA C may have been associated with historical site operations and/or with the deposition of air-borne emissions from historical operations at TA-50 rather than from releases from the disposal units at MDA C. However, the work plan proposed conducting additional surface sampling along the eastern boundary of MDA C to define the extent of radionuclide contamination (LANL 2005, 91547, p. 10).

The nature and extent of subsurface contamination at MDA C were discussed in the approved MDA C work plan (LANL 2005, 91547, pp. 13–15). The additional data needs identified included determining the extent of metals, cyanide, and radionuclide contamination in tuff beneath the pits and shafts; determining the concentrations and spatial extent of VOCs and tritium in the vapor phase; determining the presence of perchlorate, nitrate, dioxins, furans; and determining the presence of perched groundwater. Additional boreholes were proposed to address the data needs. The subsurface source of contamination at MDA C is the inventory within the pits and shafts.

F-3.1 Inorganic Chemicals

F-3.1.1 Surface Inorganic Chemicals

The nature and extent of inorganic chemical contamination on the surface at MDA C were defined in the approved investigation work plan (LANL 2005, 91547), and no additional surface samples were collected and analyzed for inorganic chemicals. The results indicated that surface contamination of inorganic chemicals at MDA C is negligible. However, the 1993 inorganic chemical data, which were the basis for this determination, were found to be CST Onsite data that did not have the supporting documentation provided by an off-site analytical laboratory. Therefore, the inorganic chemical data from 1993 are only screening-level data. The 1993 inorganic chemical surface results are summarized below:

- lead and silver were the only metals detected at concentrations above BV;
- statistical analyses presented in Appendix D of the investigation work plan indicated that the range of concentrations was almost identical to the range of background concentrations for both lead and silver; and
- extent of surface inorganic chemical contamination was defined (LANL 2005, 91547, p. 8).

F-3.1.2 Subsurface Inorganic Chemicals

Figures F-2.2-1 and F-2.2-2 show the distribution of inorganic COPCs in tuff. Twenty-one inorganic chemicals were identified as COPCs in tuff (Table F-2.1-2). Inorganic chemicals were detected or were detected above BVs at the total depth (TD) in several boreholes. In many cases, nitrate or nitrate and perchlorate were the only detects. Both were detected at low levels (less than 1.5 mg/kg for nitrate and less than 0.05 mg/kg for perchlorate) at TD and either showed a slight change or no change in concentrations with depth. Nitrate is also naturally occurring. The nature and extent of nitrate and perchlorate are defined.

The approved investigation work plan (LANL 2005, 91547) identified the extent of cyanide in the tuff beneath Pit 6 as a data issue. Cyanide was detected in 8 of 193 samples collected in 2005–2006, and all detected cyanide concentrations were less than the cyanide BV of 0.5 mg/kg. The nature and extent of cyanide is defined.

At other boreholes, inorganic chemicals were detected slightly above background (less than twice the BV or maximum background concentration) at TD. The vertical profile generally shows no detections above BV in the upper units (Qbt 2 and Qbt 3), and detections above BV in the lower units of the Bandelier Tuff are not indicative of a release.

Aluminum, beryllium, and lead were detected above their Qbt 2 BVs in borehole location 50-24768. Aluminum and beryllium concentrations were within the range of background concentrations (350–8370 mg/kg and 0.04–1.8 mg/kg, respectively), and lead was detected slightly above the maximum

background concentration (19.7 mg/kg compared to 15.5 mg/kg). The extent of aluminum, beryllium, and lead is defined in this borehole.

Selenium was detected above the Qbt 2 and Qbt 3 BV (0.3 mg/kg) in borehole location 50-24771. Selenium concentrations ranged from 10.1 mg/kg to 12 mg/kg from 40 ft to 150 ft. Selenium was not detected above BV at similar depths in nearby borehole locations 50-24773 and 50-24770 (within 80 to 100 ft of borehole location 50-24771). The extent of selenium is defined in this borehole.

Chromium was detected above the Qbt 1g BV (2.6 mg/kg) at TD in borehole location 50-24784. Chromium was detected below the BV or at the BV in shallower samples from 55 ft to 275 ft. The concentration (19.4 mg/kg) is less than the maximum concentration of 23.4 mg/kg detected at 50 ft. In addition, chromium was not detected above BV at 275 ft in nearby borehole location 50-24785 (within approximately 50 ft). The extent of chromium is defined in this borehole.

Arsenic, lead, selenium, and zinc were detected above their Qbt 1g BVs in borehole location 50-24785. The arsenic concentration (0.67 mg/kg) was within the range of background concentrations. The lead concentration (81.5 mg/kg) was approximately 4 times the maximum background concentration (20 mg/kg). The selenium concentration decreased from 3.14 mg/kg at 250 ft to 1.75 mg/kg at 275 ft depth. The zinc concentration (81.7 mg/kg) was less than twice the maximum background concentration (46 mg/kg). None of these inorganic chemicals were detected above BV in borehole location 50-24784 at the same or deeper depth. The extent of arsenic, lead, selenium, and zinc is defined in this borehole.

Beryllium was detected above its Qbt 2 BV (1.21 mg/kg) borehole location 50-24799. The beryllium concentration (2.67 mg/kg) was less than 2 times the maximum background concentration (1.8 mg/kg). Also, beryllium was not detected above its BV in shallower depths from 40 ft to 100 ft and was not detected above BV in nearby borehole locations (50-24801 and 50-24766 approximately 60 ft away). The extent of beryllium is defined in this borehole.

Selenium was detected above its Qbt 2 BV (0.3 mg/kg) in borehole location 50-24801. The concentration increased slightly from the preceding depth, but selenium was not detected above BV in nearby borehole locations (50-24799 and 50-24783 approximately 50 ft to 60 ft) at similar or deeper depths. The extent of selenium is defined in this borehole.

Lead was detected above its Qbt 2 BV (11.2 mg/kg) in borehole location 50-24804. The lead concentration (47.8 mg/kg at 147.5 ft) increased slightly from the preceding depth (36 mg/kg at 122.5 ft) and is approximately 3 times the maximum background concentration (15.5 mg/kg). The lead concentration decreased from the maximum concentration (68.6 mg/kg) at 17.1 ft. Lead was not detected above BV in borehole location 50-24810, approximately 25 to 30 ft away. The extent of lead is defined in this borehole.

Aluminum, arsenic, beryllium, calcium, chromium, copper, lead, magnesium, selenium, and zinc were detected above their respective Qbt 2 BVs in borehole location 50-24812. Arsenic, chromium, and lead concentrations are within the range of background concentrations. Copper and zinc concentrations are slightly above the maximum background concentrations (less than 2 mg/kg and 5 mg/kg, respectively). Calcium and magnesium concentrations were less than twice the maximum background concentrations. Aluminum and beryllium were not detected above BVs in any shallower depths. Selenium concentration increased with depth in this borehole (3.33 mg/kg at TD was the maximum concentration). The selenium concentrations were less in this borehole than those detected in borehole location 50-24771 approximately 200 ft north. None of these inorganic chemicals were detected above BVs in the closest borehole location (50-24813 approximately 140 ft to the east). The extent of these inorganic chemicals is defined in this borehole.

Chromium was detected above its Qbt 2 BV (7.14 mg/kg) in borehole location 50-24816. The chromium concentration (8.14 mg/kg) is within the range of background concentrations. The extent of chromium is defined in this borehole.

Aluminum, arsenic, barium, beryllium, iron, manganese, and zinc were detected above their respective Qbt 1g BVs in borehole location 50-24817. Aluminum, barium, beryllium, iron, and manganese concentrations are less than 2 times the maximum background concentrations. The arsenic concentration (2.88 mg/kg) is approximately 4 times the maximum background concentration. The zinc concentration (44.8 mg/kg) is within the range of background concentrations. None of these inorganic chemicals were detected above BVs in shallower depths. In addition, this borehole location is outside of the fenced area to the north of MDA C. The extent of these inorganic chemicals is defined in this borehole.

Copper was detected above its Qbt 1g BV (3.96 mg/kg) in borehole location 50-24818. The concentration of copper (11.3 mg/kg) is approximately 3 times the BV and decreases from concentrations reported in shallower depths. The extent of copper is defined in this borehole.

Arsenic, barium, iron, and manganese were detected above their respective Qbt 1g BVs in borehole location 50-24820. Concentrations of barium, iron, and manganese were less than 2 times the maximum background concentrations and the arsenic concentration was less than 3 times the maximum background concentration. The barium concentration decreased from the maximum at 100 ft (108 mg/kg), while the other inorganic chemicals were not detected in shallower depths. The extent of arsenic, barium, iron, and manganese is defined in this borehole.

Chromium, iron, and manganese were detected above their respective Qbt 1g BVs in borehole location 50-24821 at concentrations less than 2 times the maximum background concentrations. The concentration of chromium decreased from 14.9 mg/kg at 160 ft to 3.8 mg/kg at 250 ft. Iron and manganese were not detected above BVs at shallower depths. The extent of chromium, iron, and manganese is defined in this borehole.

Arsenic, chromium, iron, and manganese were detected above their respective Qbt 1g BVs in borehole location 50-24822. The arsenic concentration (0.64 mg/kg) is within the range of background concentrations. The concentrations of chromium, iron, and manganese are less than 2 times the maximum background concentrations. None of the inorganic chemicals were detected above BVs at shallower depths. The extent of arsenic, chromium, iron, and manganese is defined in this borehole.

Chromium was detected above its Qbt 1g BV (2.6 mg/kg) in borehole location 50-24451. The chromium concentration (2.99 mg/kg) is less than 2 times the BV. Chromium was not detected above BV at shallower depths. The extent of chromium is defined in this borehole.

Generally, the data for the inorganic chemicals indicate that most of the detections above BVs occur within the boundaries of MDA C.

F-3.2 Radionuclide Contamination

F-3.2.1 Surface Radionuclides

The approved investigation work plan (LANL 2005, 91547) concluded that the extent of surface radionuclide contamination within MDA C was defined (LANL 2005, 91547, p. 8). The work plan specified that surface samples will be collected and analyzed for americium-241, isotopic plutonium, isotopic uranium, and for gamma emitting radionuclides (LANL 2005, 91547, p. 33) to determine the extent of radionuclide contamination to the east of MDA C.

The six surface samples collected in 2005 (Figure F-2.4-1) provided the following determination of extent east of MDA C:

- Americium-241 extent was defined by decreasing concentrations with increasing distance from the fence as well as downslope east of MDA C (locations 50-22746 and 50-22747).
- Cesium-134 extent was defined by decreasing concentrations east of the fence and at downslope locations east of MDA C (locations 50-22746 and 50-22747).
- Plutonium-238 extent was defined by a concentration within the range of plutonium-238 FVs and decreasing concentrations at the two locations farthest downslope east of MDA C (locations 50-22746 and 50-22747).
- Plutonium-239 extent was defined by decreasing concentrations with distance from the eastern fenceline.
- Thorium-232 extent was defined by decreasing concentrations at all of the 2005 surface sampling locations (locations 50-22742 through 50-22747).
- Isotopic uranium extent was defined by decreasing concentrations or concentrations less than BV in the samples collected east of the MDA C fenceline (locations 50-22742 through 50-22747).

The surface lateral extent of radionuclide contamination was defined by the six additional surface samples collected east of the MDA C fenceline.

F-3.2.2 Subsurface Radionuclides

Cesium-134, cesium-137, cobalt-60, europium-152, ruthenium-106, sodium-22, uranium-234, and uranium-238 were detected or detected above BVs in tuff in 1 to 3 samples. Cesium-134, cesium-137, cobalt-60, europium-152, and ruthenium-106 decreased to nondetect with depth in the boreholes in which they were detected. Sodium-22, uranium-234, and uranium-238 also decreased to nondetects with depth in all but one borehole location each. Sodium-22 was detected at TD in borehole location 50-09109 at 0.056 pCi/g. Sodium-22 was not detected at shallower depths in this borehole and was not detected in borehole location 50-24784 approximately 15 ft south to 299.8 ft. Uranium-234 and uranium-238 were detected above Qbt 2 BVs at TD in borehole location 50-24816 at concentrations (2.15 pCi/g and 2.43 pCi/g) less than a pCi/g above the BVs, and neither isotope was detected at shallower depths. The extent of these radionuclides is defined.

Americium-241 was detected at TD in eight boreholes at concentrations ranging from 0.01 pCi/g to 0.42 pCi/g. In six of eight boreholes the americium-241 concentrations remain essentially unchanged with depth. In the other two borehole locations (50-24768 and 50-24783), americium-241 was detected only at TD. At the surrounding borehole locations, americium-241 was not detected or was detected at similar, low concentrations. The extent of americium-241 is defined.

Strontium-90 was detected in five boreholes. Its concentrations decreased with depth in three boreholes. Strontium-90 was detected at TD in two borehole locations (50-09103 and 50-09106) at 116.8 ft and 118 ft, respectively. Strontium-90 concentrations were less than 1 pCi/g in all cases. Strontium-90 was not detected at nearby borehole locations (50-24814 and 50-24802 at a distance of approximately 25 ft) at similar or deeper depths. The extent of strontium-90 is defined.

Uranium-235 was detected above BVs in 16 boreholes, 9 at TD. All uranium-235 concentrations were less than 2 times the BVs and remained consistent within each tuff unit. The low level and consistent

concentrations indicate that uranium-235 is present at naturally occurring concentrations. The extent of uranium-235 is defined.

Tritium was detected in core in the 1995 borehole locations. Its concentrations decreased with depth following an increase at shallower depths in all but two borehole locations. Borehole locations 50-09101 and 50-09108 showed an increase in concentrations with depth; the maximum concentration was at TD. In borehole location 50-09101, tritium was detected (3.67 pCi/g) at 114.5 ft along the fence near the northeast corner of pit 6. In borehole location 50-09108, tritium was detected (106.71 pCi/g) at 115 ft south of the chemical pit. Tritium was not analyzed for in core in the 2005–2006 borehole samples. Tritium was not detected at higher concentrations at similar depths in the closest 1995 borehole, except in borehole location 50-09107, where tritium was detected at 29.96 pCi/g at 111 ft. However, tritium decreased substantially with depth in this borehole. The extent of tritium in core is defined.

Plutonium-238 was detected in eight boreholes, three at TD. Plutonium-238 was detected at 116.8 ft in borehole location 50-09103 at 0.014 pCi/g. It was not detected in borehole location 50-24814, approximately 15 to 20 ft to the south. Plutonium-238 was detected in borehole locations 50-24782 and 50-24783 at 157.5 ft and 152.5 ft, respectively. Its concentrations in borehole location 50-24782 decreased with depth (from 0.3 pCi/g to 0.088 pCi/g). Plutonium-238 was detected only at 152.5 ft in borehole location 50-24783 and was not detected in borehole location 50-24801, approximately 40 ft to the northwest. The extent of plutonium-238 is defined.

Plutonium-239 was detected in 12 boreholes, 6 at TD. Plutonium-239 was detected at low levels (less than 0.1 pCi/g) in three borehole locations (50-09105, 50-09106, and 50-09108) at TD. It was not detected at any of the shallower depths or detected only at one shallower depth. Plutonium-239 was not detected at the surrounding borehole locations. Plutonium-239 was detected in borehole locations 50-24782 and 50-24783 at 157.5 ft and 152.5 ft, respectively. Concentrations in borehole location 50-24782 decreased with depth (from 0.684 pCi/g to 0.0478 pCi/g). Plutonium-239 was detected only at 152.5 ft in borehole location 50-24783 and was not detected in borehole location 50-24801, approximately 40 ft to the northwest. Plutonium-239 was detected at 0.0269 pCi/g only at 147.5 ft in borehole location 50-24451. This borehole location is across Pajarito Road, and plutonium-239 was not detected in the closest borehole locations on the same side of the road (locations 50-24820 and 50-24821). The extent of plutonium-239 is defined.

The radionuclide results indicated that most of the detected concentrations or detected concentrations above BVs occur within the MDA C boundaries. Only a few radionuclides were detected at low concentrations in the borehole locations to the south and east of MDA C.

F-3.2.3 Pore-Gas Tritium

Pore-gas samples were collected from the boreholes drilled in 2005 and 2006 as well as from borehole locations 50-09100 and 50-10131 and analyzed for tritium. Figure F-3.2-1 shows the locations of the boreholes and the depths of the pore-gas samples. The tritium concentrations from the first-round samples are shown in a three-dimensional plot in Figure F-2.6-3. The highest tritium pore-gas concentrations were reported in the borehole locations from the interior of MDA C. In general, tritium pore-gas concentrations decreased with depth from the maximum in each borehole location and decreased with distance from the center of MDA C.

Tritium concentrations were lower in borehole locations 50-24820 and 50-24821 across Pajarito Road than in borehole locations within the fenced area; tritium was not detected in pore gas in borehole location 50-24822 to the east of MDA. Higher tritium pore-gas concentrations were detected in borehole location 50-24451, also across Pajarito Road and south of borehole location 50-24821, but the concentrations

were similar to those detected in perimeter borehole locations. Tritium was elevated in borehole location 50-24813 at TD (150 ft), and the concentrations increased with depth (maximum concentration was at TD). Tritium concentrations were lower at surrounding boreholes, including borehole location 50-24821 across Pajarito Road, at similar depths. Tritium pore-gas concentrations in borehole locations 50-24818 and 50-09100, north of Pit 5, were similar at shallow depths to those as borehole locations 50-24773 and 50-24770, south of Pit 5. Tritium decreased substantially with depth in all of these boreholes. Borehole location 50-24769, located south of Pit 5 and at the eastern end of the pit had elevated tritium concentrations, which decreased with depth and decreased to the north, south, and east (borehole locations 50-24768, 50-24815, and 50-24822, respectively). Borehole location 50-24817, north of Pit 6 and outside of the fence, had elevated tritium concentrations, which may be from other sources at TA-50. The extent of tritium in pore gas is defined.

As shown in Figures F-2.6-4 through F-2.6-37, tritium concentrations decreased with depth at most borehole locations for the first and second rounds of pore-gas samples. However, the magnitude of the change in concentrations varies. The majority of borehole locations showed similar overall trends in tritium concentrations for the two rounds of pore-gas samples (i.e., a decrease from the maximum concentration at TD). The majority of borehole locations also had similar tritium concentrations at TD (within a factor of 3 or less), regardless of the overall trend with depth. In some cases the trend and/or the concentrations differed between the first and second-round samples.

F-3.3 Organic Chemical Contamination

As the approved investigation work plan (LANL 2005, 91547) states, the tuff data for SVOCs do not show evidence of a release from the disposal units. Additional data for organic chemicals were collected and the nature and extent of organic COPCs are discussed below.

F-3.3.1 Surface Organic Chemicals

Most of the organic chemical data in surface samples from previous MDA C Resource Conservation and Recovery Act facility investigation sampling were CST Offsite vintage data and were used to determine nature and extent. The organic chemicals detected in the surface samples are acenaphthene, Aroclor-1254, and Aroclor-1260 and are presented in Figure F-2.8-1. The work plan stated that the sporadic detections of SVOCs and Aroclors in the surface soil were not indicative of a release, and the extent of surface organic chemical contamination was defined (LANL 2005, 91547, p. 8).

F-3.3.2 Subsurface Organic Chemicals

Forty-one organic chemicals were detected in tuff (Table F-2.9-2 and Figures F-2.9-1 and F-2.9-2). Most were detected sporadically in one to five samples at intermediate depths; their concentrations decreased with depth to nondetects. Organic chemicals were detected in 11 borehole locations at TD; in 4 of these borehole locations VOCs, PCBs, or SVOCs were also detected at TD, and dioxin and/or furan congeners were detected in 8 borehole locations at TD.

Acetone was detected at a concentration of 0.003 mg/kg in borehole location 50-09110 at TD (89.4 ft). The acetone concentration is at a trace level (less than the estimated quantitation limit [EQL]). In addition, acetone was not detected in shallower samples in this borehole or at similar depths in nearby borehole location 50-09109 (core samples were not analyzed for VOCs in 2005–2006). The extent of acetone is defined.

Aroclor-1242, Aroclor-1254, and Aroclor-1260 were detected in borehole location 50-24773 at TD (152.8 ft). Their concentrations were low (0.02 mg/kg for Aroclor-1242, 0.0055 mg/kg for Aroclor-1254, and 0.0032 mg/kg for Aroclor-1260), and none of the Aroclors were detected in shallower samples in this borehole location. The Aroclors were also not detected in the borehole location closest to 50-24773 (50-24771), approximately 80 ft to the east. The extent of Aroclor-1242, Aroclor-1254, and Aroclor-1260 is defined.

Bis(2-ethylhexyl)phthalate, di-n-butyl phthalate, fluoranthene, and pyrene were detected in borehole location 50-24784 at TD (299.8 ft). The SVOCs were detected at trace levels (near or below the EQLs) and were not detected at shallower depths in this borehole location. SVOCs were not detected at similar depths in the surrounding borehole locations. The extent of bis(2-ethylhexyl)phthalate, di-n-butyl phthalate, fluoranthene, and pyrene is defined.

Anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzoic acid, and bis(2-ethylhexyl)phthalate were detected in borehole location 50-24820 at TD (250 ft). Their concentrations were the same as in shallower depths for anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and bis(2-ethylhexyl)phthalate; benzoic acid was detected only in the TD sample. All concentrations were at trace levels (near or below the EQLs). This borehole location is on the other side of Pajarito Road from MDA C, and SVOCs were not detected at similar depths in other borehole locations on this side of the road. The extent of anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzoic acid, and bis(2-ethylhexyl)phthalate is defined.

Dioxin and furan congeners were detected in borehole locations 50- 24769, 50-24784, 50-24796, 50-24802, 50-24804, 50-24812, 50-24815, and 50-24816 at TD (149.4 ft to 299.8 ft). All concentrations were at trace levels (less than the EQLs) and did not change substantially with depth. In general, the number of congeners decreased with depth so that only hepta- and/or octa-dioxin and furan congener were detected at TD. At one borehole location (50-24812), 1,2,3,7,8-pentachlordibenzofuran was detected at TD but not at shallower depths. Dioxin and furan congeners were not detected at similar depths in nearby borehole locations. The extent of dioxin and furan congeners is defined.

F-3.3.3 Pore-Gas VOCs

Figure F-3.2-1 shows the borehole locations and pore-gas samples collected and Plates 1 and 2 present the VOCs detected in pore gas. Figures F-3.3-1 through F-3.3-4 show the relative magnitude of trichloroethene, 1,1,1-trichloroethane, tetrachloroethane, and chloroform concentrations and their relative distribution by location and depth, respectively, in the boreholes.

VOC pore-gas concentrations are low (generally 1000 $\mu\text{g}/\text{m}^3$ or less) for most VOCs detected, with little or no change in concentrations with depth (their concentrations remain less than 1000 $\mu\text{g}/\text{m}^3$ at TD) (Table F-2.6-2). Generally, the VOC pore-gas concentrations in borehole locations inside the fence at MDA C reach the maximum concentration at depths ranging from approximately 125 ft to 200 ft. Below 200 ft, pore-gas concentrations tend to decrease or to remain unchanged to 250 ft. In the deepest borehole (location 50-24818), VOC pore-gas concentrations decrease substantially below 315 ft.

VOC pore-gas concentrations to the north of MDA C in borehole location 50-24817 are generally less than or similar to VOC pore-gas concentrations in borehole locations inside the fence (location 50-24796 and 50-24797) and are less than concentrations detected in the deep borehole location 50-24818 and borehole location 50-09100. Concentrations are generally also lower in the western perimeter borehole locations (50-24784, 50-24785, and 50-24816) and in the eastern perimeter borehole locations (50-24768, 50-24814, and 50-24815). Low VOC pore-gas concentrations were also detected in borehole location 50-24822, outside the fenced area to the east of MDA C. Trichloroethene concentrations in borehole location 50-24822 are higher than in borehole locations 50-24814 and 50-24815, but the

concentrations are similar to those in borehole location 50-24768, and its concentrations decrease with depth in borehole location 50-24822. Borehole locations to the south of MDA C (locations 50-24820, 50-24821, and 50-24451) also have lower VOC pore-gas concentrations than borehole locations along the southern fenceline (50-24810, 50-24811, 50-24812, and 50-24813). In addition, concentrations of VOCs are lower in borehole location 50-24451, the southern most borehole location, than in borehole locations 50-24820 and 50-24821.

Downward migration of VOCs in pore gas is limited by hydrostatic pressure and the lack of saturated conditions. In addition, the pore-gas screening evaluation presented in Appendix G indicates no potential for migration to groundwater. Based on the site conditions, the pore-gas screening and the pore-gas data, the extent of VOCs in pore gas at MDA C has been defined.

F-4.0 SUMMARY

The nature and extent of contamination at MDA C have been defined. Surface contamination is sporadic and limited. Subsurface contamination is delineated by the boreholes samples (core and pore gas) both laterally and vertically. COPCs are generally limited to the upper 150–200 ft of tuff; below these depths COPCs are detected sporadically in core at low or trace concentrations. Pore-gas concentrations of tritium and VOCs are generally low and decrease with distance from the disposal units both laterally and vertically. The lack of saturated conditions and hydrostatic pressure severely limits the movement of contamination toward groundwater. As a result, the potential for COPC migration to groundwater is very low.

F-5.0 REFERENCES

The following list includes all documents cited in this appendix. Parenthetical information following each reference provides the author(s), publication date, and ER ID number. This information is also included in text citations. ER ID numbers are assigned by the Environmental Programs Directorate's Records Processing Facility (RPF) and are used to locate the document at the RPF and, where applicable, in the master reference set.

Copies of the master reference set are maintained at the NMED Hazardous Waste Bureau; the U.S. Department of Energy–Los Alamos Site Office; the U.S. Environmental Protection Agency, Region 6; and the Directorate. The set was developed to ensure that the administrative authority has all material needed to review this document, and it is updated with every document submitted to the administrative authority. Documents previously submitted to the administrative authority are not included.

EPA (U.S. Environmental Protection Agency), December 1989. "Risk Assessment Guidance for Superfund Vol. I, Human Health Evaluation Manual (Part A)," Interim Final, EPA 540/89/002, Office of Solid Waste and Emergency Response, Washington, D.C. (EPA 1989, 08021)

LANL (Los Alamos National Laboratory), September 1998. "Inorganic and Radionuclide Background Data for Soils, Canyon Sediments, and Bandelier Tuff at Los Alamos National Laboratory," Los Alamos National Laboratory document LA-UR-98-4847, Los Alamos, New Mexico. (LANL 1998, 59730)

LANL (Los Alamos National Laboratory), October 2005. "Investigation Work Plan for Material Disposal Area C, Solid Waste Management Unit 50-009, at Technical Area 50, Revision 2," Los Alamos National Laboratory document LA-UR-05-7363, Los Alamos, New Mexico. (LANL 2005, 91547)

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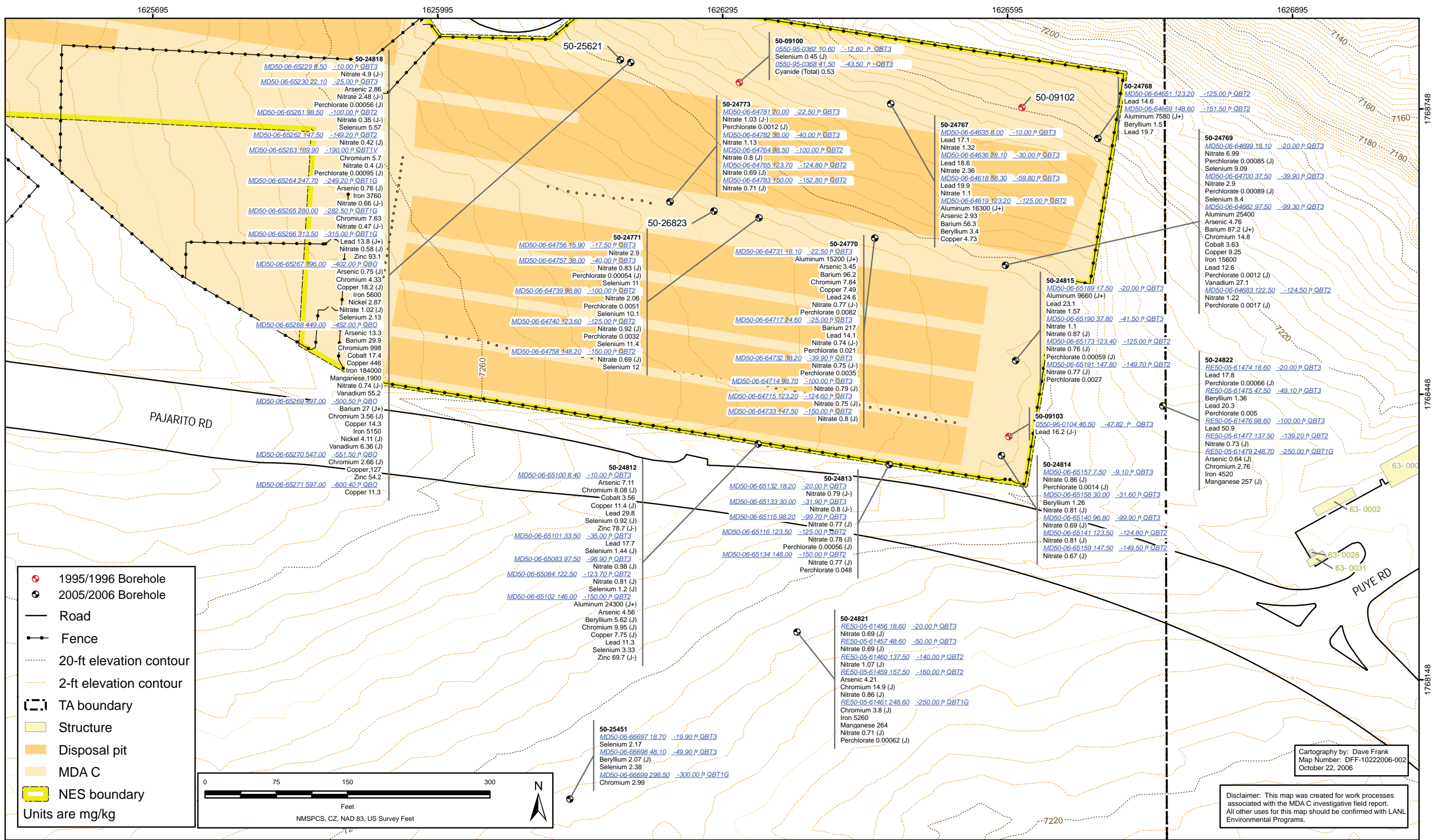


Figure F-2.2-2. Inorganic chemicals detected or detected above background values in tuff samples, eastern portion of MDA C

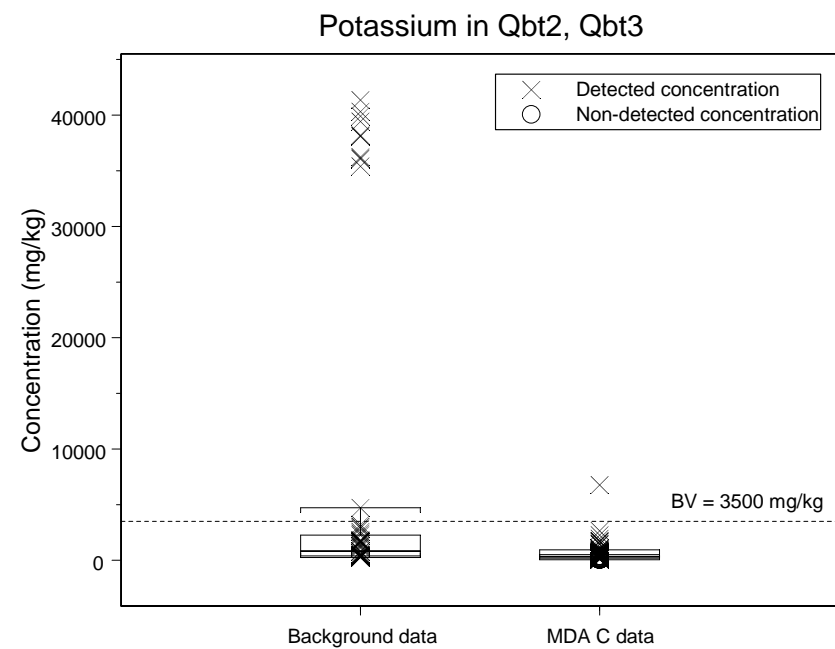


Figure F-2.2-3. Potassium in tuff units Qbt 2 and Qbt 3 at MDA C compared to background data

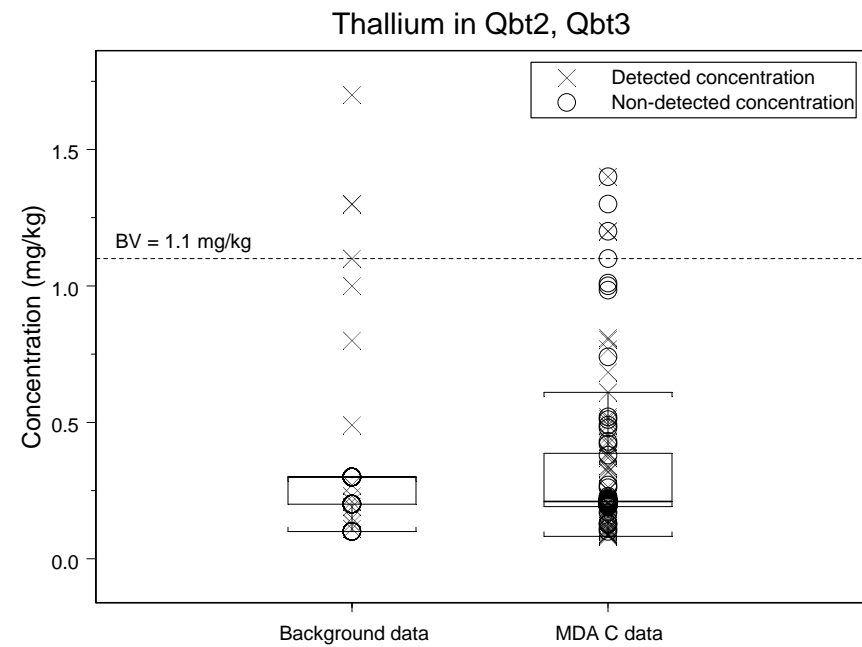
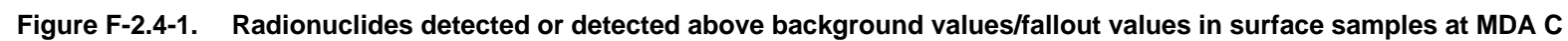


Figure F-2.2-4. Thallium in tuff units Qbt 2 and Qbt 3 at MDA C compared to background data



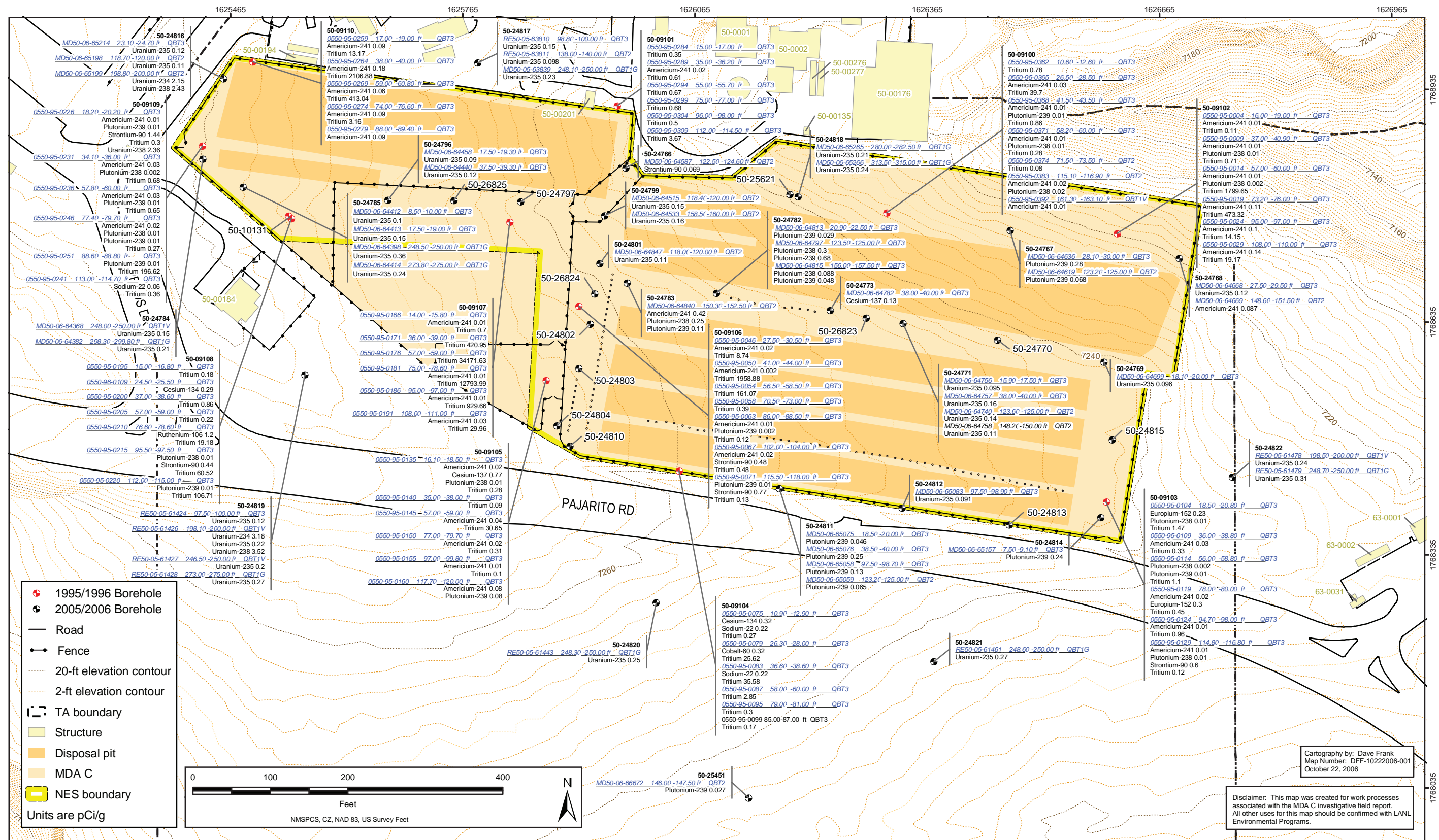


Figure F-2.5-1. Radionuclides detected or detected above background values in subsurface tuff samples at MDA C

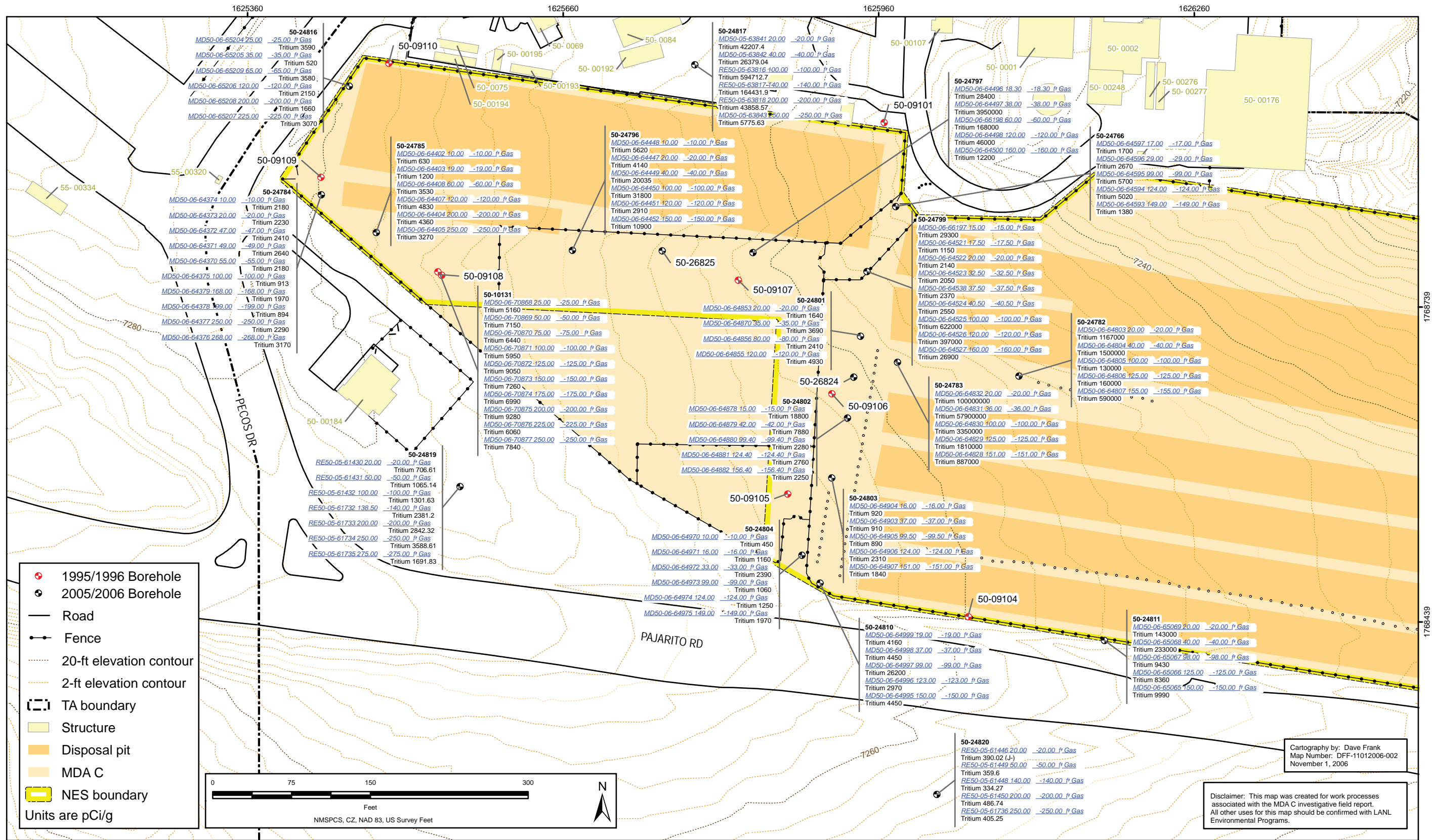


Figure F-2.6-1. Tritium detected in pore-gas samples, western portion of MDA C

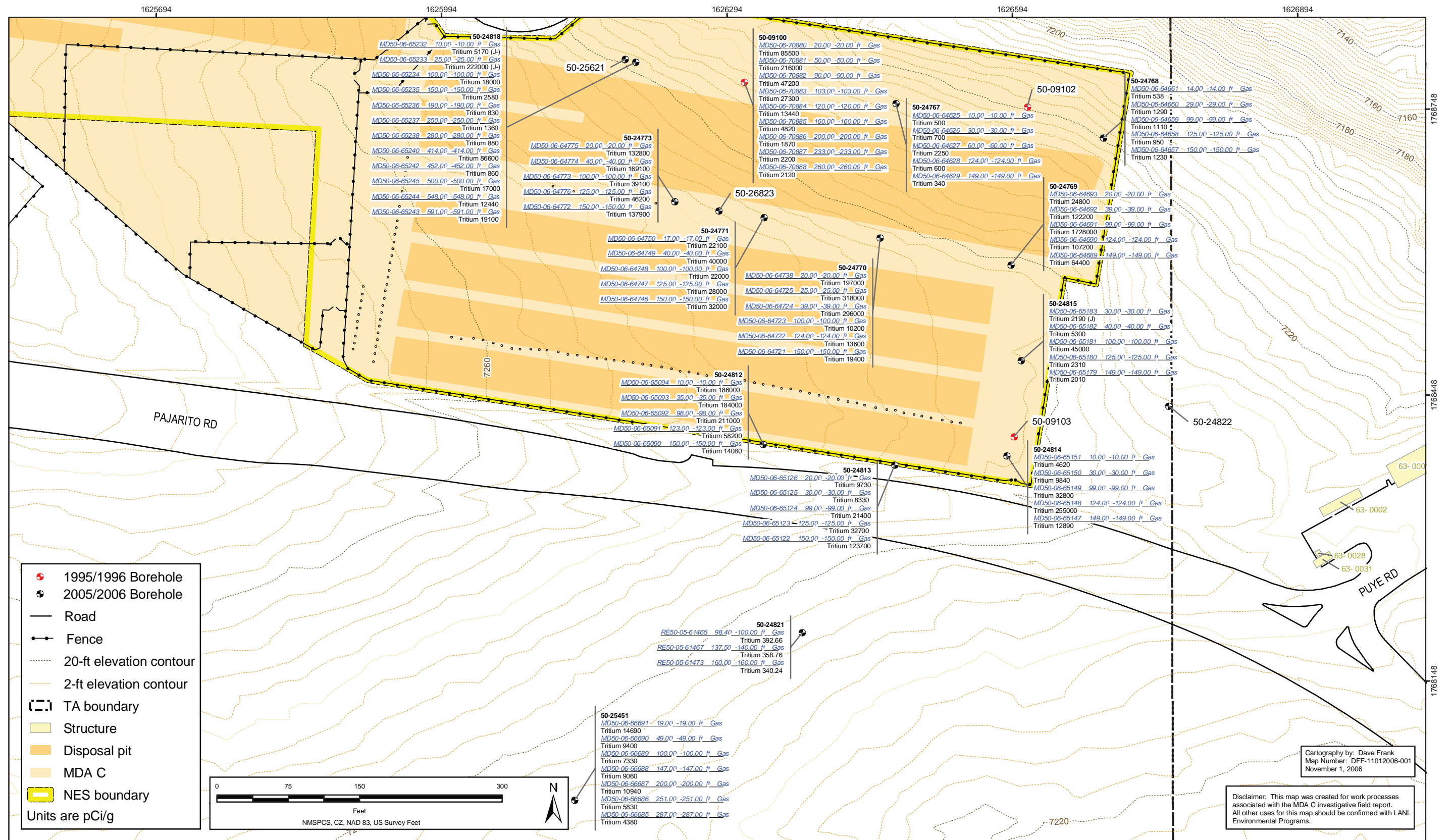


Figure F-2.6-2. Tritium detected in pore-gas samples, eastern portion of MDA C

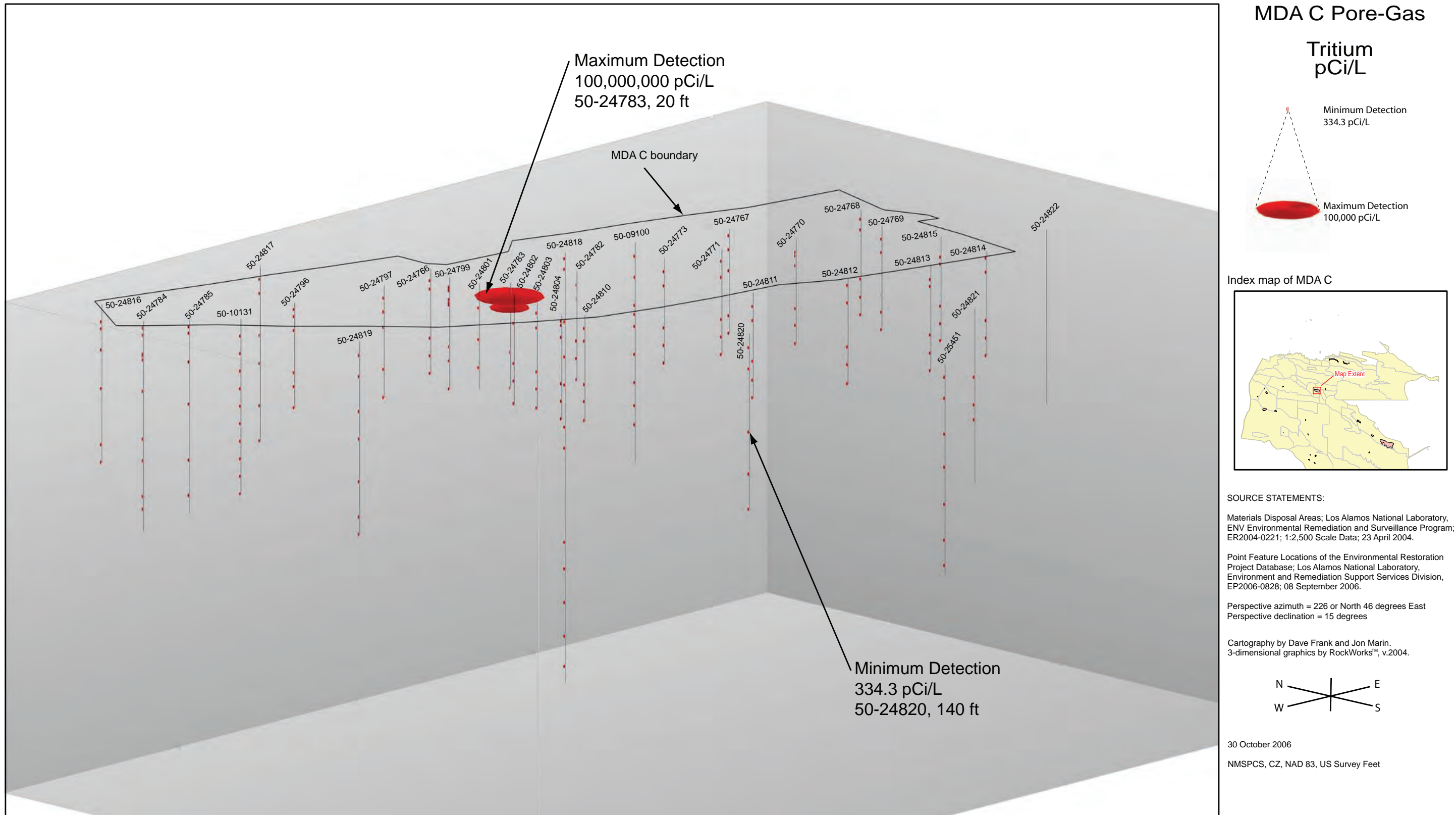


Figure F-2.6-3. Tritium concentrations in pore gas

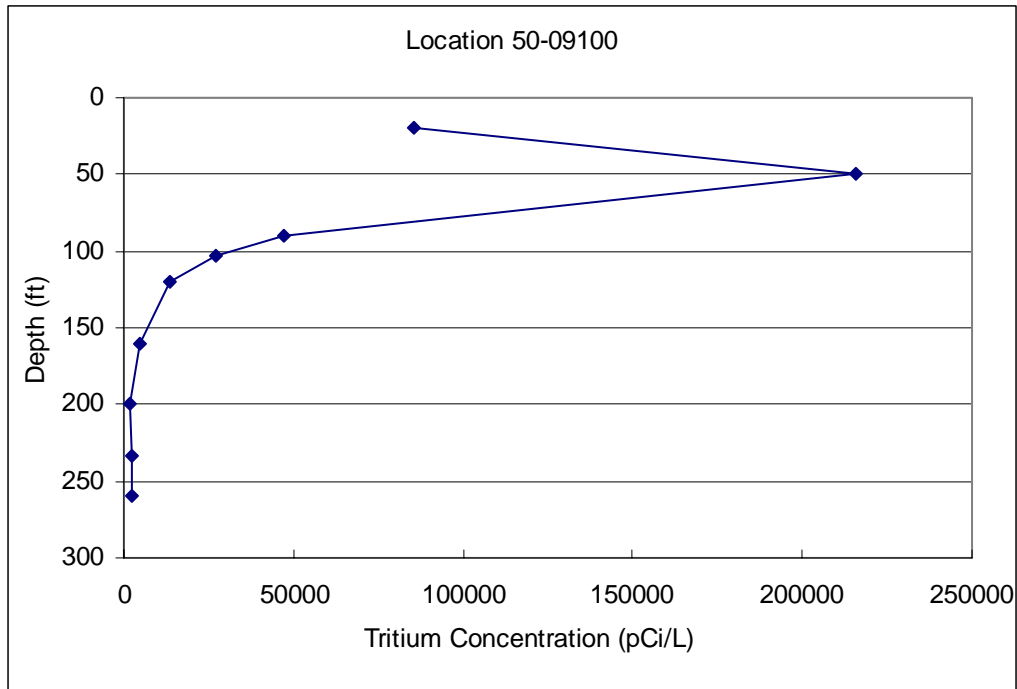


Figure F-2.6-4. Tritium concentrations in pore-gas samples at location 50-09100

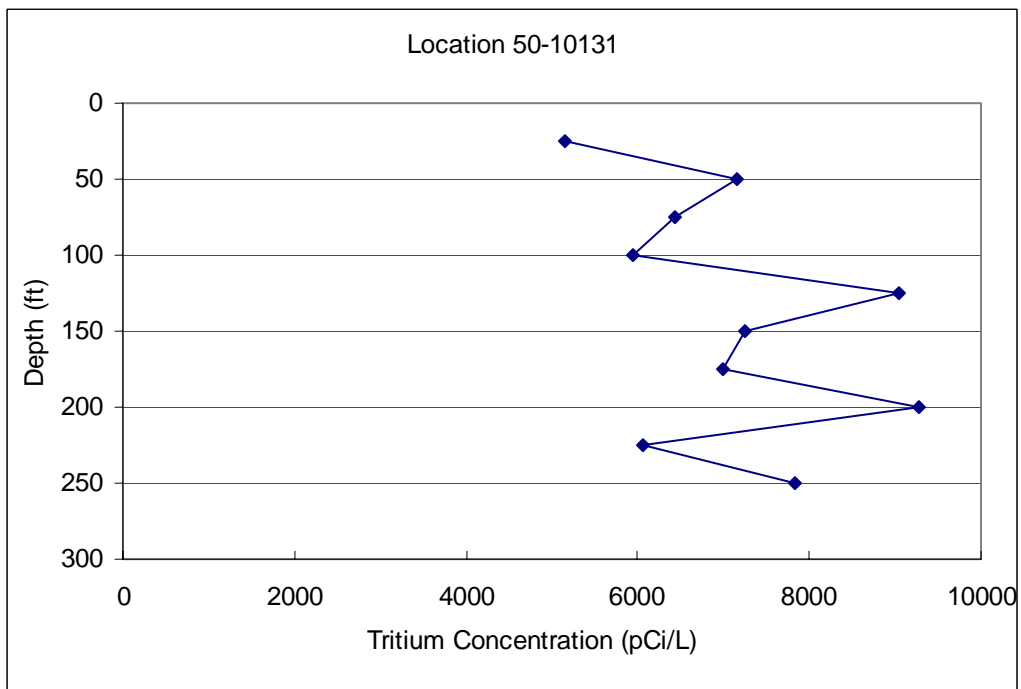


Figure F-2.6-5. Tritium concentrations in pore-gas samples at location 50-10131

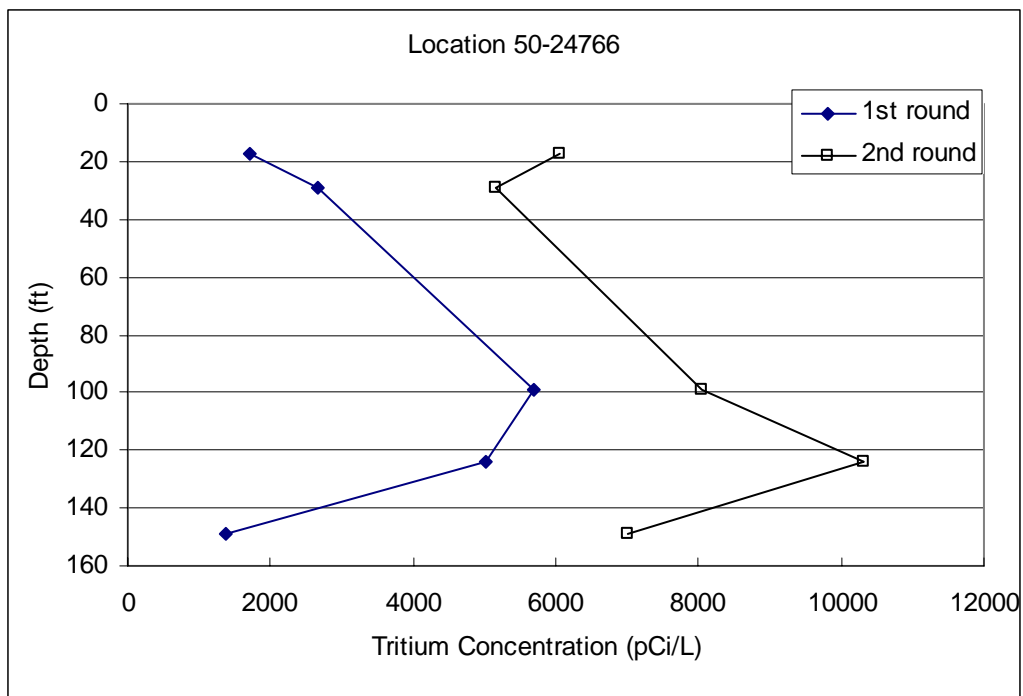


Figure F-2.6-6. Tritium concentrations in the first- and second-round pore-gas samples at location 50-24766

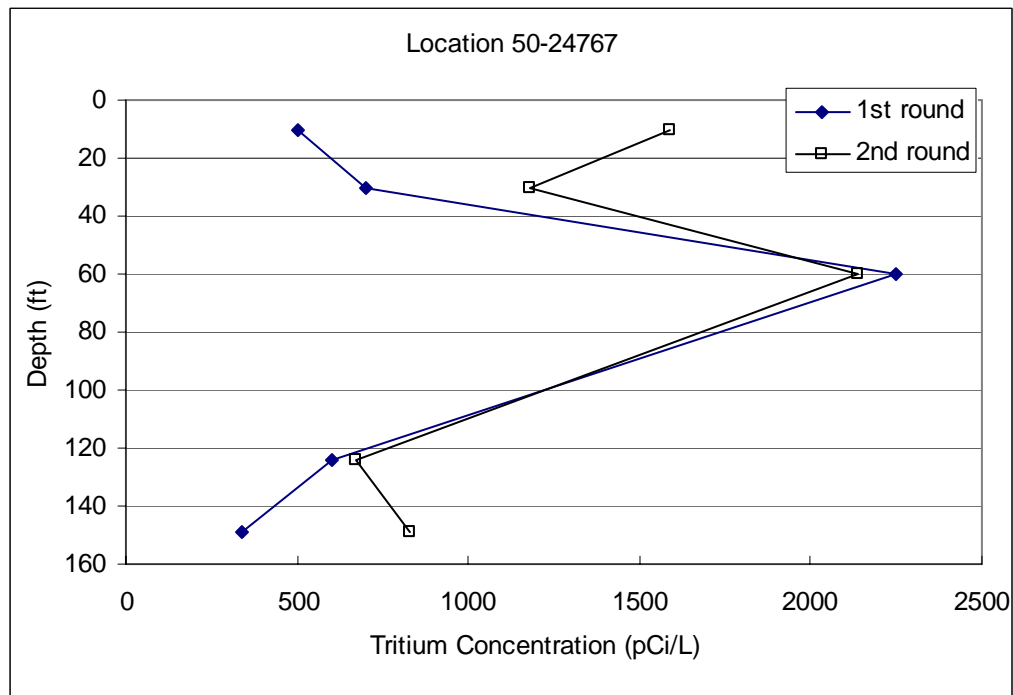


Figure F-2.6-7. Tritium concentrations in the first- and second-round pore-gas samples at location 50-24767

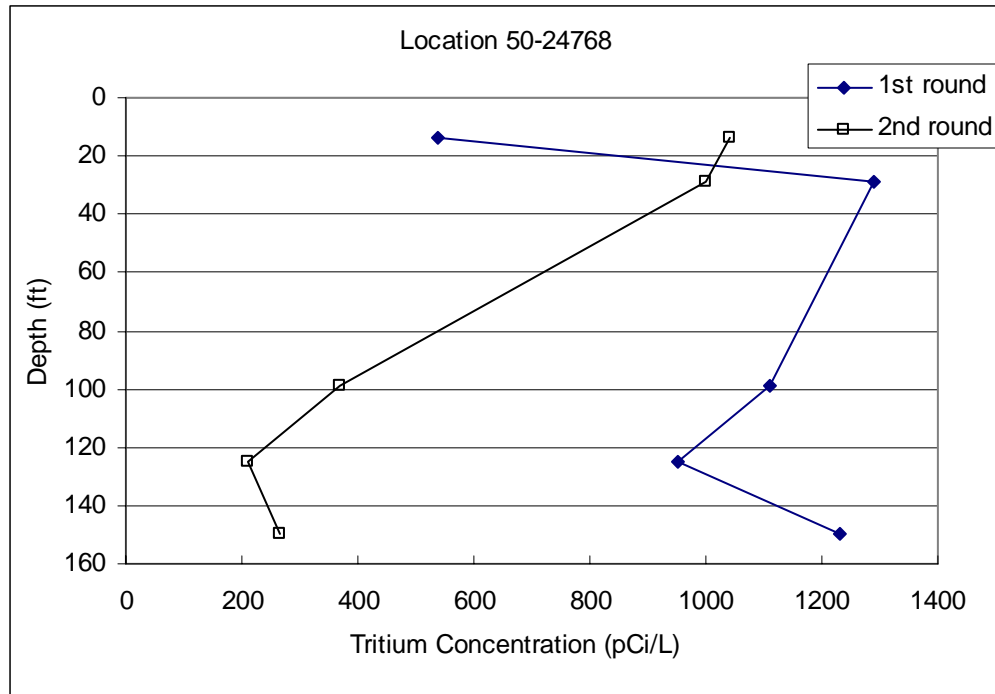


Figure F-2.6-8. Tritium concentrations in the first- and second-round pore-gas samples at location 50-24768

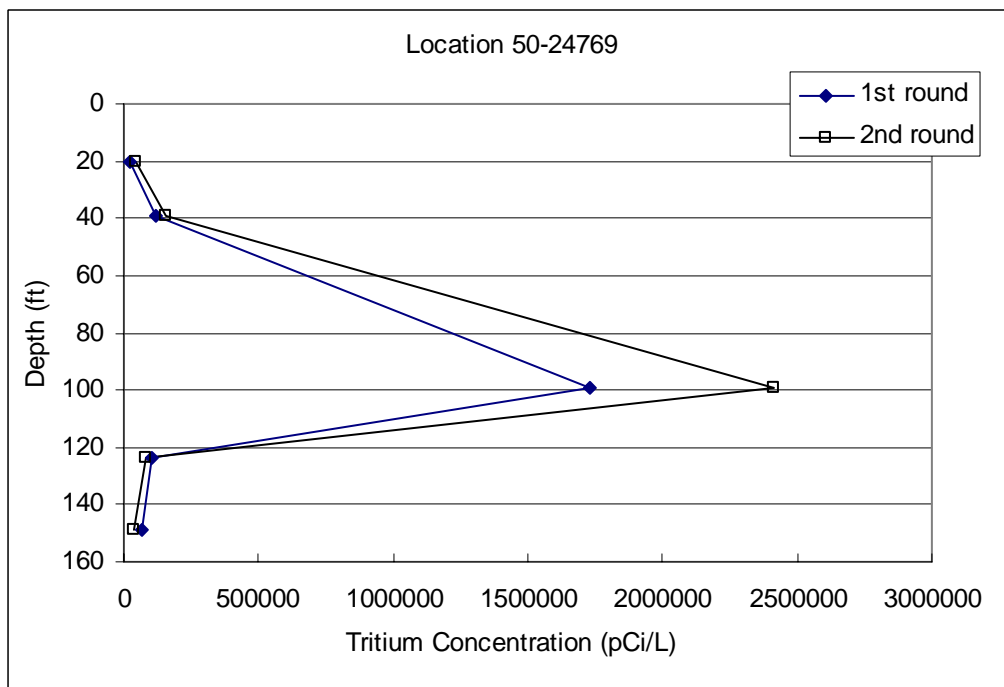


Figure F-2.6-9. Tritium concentrations in the first- and second-round pore-gas samples at location 50-24769

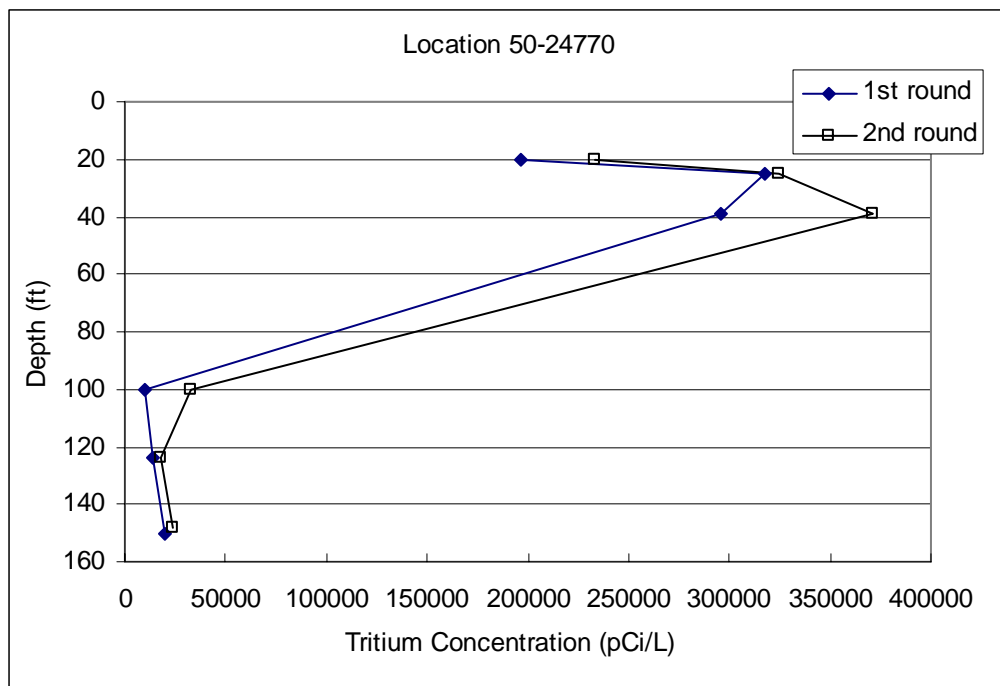


Figure F-2.6-10. Tritium concentrations in the first- and second-round pore-gas samples at location 50-24770

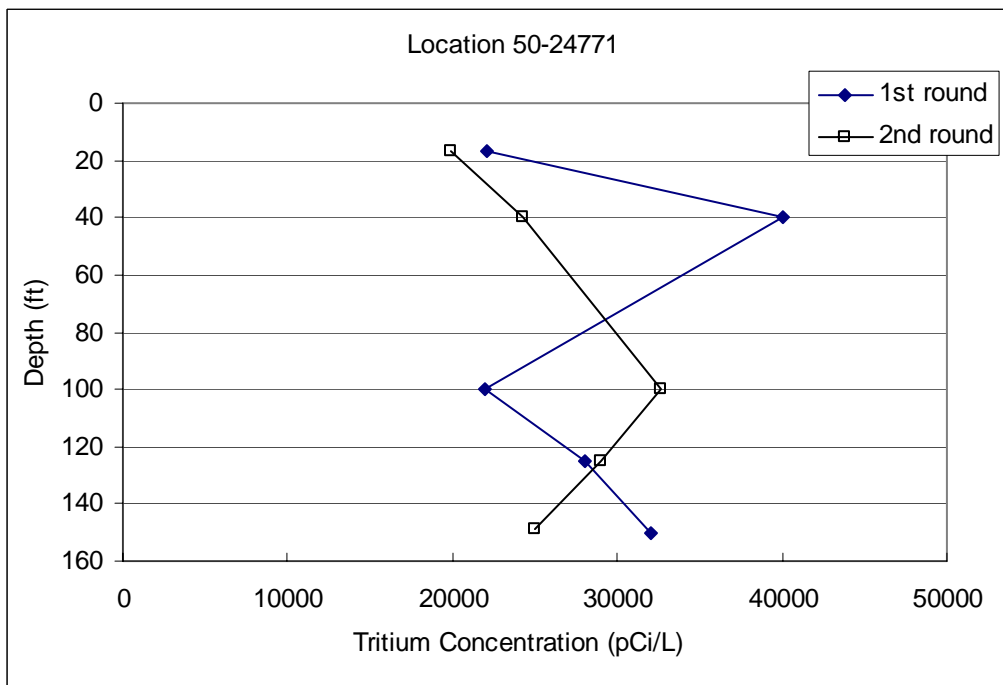


Figure F-2.6-11. Tritium concentrations in the first- and second-round pore-gas samples at location 50-24771

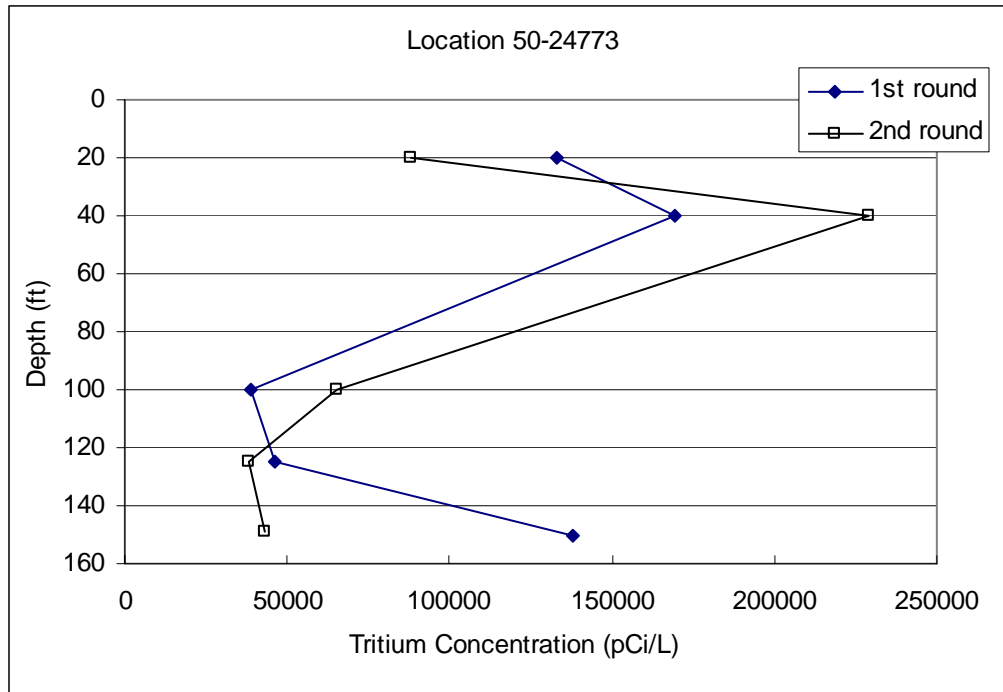


Figure F-2.6-12. Tritium concentrations in the first- and second-round pore-gas samples at location 50-24773

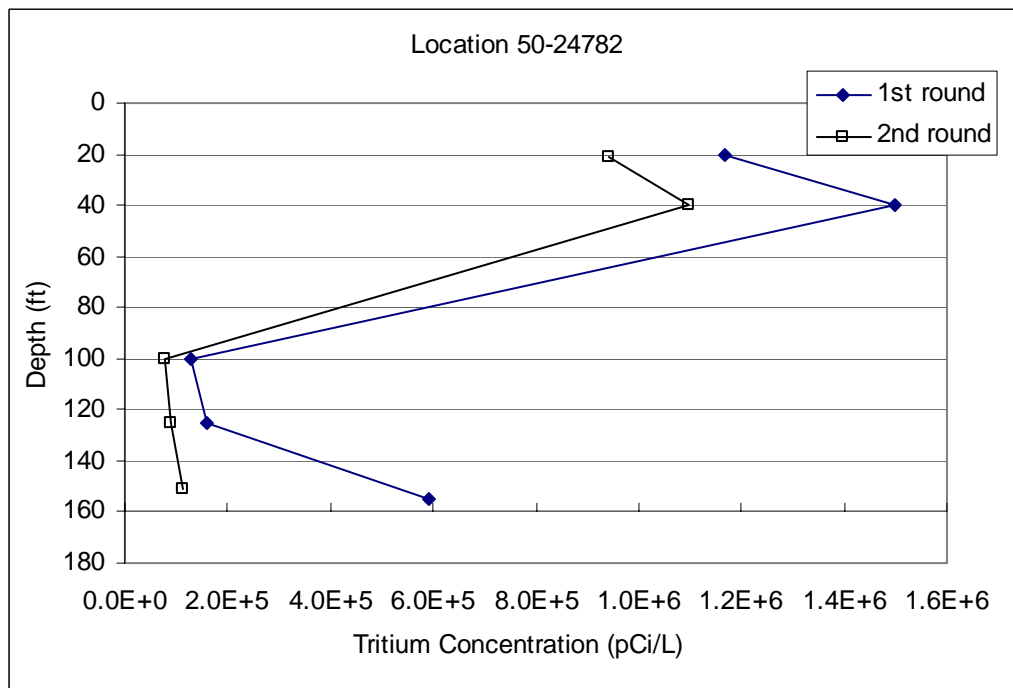


Figure F-2.6-13. Tritium concentrations in the first- and second-round pore-gas samples at location 50-24782

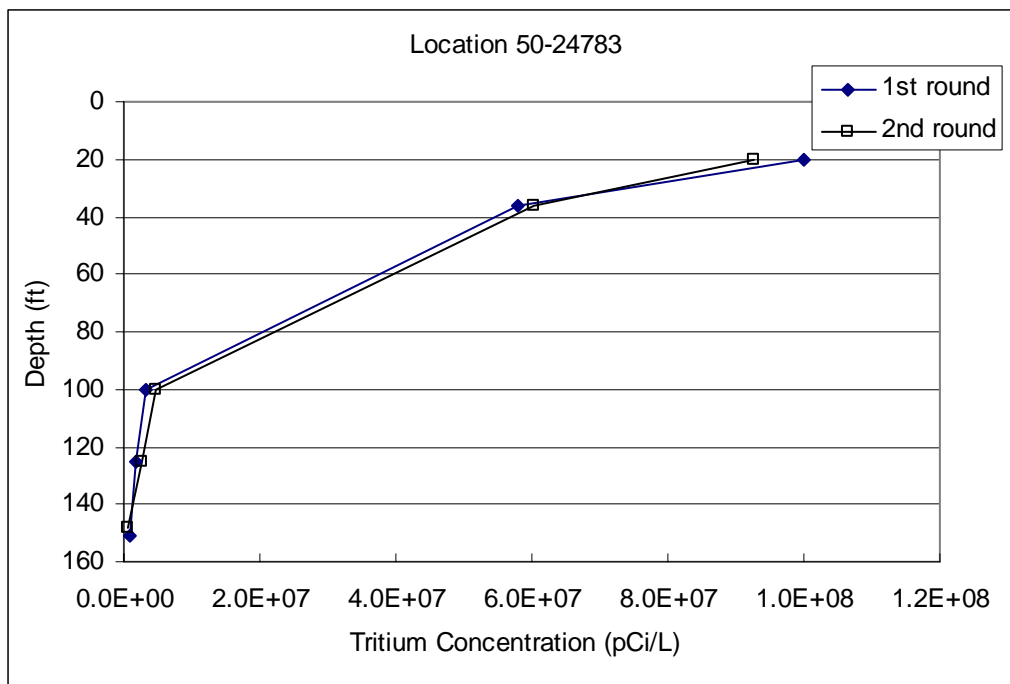


Figure F-2.6-14. Tritium concentrations in the first- and second-round pore-gas samples at location 50-24783

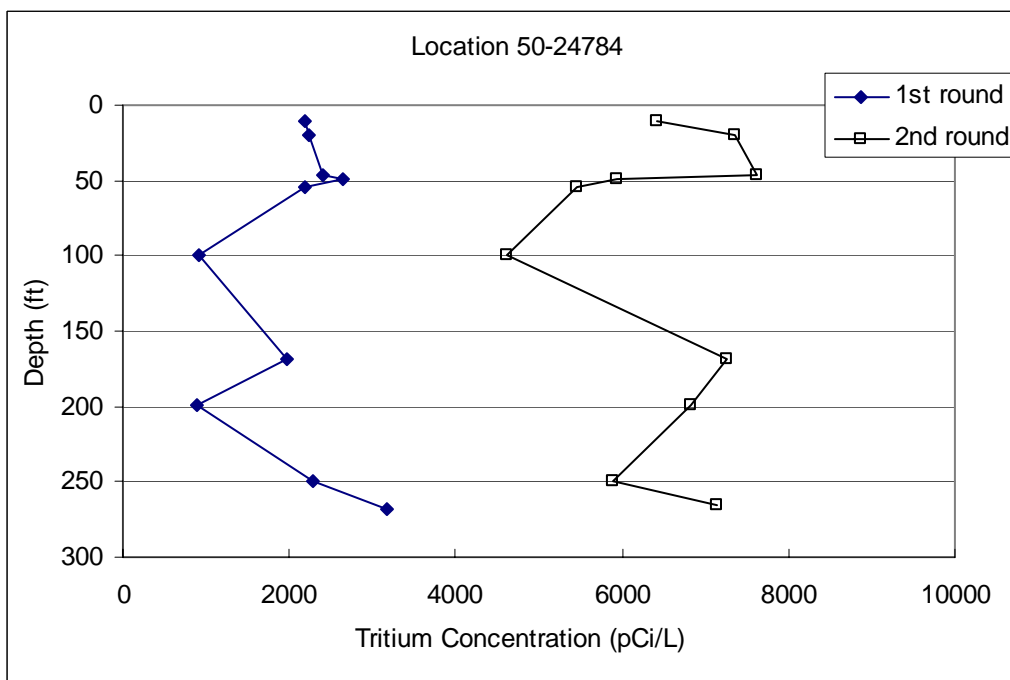


Figure F-2.6-15. Tritium concentrations in the first- and second-round pore-gas samples at location 50-24784

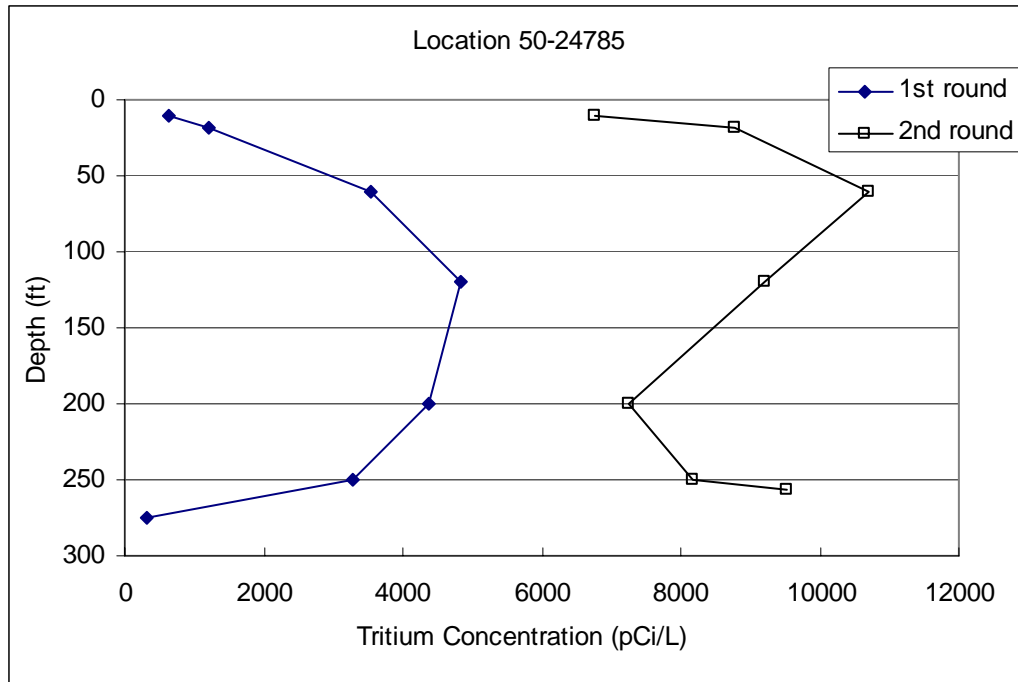


Figure F-2.6-16. Tritium concentrations in the first- and second-round pore-gas samples at location 50-24785 (Note: minimum detectable concentration used for first-round sample at 275 ft.)

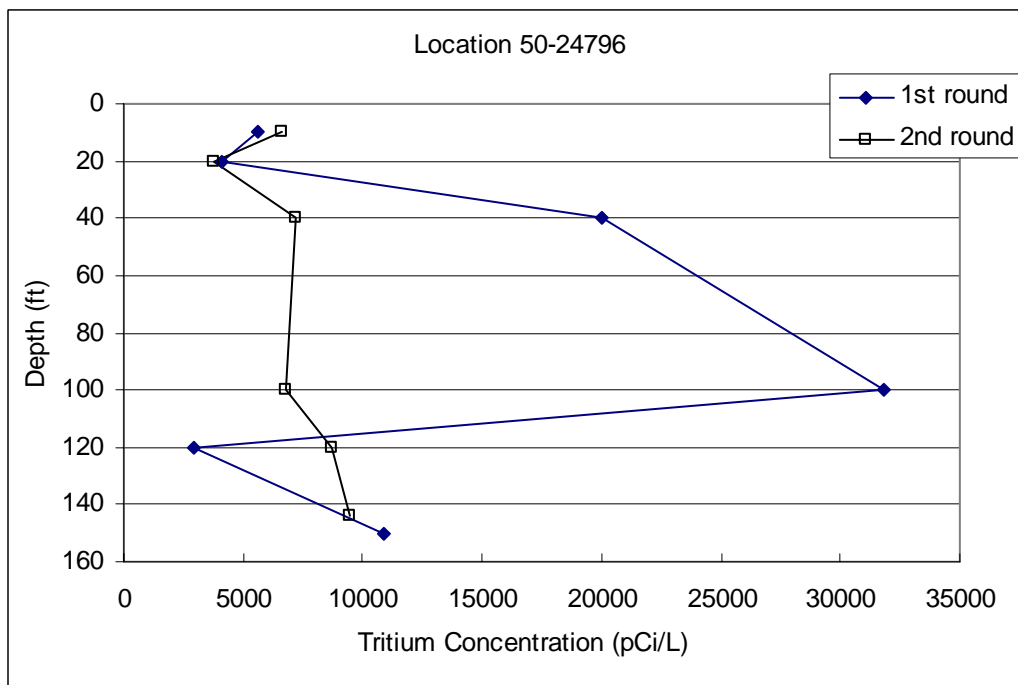


Figure F-2.6-17. Tritium concentrations in the first- and second-round pore-gas samples at location 50-24796

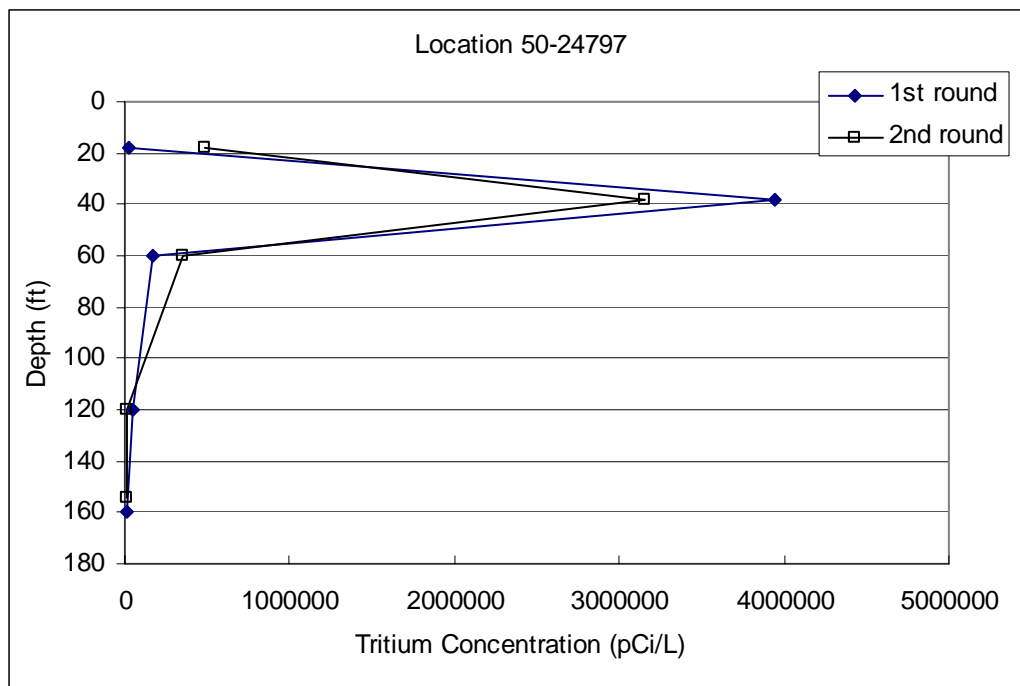


Figure F-2.6-18. Tritium concentrations in the first- and second-round pore-gas samples at location 50-24797

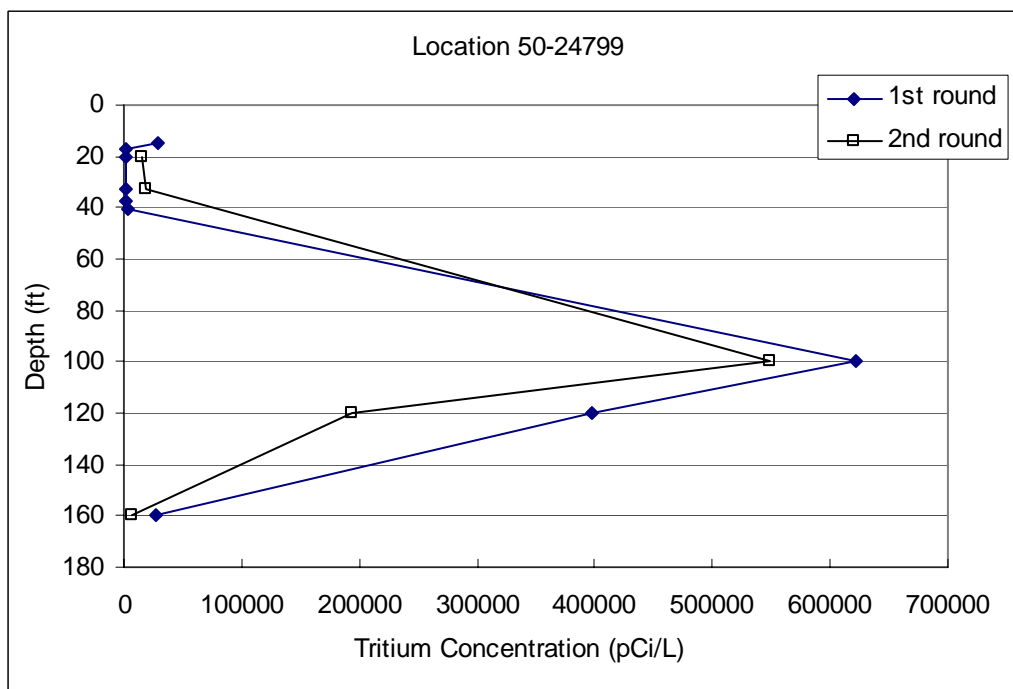


Figure F-2.6-19. Tritium concentrations in the first- and second-round pore-gas samples at location 50-24799

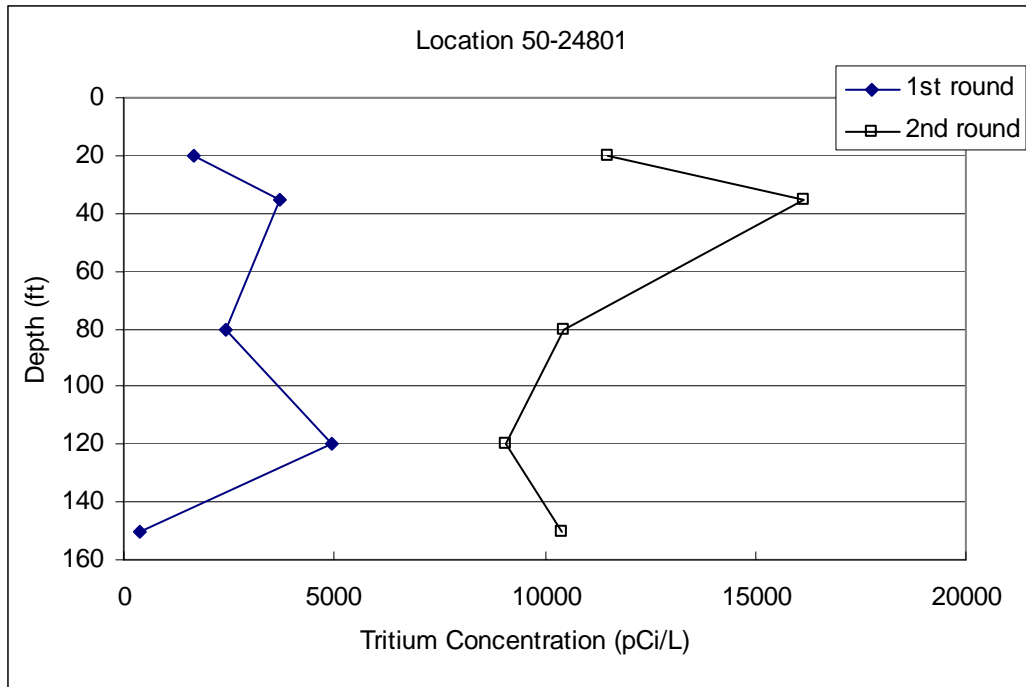


Figure F-2.6-20. Tritium concentrations in the first- and second-round pore-gas samples at location 50-24801 (Note: minimum detectable concentration used for first-round sample at 150 ft)

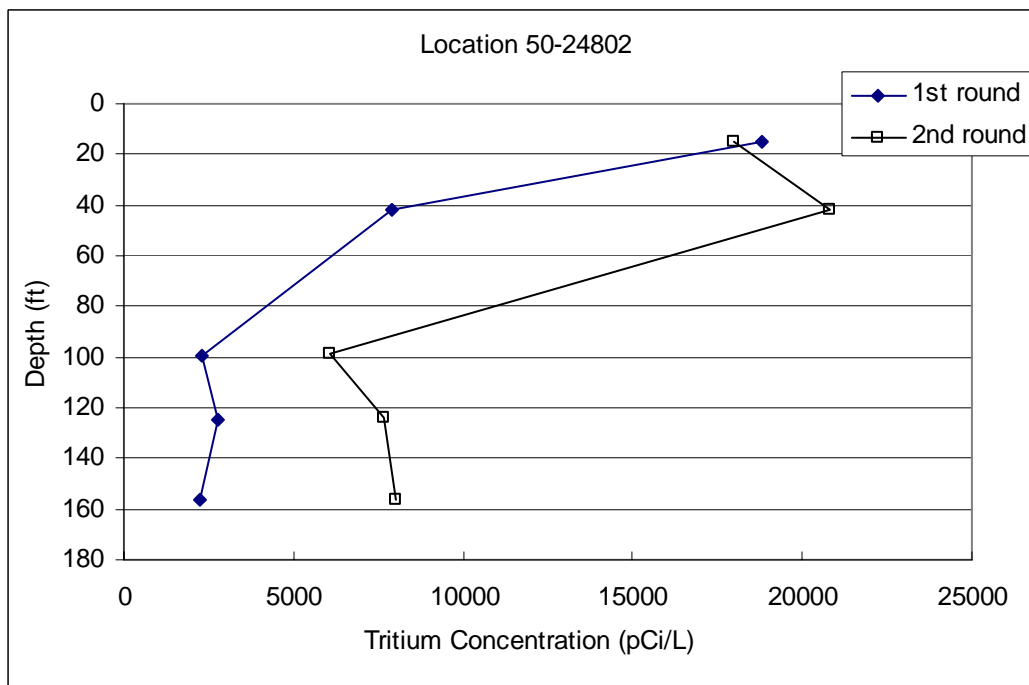


Figure F-2.6-21. Tritium concentrations in the first- and second-round pore-gas samples at location 50-24802

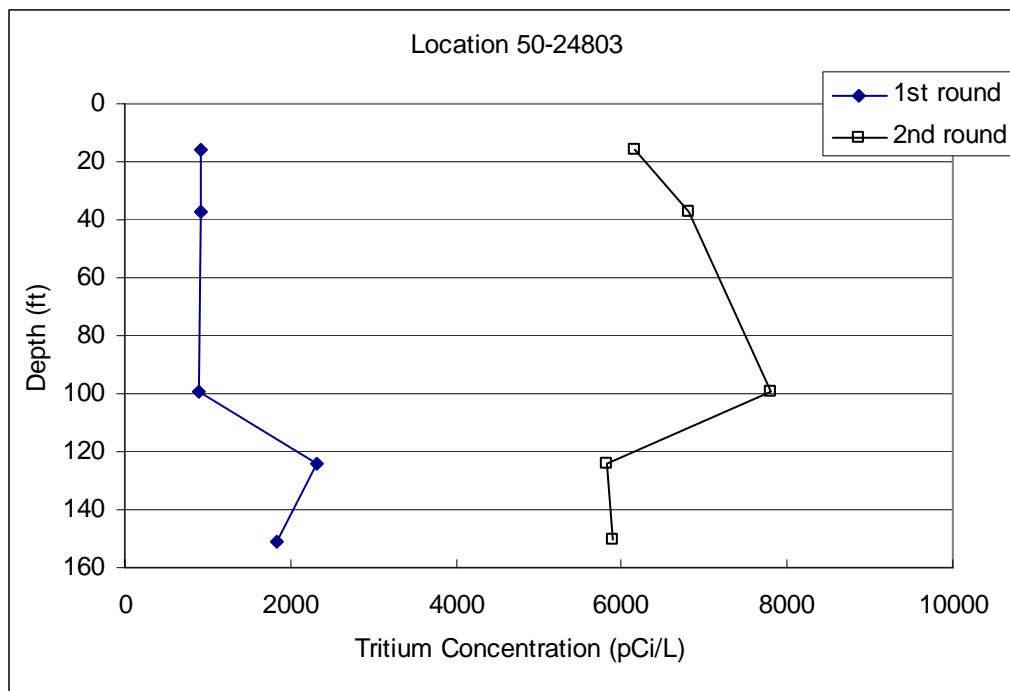


Figure F-2.6-22. Tritium concentrations in the first- and second-round pore-gas samples at location 50-24803

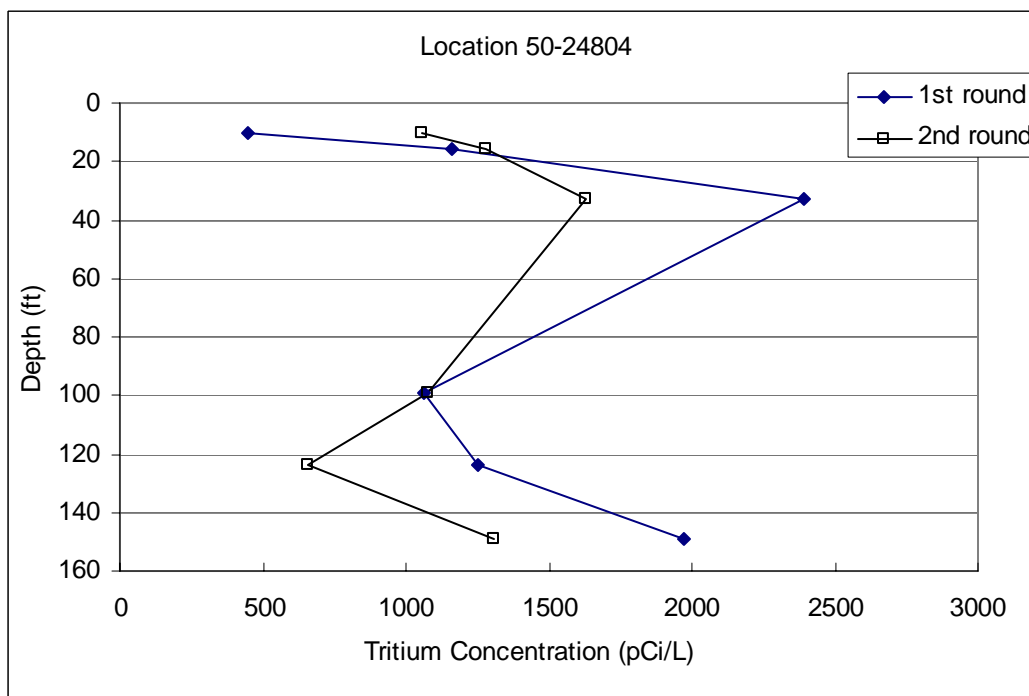


Figure F-2.6-23. Tritium concentrations in the first- and second-round pore-gas samples at location 50-24804

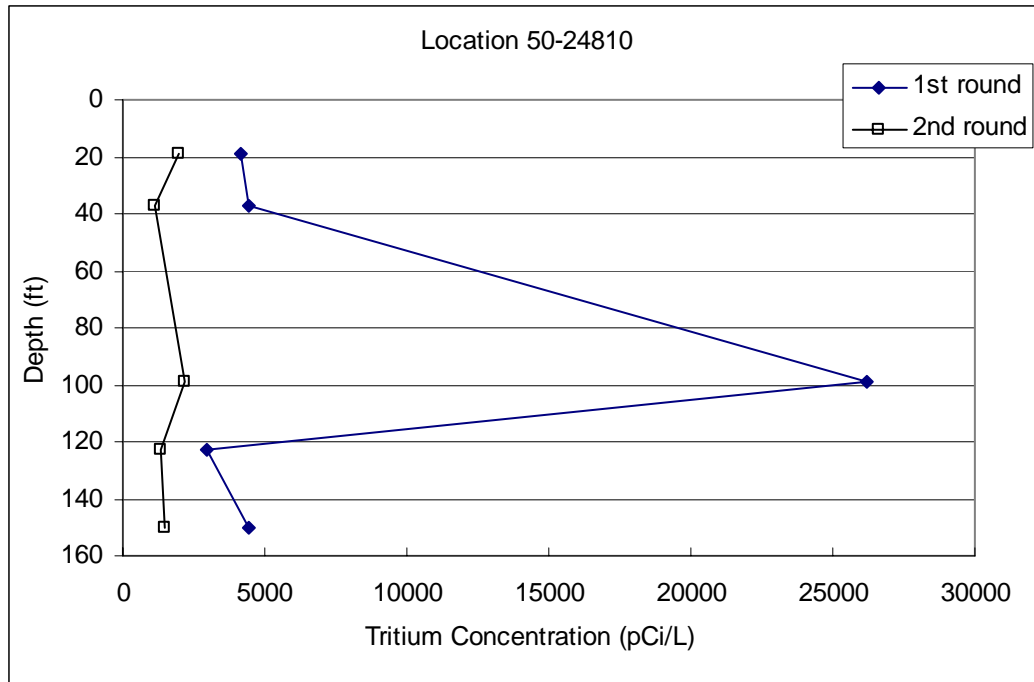


Figure F-2.6-24. Tritium concentrations in the first- and second-round pore-gas samples at location 50-24810

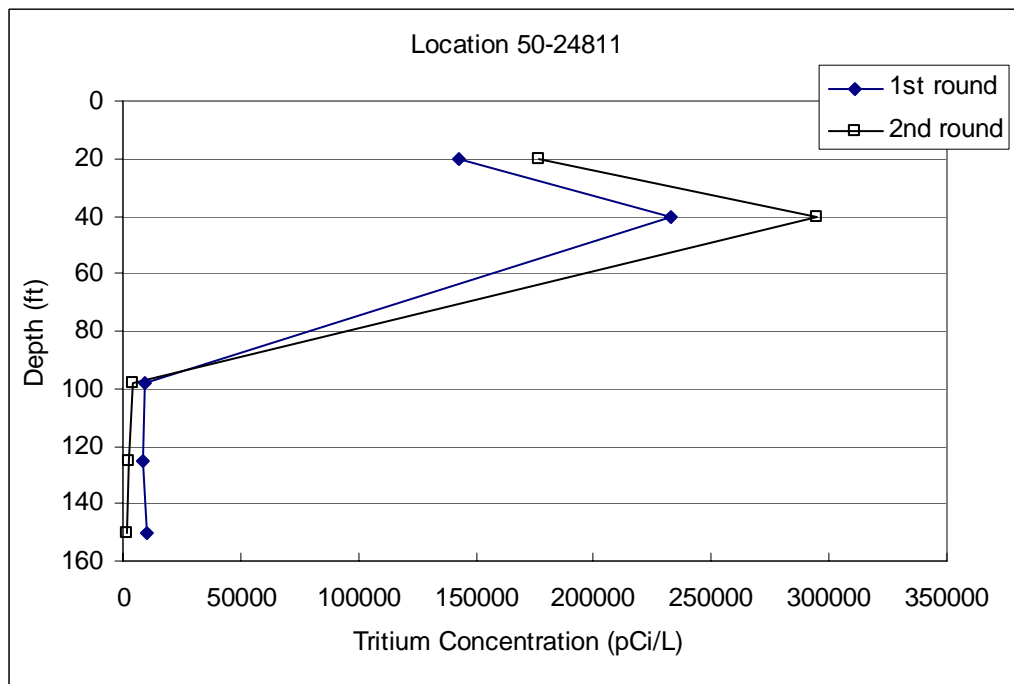


Figure F-2.6-25. Tritium concentrations in the first- and second-round pore-gas samples at location 50-24811

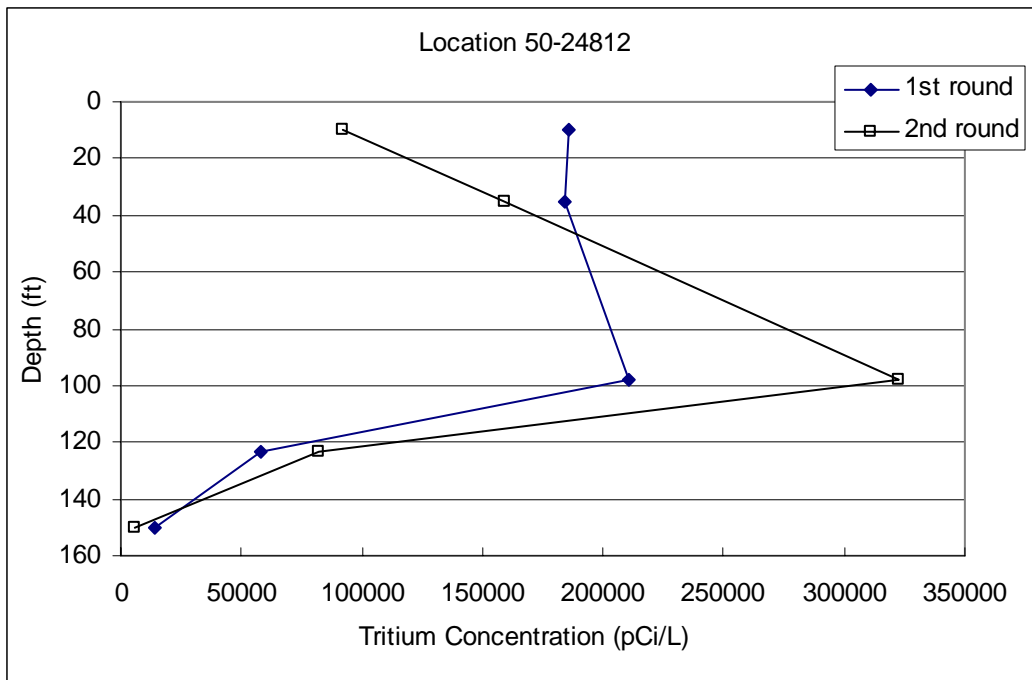


Figure F-2.6-26. Tritium concentrations in the first- and second-round pore-gas samples at location 50-24812

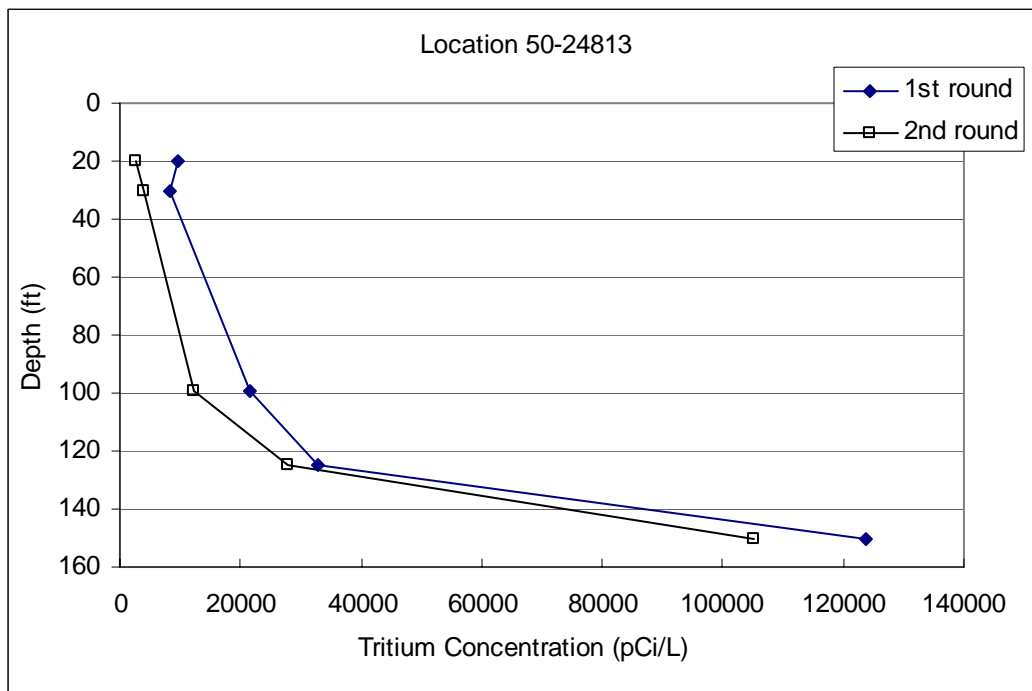


Figure F-2.6-27. Tritium concentrations in the first- and second-round pore-gas samples at location 50-24813

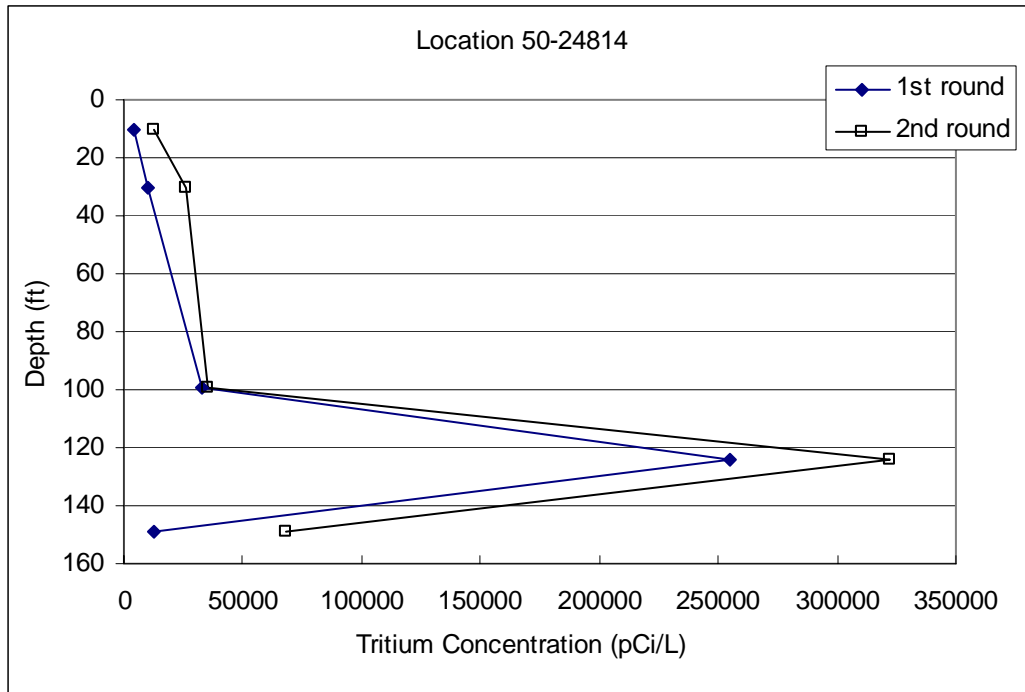


Figure F-2.6-28. Tritium concentrations in the first- and second-round pore-gas samples at location 50-24814

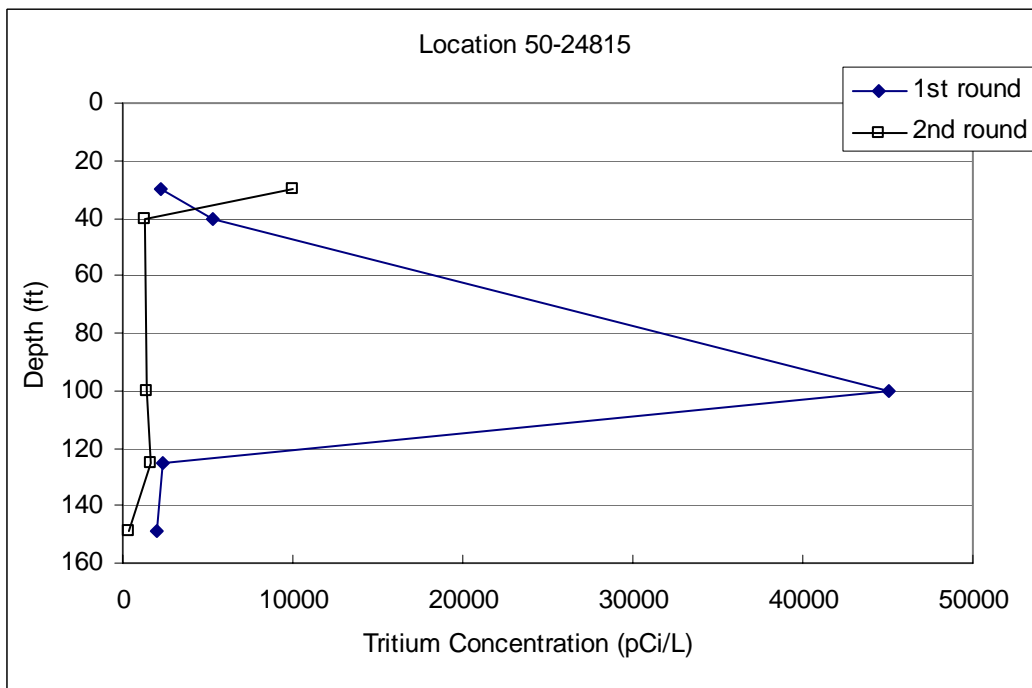


Figure F-2.6-29. Tritium concentrations in the first- and second-round pore-gas samples at location 50-24815

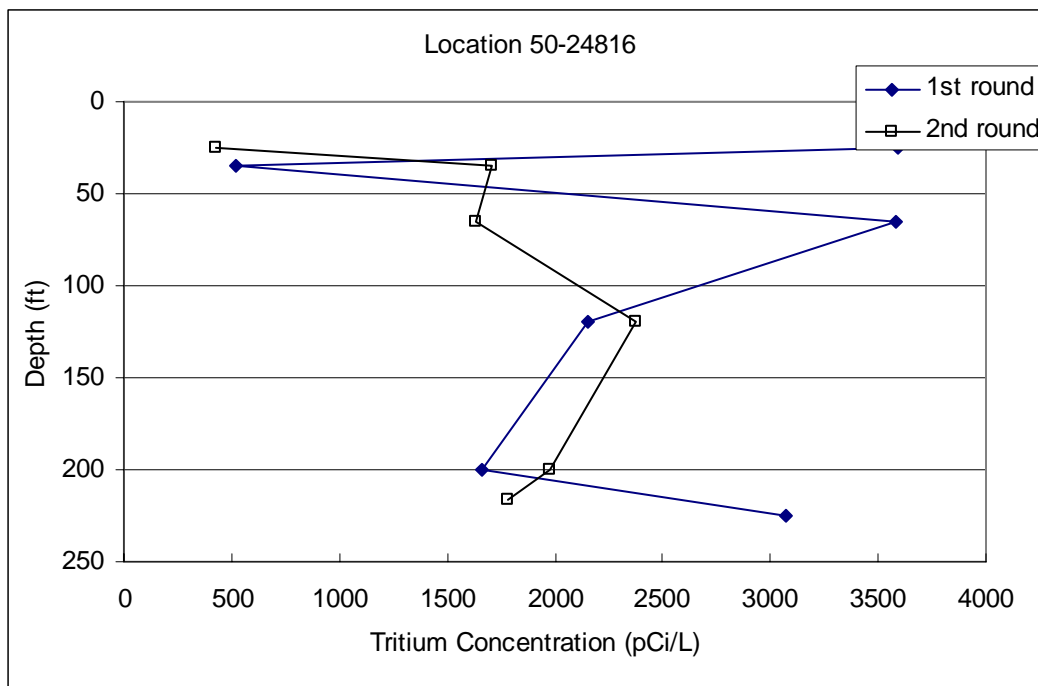


Figure F-2.6-30. Tritium concentrations in the first- and second-round pore-gas samples at location 50-24816

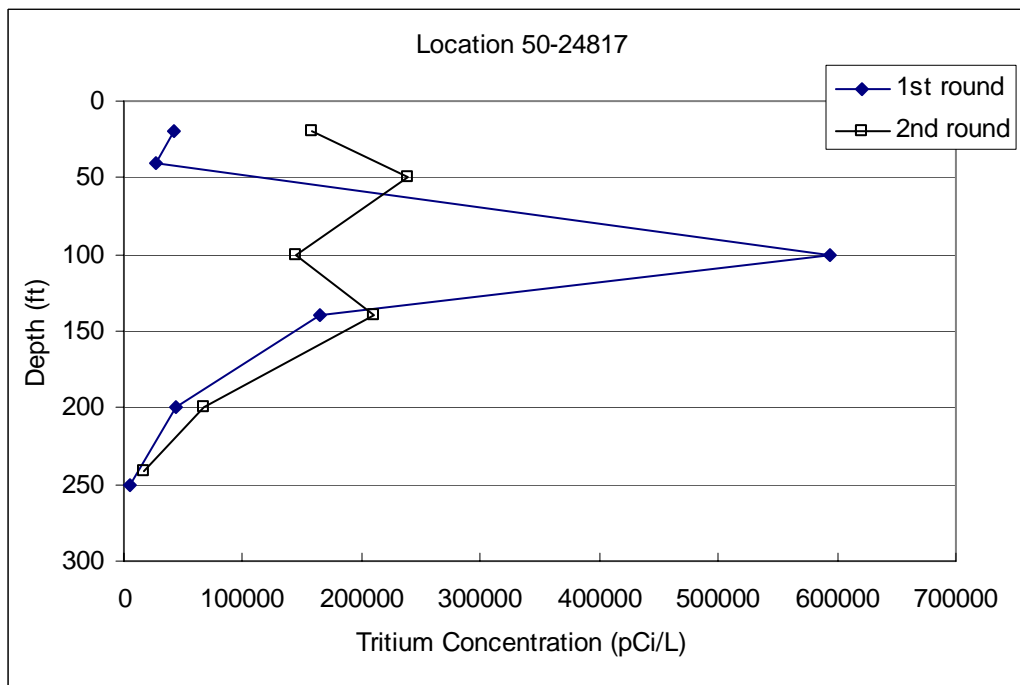


Figure F-2.6-31. Tritium concentrations in the first- and second-round pore-gas samples at location 50-24817

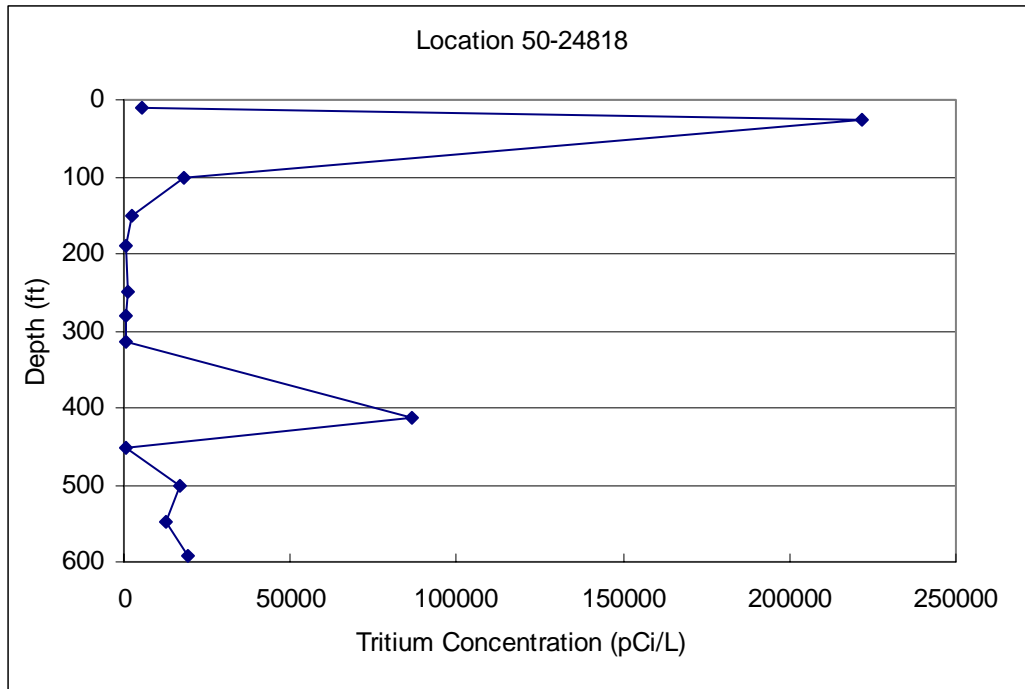


Figure F-2.6-32. Tritium concentrations in pore-gas samples at location 50-24818 (Note: minimum detectable concentration used for sample at 315 ft)

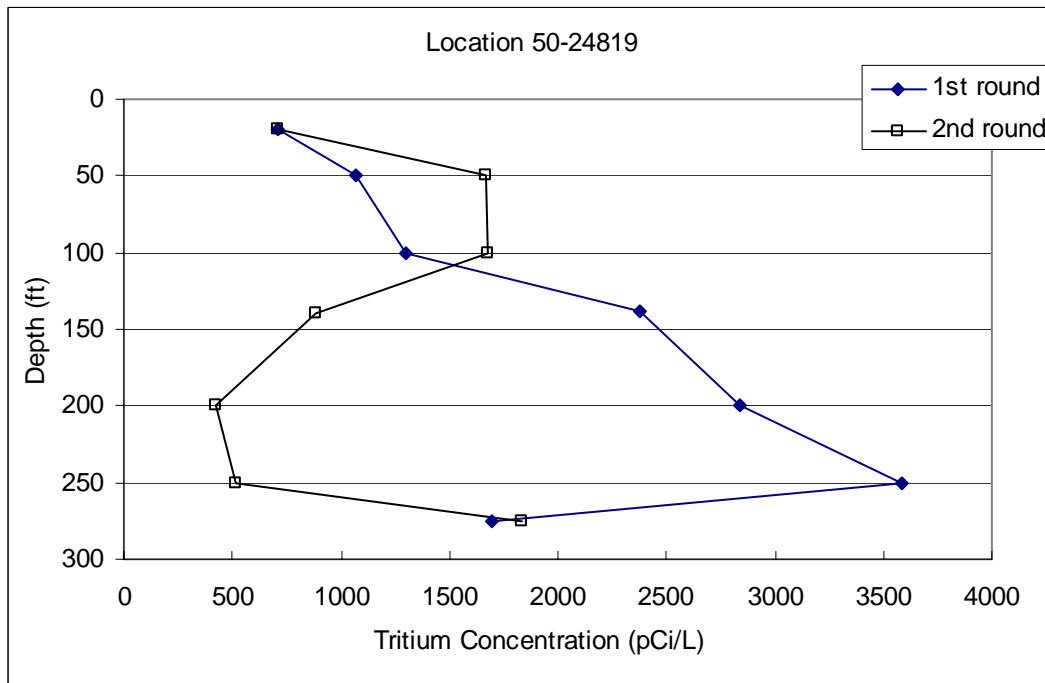


Figure F-2.6-33. Tritium concentrations in the first- and second-round pore-gas samples at location 50-24819

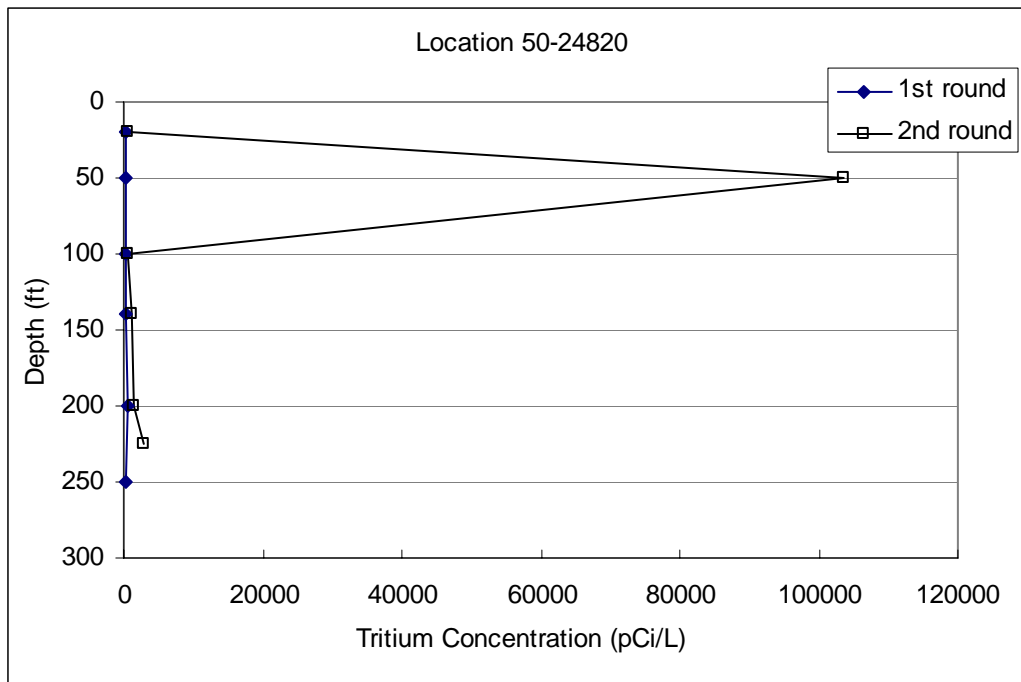


Figure F-2.6-34. Tritium concentrations in the first- and second-round pore-gas samples at location 50-24820 (Note: minimum detectable concentration used for first-round sample at 100 ft.)

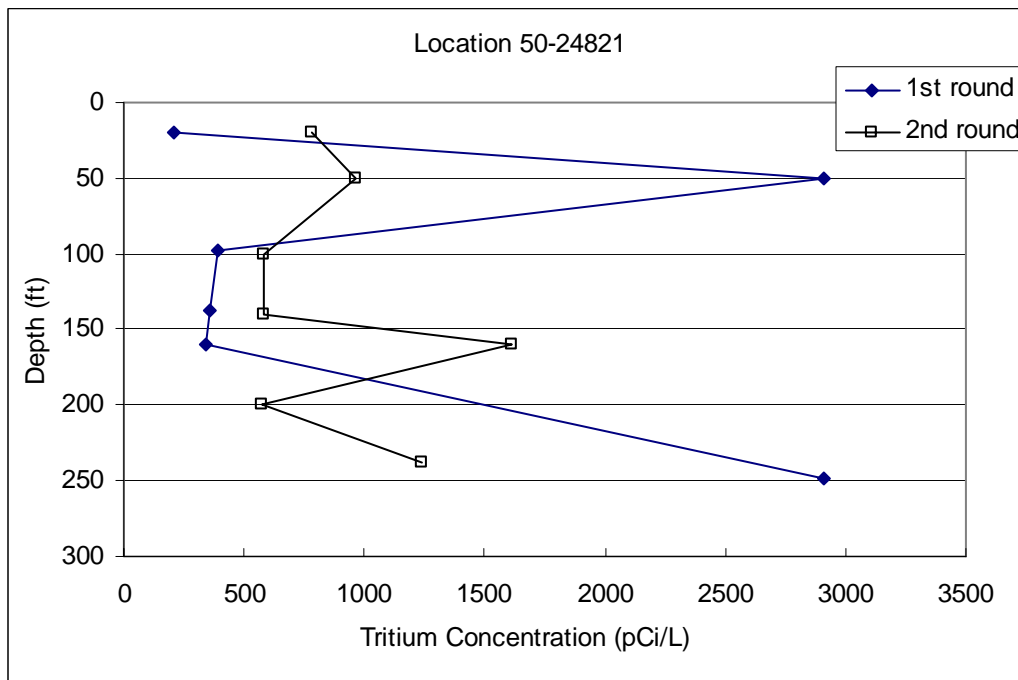


Figure F-2.6-35. Tritium concentrations in the first- and second-round pore-gas samples at location 50-24821 (Note: minimum detectable concentration used for first-round samples at 20, 50, and 248.6 ft and for second-round samples at 100, 140, and 200 ft.)

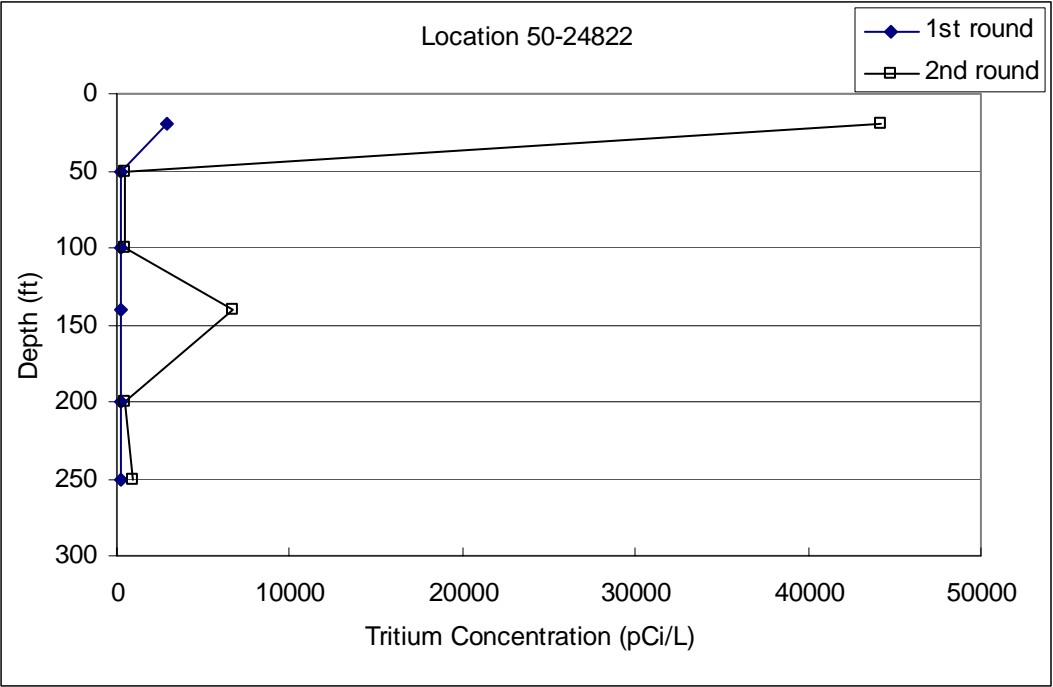


Figure F-2.6-36. Tritium concentrations in the first- and second-round pore-gas samples at location 50-24822 (Note: minimum detectable concentration used for all the first-round samples and for second-round samples at 50, 100, and 200 ft.)

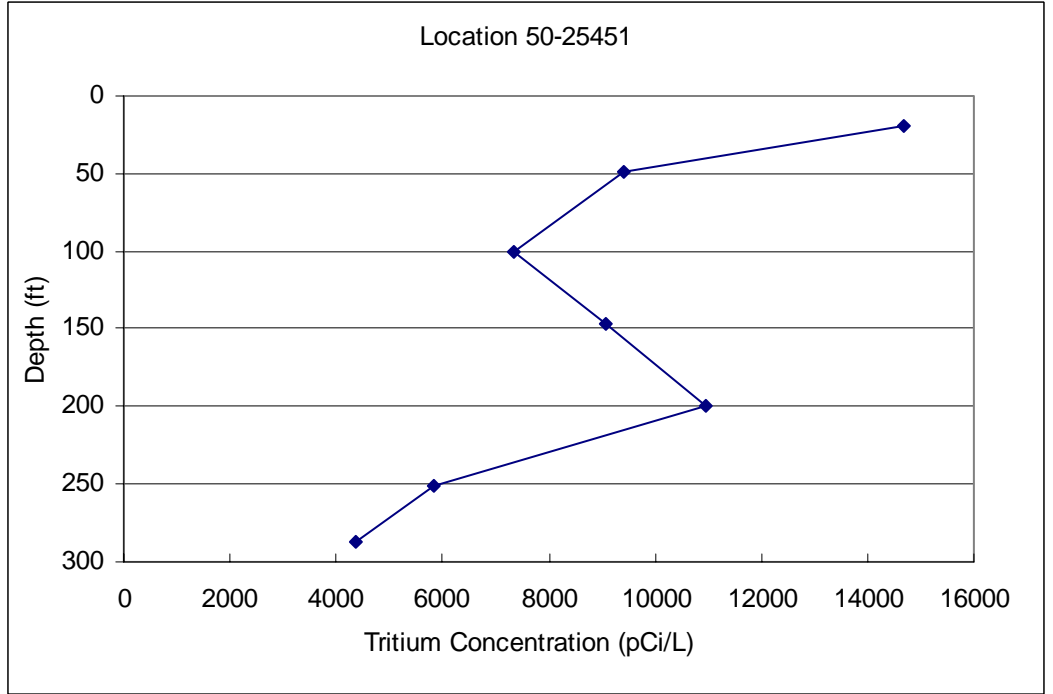


Figure F-2.6-37. Tritium concentrations in pore-gas samples at location 50-25451

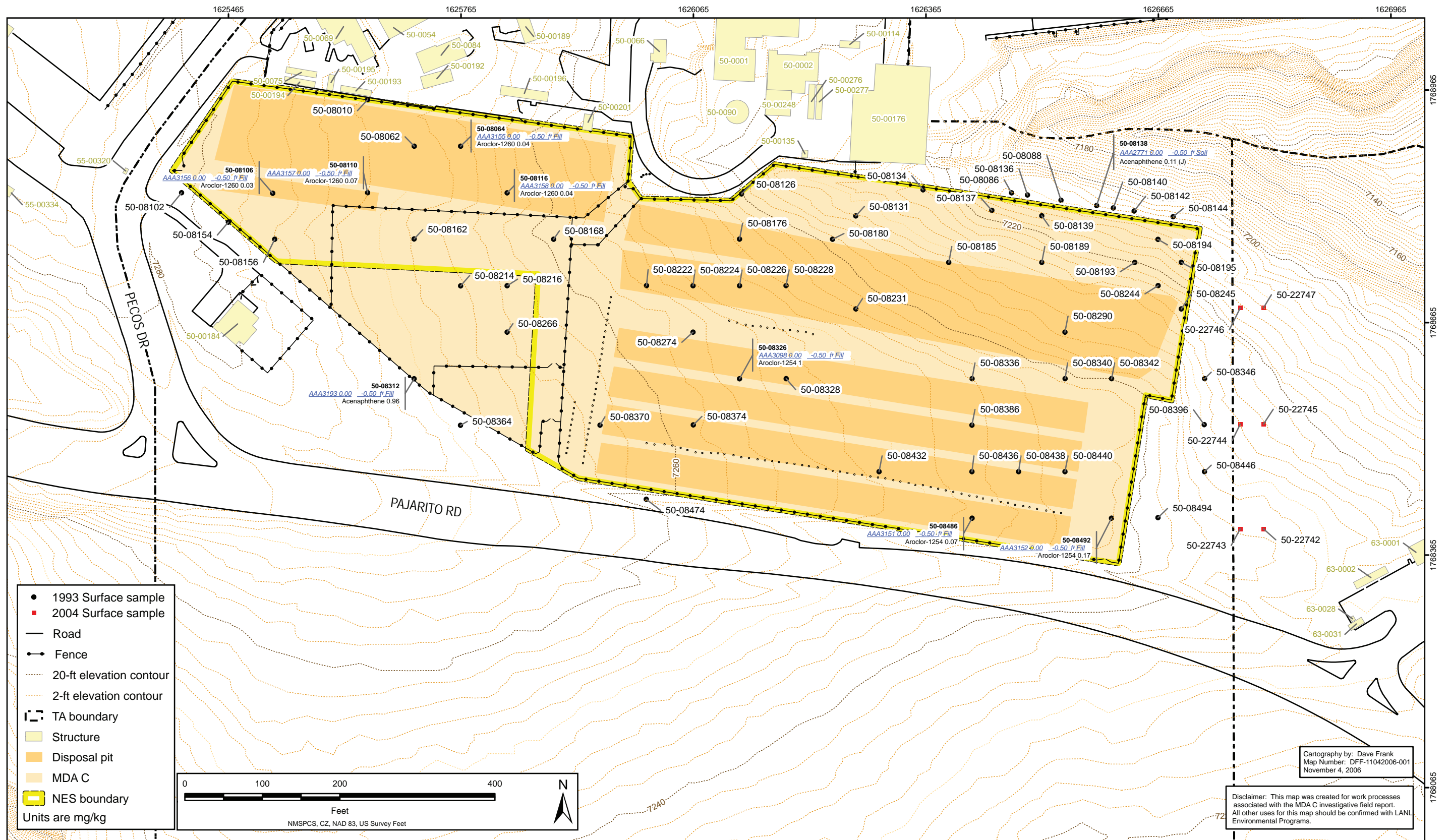
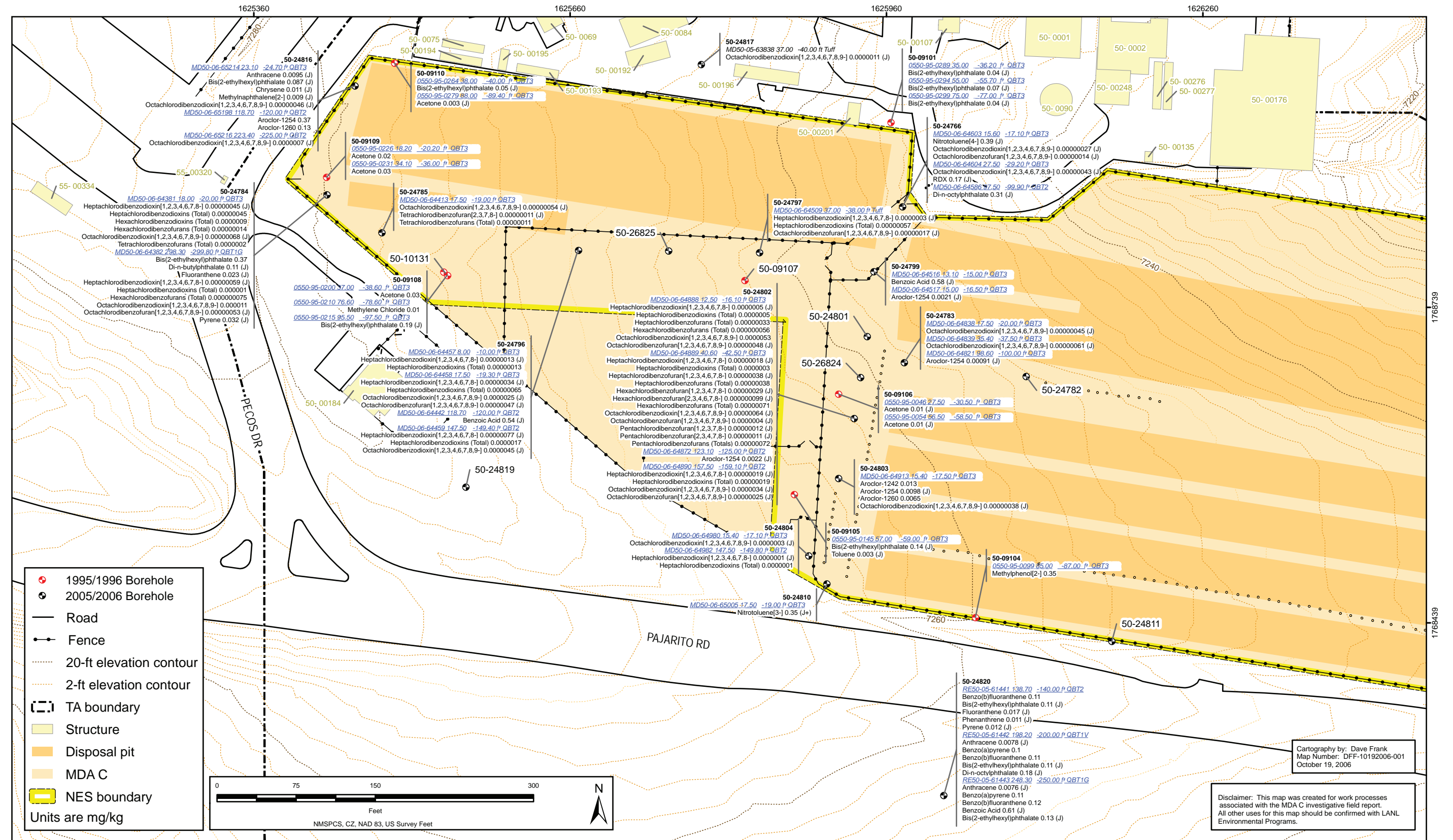


Figure F-2.8-1. Organic chemicals detected in surface samples at MDA C



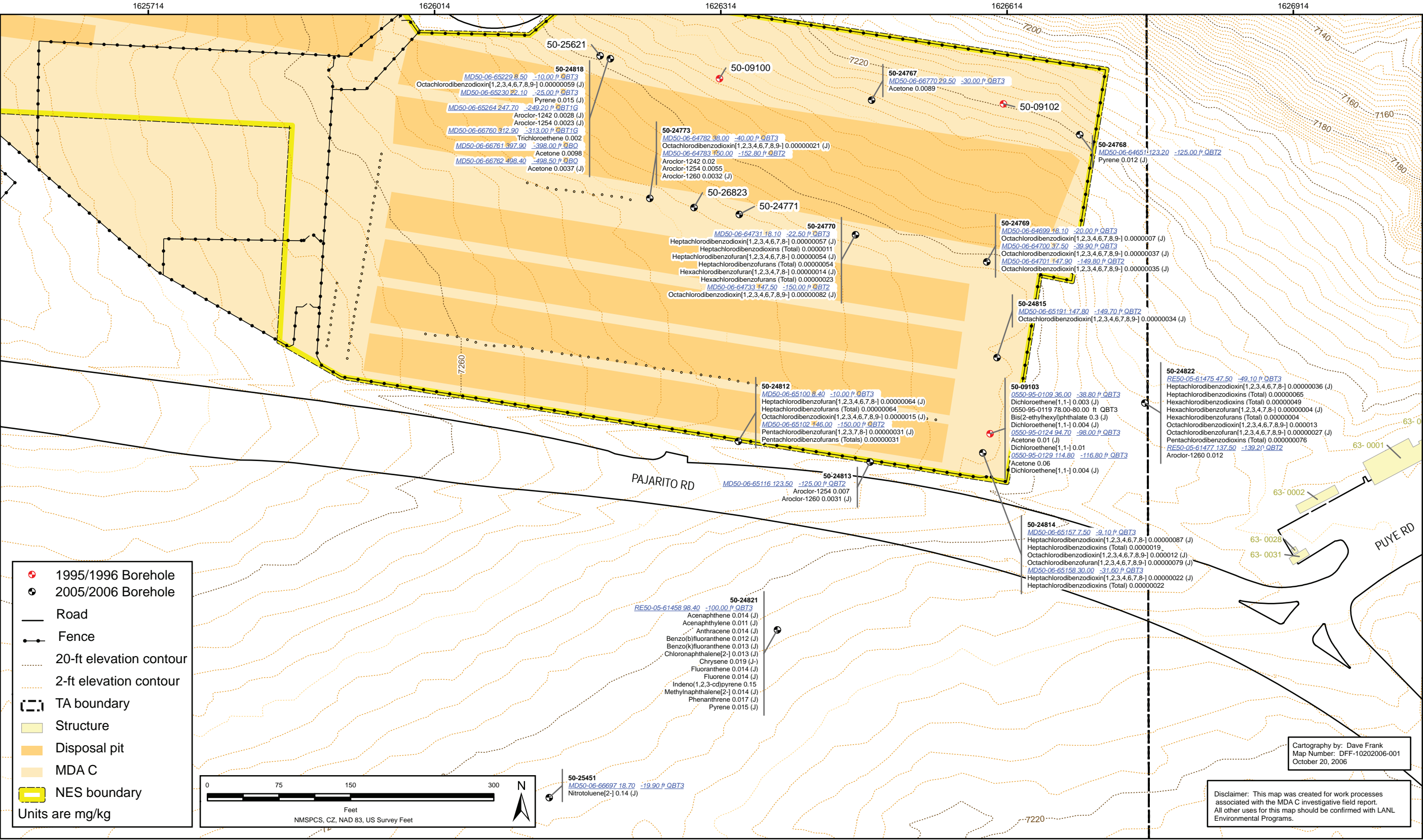


Figure F-2.9-2. Organic chemicals detected in subsurface tuff samples, eastern portion of MDA C

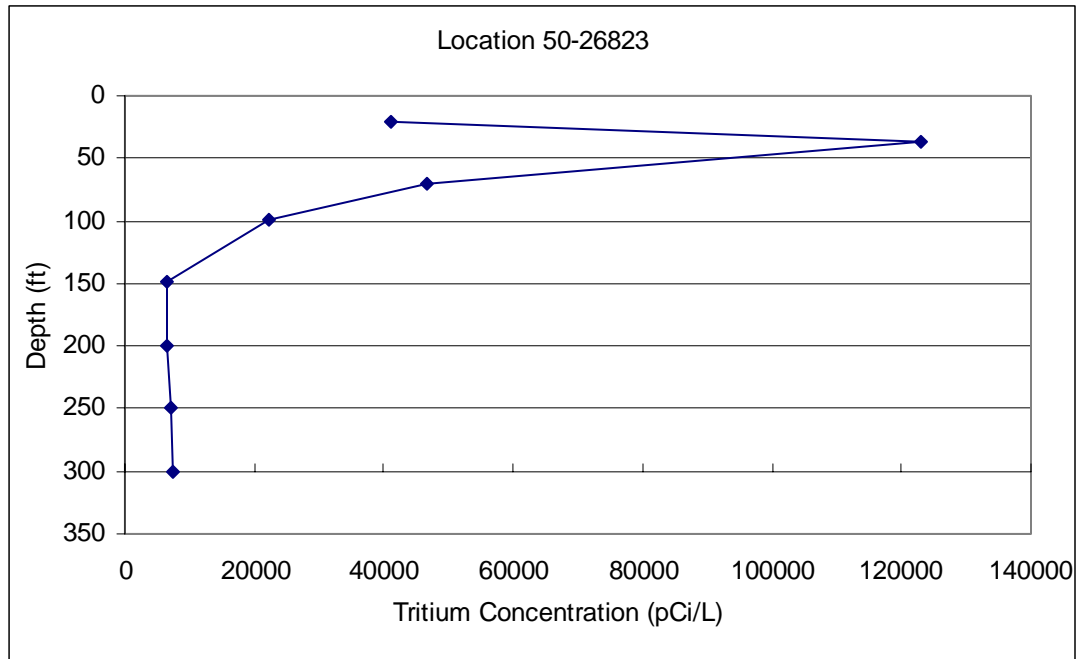


Figure F-2.12-1. Tritium concentrations in pore-gas samples at location 50-26823

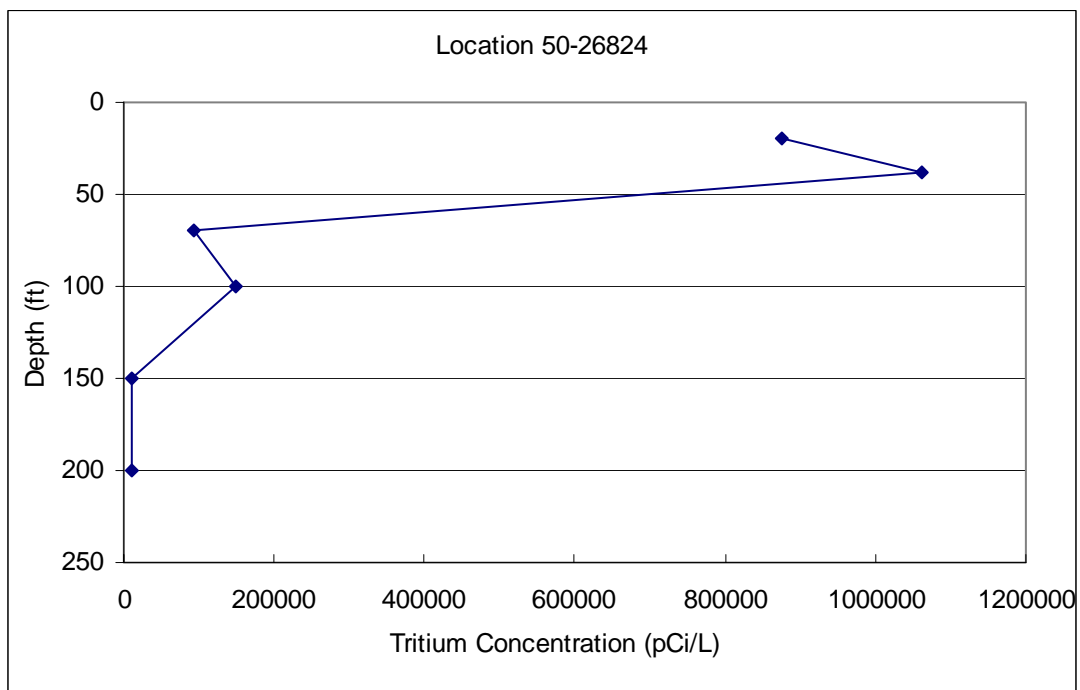


Figure F-2.12-2. Tritium concentrations in pore-gas samples at location 50-26824

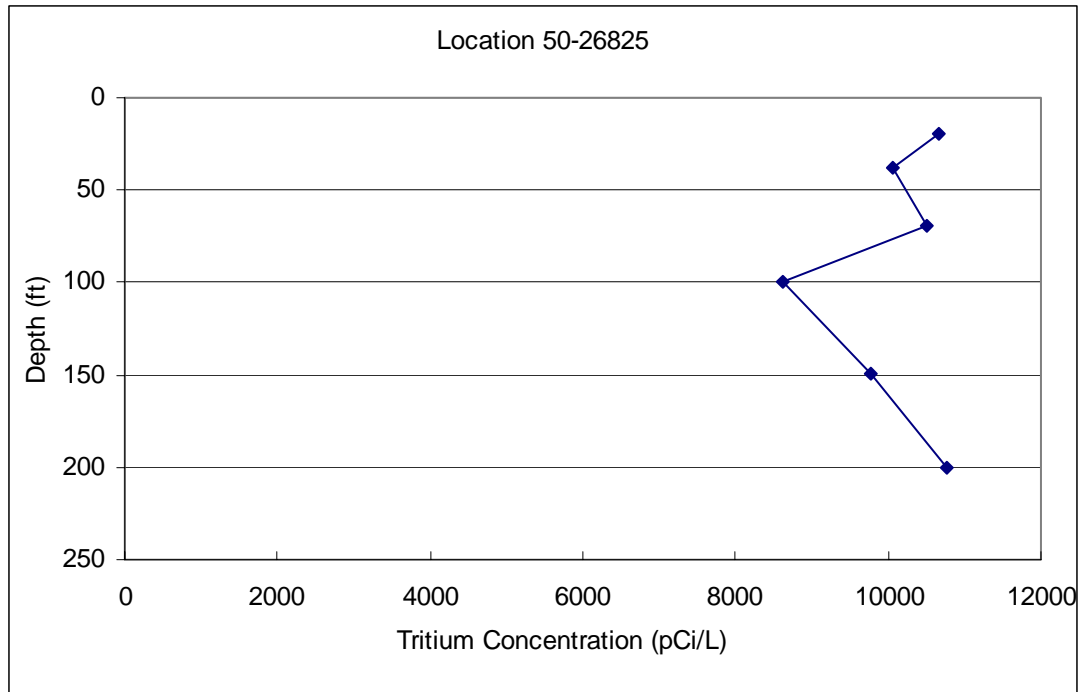


Figure F-2.12-3. Tritium concentrations in pore-gas samples at location 50-26825

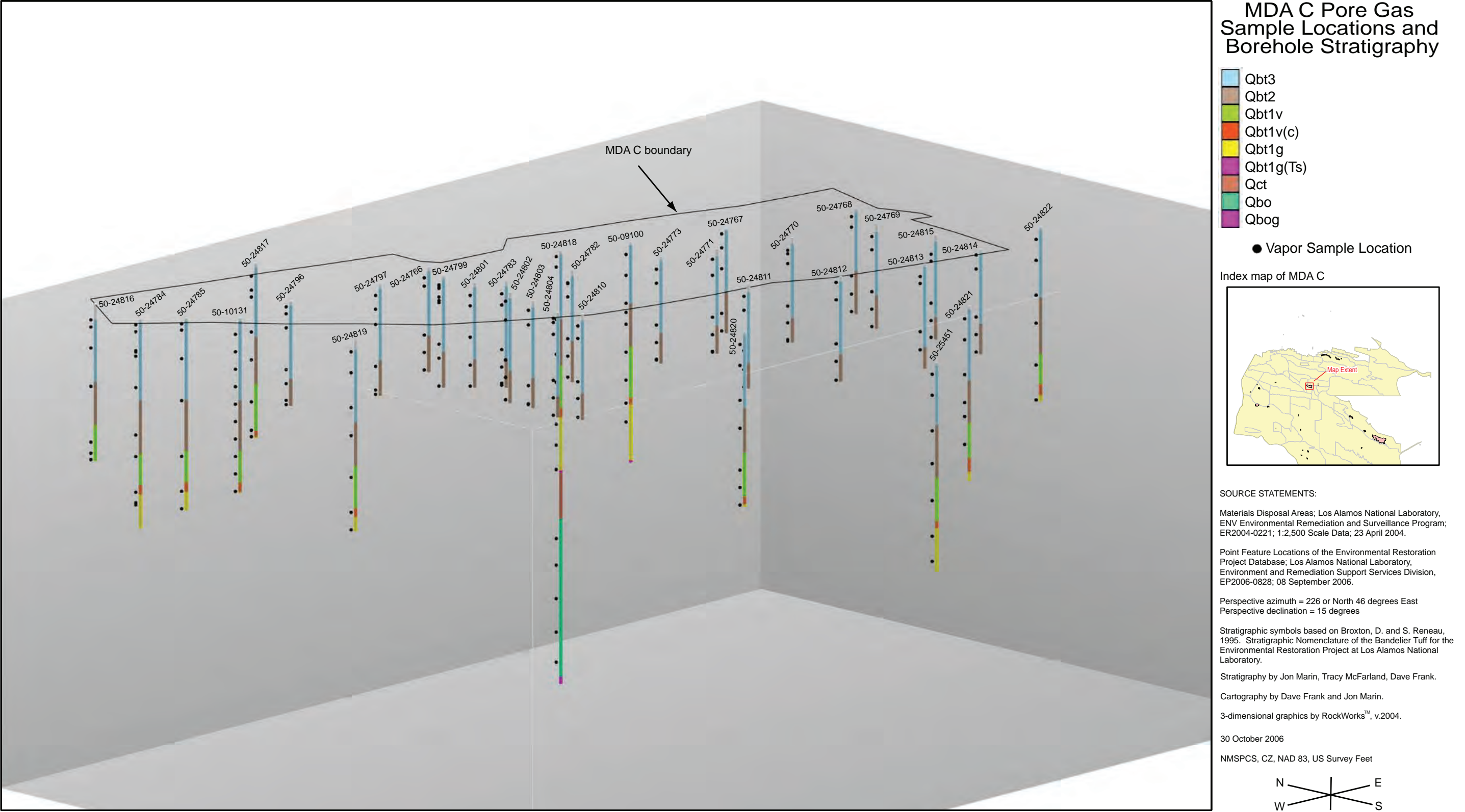


Figure F-3.2-1. Pore-gas sampling locations

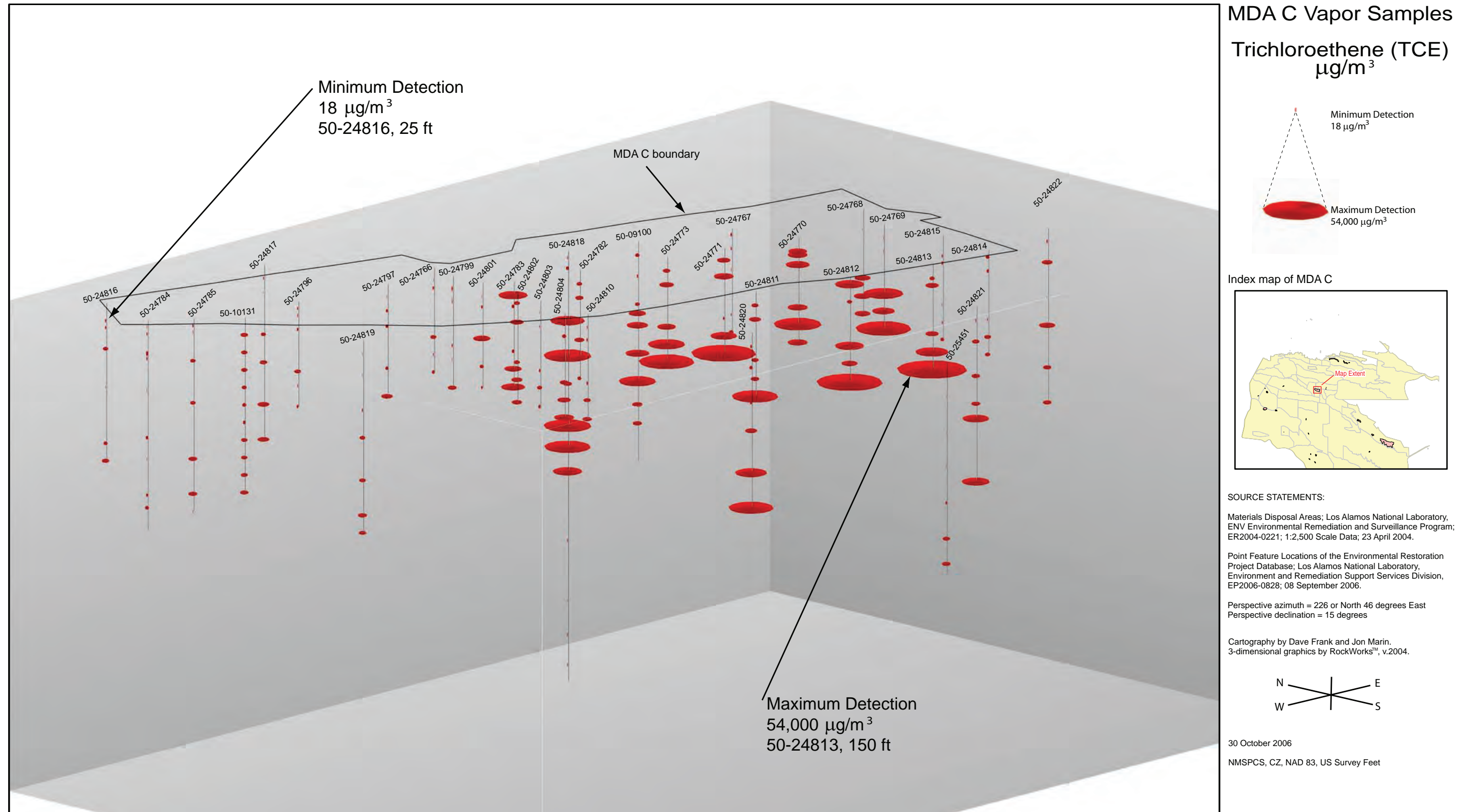
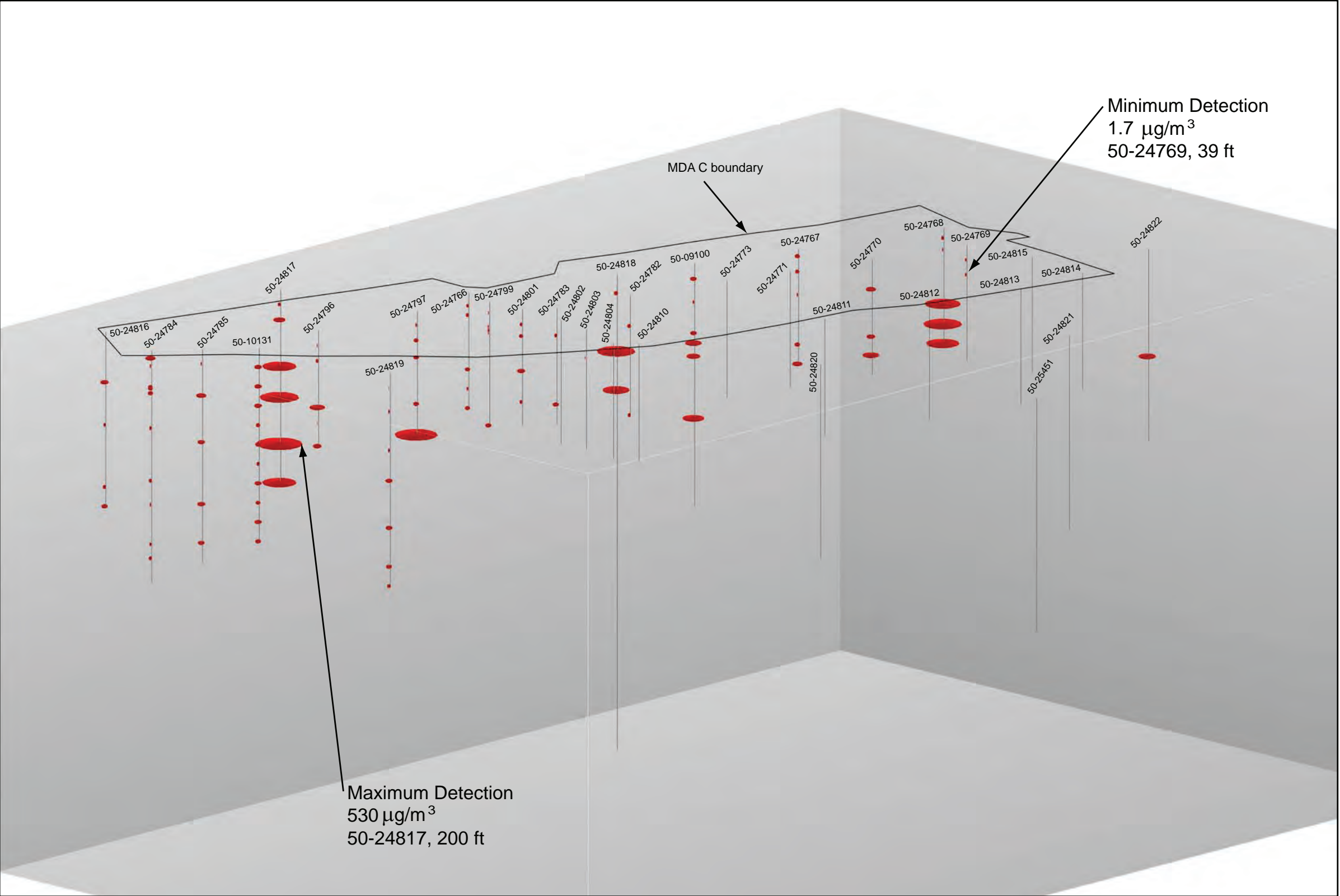
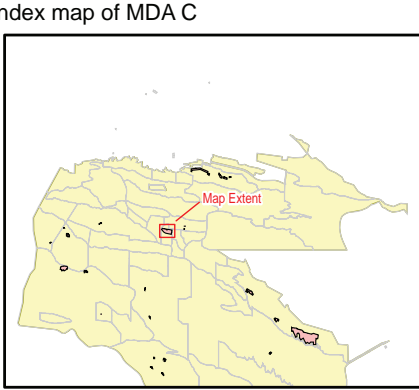
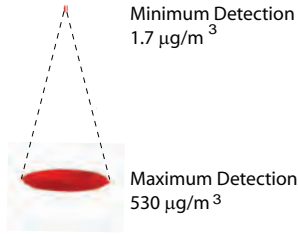


Figure F-3.3-1. Trichloroethene concentrations in pore gas



MDA C Pore Gas
1,1,1-Trichloroethane (TCA)
 $\mu\text{g}/\text{m}^3$



SOURCE STATEMENTS:

Materials Disposal Areas; Los Alamos National Laboratory, ENV Environmental Remediation and Surveillance Program; ER2004-0221; 1:2,500 Scale Data; 23 April 2004.

Point Feature Locations of the Environmental Restoration Project Database; Los Alamos National Laboratory, Environment and Remediation Support Services Division, EP2006-0828; 08 September 2006.

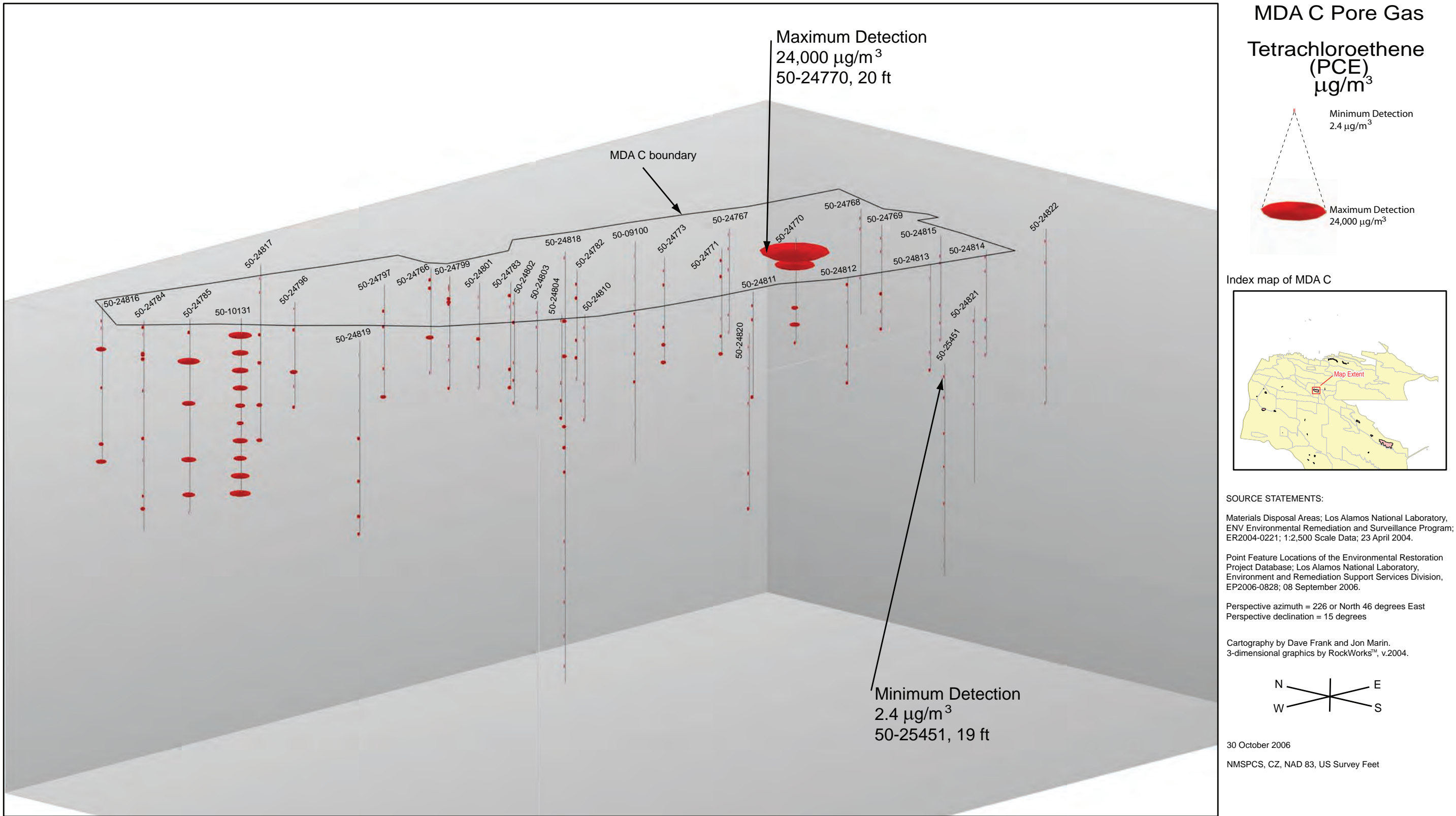
Perspective azimuth = 226 or North 46 degrees East
Perspective declination = 15 degrees

Cartography by Dave Frank and Jon Marin.
3-dimensional graphics by RockWorks™, v.2004.



30 October 2006
NMSPCS, CZ, NAD 83, US Survey Feet

Figure F-3.3-2. 1,1,1-Trichloroethane concentrations in pore gas



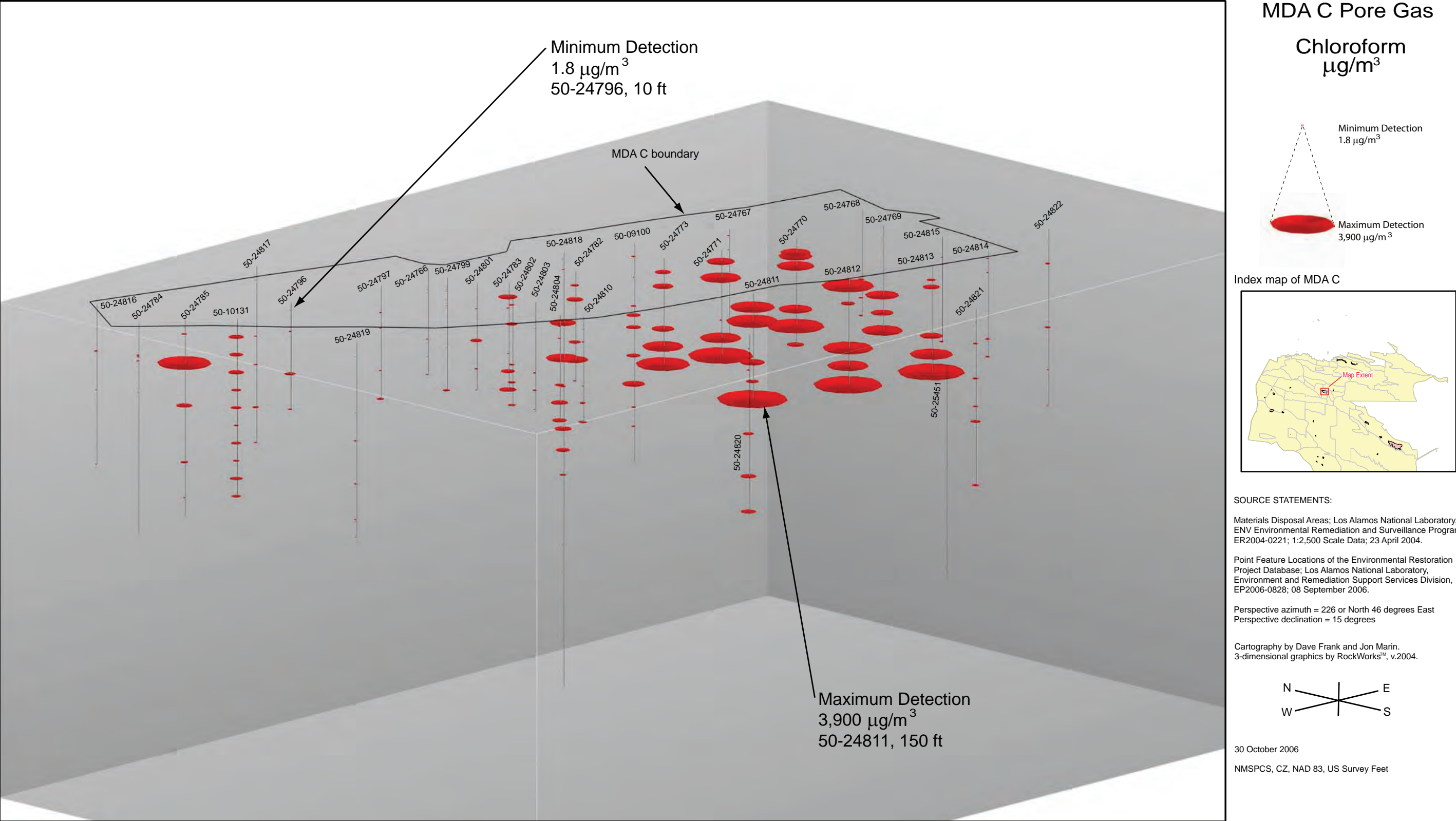


Figure F-3.3-4. Chloroform concentrations in pore gas

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Table F-1.2-1
Summary of COPCs at MDA C by Media

	Soil/Fill	Tuff	Pore Gas
Inorganic Chemicals	Lead and silver based on 1993 CST-Onsite data	Aluminum	n/a*
		Antimony	
		Arsenic	
		Barium	
		Beryllium	
		Cadmium	
		Chromium	
		Cobalt	
		Copper	
		Cyanide (Total)	
		Iron	
		Lead	
		Manganese	
		Mercury	
		Nickel	
		Nitrate	
		Perchlorate	
		Selenium	
		Silver	
		Vanadium	
		Zinc	
Radionuclides	Americium-241	Americium-241	Tritium
	Cesium-134	Cesium-134	
	Plutonium-238	Cesium-137	
	Plutonium-239	Cobalt-60	
	Thorium-232	Europium-152	
	Tritium	Plutonium-238	
	Uranium-238	Plutonium-239	
		Ruthenium-106	
		Sodium-22	
		Strontium-90	
		Uranium-234	
		Uranium-235	
		Uranium-238	
Organic Chemicals	Acenaphthene	Acenaphthene	Acetone
	Aroclor-1254	Acenaphthylene	Benzene
	Aroclor-1260	Acetone	Butadiene[1,3-]
		Anthracene	Butanol[1-]
		Aroclor-1242	Butanone[2-]
		Aroclor-1254	Carbon Disulfide

Table F-1.2-1 (continued)

Soil/Fill	Tuff	Pore Gas
	Aroclor-1260	Carbon Tetrachloride
	Benzo(a)pyrene	Chlorodibromomethane
	Benzo(b)fluoranthene	Chlorodifluoromethane
	Benzo(k)fluoranthene	Chloroform
	Benzoic Acid	Chloromethane
	Bis(2-ethylhexyl)phthalate	Cyclohexane
	Chloronaphthalene[2-]	Dichloro-1,1,2,2-tetrafluoroethane[1,2-]
	Chrysene	Dichlorobenzene[1,2-]
	Dichloroethene[1,1-]	Dichlorodifluoromethane
	Di-n-butylphthalate	Dichloroethane[1,1-]
	Di-n-octylphthalate	Dichloroethane[1,2-]
	Fluoranthene	Dichloroethene[1,1-]
	Fluorene	Dichloroethene[cis-1,2-]
	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Dichloropropane[1,2-]
	Heptachlorodibenzodioxins (Total)	Dioxane[1,4-]
	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	Ethanol
	Heptachlorodibenzofurans (Total)	Ethylbenzene
	Hexachlorodibenzodioxins (Total)	Ethyltoluene[4-]
	Hexachlorodibenzofuran[1,2,3,4,7,8-]	Hexane
	Hexachlorodibenzofuran[2,3,4,6,7,8-]	Hexanone[2-]
	Hexachlorodibenzofurans (Total)	Methanol
	Indeno(1,2,3-cd)pyrene	Methyl-2-pentanone[4-]
	Methylene Chloride	Methylene Chloride
	Methylnaphthalene[2-]	n-Heptane
	Methylphenol[2-]	Propylene
	Nitrotoluene[2-]	Styrene
	Nitrotoluene[3-]	Tetrachloroethene
	Nitrotoluene[4-]	Toluene
	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Trichloro-1,2,2-trifluoroethane[1,1,2-]
	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	Trichloroethane[1,1,1-]
	Pentachlorodibenzodioxins (Total)	Trichloroethane[1,1,2-]
	Pentachlorodibenzofuran[1,2,3,7,8-]	Trichloroethene
	Pentachlorodibenzofuran[2,3,4,7,8-]	Trichlorofluoromethane
	Pentachlorodibenzofurans (Totals)	Trimethylbenzene[1,2,4-]
	Phenanthrene	Trimethylbenzene[1,3,5-]
	Pyrene	Xylene (Total)
	RDX	Xylene[1,2-]
	Tetrachlorodibenzofuran[2,3,7,8-]	Xylene[1,3-]+Xylene[1,4-]
	Tetrachlorodibenzofurans (Total)	
	Toluene	
	Trichloroethene	

*n/a = Not applicable.

Table F-2.0-1
Summary of Surface Soil and Fill Samples Collected at MDA C

Location ID	Sample ID	Depth (ft)	Media	Collection Date	PCB	SVOC	Americium-241	Gamma Spectroscopy	Tritium	Isotopic Plutonium	Isotopic Uranium	Strontium-90
50-08010	AAA3153	0–0.5	Fill	6/24/1993	14927 ^a	14927	14925	14925	14925	14925	14925	14925
50-08062	AAA3154	0–0.5	Fill	6/24/1993	14927	14927	14925	— ^b	14925	14925	14925	14925
50-08064	AAA3155	0–0.5	Fill	6/24/1993	14927	14927	14925	14925	14925	14925	14925	14925
50-08086	AAA2768	0–0.5	Soil	6/14/1993	14840	14840	14845	—	14845	14845	14845	14845
50-08088	AAA2769	0–0.5	Soil	6/14/1993	14840	14840	14845	14845	14845	14845	14845	14845
50-08102	AAA3143	0–0.5	Soil	6/23/1993	14880	14880	14916	14916	—	14916	14916	14916
50-08106	AAA3156	0–0.5	Fill	6/24/1993	14927	14927	14925	—	14925	14925	14925	14925
50-08110	AAA3157	0–0.5	Fill	6/24/1993	14927	14927	14925	14925	14925	14925	14925	14925
50-08116	AAA3158	0–0.5	Fill	6/24/1993	14927	14927	14925	—	14925	14925	14925	14925
50-08126	AAA2797	0–0.5	Fill	6/16/1993	14865	14865	14866	14866	14866	14866	14866	14866
50-08131	AAA3242	0–0.5	Fill	7/14/1993	—	—	15093	15093	15093	15093	15093	15093
50-08134	AAA2798	0–0.5	Fill	6/16/1993	14865	14865	14866	14866	14866	14866	14866	14866
50-08136	AAA2770	0–0.5	Soil	6/14/1993	14840	14840	14845	14845	14845	14845	14845	14845
50-08137	AAA3243	0–0.5	Fill	7/14/1993	—	—	15093	15093	15093	15093	15093	15093
50-08138	AAA2771	0–0.5	Soil	6/14/1993	14840	14840	14845	14845	14845	14845	14845	14845
50-08139	AAA3244	0–0.5	Fill	7/14/1993	—	—	15093	15093	15093	15093	15093	15093
50-08140	AAA2772	0–0.5	Soil	6/14/1993	14840	14840	14845	14845	14845	14845	14845	14845
50-08142	AAA2773	0–0.5	Soil	6/14/1993	14840	14840	14845	14845	14845	14845	14845	14845
50-08144	AAA2774	0–0.5	Soil	6/14/1993	14840	14840	14845	14845	14845	14845	14845	14845
50-08154	AAA3144	0–0.5	Soil	6/23/1993	14880	14880	14916	14916	—	14916	14916	14916
50-08156	AAA3159	0–0.5	Fill	6/24/1993	14927	14927	14925	14925	14925	14925	14925	14925
50-08162	AAA3160	0–0.5	Fill	6/24/1993	14927	14927	14925	14925	14925	14925	14925	14925
50-08168	AAA3189	0–0.5	Fill	6/28/1993	14949	14949	14948	14948	14948	14948	14948	14948
50-08176	AAA2799	0–0.5	Fill	6/16/1993	14865	14865	14866	14866	14866	14866	14866	14866
50-08180	AAA2800	0–0.5	Fill	6/16/1993	14865	14865	14866	—	14866	14866	14866	14866

Table F-2.0-1 (continued)

Location ID	Sample ID	Depth (ft)	Media	Collection Date	PCB	SVOC	Americium-241	Gamma Spectroscopy	Tritium	Isotopic Plutonium	Isotopic Uranium	Strontium-90
50-08185	AAA3245	0–0.5	Fill	7/14/1993	—	—	15093	15093	15093	15093	15093	15093
50-08189	AAA3246	0–0.5	Fill	7/14/1993	—	—	15093	15093	15093	15093	15093	15093
50-08193	AAA3247	0–0.5	Fill	7/14/1993	—	—	15093	15093	15093	15093	15093	15093
50-08194	AAA2801	0–0.5	Fill	6/16/1993	14865	14865	14866	—	14866	14866	14866	14866
50-08195	AAA3248	0–0.5	Fill	7/14/1993	—	—	15093	15093	15093	15093	15093	15093
50-08214	AAA3190	0–0.5	Fill	6/28/1993	14949	14949	14948	14948	14948	14948	14948	14948
50-08216	AAA3191	0–0.5	Fill	6/28/1993	14949	14949	14948	14948	14948	14948	14948	14948
50-08222	AAA2802	0–0.5	Fill	6/16/1993	14865	14865	14866	14866	14866	14866	14866	14866
50-08224	AAA2803	0–0.5	Fill	6/16/1993	14865	14865	14866	—	14866	14866	14866	14866
50-08226	AAA2804	0–0.5	Fill	6/16/1993	14865	14865	14866	14866	14866	14866	14866	14866
50-08228	AAA2805	0–0.5	Fill	6/16/1993	14865	14865	14866	—	14866	14866	14866	14866
50-08231	AAA3249	0–0.5	Fill	7/14/1993	—	—	15093	15093	15093	15093	15093	15093
50-08240	AAA3092	0–0.5	Fill	6/17/1993	14870	14870	14869	—	14869	14869	14869	14869
50-08244	AAA3093	0–0.5	Fill	6/17/1993	14870	14870	14869	14869	14869	14869	14869	14869
50-08245	AAA3250	0–0.5	Fill	7/14/1993	—	—	15093	15093	15093	15093	15093	15093
50-08266	AAA3192	0–0.5	Fill	6/28/1993	14949	14949	14948	14948	14948	14948	14948	14948
50-08274	AAA3094	0–0.5	Fill	6/17/1993	14870	14870	14869	14869	14869	14869	14869	14869
50-08286	AAA3095	0–0.5	Fill	6/17/1993	14870	14870	14869	—	14869	14869	14869	14869
50-08290	AAA3096	0–0.5	Fill	6/17/1993	14870	14870	14869	—	14869	14869	14869	14869
50-08312	AAA3193	0–0.5	Fill	6/28/1993	14949	14949	14948	14948	14948	14948	14948	14948
50-08324	AAA3097	0–0.5	Fill	6/17/1993	14870	14870	14869	—	14869	14869	14869	14869
50-08326	AAA3098	0–0.5	Fill	6/17/1993	14870	14870	14869	14869	14869	14869	14869	14869
50-08328	AAA3099	0–0.5	Fill	6/17/1993	14870	14870	14869	—	14869	14869	14869	14869
50-08336	AAA3118	0–0.5	Fill	6/21/1993	14889	14889	14890	14890	14890	14890	14890	14890
50-08340	AAA3119	0–0.5	Fill	6/21/1993	14889	14889	14890	14890	14890	14890	14890	14890
50-08342	AAA3120	0–0.5	Fill	6/21/1993	14889	14889	14890	14890	14890	14890	14890	14890

Table F-2.0-1 (continued)

Location ID	Sample ID	Depth (ft)	Media	Collection Date	PCB	SVOC	Americium-241	Gamma Spectroscopy	Tritium	Isotopic Plutonium	Isotopic Uranium	Strontium-90
50-08346	AAA2775	0–0.5	Soil	6/14/1993	14840	14840	14845	14845	14845	14845	14845	14845
50-08364	AAA3145	0–0.5	Soil	6/23/1993	14880	14880	14916	14916	—	14916	14916	14916
50-08370	AAA3121	0–0.5	Fill	6/21/1993	14889	14889	14890	14890	14890	14890	14890	14890
50-08374	AAA3122	0–0.5	Fill	6/21/1993	14889	14889	14890	14890	14890	14890	14890	14890
50-08386	AAA3123	0–0.5	Fill	6/21/1993	14889	14889	14890	14890	14890	14890	14890	14890
50-08396	AAA2776	0–0.5	Soil	6/14/1993	14840	14840	14845	14845	14845	14845	14845	14845
50-08418	AAA3146	0–0.5	Soil	6/23/1993	14880	14880	14916	14916	—	14916	14916	14916
50-08428	AAA3124	0–0.5	Fill	6/21/1993	14889	14889	14890	14890	14890	14890	14890	14890
50-08432	AAA3125	0–0.5	Fill	6/21/1993	14889	14889	14890	—	14890	14890	14890	14890
50-08436	AAA3147	0–0.5	Fill	6/23/1993	14880	14880	14916	14916	—	14916	14916	14916
50-08438	AAA3148	0–0.5	Fill	6/23/1993	14880	14880	14916	14916	—	14916	14916	14916
50-08440	AAA3149	0–0.5	Fill	6/23/1993	14880	14880	14916	14916	—	14916	14916	14916
50-08446	AAA2777	0–0.5	Soil	6/14/1993	14840	14840	14845	14845	14845	14845	14845	14845
50-08474	AAA2778	0–0.5	Soil	6/14/1993	14840	14840	14845	—	14845	14845	14845	14845
50-08486	AAA3151	0–0.5	Fill	6/23/1993	14880	14880	14916	14916	—	14916	14916	14916
50-08492	AAA3152	0–0.5	Fill	6/23/1993	14880	14880	14916	14916	—	14916	14916	14916
50-08494	AAA2779	0–0.5	Soil	6/14/1993	14840	14840	14845	—	14845	14845	14845	14845
50-22742	MD50-04-53250	0–0.5	Soil	5/6/2004	—	—	2149S	2149S	—	2149S	2149S	2149S
50-22743	MD50-04-53251	0–0.5	Soil	5/6/2004	—	—	2149S	2149S	—	2149S	2149S	2149S
50-22744	MD50-04-53252	0–0.5	Soil	5/6/2004	—	—	2149S	2149S	—	2149S	2149S	2149S
50-22745	MD50-04-53253	0–0.5	Soil	5/6/2004	—	—	2149S	2149S	—	2149S	2149S	2149S
50-22746	MD50-04-53254	0–0.5	Soil	5/6/2004	—	—	2149S	2149S	—	2149S	2149S	2149S
50-22747	MD50-04-53255	0–0.5	Soil	5/6/2004	—	—	2149S	2149S	—	2149S	2149S	2149S

Note: Inorganic chemical analyses from 1993, which are CST Onsite vintage data, are not included in the table.

^a Analytical request number.

^b — = Analysis not requested.

Table F-2.0-2
Summary of Subsurface Tuff Samples Collected at MDA C

Location ID	Sample ID	Depth (ft)	Media	Collection Date	Americium-241	Anions	Cyanide	Dioxins & Furans	Gamma Spectroscopy	Tritium	High Explosives	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	Metals	PCBs	Perchlorate	Pesticides & PCBs	Strontium-90	SVOCs	VOCs
50-09100	0550-95-0362	10.6–12.6	QBT3	7/18/1995	700 ^a	— ^b	699	—	700	700	—	700	700	700	699	—	—	—	700	698	—
50-09100	0550-95-0365	26.5–28.5	QBT3	7/19/1995	723	—	722	—	723	723	—	723	723	723	722	—	—	—	723	721	—
50-09100	0550-96-0100	32.7–33.7	QBT3	2/27/1996	1835	—	1834	—	1835	—	—	1835	1835	1835	1834	—	—	—	1835	—	—
50-09100	0550-95-0368	41.5–43.5	QBT3	7/19/1995	723	—	722	—	723	723	—	723	723	723	722	—	—	—	723	721	—
50-09100	0550-95-0371	58.2–60	QBT3	7/19/1995	723	—	722	—	723	723	—	723	723	723	722	—	—	—	723	721	—
50-09100	0550-95-0374	71.5–73.5	QBT2	7/26/1995	736	—	735	—	736	736	—	736	736	736	735	—	—	—	736	734	—
50-09100	0550-95-0383	115.1–116.9	QBT2	7/28/1995	762	—	761	—	762	762	—	762	762	762	761	—	—	—	762	760	—
50-09100	0550-95-0392	161.3–163.1	QBT1V	7/28/1995	762	—	761	—	762	762	—	762	762	762	761	—	—	—	762	760	—
50-09101	0550-95-0284	15–17	QBT3	9/21/1995	1189	—	1187	—	1189	1189	—	1189	1189	1189	1187	—	—	1185	1189	1185	1185
50-09101	0550-96-0101	26.85–27.85	QBT3	2/27/1996	1835	—	1834	—	1835	—	—	1835	1835	1835	1834	—	—	—	1835	—	—
50-09101	0550-95-0289	35–36.2	QBT3	9/21/1995	1189	—	1187	—	1189	1189	—	1189	1189	1189	1187	—	—	1185	1189	1185	1185
50-09101	0550-96-0102	44–45.1	QBT3	2/27/1996	1835	—	1834	—	1835	—	—	1835	1835	1835	1834	—	—	—	1835	—	—
50-09101	0550-95-0294	55–55.7	QBT3	9/21/1995	1189	—	1187	—	1189	1189	—	1189	1189	1189	1187	—	—	1185	1189	1185	1185
50-09101	0550-96-0103	62.5–63.2	QBT3	2/27/1996	1835	—	1834	—	1835	—	—	1835	1835	1835	1834	—	—	—	1835	—	—
50-09101	0550-95-0299	75–77	QBT3	9/21/1995	1189	—	1187	—	1189	1189	—	1189	1189	1189	1187	—	—	1185	1189	1185	1185
50-09101	0550-95-0304	96–98	QBT3	9/22/1995	1189	—	1187	—	1189	1189	—	1189	1189	1189	1187	—	—	1185	1189	1185	1185
50-09101	0550-95-0309	112–114.5	QBT3	9/22/1995	1189	—	1187	—	1189	1189	—	1189	1189	1189	1187	—	—	1185	1189	1185	1185
50-09102	0550-95-0004	16–19	QBT3	8/3/1995	821	—	820	—	821	821	—	821	821	821	820	—	—	—	821	800	—
50-09102	0550-95-0009	37–40.9	QBT3	8/4/1995	821	—	820	—	821	821	—	821	821	821	820	—	—	—	821	800	—
50-09102	0550-95-0014	57–60	QBT3	8/4/1995	821	—	820	—	821	821	—	821	821	821	820	—	—	—	821	800	—
50-09102	0550-95-0019	73.2–76	QBT3	8/8/1995	878	—	877	—	878	878	—	878	878	878	877	—	—	—	878	—	—
50-09102	0550-95-0024	95–97	QBT3	8/8/1995	878	—	877	—	878	878	—	878	878	878	877	—	—	—	878	876	—
50-09102	0550-95-0029	108–110	QBT3	8/8/1995	878	—	877	—	878	878	—	878	878	878	877	—	—	—	878	876	—
50-09103	0550-95-0104	18.5–20.8	QBT3	8/18/1995	988	—	987	—	988	988	—	988	988	988	987	—	—	986	988	986	986
50-09103	0550-95-0109	36–38.8	QBT3	8/21/1995	988	—	987	—	988	988	—	988	988	988	987	—	—	986	988	986	986

Table F-2.0-2 (continued)

Location ID	Sample ID	Depth (ft)	Media	Collection Date	Americium-241	Anions	Cyanide	Dioxins & Furans	Gamma Spectroscopy	Tritium	High Explosives	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	Metals	PCBs	Perchlorate	Pesticides & PCBs	Strontium-90	SVOCs	VOCs
50-09103	0550-96-0104	46.5–47.82	QBT3	2/27/1996	1835	—	1834	—	1835	—	—	1835	1835	1835	1834	—	—	—	1835	—	—
50-09103	0550-95-0114	56–58.8	QBT3	8/21/1995	988	—	987	—	988	988	—	988	988	988	987	—	—	986	988	986	986
50-09103	0550-95-0119	78–80	QBT3	8/22/1995	988	—	987	—	988	988	—	988	988	988	987	—	—	986	988	986	986
50-09103	0550-95-0124	94.7–98	QBT3	8/22/1995	988	—	987	—	988	988	—	988	988	988	987	—	—	986	988	986	986
50-09103	0550-95-0129	114.8–116.8	QBT3	8/22/1995	988	—	987	—	988	988	—	988	988	988	987	—	—	986	988	986	986
50-09104	0550-95-0075	10.9–12.9	QBT3	8/16/1995	947	—	946	—	947	947	—	947	947	947	946	—	—	945	947	945	945
50-09104	0550-95-0079	26.3–28	QBT3	8/16/1995	947	—	946	—	947	947	—	947	947	947	946	—	—	945	947	945	945
50-09104	0550-95-0083	36.6–38.6	QBT3	8/16/1995	947	—	946	—	947	947	—	947	947	947	946	—	—	945	947	945	945
50-09104	0550-96-0105	44.1–45.1	QBT3	2/27/1996	1835	—	1834	—	1835	—	—	1835	1835	1835	1834	—	—	—	1835	—	—
50-09104	0550-95-0087	58–60	QBT3	8/16/1995	947	—	946	—	947	947	—	947	947	947	946	—	—	945	947	945	945
50-09104	0550-95-0095	79–81	QBT3	8/17/1995	947	—	946	—	947	947	—	947	947	947	946	—	—	945	947	945	945
50-09104	0550-95-0099	85–87	QBT3	8/17/1995	947	—	946	—	947	947	—	947	947	947	946	—	—	945	947	945	945
50-09105	0550-95-0135	16.1–18.5	QBT3	8/24/1995	1015	—	—	—	1015	1015	—	1015	1015	1015	1014	—	—	1013	1015	1013	1013
50-09105	0550-95-0140	35–38	QBT3	8/24/1995	1015	—	—	—	1015	1015	—	1015	1015	1015	1014	—	—	1013	1015	1013	1013
50-09105	0550-95-0145	57–59	QBT3	8/25/1995	1015	—	—	—	1015	1015	—	1015	1015	1015	1014	—	—	1013	1015	1013	1013
50-09105	0550-96-0106	62.1–63	QBT3	2/27/1996	1835	—	1834	—	1835	—	—	1835	1835	1835	1834	—	—	—	1835	—	—
50-09105	0550-95-0150	77–79.7	QBT3	8/25/1995	1015	—	—	—	1015	1015	—	1015	1015	1015	1014	—	—	1013	1015	1013	1013
50-09105	0550-95-0155	97–99.8	QBT3	8/25/1995	1015	—	—	—	1015	1015	—	1015	1015	1015	1014	—	—	1013	1015	1013	1013
50-09105	0550-95-0160	117.7–120	QBT3	8/28/1995	1024	—	1018	—	1024	1024	—	1024	1024	1024	1018	—	—	1017	1024	1017	1017
50-09106	0550-95-0046	27.5–30.5	QBT3	8/11/1995	867	—	864	—	867	867	—	867	867	867	864	—	—	863	867	863	863
50-09106	0550-95-0050	41–44	QBT3	8/14/1995	922	—	908	—	922	922	—	922	922	922	908	—	—	907	922	907	907
50-09106	0550-95-0054	56.5–58.5	QBT3	8/14/1995	922	—	908	—	922	922	—	922	922	922	908	—	—	907	922	907	907
50-09106	0550-95-0058	70.5–73	QBT3	8/15/1995	922	—	908	—	922	922	—	922	922	922	908	—	—	907	922	907	907
50-09106	0550-95-0063	86–88.5	QBT3	8/15/1995	922	—	908	—	922	922	—	922	922	922	908	—	—	907	922	907	907
50-09106	0550-95-0067	102–104	QBT3	8/15/1995	922	—	908	—	922	922	—	922	922	922	908	—	—	907	922	907	907
50-09106	0550-95-0071	115.5–118	QBT3	8/15/1995	922	—	908	—	922	922	—	922	922	922	908	—	—	907	922	907	907

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Table F-2.0-2 (continued)

Location ID	Sample ID	Depth (ft)	Media	Collection Date	Americium-241	Anions	Cyanide	Dioxins & Furans	Gamma Spectroscopy	Tritium	High Explosives	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	Metals	PCBs	Perchlorate	Pesticides & PCBs	Strontium-90	SVOCs	SOCs
50-09107	0550-95-0166	14–15.8	QBT3	8/29/1995	1048	—	1047	—	1048	1048	—	1048	1048	1048	1047	—	—	1046	1048	1046	1046
50-09107	0550-95-0171	36–39	QBT3	8/29/1995	1048	—	1047	—	1048	1048	—	1048	1048	1048	1047	—	—	1046	1048	1046	1046
50-09107	0550-96-0107	46.9–48.5	QBT3	2/27/1996	1835	—	1834	—	1835	—	—	1835	1835	1835	1834	—	—	—	1835	—	—
50-09107	0550-95-0176	57–59	QBT3	8/30/1995	1048	—	1047	—	1048	1048	—	1048	1048	1048	1047	—	—	1046	1048	1046	1046
50-09107	0550-96-0108	66.2–67	QBT3	2/27/1996	1835	—	1834	—	1835	—	—	1835	1835	1835	1834	—	—	—	1835	—	—
50-09107	0550-95-0181	75–78.6	QBT3	8/30/1995	1048	—	1047	—	1048	1048	—	1048	1048	1048	1047	—	—	1046	1048	1046	1046
50-09107	0550-95-0186	95–97	QBT3	8/30/1995	1048	—	1047	—	1048	1048	—	1048	1048	1048	1047	—	—	1046	1048	1046	1046
50-09107	0550-95-0191	108–111	QBT3	8/30/1995	1048	—	1047	—	1048	1048	—	1048	1048	1048	1047	—	—	1046	1048	1046	1046
50-09108	0550-95-0195	15–16.8	QBT3	9/5/1995	1091	—	1090	—	1091	1091	—	1091	1091	1091	1090	—	—	1089	1091	1089	1089
50-09108	0550-96-0109	24.5–25.5	QBT3	2/27/1996	1835	—	1834	—	1835	—	—	1835	1835	1835	1834	—	—	—	1835	—	—
50-09108	0550-95-0200	37–38.6	QBT3	9/6/1995	1091	—	1090	—	1091	1091	—	1091	1091	1091	1090	—	—	1089	1091	1089	1089
50-09108	0550-96-0110	44.9–45.9	QBT3	2/27/1996	1835	—	1834	—	1835	—	—	1835	1835	1835	1834	—	—	—	1835	—	—
50-09108	0550-95-0205	57–59	QBT3	9/6/1995	1091	—	1090	—	1091	1091	—	1091	1091	1091	1090	—	—	1089	1091	1089	1089
50-09108	0550-95-0210	76.6–78.6	QBT3	9/6/1995	1091	—	1090	—	1091	1091	—	1091	1091	1091	1090	—	—	1089	1091	1089	1089
50-09108	0550-95-0215	95.5–97.5	QBT3	9/11/1995	1128	—	1126	—	1128	1128	—	1128	1128	1128	1126	—	—	1125	1128	1125	1125
50-09108	0550-95-0220	112–115	QBT3	9/11/1995	1128	—	1126	—	1128	1128	—	1128	1128	1128	1126	—	—	1125	1128	1125	1125
50-09109	0550-95-0226	18.2–20.2	QBT3	9/12/1995	1148	—	1150	—	1148	1148	—	1148	1148	1148	1150	—	—	1149	1148	1149	1149
50-09109	0550-95-0231	34.1–36	QBT3	9/12/1995	1148	—	1150	—	1148	1148	—	1148	1148	1148	1150	—	—	1149	1148	1149	1149
50-09109	0550-96-0111	46–47	QBT3	2/27/1996	1835	—	1834	—	1835	—	—	1835	1835	1835	1834	—	—	—	1835	—	—
50-09109	0550-95-0236	57.8–60	QBT3	9/12/1995	1148	—	1150	—	1148	1148	—	1148	1148	1148	1150	—	—	1149	1148	1149	1149
50-09109	0550-96-0112	66–67	QBT3	2/27/1996	1835	—	1834	—	1835	—	—	1835	1835	1835	1834	—	—	—	1835	—	—
50-09109	0550-95-0246	77.4–79.7	QBT3	9/14/1995	1164	—	1163	—	1164	1164	—	1164	1164	1164	1163	—	—	1162	1164	1162	1162
50-09109	0550-95-0251	88.6–88.8	QBT3	9/14/1995	1164	—	1163	—	1164	1164	—	1164	1164	1164	1163	—	—	1162	1164	1162	1162
50-09109	0550-95-0241	113–114.7	QBT3	9/14/1995	1164	—	1163	—	1164	1164	—	1164	1164	1164	1163	—	—	1162	1164	1162	1162
50-09110	0550-95-0259	17–19	QBT3	9/18/1995	1178	—	1177	—	1178	1178	—	1178	1178	1178	1177	—	—	1176	1178	1176	1176
50-09110	0550-96-0113	24.1–24.8	QBT3	2/27/1996	1835	—	1834	—	1835	—	—	1835	1835	1835	1834	—	—	—	1835	—	—

MDA C Investigation Report

Table F-2.0-2 (continued)

Location ID	Sample ID	Depth (ft)	Media	Collection Date	Americium-241	Anions	Cyanide	Dioxins & Furans	Gamma Spectroscopy	Tritium	High Explosives	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	Metals	PCBs	Perchlorate	Pesticides & PCBs	Strontium-90	SVOCs	VOCs
50-09110	0550-95-0264	38–40	QBT3	9/18/1995	1178	—	1177	—	1178	1178	—	1178	1178	1178	1177	—	—	1176	1178	1176	1176
50-09110	0550-96-0114	48.5–49.5	QBT3	2/27/1996	1835	—	1834	—	1835	—	—	1835	1835	1835	1834	—	—	—	1835	—	—
50-09110	0550-95-0269	59–60.8	QBT3	9/18/1995	1178	—	1177	—	1178	1178	—	1178	1178	1178	1177	—	—	1176	1178	1176	1176
50-09110	0550-95-0274	74–76.6	QBT3	9/19/1995	1178	—	1177	—	1178	1178	—	1178	1178	1178	1177	—	—	1176	1178	1176	1176
50-09110	0550-95-0279	88–89.4	QBT3	9/19/1995	1178	—	1177	—	1178	1178	—	1178	1178	1178	1177	—	—	1176	1178	1176	1176
50-24766	MD50-06-64603	15.6–17.1	QBT3	4/21/2006	5069S	5068S	5068S	5066S	5069S	—	5067S	5069S	—	5069S	5068S	5067S	5067S	—	5069S	5067S	—
50-24766	MD50-06-64604	27.5–29.2	QBT3	4/21/2006	5069S	5068S	5068S	5066S	5069S	—	5067S	5069S	—	5069S	5068S	5067S	5067S	—	5069S	5067S	—
50-24766	MD50-06-64586	97.5–99.9	QBT2	4/24/2006	5073S	5072S	5072S	—	5073S	—	—	5073S	—	5073S	5072S	5071S	5071S	—	5073S	5071S	—
50-24766	MD50-06-64587	122.5–124.6	QBT2	4/24/2006	5073S	5072S	5072S	—	5073S	—	—	5073S	—	5073S	5072S	5071S	5071S	—	5073S	5071S	—
50-24766	MD50-06-64605	148.1–149.5	QBT2	4/24/2006	5082S	5082S	5082S	5080S	5082S	—	—	5082S	—	5082S	5082S	5081S	5081S	—	5082S	5081S	—
50-24767	MD50-06-64635	8–10	QBT3	3/9/2006	4737S	4737S	4737S	4735S	4737S	—	4736S	4737S	—	4737S	4737S	4736S	4736S	—	4737S	4736S	—
50-24767	MD50-06-64636	28.1–30	QBT3	3/13/2006	4754S	4754S	4754S	4752S	4754S	—	4753S	4754S	—	4754S	4754S	4753S	4753S	—	4754S	4753S	—
50-24767	MD50-06-66770	29.5–30	QBT3	3/13/2006	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4741S
50-24767	MD50-06-64618	58.3–59.8	QBT3	3/14/2006	4768S	4767S	4767S	—	4768S	—	—	4768S	—	4768S	4767S	4766S	4766S	—	4768S	4766S	—
50-24767	MD50-06-66772	59.9–60	QBT3	3/14/2006	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4764S
50-24767	MD50-06-64619	123.2–125	QBT2	3/14/2006	4768S	4767S	4767S	—	4768S	—	—	4768S	—	4768S	4767S	4766S	4766S	—	4768S	4766S	—
50-24767	MD50-06-64637	148.3–149.8	QBT2	3/14/2006	4768S	4767S	4767S	4765S	4768S	—	—	4768S	—	4768S	4767S	4766S	4766S	—	4768S	4766S	—
50-24768	MD50-06-64667	12.5–15	QBT3	3/15/2006	4782S	4781S	4781S	4779S	4782S	—	4780S	4782S	—	4782S	4781S	4780S	4780S	—	4782S	4780S	—
50-24768	MD50-06-64668	27.5–29.5	QBT3	3/15/2006	4782S	4781S	4781S	4779S	4782S	—	4780S	4782S	—	4782S	4781S	4780S	4780S	—	4782S	4780S	—
50-24768	MD50-06-64650	96.7–99.5	QBT2	3/16/2006	4807S	4806S	4806S	—	4807S	—	—	4807S	—	4807S	4806S	4805S	4805S	—	4807S	4805S	—
50-24768	MD50-06-64651	123.2–125	QBT2	3/16/2006	4807S	4806S	4806S	—	4807S	—	—	4807S	—	4807S	4806S	4805S	4805S	—	4807S	4805S	—
50-24768	MD50-06-64669	148.6–151.5	QBT2	3/16/2006	4807S	4806S	4806S	4804S	4807S	—	—	4807S	—	4807S	4806S	4805S	4805S	—	4807S	4805S	—
50-24769	MD50-06-64699	18.1–20	QBT3	3/17/2006	4815S	4814S	4814S	4812S	4815S	—	4813S	4815S	—	4815S	4814S	4813S	4813S	—	4815S	4813S	—
50-24769	MD50-06-64700	37.5–39.9	QBT3	3/17/2006	4815S	4814S	4814S	4812S	4815S	—	4813S	4815S	—	4815S	4814S	4813S	4813S	—	4815S	4813S	—
50-24769	MD50-06-64682	97.5–99.3	QBT3	3/20/2006	4839S	4838S	4838S	—	4839S	—	—	4839S	—	4839S	4838S	4837S	4837S	—	4839S	4837S	—
50-24769	MD50-06-64683	122.5–124.5	QBT2	3/20/2006	4839S	4838S	4838S	—	4839S	—	—	4839S	—	4839S	4838S	4837S	4837S	—	4839S	4837S	—

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Table F-2.0-2 (continued)

Location ID	Sample ID	Depth (ft)	Media	Collection Date	Americium-241	Anions	Cyanide	Dioxins & Furans	Gamma Spectroscopy	Tritium	High Explosives	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	Metals	PCBs	Perchlorate	Pesticides & PCBs	Strontium-90	SVOCs	SOCs
50-24769	MD50-06-64701	147.9–149.8	QBT2	3/20/2006	4839S	4838S	4838S	4841S	4839S	—	—	4839S	—	4839S	4838S	4837S	4837S	—	4839S	4837S	—
50-24770	MD50-06-64731	18.1–22.5	QBT3	3/27/2006	4909S	4908S	4908S	4906S	4909S	—	4907S	4909S	—	4909S	4908S	4907S	4907S	—	4909S	4907S	—
50-24770	MD50-06-64717	24.6–25	QBT3	3/27/2006	4909S	4908S	4908S	—	4909S	—	—	4909S	—	4909S	4908S	4907S	4907S	—	4909S	4907S	—
50-24770	MD50-06-64732	38.2–39.9	QBT3	3/27/2006	4909S	4908S	4908S	4906S	4909S	—	4907S	4909S	—	4909S	4908S	4907S	4907S	—	4909S	4907S	—
50-24770	MD50-06-64714	98.7–100	QBT3	3/28/2006	4931S	4931S	4931S	—	4931S	—	—	4931S	—	4931S	4931S	4930S	4930S	—	4931S	4930S	—
50-24770	MD50-06-64715	123.2–124.6	QBT3	3/29/2006	4939S	4938S	4938S	—	4939S	—	—	4939S	—	4939S	4938S	4937S	4937S	—	4939S	4937S	—
50-24770	MD50-06-64733	147.5–150	QBT2	3/29/2006	4939S	4938S	4938S	4936S	4939S	—	—	4939S	—	4939S	4938S	4937S	4937S	—	4939S	4937S	—
50-24771	MD50-06-64756	15.9–17.5	QBT3	3/22/2006	4853S	4853S	4853S	4851S	4853S	—	4852S	4853S	—	4853S	4853S	4852S	4852S	—	4853S	4852S	—
50-24771	MD50-06-64757	38–40	QBT3	3/23/2006	4884S	4883S	4883S	4881S	4884S	—	4882S	4884S	—	4884S	4883S	4882S	4882S	—	4884S	4882S	—
50-24771	MD50-06-64739	98.8–100	QBT2	3/23/2006	4884S	4883S	4883S	—	4884S	—	—	4884S	—	4884S	4883S	4882S	4882S	—	4884S	4882S	—
50-24771	MD50-06-64740	123.6–125	QBT2	3/24/2006	4884S	4883S	4883S	—	4884S	—	—	4884S	—	4884S	4883S	4882S	4882S	—	4884S	4882S	—
50-24771	MD50-06-64758	148.2–150	QBT2	3/24/2006	4884S	4883S	4883S	4881S	4884S	—	—	4884S	—	4884S	4883S	4882S	4882S	—	4884S	4882S	—
50-24773	MD50-06-64781	20–22.5	QBT3	3/17/2006	4819S	4818S	4818S	4816S	4819S	—	4817S	4819S	—	4819S	4818S	4817S	4817S	—	4819S	4817S	—
50-24773	MD50-06-64782	38–40	QBT3	3/20/2006	4836S	4836S	4836S	4840S	4836S	—	4835S	4836S	—	4836S	4836S	4835S	4835S	—	4836S	4835S	—
50-24773	MD50-06-64764	98.5–100	QBT2	3/21/2006	4850S	4849S	4849S	—	4850S	—	—	4850S	—	4850S	4849S	4848S	4848S	—	4850S	4848S	—
50-24773	MD50-06-64765	123.7–124.8	QBT2	3/21/2006	4850S	4849S	4849S	—	4850S	—	—	4850S	—	4850S	4849S	4848S	4848S	—	4850S	4848S	—
50-24773	MD50-06-64783	150–152.8	QBT2	3/21/2006	4850S	4849S	4849S	4847S	4850S	—	—	4850S	—	4850S	4849S	4848S	4848S	—	4850S	4848S	—
50-24782	MD50-06-64813	20.9–22.5	QBT3	3/14/2006	4763S	4762S	4762S	4760S	4763S	—	4761S	4763S	—	4763S	4762S	4761S	4761S	—	4763S	4761S	—
50-24782	MD50-06-64814	35.3–37.1	QBT3	3/14/2006	4763S	4762S	4762S	4760S	4763S	—	4761S	4763S	—	4763S	4762S	4761S	4761S	—	4763S	4761S	—
50-24782	MD50-06-64796	98.5–100	QBT3	3/15/2006	4784S	4784S	4784S	—	4784S	—	—	4784S	—	4784S	4784S	4783S	4783S	—	4784S	4783S	—
50-24782	MD50-06-64797	123.5–125	QBT3	3/16/2006	4803S	4802S	4802S	—	4803S	—	—	4803S	—	4803S	4802S	4801S	4801S	—	4803S	4801S	—
50-24782	MD50-06-64815	156–157.5	QBT3	3/16/2006	4803S	4802S	4802S	4800S	4803S	—	—	4803S	—	4803S	4802S	4801S	4801S	—	4803S	4801S	—
50-24783	MD50-06-64838	17.5–20	QBT3	3/8/2006	4725S	4724S	4724S	4730S	4725S	—	4723S	4725S	—	4725S	4724S	4723S	4723S	—	4725S	4723S	—
50-24783	MD50-06-64839	35.4–37.5	QBT3	3/9/2006	4725S	4724S	4724S	4730S	4725S	—	4723S	4725S	—	4725S	4724S	4723S	4723S	—	4725S	4723S	—
50-24783	MD50-06-64821	98.6–100	QBT3	3/10/2006	4739S	4739S	4739S	—	4739S	—	—	4739S	—	4739S	4739S	4738S	4738S	—	4739S	4738S	—
50-24783	MD50-06-64822	123.3–125	QBT2	3/13/2006	4751S	4750S	4750S	—	4751S	—	—	4751S	—	4751S	4750S	4749S	4749S	—	4751S	4749S	—

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Table F-2.0-2 (continued)

Location ID	Sample ID	Depth (ft)	Media	Collection Date	Americium-241	Anions	Cyanide	Dioxins & Furans	Gamma Spectroscopy	Tritium	High Explosives	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	Metals	PCBs	Perchlorate	Pesticides & PCBs	Strontium-90	SVOCs	VOCs
50-24783	MD50-06-64840	150.3–152.5	QBT2	3/13/2006	4751S	4750S	4750S	4748S	4751S	—	—	4751S	—	4751S	4750S	4749S	4749S	—	4751S	4749S	—
50-24784	MD50-06-64380	8–10	QBT3	2/10/2006	4579S	4579S	4579S	4577S	4579S	—	4578S	4579S	—	4579S	4579S	4578S	4578S	—	4579S	4578S	—
50-24784	MD50-06-64381	18–20	QBT3	2/14/2006	4598S	4597S	4597S	4595S	4598S	—	4596S	4598S	—	4598S	4597S	4596S	4596S	—	4598S	4596S	—
50-24784	MD50-06-64363	46.1–47.5	QBT3	2/14/2006	4598S	4597S	4597S	—	4598S	—	—	4598S	—	4598S	4597S	4596S	4596S	—	4598S	4596S	—
50-24784	MD50-06-64364	48.7–50	QBT3	2/14/2006	4598S	4597S	4597S	—	4598S	—	—	4598S	—	4598S	4597S	4596S	4596S	—	4598S	4596S	—
50-24784	MD50-06-64365	51–55	QBT3	2/21/2006	4626S	4625S	4625S	—	4626S	—	—	4626S	—	4626S	4625S	4624S	4624S	—	4626S	4624S	—
50-24784	MD50-06-64367	98.5–100	QBT3	2/21/2006	4626S	4625S	4625S	—	4626S	—	—	4626S	—	4626S	4625S	4624S	4624S	—	4626S	4624S	—
50-24784	MD50-06-64366	167.5–169	QBT2	2/24/2006	4661S	4660S	4660S	—	4661S	—	—	4661S	—	4661S	4660S	4659S	4659S	—	4661S	4659S	—
50-24784	MD50-06-64369	197.9–199.2	QBT1V	2/27/2006	4672S	4671S	4671S	—	4672S	—	—	4672S	—	4672S	4671S	4670S	4670S	—	4672S	4670S	—
50-24784	MD50-06-64368	248–250	QBT1V	2/27/2006	4672S	4671S	4671S	—	4672S	—	—	4672S	—	4672S	4671S	4670S	4670S	—	4672S	4670S	—
50-24784	MD50-06-65526	273.5–275	QBT1G	2/28/2006	4681S	4681S	4681S	—	4681S	—	—	4681S	—	4681S	4681S	4680S	4680S	—	4681S	4680S	—
50-24784	MD50-06-64382	298.3–299.8	QBT1G	2/28/2006	4679S	4679S	4679S	4678S	4679S	—	—	4679S	—	4679S	4679S	4677S	4677S	—	4679S	4677S	—
50-24785	MD50-06-64412	8.5–10	QBT3	1/23/2006	4425S	4424S	4424S	4422S	4425S	—	4423S	4425S	—	4425S	4424S	4423S	4423S	—	4425S	4423S	—
50-24785	MD50-06-64413	17.5–19	QBT3	1/24/2006	4438S	4437S	4437S	4435S	4438S	—	4436S	4438S	—	4438S	4437S	4436S	4436S	—	4438S	4436S	—
50-24785	MD50-06-64395	57.5–60	QBT3	1/25/2006	4468S	4467S	4467S	—	4468S	—	—	4468S	—	4468S	4467S	4466S	4466S	—	4468S	4466S	—
50-24785	MD50-06-64396	117.5–120	QBT2	1/27/2006	4484S	4483S	4483S	—	4484S	—	—	4484S	—	4484S	4483S	4482S	4482S	—	4484S	4482S	—
50-24785	MD50-06-64397	198.7–200	QBT1V	1/31/2006	4499S	4498S	4498S	—	4499S	—	—	4499S	—	4499S	4498S	4497S	4497S	—	4499S	4497S	—
50-24785	MD50-06-64398	248.5–250	QBT1G	2/2/2006	4539S	4539S	4539S	—	4539S	—	—	4539S	—	4539S	4539S	4538S	4538S	—	4539S	4538S	—
50-24785	MD50-06-64414	273.8–275	QBT1G	2/6/2006	4544S	4544S	4544S	4545S	4544S	—	—	4544S	—	4544S	4544S	4544S	4544S	—	4544S	4544S	—
50-24796	MD50-06-64457	8–10	QBT3	12/21/2005	4250S	4250S	4250S	4250S	4250S	—	4250S	4250S	—	4250S	4250S	4250S	—	—	4250S	4250S	—
50-24796	MD50-06-64458	17.5–19.3	QBT3	12/21/2005	4250S	4250S	4250S	4250S	4250S	—	4250S	4250S	—	4250S	4250S	4250S	—	—	4250S	4250S	—
50-24796	MD50-06-64440	37.5–39.3	QBT3	1/3/2006	4271S	4270S	4270S	—	4271S	—	—	4271S	—	4271S	4270S	4269S	—	—	4271S	4269S	—
50-24796	MD50-06-64441	97.5–100	QBT3	1/4/2006	4271S	4270S	4270S	—	4271S	—	—	4271S	—	4271S	4270S	4269S	—	—	4271S	4269S	—
50-24796	MD50-06-64442	118.7–120	QBT2	1/5/2006	4281S	4280S	4280S	—	4281S	—	—	4281S	—	4281S	4280S	4278S	—	—	4281S	4278S	—
50-24796	MD50-06-64459	147.5–149.4	QBT2	1/5/2006	4281S	4280S	4280S	4279S	4281S	—	—	4281S	—	4281S	4280S	4278S	—	—	4281S	4278S	—
50-24797	MD50-06-64506	17.5–18.3	QBT3	1/10/2006	4311S	4311S	4311S	4304S	4311S	—	4311S	4311S	—	4311S	4311S	4311S	4311S	—	4311S	4311S	—

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Table F-2.0-2 (continued)

Location ID	Sample ID	Depth (ft)	Media	Collection Date	Americium-241	Anions	Cyanide	Dioxins & Furans	Gamma Spectroscopy	Tritium	High Explosives	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	Metals	PCBs	Perchlorate	Pesticides & PCBs	Strontium-90	SVOCs	SOCs
50-24797	MD50-06-64509	37–38	QBT3	1/11/2006	4320S	4320S	4320S	4319S	4320S	—	4320S	4320S	—	4320S	4320S	4320S	4320S	—	4320S	4320S	—
50-24797	MD50-06-64489	58–60	QBT3	1/12/2006	4335S	4334S	4334S	—	4335S	—	—	4335S	—	4335S	4334S	4333S	4333S	—	4335S	4333S	—
50-24797	MD50-06-64490	117–120	QBT2	1/13/2006	4335S	4334S	4334S	—	4335S	—	—	4335S	—	4335S	4334S	4333S	4333S	—	4335S	4333S	—
50-24797	MD50-06-64508	157.5–159	QBT2	1/19/2006	4380S	4380S	4380S	4378S	4380S	—	—	4380S	—	4380S	4380S	4379S	4379S	—	4380S	4379S	—
50-24799	MD50-06-64516	13.1–15	QBT3	1/9/2006	4298S	4298S	4298S	—	4298S	—	—	4298S	—	4298S	4298S	4298S	4298S	—	4298S	4298S	—
50-24799	MD50-06-64517	15–16.5	QBT3	1/9/2006	4298S	4298S	4298S	—	4298S	—	—	4298S	—	4298S	4298S	4298S	4298S	—	4298S	4298S	—
50-24799	MD50-06-64531	18–20	QBT3	1/9/2006	4298S	4298S	4298S	4297S	4298S	—	4298S	4298S	—	4298S	4298S	4298S	4298S	—	4298S	4298S	—
50-24799	MD50-06-64532	30.6–32.5	QBT3	1/10/2006	4310S	4310S	4310S	4301S	4310S	—	4309S	4310S	—	4310S	4310S	4309S	4309S	—	4310S	4309S	—
50-24799	MD50-06-64518	34.5–36	QBT3	1/10/2006	4310S	4310S	4310S	—	4310S	—	—	4310S	—	4310S	4310S	4309S	4309S	—	4310S	4309S	—
50-24799	MD50-06-64519	38.5–40	QBT3	1/10/2006	4310S	4310S	4310S	—	4310S	—	—	4310S	—	4310S	4310S	4309S	4309S	—	4310S	4309S	—
50-24799	MD50-06-64514	98.3–100	QBT3	1/13/2006	4337S	4337S	4337S	—	4337S	—	—	4337S	—	4337S	4337S	4336S	4336S	—	4337S	4336S	—
50-24799	MD50-06-64515	118.4–120	QBT2	1/17/2006	4374S	4373S	4373S	—	4374S	—	—	4374S	—	4374S	4373S	4371S	4371S	—	4374S	4371S	—
50-24799	MD50-06-64533	158.5–160	QBT2	1/17/2006	4374S	4373S	4373S	4372S	4374S	—	—	4374S	—	4374S	4373S	4371S	4371S	—	4374S	4371S	—
50-24801	MD50-06-64863	16.8–20	QBT3	2/1/2006	4504S	4504S	4504S	4504S	4504S	—	4504S	4504S	—	4504S	4504S	4504S	4504S	—	4504S	4504S	—
50-24801	MD50-06-64864	33–35	QBT3	2/1/2006	4504S	4504S	4504S	4504S	4504S	—	4504S	4504S	—	4504S	4504S	4504S	4504S	—	4504S	4504S	—
50-24801	MD50-06-64846	78–80	QBT3	2/2/2006	4541S	4541S	4541S	—	4541S	—	—	4541S	—	4541S	4541S	4540S	4540S	—	4541S	4540S	—
50-24801	MD50-06-64847	118–120	QBT2	2/3/2006	4542S	4542S	4542S	—	4542S	—	—	4542S	—	4542S	4542S	4542S	4542S	—	4542S	4542S	—
50-24801	MD50-06-64865	148.3–150	QBT2	2/6/2006	4542S	4542S	4542S	4543S	4542S	—	—	4542S	—	4542S	4542S	4542S	4542S	—	4542S	4542S	—
50-24802	MD50-06-64888	12.5–16.1	QBT3	3/1/2006	4686S	4686S	4686S	4695S	4686S	—	4687S	4686S	—	4686S	4686S	4687S	4687S	—	4686S	4687S	—
50-24802	MD50-06-64889	40.6–42.5	QBT3	3/2/2006	4686S	4686S	4686S	4695S	4686S	—	4687S	4686S	—	4686S	4686S	4687S	4687S	—	4686S	4687S	—
50-24802	MD50-06-64871	98.2–100	QBT3	3/2/2006	4694S	4693S	4693S	—	4694S	—	—	4694S	—	4694S	4693S	4691S	4691S	—	4694S	4691S	—
50-24802	MD50-06-64872	123.1–125	QBT2	3/2/2006	4694S	4693S	4693S	—	4694S	—	—	4694S	—	4694S	4693S	4691S	4691S	—	4694S	4691S	—
50-24802	MD50-06-64890	157.5–159.1	QBT2	3/2/2006	4694S	4693S	4693S	4692S	4694S	—	—	4694S	—	4694S	4693S	4691S	4691S	—	4694S	4691S	—
50-24803	MD50-06-64913	15.4–17.5	QBT3	3/3/2006	4707S	4707S	4707S	4705S	4707S	—	4706S	4707S	—	4707S	4707S	4706S	4706S	—	4707S	4706S	—
50-24803	MD50-06-64914	36–37.5	QBT3	3/6/2006	4711S	4710S	4710S	4708S	4711S	—	4709S	4711S	—	4711S	4710S	4709S	4709S	—	4711S	4709S	—
50-24803	MD50-06-64896	98.7–99.8	QBT3	3/6/2006	4711S	4710S	4710S	—	4711S	—	—	4711S	—	4711S	4710S	4709S	4709S	—	4711S	4709S	—

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Table F-2.0-2 (continued)

Location ID	Sample ID	Depth (ft)	Media	Collection Date	Americium-241	Anions	Cyanide	Dioxins & Furans	Gamma Spectroscopy	Tritium	High Explosives	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	Metals	PCBs	Perchlorate	Pesticides & PCBs	Strontium-90	SVOCs	VOCs
50-24803	MD50-06-64897	123.3–124.8	QBT2	3/6/2006	4711S	4710S	4710S	—	4711S	—	—	4711S	—	4711S	4710S	4709S	4709S	—	4711S	4709S	—
50-24803	MD50-06-64915	150–153.9	QBT2	3/7/2006	4711S	4710S	4710S	4708S	4711S	—	—	4711S	—	4711S	4710S	4709S	4709S	—	4711S	4709S	—
50-24804	MD50-06-64965	8.6–9.8	QBT3	4/26/2006	5091S	5090S	5090S	—	5091S	—	—	5091S	—	5091S	5090S	5089S	5089S	—	5091S	5089S	—
50-24804	MD50-06-64966	10–11.4	QBT3	4/26/2006	5091S	5090S	5090S	—	5091S	—	—	5091S	—	5091S	5090S	5089S	5089S	—	5091S	5089S	—
50-24804	MD50-06-64980	15.4–17.1	QBT3	4/26/2006	5091S	5090S	5090S	5088S	5091S	—	5089S	5091S	—	5091S	5090S	5089S	5089S	—	5091S	5089S	—
50-24804	MD50-06-64981	32.5–34.2	QBT3	4/27/2006	5114S	5113S	5113S	5111S	5114S	—	5112S	5114S	—	5114S	5113S	5112S	5112S	—	5114S	5112S	—
50-24804	MD50-06-64963	97.8–99.2	QBT3	4/27/2006	5114S	5113S	5113S	—	5114S	—	—	5114S	—	5114S	5113S	5112S	5112S	—	5114S	5112S	—
50-24804	MD50-06-64964	122.5–124.1	QBT3	4/28/2006	5114S	5113S	5113S	—	5114S	—	—	5114S	—	5114S	5113S	5112S	5112S	—	5114S	5112S	—
50-24804	MD50-06-64982	147.5–149.8	QBT2	4/28/2006	5114S	5113S	5113S	5111S	5114S	—	—	5114S	—	5114S	5113S	5112S	5112S	—	5114S	5112S	—
50-24810	MD50-06-65005	17.5–19	QBT3	4/14/2006	5038S	5037S	5037S	5035S	5038S	—	5036S	5038S	—	5038S	5037S	5036S	5036S	—	5038S	5036S	—
50-24810	MD50-06-65006	35.5–37.1	QBT3	4/14/2006	5038S	5037S	5037S	5035S	5038S	—	5036S	5038S	—	5038S	5037S	5036S	5036S	—	5038S	5036S	—
50-24810	MD50-06-64988	97.5–99	QBT3	4/14/2006	5038S	5037S	5037S	—	5038S	—	—	5038S	—	5038S	5037S	5036S	5036S	—	5038S	5036S	—
50-24810	MD50-06-64989	122.5–123.9	QBT2	4/14/2006	5038S	5037S	5037S	—	5038S	—	—	5038S	—	5038S	5037S	5036S	5036S	—	5038S	5036S	—
50-24810	MD50-06-65007	148.3–151.6	QBT2	4/17/2006	5042S	5041S	5041S	5039S	5042S	—	—	5042S	—	5042S	5041S	5040S	5040S	—	5042S	5040S	—
50-24811	MD50-06-65075	18.5–20	QBT3	4/10/2006	5004S	5003S	5003S	5001S	5004S	—	5002S	5004S	—	5004S	5003S	5002S	5002S	—	5004S	5002S	—
50-24811	MD50-06-65076	38.5–40	QBT3	4/10/2006	5004S	5003S	5003S	5001S	5004S	—	5002S	5004S	—	5004S	5003S	5002S	5002S	—	5004S	5002S	—
50-24811	MD50-06-65058	97.5–98.7	QBT3	4/11/2006	5010S	5009S	5009S	—	5010S	—	—	5010S	—	5010S	5009S	5008S	5008S	—	5010S	5008S	—
50-24811	MD50-06-65059	123.2–125	QBT2	4/11/2006	5010S	5009S	5009S	—	5010S	—	—	5010S	—	5010S	5009S	5008S	5008S	—	5010S	5008S	—
50-24811	MD50-06-65077	147.5–150.6	QBT2	4/12/2006	5025S	5025S	5025S	5023S	5025S	—	—	5025S	—	5025S	5025S	5024S	5024S	—	5025S	5024S	—
50-24812	MD50-06-65100	8.4–10	QBT3	4/3/2006	4970S	4970S	4970S	4969S	4970S	—	4970S	4970S	—	4970S	4970S	4970S	4970S	—	4970S	4970S	—
50-24812	MD50-06-65101	33.5–35	QBT3	4/3/2006	4970S	4970S	4970S	4969S	4970S	—	4970S	4970S	—	4970S	4970S	4970S	4970S	—	4970S	4970S	—
50-24812	MD50-06-65083	97.5–98.9	QBT3	4/4/2006	4968S	4968S	4968S	—	4968S	—	—	4968S	—	4968S	4968S	4968S	4968S	—	4968S	4968S	—
50-24812	MD50-06-65084	122.5–123.7	QBT2	4/4/2006	4968S	4968S	4968S	—	4968S	—	—	4968S	—	4968S	4968S	4968S	4968S	—	4968S	4968S	—
50-24812	MD50-06-65102	146–150	QBT2	4/5/2006	4975S	4975S	4975S	4974S	4975S	—	—	4975S	—	4975S	4975S	4975S	4975S	—	4975S	4975S	—
50-24813	MD50-06-65132	18.2–20	QBT3	3/29/2006	4935S	4934S	4934S	4932S	4935S	—	4933S	4935S	—	4935S	4934S	4933S	4933S	—	4935S	4933S	—
50-24813	MD50-06-65133	30–31.9	QBT3	3/29/2006	4935S	4934S	4934S	4932S	4935S	—	4933S	4935S	—	4935S	4934S	4933S	4933S	—	4935S	4933S	—

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Table F-2.0-2 (continued)

Location ID	Sample ID	Depth (ft)	Media	Collection Date	Americium-241	Anions	Cyanide	Dioxins & Furans	Gamma Spectroscopy	Tritium	High Explosives	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	Metals	PCBs	Perchlorate	Pesticides & PCBs	Strontium-90	SVOCs	SOCs
50-24813	MD50-06-65115	98.2–99.7	QBT3	3/30/2006	4949S	4948S	4948S	—	4949S	—	—	4949S	—	4949S	4948S	4947S	4947S	—	4949S	4947S	—
50-24813	MD50-06-65116	123.5–125	QBT2	3/30/2006	4949S	4948S	4948S	—	4949S	—	—	4949S	—	4949S	4948S	4947S	4947S	—	4949S	4947S	—
50-24813	MD50-06-65134	148–150	QBT2	3/30/2006	4949S	4948S	4948S	4946S	4949S	—	—	4949S	—	4949S	4948S	4947S	4947S	—	4949S	4947S	—
50-24814	MD50-06-65157	7.5–9.1	QBT3	3/24/2006	4880S	4880S	4880S	4878S	4880S	—	4879S	4880S	—	4880S	4880S	4879S	4879S	—	4880S	4879S	—
50-24814	MD50-06-65158	30–31.6	QBT3	3/27/2006	4913S	4912S	4912S	4910S	4913S	—	4911S	4913S	—	4913S	4912S	4911S	4912S	—	4913S	4911S	—
50-24814	MD50-06-65140	96.8–99.9	QBT3	3/27/2006	4913S	4912S	4912S	—	4913S	—	—	4913S	—	4913S	4912S	4911S	4911S	—	4913S	4911S	—
50-24814	MD50-06-65141	123.5–124.8	QBT2	3/27/2006	4913S	4912S	4912S	—	4913S	—	—	4913S	—	4913S	4912S	4911S	4911S	—	4913S	4911S	—
50-24814	MD50-06-65159	147.5–149.5	QBT2	3/27/2006	4913S	4912S	4912S	4910S	4913S	—	—	4913S	—	4913S	4912S	4911S	4911S	—	4913S	4911S	—
50-24815	MD50-06-65189	17.5–20	QBT3	3/21/2006	4846S	4845S	4845S	4843S	4846S	—	4844S	4846S	—	4846S	4845S	4844S	4844S	—	4846S	4844S	—
50-24815	MD50-06-65190	37.8–41.5	QBT3	3/21/2006	4846S	4845S	4845S	4843S	4846S	—	4844S	4846S	—	4846S	4845S	4844S	4844S	—	4846S	4844S	—
50-24815	MD50-06-65172	98.8–100	QBT3	3/22/2006	4857S	4856S	4856S	—	4857S	—	—	4857S	—	4857S	4856S	4855S	4855S	—	4857S	4855S	—
50-24815	MD50-06-65173	123.4–125	QBT2	3/22/2006	4857S	4856S	4856S	—	4857S	—	—	4857S	—	4857S	4856S	4855S	4855S	—	4857S	4855S	—
50-24815	MD50-06-65191	147.8–149.7	QBT2	3/22/2006	4857S	4856S	4856S	4854S	4857S	—	—	4857S	—	4857S	4856S	4855S	4855S	—	4857S	4855S	—
50-24816	MD50-06-65214	23.1–24.7	QBT3	1/20/2006	4415S	4414S	4414S	4412S	4415S	—	4413S	4415S	—	4415S	4414S	4413S	4413S	—	4415S	4413S	—
50-24816	MD50-06-65215	32.2–34	QBT3	1/20/2006	4415S	4414S	4414S	4412S	4415S	—	4413S	4415S	—	4415S	4414S	4413S	4413S	—	4415S	4413S	—
50-24816	MD50-06-65197	63.8–65	QBT3	1/23/2006	4441S	4440S	4440S	—	4441S	—	—	4441S	—	4441S	4440S	4439S	4439S	—	4441S	4439S	—
50-24816	MD50-06-65198	118.7–120	QBT2	1/24/2006	4441S	4440S	4440S	—	4441S	—	—	4441S	—	4441S	4440S	4439S	4439S	—	4441S	4439S	—
50-24816	MD50-06-65199	198.8–200	QBT2	1/27/2006	4465S	4464S	4464S	—	4465S	—	—	4465S	—	4465S	4464S	4463S	4463S	—	4465S	4463S	—
50-24816	MD50-06-65216	223.4–225	QBT2	1/27/2006	4465S	4464S	4464S	4462S	4465S	—	—	4465S	—	4465S	4464S	4463S	4463S	—	4465S	4463S	—
50-24817	MD50-05-63837	18.4–20	QBT3	9/22/2005	4015S	4014S	4014S	4012S	4015S	—	—	4015S	—	4015S	4014S	4013S	—	—	4015S	4013S	—
50-24817	RE50-05-63807	18.4–20	QBT3	9/22/2005	—	—	—	—	—	—	3983S	—	—	—	—	—	—	—	—	—	—
50-24817	MD50-05-63838	37–40	QBT3	9/22/2005	4015S	4014S	4014S	4012S	4015S	—	—	4015S	—	4015S	4014S	4013S	—	—	4015S	4013S	—
50-24817	RE50-05-63808	37–40	QBT3	9/22/2005	—	—	—	—	—	—	3994S	—	—	—	—	—	—	—	—	—	—
50-24817	RE50-05-63810	98.8–100	QBT3	9/26/2005	4016S	4016S	4016S	—	4016S	—	—	4016S	—	4016S	4016S	4016S	—	—	4016S	4016S	—
50-24817	RE50-05-63811	138–140	QBT2	9/27/2005	4034S	4033S	4033S	—	4034S	—	—	4034S	—	4034S	4033S	4032S	—	—	4034S	4032S	—
50-24817	RE50-05-63812	198.4–200	QBT1V	9/28/2005	4034S	4033S	4033S	—	4034S	—	—	4034S	—	4034S	4033S	4032S	—	—	4034S	4032S	—

MDA C Investigation Report

Table F-2.0-2 (continued)

Location ID	Sample ID	Depth (ft)	Media	Collection Date	Americium-241	Anions	Cyanide	Dioxins & Furans	Gamma Spectroscopy	Tritium	High Explosives	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	Metals	PCBs	Perchlorate	Pesticides & PCBs	Strontium-90	SVOCs	VOCs
50-24817	MD50-05-63839	248.1–250	QBT1G	10/3/2005	4055S	4055S	4055S	4056S	4055S	—	—	4055S	—	4055S	4055S	4055S	—	—	4055S	4055S	—
50-24818	MD50-06-65229	8.5–10	QBT3	2/8/2006	4556S	4556S	4556S	4554S	4556S	—	4555S	4556S	—	4556S	4556S	4555S	4555S	—	4556S	4555S	—
50-24818	MD50-06-65230	22.1–25	QBT3	2/9/2006	4571S	4570S	4570S	4569S	4571S	—	4568S	4571S	—	4571S	4570S	4568S	4568S	—	4571S	4568S	—
50-24818	MD50-06-65261	98.5–100	QBT2	2/14/2006	4588S	4587S	4587S	—	4588S	—	—	4588S	—	4588S	4587S	4586S	4586S	—	4588S	4586S	—
50-24818	MD50-06-66758	100.4–100.5	QBT2	2/16/2006	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4602S
50-24818	MD50-06-65262	147.5–149.2	QBT2	2/21/2006	4623S	4623S	4623S	—	4623S	—	—	4623S	—	4623S	4623S	4622S	4622S	—	4623S	4622S	—
50-24818	MD50-06-65263	189.9–190	QBT1V	2/23/2006	4648S	4649S	4649S	—	4648S	—	—	4648S	—	4648S	4649S	4647S	4647S	—	4648S	4647S	—
50-24818	MD50-06-66759	190–190	QBT1V	2/23/2006	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4632S
50-24818	MD50-06-65264	247.7–249.2	QBT1G	2/24/2006	4658S	4657S	4657S	—	4658S	—	—	4658S	—	4658S	4657S	4656S	4656S	—	4658S	4656S	—
50-24818	MD50-06-65265	280–282.5	QBT1G	2/27/2006	4675S	4674S	4674S	—	4675S	—	—	4675S	—	4675S	4674S	4673S	4673S	—	4675S	4673S	—
50-24818	MD50-06-66760	312.9–313	QBT1G	2/28/2006	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4666S
50-24818	MD50-06-65266	313.5–315	QBT1G	2/28/2006	4683S	4683S	4683S	—	4683S	—	—	4683S	—	4683S	4683S	4682S	4682S	—	4683S	4682S	—
50-24818	MD50-06-65267	396–402	QBO	4/27/2006	5110S	5110S	5110S	—	5110S	—	—	5110S	—	5110S	5110S	5109S	5109S	—	5110S	5109S	—
50-24818	MD50-06-66761	397.9–398	QBO	4/27/2006	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	5108S
50-24818	MD50-06-65268	449–452	QBO	5/22/2006	5345S	5345S	5345S	—	5345S	—	—	5345S	—	5345S	5345S	5344S	5344S	—	5345S	5344S	—
50-24818	MD50-06-65269	497–500.5	QBO	5/24/2006	5366S	5366S	5366S	—	5366S	—	—	5366S	—	5366S	5366S	5365S	5365S	—	5366S	5365S	—
50-24818	MD50-06-66762	498.4–498.5	QBO	5/24/2006	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	5328S
50-24818	MD50-06-65270	547–551.5	QBO	5/24/2006	5369S	5368S	5368S	—	5369S	—	—	5369S	—	5369S	5368S	5367S	5367S	—	5369S	5367S	—
50-24818	MD50-06-65271	597–600.4	QBO	5/25/2006	5369S	5368S	5368S	—	5369S	—	—	5369S	—	5369S	5368S	5367S	5367S	—	5369S	5367S	—
50-24818	MD50-06-66763	600.4–600.5	QBO	5/25/2006	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	5334S
50-24819	RE50-05-61422	18.5–20	QBT3	8/10/2005	3676S	3675S	3675S	—	3676S	—	—	3676S	—	3676S	3675S	3674S	—	—	3676S	3674S	—
50-24819	RE50-05-61423	48–50	QBT3	8/11/2005	3689S	3688S	3688S	3840S	3689S	—	—	3689S	—	3689S	3688S	3687S	—	—	3689S	3687S	—
50-24819	RE50-05-61424	97.5–100	QBT3	8/15/2005	3707S	3706S	3706S	—	3707S	—	—	3707S	—	3707S	3706S	3705S	—	—	3707S	3705S	—
50-24819	RE50-05-61425	138.5–140	QBT2	8/15/2005	3707S	3706S	3706S	—	3707S	—	—	3707S	—	3707S	3706S	3705S	—	—	3707S	3705S	—
50-24819	RE50-05-61426	198.1–200	QBT1V	8/17/2005	3737S	3737S	3737S	—	3737S	—	—	3737S	—	3737S	3737S	3737S	—	—	3737S	3737S	—
50-24819	RE50-05-61427	246.5–250	QBT1V	8/18/2005	3734S	3734S	3734S	—	3734S	—	—	3734S	—	3734S	3734S	3734S	—	—	3734S	3734S	—

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Table F-2.0-2 (continued)

Location ID	Sample ID	Depth (ft)	Media	Collection Date	Americium-241	Anions	Cyanide	Dioxins & Furans	Gamma Spectroscopy	Tritium	High Explosives	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	Metals	PCBs	Perchlorate	Pesticides & PCBs	Strontium-90	SVOCs	SOCs
50-24819	RE50-05-61428	273–275	QBT1G	8/19/2005	3757S	3756S	3756S	3755S	3757S	—	—	3757S	—	3757S	3756S	3754S	—	—	3757S	3754S	—
50-24820	RE50-05-61438	17.5–20	QBT3	8/23/2005	3788S	3788S	3788S	—	3788S	—	—	3788S	—	3788S	3788S	3788S	3788S	—	3788S	—	—
50-24820	RE50-05-61439	48.4–50	QBT3	8/24/2005	3794S	3794S	3794S	3793S	3794S	—	—	3794S	—	3794S	3794S	3794S	3794S	—	3794S	—	—
50-24820	RE50-05-63429	48.4–50	QBT3	8/24/2005	—	—	—	—	—	—	3792S	—	—	—	—	—	—	—	—	—	—
50-24820	RE50-05-61440	97.5–100	QBT3	8/25/2005	3806S	3805S	3805S	—	3806S	—	—	3806S	—	3806S	3805S	3804S	3806S	—	3804S	—	—
50-24820	RE50-05-61441	138.7–140	QBT2	8/26/2005	3826S	3826S	3826S	—	3826S	—	—	3826S	—	3826S	3826S	3826S	3826S	—	3826S	—	—
50-24820	RE50-05-61442	198.2–200	QBT1V	8/29/2005	3833S	3832S	3832S	—	3833S	—	—	3833S	—	3833S	3832S	3831S	3833S	—	3831S	—	—
50-24820	RE50-05-61443	248.3–250	QBT1G	8/30/2005	3833S	3832S	3832S	—	3833S	—	—	3833S	—	3833S	3832S	3831S	3833S	—	3831S	—	—
50-24821	RE50-05-61456	18.6–20	QBT3	9/1/2005	3841S	3841S	3841S	—	3841S	—	—	3841S	—	3841S	3841S	3841S	3841S	—	3841S	—	—
50-24821	RE50-05-63430	18.6–20	QBT3	9/1/2005	—	—	—	—	—	—	3866S	—	—	—	—	—	—	—	—	—	—
50-24821	RE50-05-61457	48.6–50	QBT3	9/2/2005	3841S	3841S	3841S	3840S	3841S	—	—	3841S	—	3841S	3841S	3841S	3841S	—	3841S	—	—
50-24821	RE50-05-63535	48.6–50	QBT3	9/2/2005	—	—	—	—	—	—	3856S	—	—	—	—	—	—	—	—	—	—
50-24821	RE50-05-61458	98.4–100	QBT3	9/6/2005	3859S	3859S	3859S	—	3859S	—	—	3859S	—	3859S	3859S	3859S	3859S	—	3859S	—	—
50-24821	RE50-05-61460	137.5–140	QBT2	9/7/2005	3870S	3870S	3870S	—	3870S	—	—	3870S	—	3870S	3870S	3870S	3870S	—	3870S	—	—
50-24821	RE50-05-61459	157.5–160	QBT2	9/8/2005	3881S	3881S	3881S	—	3881S	—	—	3881S	—	3881S	3881S	3881S	3881S	—	3881S	—	—
50-24821	RE50-05-61461	248.6–250	QBT1G	9/12/2005	3893S	3893S	3893S	—	3893S	—	—	3893S	—	3893S	3893S	3893S	3893S	—	3893S	—	—
50-24822	RE50-05-61474	18.6–20	QBT3	9/14/2005	3902S	3902S	3902S	—	3902S	—	—	3902S	—	3902S	3902S	3902S	—	—	3902S	3902S	—
50-24822	RE50-05-61475	47.5–49.1	QBT3	9/15/2005	3924S	3924S	3924S	3925S	3924S	—	—	3924S	—	3924S	3924S	3924S	—	—	3924S	3924S	—
50-24822	RE50-05-63431	47.5–49.1	QBT3	9/15/2005	—	—	—	—	—	—	3920S	—	—	—	—	—	—	—	—	—	—
50-24822	RE50-05-61476	98.6–100	QBT3	9/15/2005	3924S	3924S	3924S	—	3924S	—	—	3924S	—	3924S	3924S	3924S	—	—	3924S	3924S	—
50-24822	RE50-05-61477	137.5–139.2	QBT2	9/16/2005	3946S	3946S	3946S	—	3946S	—	—	3946S	—	3946S	3946S	3946S	—	—	3946S	3946S	—
50-24822	RE50-05-61478	198.5–200	QBT1V	9/19/2005	3951S	3951S	3951S	—	3951S	—	—	3951S	—	3951S	3951S	3951S	—	—	3951S	3951S	—
50-24822	RE50-05-61479	248.7–250	QBT1G	9/20/2005	3961S	3961S	3961S	—	3961S	—	—	3961S	—	3961S	3961S	3960S	—	—	3961S	3960S	—
50-25451	MD50-06-66697	18.7–19.9	QBT3	4/4/2006	4967S	4967S	4967S	4966S	4967S	—	4967S	4967S	—	4967S	4967S	4967S	4967S	—	4967S	4967S	—
50-25451	MD50-06-66698	48.1–49.9	QBT3	4/4/2006	4967S	4967S	4967S	4966S	4967S	—	4967S	4967S	—	4967S	4967S	4967S	4967S	—	4967S	4967S	—
50-25451	MD50-06-66671	96–100	QBT2	4/6/2006	5000S	4999S	4999S	—	5000S	—	—	5000S	—	5000S	4999S	4998S	4998S	—	5000S	4998S	—

MDA C Investigation Report

Table F-2.0-2 (continued)

Location ID	Sample ID	Depth (ft)	Media	Collection Date	Americium-241	Anions	Cyanide	Dioxins & Furans	Gamma Spectroscopy	Tritium	High Explosives	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	Metals	PCBs	Perchlorate	Pesticides & PCBs	Strontium-90	SVOCs	VOCs
50-25451	MD50-06-66672	146–147.5	QBT2	4/6/2006	5000S	4999S	4999S	—	5000S	—	—	5000S	—	5000S	4999S	4998S	4998S	—	5000S	4998S	—
50-25451	MD50-06-66673	198.9–200	QBT2	4/10/2006	5000S	4999S	4999S	—	5000S	—	—	5000S	—	5000S	4999S	4998S	4998S	—	5000S	4998S	—
50-25451	MD50-06-66674	251.2–252.5	QBT1G	4/11/2006	5012S	5012S	5012S	—	5012S	—	—	5012S	—	5012S	5012S	5011S	5011S	—	5012S	5011S	—
50-25451	MD50-06-66699	298.5–300	QBT1G	4/12/2006	5028S	5028S	5028S	5026S	5028S	—	—	5028S	—	5028S	5028S	5027S	5027S	—	5028S	5027S	—
50-25621	MD50-06-68034	29.7–30	QBT3	3/23/2006	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4861S
50-25621	MD50-06-68035	59.7–60	QBT3	3/24/2006	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4861S

^a Analytical request number.
^b — = Analysis not requested.

Table F-2.0-3
Summary of Pore-Gas Samples Collected at MDA C

Location ID	1 st Round Sample ID	Depth (ft)	Collection Date	Tritium	VOCs	2 nd Round Sample ID	Depth (ft)	Collection Date	Tritium	VOCs
50-09100	MD50-00-0099	90	8/2/2000	— ^a	7248R ^b	n.c. ^c	n.c.	n.c.	n.c.	n.c.
50-09100	MD50-00-0100	315	8/2/2000	—	7248R	n.c.	n.c.	n.c.	n.c.	n.c.
50-09100	MD50-00-0124	90	12/18/2000	—	8175R	n.c.	n.c.	n.c.	n.c.	n.c.
50-09100	MD50-00-0123	200	12/18/2000	—	8175R	n.c.	n.c.	n.c.	n.c.	n.c.
50-09100	MD50-06-70880	20	5/24/2006	5372S	5331S	n.c.	n.c.	n.c.	n.c.	n.c.
50-09100	MD50-06-70881	50	5/23/2006	5372S	5331S	n.c.	n.c.	n.c.	n.c.	n.c.
50-09100	MD50-06-70882	90	5/23/2006	5321S	5320S	n.c.	n.c.	n.c.	n.c.	n.c.
50-09100	MD50-06-70883	103	5/23/2006	5321S	5320S	n.c.	n.c.	n.c.	n.c.	n.c.
50-09100	MD50-06-70884	120	5/22/2006	5314S	5313S	n.c.	n.c.	n.c.	n.c.	n.c.
50-09100	MD50-06-70885	160	5/22/2006	5314S	5313S	n.c.	n.c.	n.c.	n.c.	n.c.
50-09100	MD50-06-70886	200	5/23/2006	5372S	5331S	n.c.	n.c.	n.c.	n.c.	n.c.
50-09100	MD50-06-70887	233	5/19/2006	5311S	5308S	n.c.	n.c.	n.c.	n.c.	n.c.
50-09100	MD50-06-70888	260	5/18/2006	5309S	5303S	n.c.	n.c.	n.c.	n.c.	n.c.
50-10131	MD50-06-70868	25	5/22/2006	5316S	5315S	n.c.	n.c.	n.c.	n.c.	n.c.
50-10131	MD50-06-70869	50	5/22/2006	5316S	5315S	n.c.	n.c.	n.c.	n.c.	n.c.
50-10131	MD50-06-70870	75	5/22/2006	5316S	5315S	n.c.	n.c.	n.c.	n.c.	n.c.
50-10131	MD50-06-70871	100	5/18/2006	5310S	5304S	n.c.	n.c.	n.c.	n.c.	n.c.
50-10131	MD50-06-70872	125	5/18/2006	5310S	5304S	n.c.	n.c.	n.c.	n.c.	n.c.
50-10131	MD50-06-70873	150	5/17/2006	5302S	5301S	n.c.	n.c.	n.c.	n.c.	n.c.
50-10131	MD50-06-70874	175	5/17/2006	5302S	5301S	n.c.	n.c.	n.c.	n.c.	n.c.
50-10131	MD50-06-70875	200	5/17/2006	5302S	5301S	n.c.	n.c.	n.c.	n.c.	n.c.
50-10131	MD50-06-70876	225	5/16/2006	5292S	5291S	n.c.	n.c.	n.c.	n.c.	n.c.
50-10131	MD50-06-70877	250	5/16/2006	5292S	5291S	n.c.	n.c.	n.c.	n.c.	n.c.
50-24766	MD50-06-64597	17	5/3/2006	5154S	5153S	MD50-06-65331	17	7/20/2006	5597S	5596S

Table F-2.0-3 (continued)

Location ID	1 st Round Sample ID	Depth (ft)	Collection Date	Tritium	VOCs	2 nd Round Sample ID	Depth (ft)	Collection Date	Tritium	VOCs
50-24766	MD50-06-64596	29	5/2/2006	5154S	5153S	MD50-06-65330	29	7/19/2006	5597S	5596S
50-24766	MD50-06-64595	99	5/2/2006	5127S	5126S	MD50-06-65329	99	7/19/2006	5597S	5596S
50-24766	MD50-06-64594	124	5/2/2006	5127S	5126S	MD50-06-65328	124	7/18/2006	5579S	5578S
50-24766	MD50-06-64593	149	5/1/2006	5127S	5126S	MD50-06-65327	149	7/18/2006	5579S	5578S
50-24767	MD50-06-64625	10	3/28/2006	4901S	4900S	MD50-06-65362	10	5/25/2006	5377S	5363S
50-24767	MD50-06-64626	30	3/28/2006	4901S	4900S	MD50-06-65361	30	5/25/2006	5373S	5335S
50-24767	MD50-06-64627	60	3/27/2006	4901S	4900S	MD50-06-65360	60	5/25/2006	5373S	5335S
50-24767	MD50-06-64628	124	3/24/2006	4893S	4874S	MD50-06-65359	124	5/24/2006	5373S	5335S
50-24767	MD50-06-64629	149	3/24/2006	4892S	4863S	MD50-06-65358	149	5/24/2006	5371S	5330S
50-24768	MD50-06-64661	14	3/30/2006	4956S	4944S	MD50-06-65370	14	6/1/2006	5387S	5384S
50-24768	MD50-06-64660	29	3/30/2006	4957S	4945S	MD50-06-65369	29	5/31/2006	5387S	5384S
50-24768	MD50-06-64659	99	3/29/2006	4954S	4915S	MD50-06-65368	99	5/31/2006	5387S	5384S
50-24768	MD50-06-64658	125	3/29/2006	4954S	4915S	MD50-06-65367	125	5/30/2006	5387S	5384S
50-24768	MD50-06-64657	150	3/29/2006	4954S	4915S	MD50-06-65366	150	5/30/2006	5387S	5384S
50-24769	MD50-06-64693	20	5/10/2006	5205S	5204S	MD50-06-65378	20	6/13/2006	5466S	5465S
50-24769	MD50-06-64692	39	5/10/2006	5205S	5204S	MD50-06-65377	39	6/13/2006	5466S	5465S
50-24769	MD50-06-64691	99	5/9/2006	5199S	5197S	MD50-06-65376	99	6/13/2006	5466S	5465S
50-24769	MD50-06-64690	124	5/9/2006	5199S	5197S	MD50-06-65375	124	6/12/2006	5430S	5429S
50-24769	MD50-06-64689	149	5/9/2006	5199S	5197S	MD50-06-65374	149	6/12/2006	5430S	5429S
50-24770	MD50-06-64738	20	4/20/2006	5052S	5051S	MD50-06-65387	20	6/16/2006	5479S	5478S
50-24770	MD50-06-64725	25	4/20/2006	5052S	5051S	MD50-06-65386	25	6/15/2006	5479S	5478S
50-24770	MD50-06-64724	39	4/19/2006	5052S	5051S	MD50-06-65385	39	6/15/2006	5472S	5468S
50-24770	MD50-06-64723	100	4/19/2006	5052S	5051S	MD50-06-65384	100	6/15/2006	5472S	5468S
50-24770	MD50-06-64722	124	4/19/2006	5052S	5051S	MD50-06-65383	124	6/14/2006	5472S	5468S
50-24770	MD50-06-64721	150	4/19/2006	5052S	5051S	MD50-06-65382	148	6/14/2006	5464S	5463S

Table F-2.0-3 (continued)

Location ID	1 st Round Sample ID	Depth (ft)	Collection Date	Tritium	VOCs	2 nd Round Sample ID	Depth (ft)	Collection Date	Tritium	VOCs
50-24771	MD50-06-64750	17	4/18/2006	5044S	5043S	MD50-06-65394	17	6/13/2006	5462S	5461S
50-24771	MD50-06-64749	40	4/18/2006	5044S	5043S	MD50-06-65393	40	6/13/2006	5462S	5461S
50-24771	MD50-06-64748	100	4/12/2006	5016S	5007S	MD50-06-65392	100	6/13/2006	5462S	5461S
50-24771	MD50-06-64747	125	4/12/2006	5016S	5007S	MD50-06-65391	125	6/12/2006	5428S	5427S
50-24771	MD50-06-64746	150	4/12/2006	5016S	5007S	MD50-06-65390	149	6/12/2006	5428S	5427S
50-24773	MD50-06-64775	20	4/11/2006	4996S	4995S	MD50-06-65405	20	6/12/2006	5425S	5424S
50-24773	MD50-06-64774	40	4/11/2006	4996S	4995S	MD50-06-65404	40	6/9/2006	5426S	5423S
50-24773	MD50-06-64773	100	4/11/2006	4996S	4995S	MD50-06-65403	100	6/9/2006	5426S	5423S
50-24773	MD50-06-64776	125	4/10/2006	4993S	4989S	MD50-06-65402	125	6/8/2006	5426S	5423S
50-24773	MD50-06-64772	150	4/6/2006	4994S	4990S	MD50-06-65401	149	6/8/2006	5410S	5407S
50-24782	MD50-06-64803	20	4/6/2006	4992S	4988S	MD50-06-65413	21	6/8/2006	5409S	5406S
50-24782	MD50-06-64804	40	4/5/2006	4971S	4972S	MD50-06-65412	40	6/7/2006	5409S	5406S
50-24782	MD50-06-64805	100	4/5/2006	4971S	4972S	MD50-06-65411	100	6/7/2006	5409S	5406S
50-24782	MD50-06-64806	125	4/5/2006	4971S	4972S	MD50-06-65410	125	6/7/2006	5409S	5406S
50-24782	MD50-06-64807	155	4/4/2006	4965S	4964S	MD50-06-65409	151	6/6/2006	5397S	5396S
50-24783	MD50-06-64832	20	4/4/2006	4962S	4961S	MD50-06-65421	20	6/5/2006	5393S	5392S
50-24783	MD50-06-64831	36	4/3/2006	4958S	4951S	MD50-06-65420	36	6/2/2006	5391S	5390S
50-24783	MD50-06-64830	100	4/3/2006	4958S	4951S	MD50-06-65419	100	6/2/2006	5391S	5390S
50-24783	MD50-06-64829	125	4/3/2006	4959S	4952S	MD50-06-65418	125	6/1/2006	5391S	5390S
50-24783	MD50-06-64828	151	3/31/2006	4955S	4943S	MD50-06-65417	148	6/1/2006	5391S	5390S
50-24784	MD50-06-64374	10	3/16/2006	4775S	4776S	MD50-06-70724	10	4/28/2006	5118S	5117S
50-24784	MD50-06-64373	20	3/16/2006	4775S	4776S	MD50-06-70723	20	4/28/2006	5118S	5117S
50-24784	MD50-06-64372	47	3/15/2006	4778S	4770S	MD50-06-70722	47	4/28/2006	5104S	5092S
50-24784	MD50-06-64371	49	3/15/2006	4778S	4770S	MD50-06-70721	49	4/27/2006	5104S	5092S
50-24784	MD50-06-64370	55	3/15/2006	4778S	4770S	MD50-06-65292	55	4/27/2006	5105S	5094S

Table F-2.0-3 (continued)

Location ID	1 st Round Sample ID	Depth (ft)	Collection Date	Tritium	VOCs	2 nd Round Sample ID	Depth (ft)	Collection Date	Tritium	VOCs
50-24784	MD50-06-64375	100	3/14/2006	4744S	4743S	MD50-06-65291	100	4/27/2006	5105S	5093S
50-24784	MD50-06-64379	168	3/14/2006	4744S	4743S	MD50-06-65290	168	4/27/2006	5105S	5093S
50-24784	MD50-06-64378	199	3/13/2006	4742S	4740S	MD50-06-65289	199	4/26/2006	5087S	5086S
50-24784	MD50-06-64377	250	3/13/2006	4742S	4740S	MD50-06-65288	250	4/26/2006	5084S	5083S
50-24784	MD50-06-64376	268	3/10/2006	4742S	4740S	MD50-06-65287	265	4/26/2006	5084S	5083S
50-24785	MD50-06-64402	10	1/23/2006	4421S	4420S	MD50-06-66783	10	5/3/2006	5150S	5149S
50-24785	MD50-06-64403	19	1/24/2006	4447S	4426S	MD50-06-65300	19	5/3/2006	5152S	5151S
50-24785	MD50-06-64408	60	2/10/2006	4585S	4563S	MD50-06-65299	60	5/2/2006	5152S	5151S
50-24785	MD50-06-64407	120	2/9/2006	4585S	4563S	MD50-06-65298	120	5/2/2006	5125S	5124S
50-24785	MD50-06-64404	200	1/31/2006	4494S	4493S	MD50-06-65297	200	5/1/2006	5116S	5115S
50-24785	MD50-06-64405	250	2/2/2006	4520S	4515S	MD50-06-65296	250	5/1/2006	5116S	5115S
50-24785	MD50-06-64406	275	2/6/2006	4522S	4517S	MD50-06-65295	256	5/1/2006	5116S	5115S
50-24796	MD50-06-64448	10	12/21/2005	4251S	4252S	MD50-06-65308	10	5/24/2006	5374S	5337S
50-24796	MD50-06-64447	20	12/21/2005	4251S	4252S	MD50-06-65307	20	5/24/2006	5370S	5329S
50-24796	MD50-06-64449	40	1/3/2006	4262S	4261S	MD50-06-65306	40	5/24/2006	5370S	5329S
50-24796	MD50-06-64450	100	1/4/2006	4262S	4261S	MD50-06-65305	100	5/24/2006	5370S	5329S
50-24796	MD50-06-64451	120	1/5/2006	4283S	4282S	MD50-06-65304	120	5/23/2006	5323S	5322S
50-24796	MD50-06-64452	150	1/5/2006	4285S	4284S	MD50-06-65303	144	5/23/2006	5323S	5322S
50-24797	MD50-06-64496	18.3	1/10/2006	4302S	4303S	MD50-06-65315	18.3	6/6/2006	5395S	5394S
50-24797	MD50-06-64497	38	1/11/2006	4318S	4317S	MD50-06-65314	38	6/5/2006	5395S	5394S
50-24797	MD50-06-66198	60	2/8/2006	4553S	4552S	MD50-06-65313	60	5/30/2006	5386S	5383S
50-24797	MD50-06-64498	120	1/13/2006	4329S	4330S	MD50-06-65312	120	5/25/2006	5375S	5339S
50-24797	MD50-06-64500	160	1/19/2006	4445S	4429S	MD50-06-65311	154	5/25/2006	5375S	5339S
50-24799	MD50-06-66197	15	2/8/2006	4527S	4528S	MD50-06-65323	20	7/24/2006	5611S	5610S
50-24799	MD50-06-64521	17.5	1/9/2006	4295S	4296S	MD50-06-65322	32.5	7/24/2006	5611S	5610S

Table F-2.0-3 (continued)

Location ID	1 st Round Sample ID	Depth (ft)	Collection Date	Tritium	VOCs	2 nd Round Sample ID	Depth (ft)	Collection Date	Tritium	VOCs
50-24799	MD50-06-64522	20	1/9/2006	4295S	4296S	MD50-06-65321	100	7/21/2006	5607S	5606S
50-24799	MD50-06-64523	32.5	1/10/2006	4299S	4300S	MD50-06-65320	120	7/21/2006	5595S	5594S
50-24799	MD50-06-64538	37.5	1/10/2006	4299S	4300S	MD50-06-65319	160	7/20/2006	5595S	5594S
50-24799	MD50-06-64524	40.5	1/11/2006	4315S	4316S	n.c.	n.c.	n.c.	n.c.	n.c.
50-24799	MD50-06-64525	100	1/13/2006	4331S	4332S	n.c.	n.c.	n.c.	n.c.	n.c.
50-24799	MD50-06-64526	120	1/17/2006	4345S	4344S	n.c.	n.c.	n.c.	n.c.	n.c.
50-24799	MD50-06-64527	160	1/17/2006	4345S	4344S	n.c.	n.c.	n.c.	n.c.	n.c.
50-24801	MD50-06-64853	20	2/1/2006	4519S	4501S	MD50-06-65429	20	7/18/2006	5577S	5576S
50-24801	MD50-06-64870	35	2/1/2006	4519S	4501S	MD50-06-65428	35	7/17/2006	5577S	5576S
50-24801	MD50-06-64856	80	2/7/2006	4530S	4531S	MD50-06-65427	80	7/17/2006	5577S	5576S
50-24801	MD50-06-64855	120	2/7/2006	4530S	4531S	MD50-06-65426	120	7/17/2006	5577S	5576S
50-24801	MD50-06-64854	150	2/6/2006	4523S	4518S	MD50-06-65425	150	7/14/2006	5566S	5565S
50-24802	MD50-06-64878	15	3/20/2006	4799S	4794S	MD50-06-65437	15	6/28/2006	5534S	5533S
50-24802	MD50-06-64879	42	3/20/2006	4799S	4794S	MD50-06-65436	42	6/27/2006	5534S	5533S
50-24802	MD50-06-64880	99.4	3/17/2006	4799S	4794S	MD50-06-65435	99	6/27/2006	5534S	5533S
50-24802	MD50-06-64881	124.4	3/17/2006	4798S	4786S	MD50-06-65434	124	6/27/2006	5534S	5533S
50-24802	MD50-06-64882	156.4	3/17/2006	4798S	4786S	MD50-06-65433	156	6/27/2006	5534S	5533S
50-24803	MD50-06-64904	16	3/23/2006	4891S	4862S	MD50-06-65445	16	6/26/2006	5525S	5524S
50-24803	MD50-06-64903	37	3/23/2006	4891S	4862S	MD50-06-65444	37	6/26/2006	5525S	5524S
50-24803	MD50-06-64905	99.5	3/22/2006	4890S	4820S	MD50-06-65443	99.5	6/26/2006	5525S	5524S
50-24803	MD50-06-64906	124	3/22/2006	4890S	4820S	MD50-06-65442	124	6/23/2006	5520S	5519S
50-24803	MD50-06-64907	151	3/21/2006	4810S	4809S	MD50-06-65441	150	6/23/2006	5520S	5519S
50-24804	MD50-06-64970	10	5/4/2006	5171S	5161S	MD50-06-65454	10	7/21/2006	5605S	5604S
50-24804	MD50-06-64971	16	5/4/2006	5171S	5161S	MD50-06-65453	16	7/21/2006	5593S	5592S
50-24804	MD50-06-64972	33	5/4/2006	5171S	5161S	MD50-06-65452	33	7/20/2006	5593S	5592S

Table F-2.0-3 (continued)

Location ID	1 st Round Sample ID	Depth (ft)	Collection Date	Tritium	VOCs	2 nd Round Sample ID	Depth (ft)	Collection Date	Tritium	VOCs
50-24804	MD50-06-64973	99	5/5/2006	5172S	5164S	MD50-06-65451	99	7/20/2006	5593S	5592S
50-24804	MD50-06-64974	124	5/5/2006	5172S	5164S	MD50-06-65450	124	7/19/2006	5593S	5592S
50-24804	MD50-06-64975	149	5/5/2006	5172S	5164S	MD50-06-65449	149	7/19/2006	5593S	5592S
50-24810	MD50-06-64999	19	5/15/2006	5281S	5280S	MD50-06-65461	19	7/18/2006	5575S	5574S
50-24810	MD50-06-64998	37	5/15/2006	5281S	5280S	MD50-06-65460	37	7/18/2006	5575S	5574S
50-24810	MD50-06-64997	99	5/15/2006	5281S	5280S	MD50-06-65459	99	7/18/2006	5575S	5574S
50-24810	MD50-06-64996	123	5/15/2006	5281S	5280S	MD50-06-65458	123	7/17/2006	5575S	5574S
50-24810	MD50-06-64995	150	5/11/2006	5232S	5225S	MD50-06-65457	150	7/17/2006	5575S	5574S
50-24811	MD50-06-65069	20	5/11/2006	5230S	5222S	MD50-06-65469	20	7/14/2006	5570S	5569S
50-24811	MD50-06-65068	40	5/10/2006	5203S	5202S	MD50-06-65468	40	7/13/2006	5570S	5569S
50-24811	MD50-06-65067	98	5/10/2006	5203S	5202S	MD50-06-65467	98	7/13/2006	5570S	5569S
50-24811	MD50-06-65066	125	5/10/2006	5203S	5202S	MD50-06-65466	125	7/12/2006	5570S	5569S
50-24811	MD50-06-65065	150	5/10/2006	5203S	5202S	MD50-06-65465	150	6/28/2006	5540S	5539S
50-24812	MD50-06-65094	10	5/9/2006	5198S	5196S	MD50-06-65477	10	6/27/2006	5536S	5535S
50-24812	MD50-06-65093	35	5/9/2006	5198S	5196S	MD50-06-65476	35	6/27/2006	5536S	5535S
50-24812	MD50-06-65092	98	5/9/2006	5198S	5196S	MD50-06-65474	98	6/27/2006	5536S	5535S
50-24812	MD50-06-65091	123	5/8/2006	5173S	5165S	MD50-06-65475	123	6/26/2006	5527S	5526S
50-24812	MD50-06-65090	150	5/5/2006	5173S	5165S	MD50-06-65473	150	6/26/2006	5527S	5526S
50-24813	MD50-06-65126	20	5/5/2006	5167S	5166S	MD50-06-65485	20	6/23/2006	5518S	5517S
50-24813	MD50-06-65125	30	5/4/2006	5170S	5160S	MD50-06-65484	30	6/23/2006	5518S	5517S
50-24813	MD50-06-65124	99	5/4/2006	5170S	5160S	MD50-06-65483	99	6/22/2006	5518S	5517S
50-24813	MD50-06-65123	125	5/4/2006	5170S	5160S	MD50-06-65482	125	6/21/2006	5502S	5501S
50-24813	MD50-06-65122	150	5/3/2006	5170S	5160S	MD50-06-65481	150	6/21/2006	5502S	5501S
50-24814	MD50-06-65151	10	5/16/2006	5294S	5293S	MD50-06-65493	10	6/20/2006	5498S	5497S
50-24814	MD50-06-65150	30	5/16/2006	5294S	5293S	MD50-06-65492	30	6/20/2006	5484S	5483S

Table F-2.0-3 (continued)

Location ID	1 st Round Sample ID	Depth (ft)	Collection Date	Tritium	VOCs	2 nd Round Sample ID	Depth (ft)	Collection Date	Tritium	VOCs
50-24814	MD50-06-65149	99	5/15/2006	5294S	5293S	MD50-06-65491	99	6/19/2006	5484S	5483S
50-24814	MD50-06-65148	124	5/15/2006	5283S	5282S	MD50-06-65490	124	6/19/2006	5484S	5483S
50-24814	MD50-06-65147	149	5/15/2006	5283S	5282S	MD50-06-65489	149	6/19/2006	5484S	5483S
50-24815	MD50-06-65183	30	5/12/2006	5244S	5243S	MD50-06-65501	30	6/15/2006	5475S	5474S
50-24815	MD50-06-65182	40	5/11/2006	5231S	5224S	MD50-06-65500	40	6/15/2006	5473S	5469S
50-24815	MD50-06-65181	100	5/11/2006	5231S	5224S	MD50-06-65499	100	6/15/2006	5473S	5469S
50-24815	MD50-06-65180	125	5/11/2006	5231S	5224S	MD50-06-65498	125	6/14/2006	5473S	5469S
50-24815	MD50-06-65179	149	5/10/2006	5201S	5200S	MD50-06-65497	149	6/14/2006	5460S	5459S
50-24816	MD50-06-65204	25	1/20/2006	4410S	4411S	MD50-06-65510	25	4/21/2006	5123S	5057S
50-24816	MD50-06-65205	35	1/20/2006	4448S	4427S	MD50-06-65509	35	4/20/2006	5055S	5054S
50-24816	MD50-06-65209	65	1/31/2006	4496S	4495S	MD50-06-65508	65	4/20/2006	5055S	5053S
50-24816	MD50-06-65206	120	1/24/2006	4448S	4428S	MD50-06-65507	120	4/20/2006	5055S	5053S
50-24816	MD50-06-65208	200	1/30/2006	4477S	4476S	MD50-06-65506	200	4/19/2006	5055S	5053S
50-24816	MD50-06-65207	225	1/27/2006	4477S	4476S	MD50-06-65505	215.8	4/19/2006	5055S	5053S
50-24817	MD50-05-63841	20	9/22/2005	4011S	4010S	MD50-06-65903	20	11/7/2005	4116S	4115S
50-24817	MD50-05-63842	40	9/22/2005	4011S	4010S	MD50-06-65904	50	11/7/2005	4116S	4115S
50-24817	RE50-05-63816	100	9/26/2005	4009S	4008S	MD50-06-65905	100	11/7/2005	4116S	4115S
50-24817	RE50-05-63817	140	9/27/2005	4028S	4027S	MD50-06-65906	140	11/4/2005	4116S	4115S
50-24817	RE50-05-63818	200	9/28/2005	4030S	4029S	MD50-06-65907	200	11/4/2005	4114S	4113S
50-24817	MD50-05-63843	250	10/3/2005	4045S	4044S	MD50-06-65908	240.9	11/4/2005	4114S	4113S
50-24818	MD50-06-65232	10	2/8/2006	4548s	4549S	n.c.	n.c.	n.c.	n.c.	n.c.
50-24818	MD50-06-65233	25	2/9/2006	4548s	4549S	n.c.	n.c.	n.c.	n.c.	n.c.
50-24818	MD50-06-65234	100	2/14/2006	4593S	4594S	n.c.	n.c.	n.c.	n.c.	n.c.
50-24818	MD50-06-65235	150	2/21/2006	4650S	4610S	n.c.	n.c.	n.c.	n.c.	n.c.
50-24818	MD50-06-65236	190	2/23/2006	4655S	4641S	n.c.	n.c.	n.c.	n.c.	n.c.

Table F-2.0-3 (continued)

Location ID	1 st Round Sample ID	Depth (ft)	Collection Date	Tritium	VOCs	2 nd Round Sample ID	Depth (ft)	Collection Date	Tritium	VOCs
50-24818	MD50-06-65237	250	2/24/2006	4662S	4645S	n.c.	n.c.	n.c.	n.c.	n.c.
50-24818	MD50-06-65238	280	2/27/2006	4662S	4645S	n.c.	n.c.	n.c.	n.c.	n.c.
50-24818	MD50-06-65239	315	2/28/2006	4663S	4664S	n.c.	n.c.	n.c.	n.c.	n.c.
50-24818	MD50-06-65240	414	5/17/2006	5299S	5298S	n.c.	n.c.	n.c.	n.c.	n.c.
50-24818	MD50-06-65242	452	6/16/2006	5477S	5476S	n.c.	n.c.	n.c.	n.c.	n.c.
50-24818	MD50-06-65245	500	6/23/2006	5516S	5512S	n.c.	n.c.	n.c.	n.c.	n.c.
50-24818	MD50-06-65244	548	6/22/2006	5500S	5499S	n.c.	n.c.	n.c.	n.c.	n.c.
50-24818	MD50-06-65243	591	6/22/2006	5500S	5499S	n.c.	n.c.	n.c.	n.c.	n.c.
50-24819	RE50-05-61430	20	8/10/2005	3667S	3666S	MD50-06-63863	20	10/18/2005	4072S	4073S
50-24819	RE50-05-61431	50	8/11/2005	3684S	3685S	MD50-06-63864	50	10/18/2005	4072S	4073S
50-24819	RE50-05-61432	100	8/15/2005	3709S	3708S	MD50-06-63865	100	10/17/2005	4072S	4073S
50-24819	RE50-05-61732	138.5–140	8/15/2005	3703S	3702S	MD50-06-63866	140	10/17/2005	4072S	4073S
50-24819	RE50-05-61733	200	8/17/2005	3724S	3723S	MD50-06-63867	200	10/13/2005	4068S	4067S
50-24819	RE50-05-61734	250	8/18/2005	3731S	3730S	MD50-06-63868	250	10/13/2005	4068S	4067S
50-24819	RE50-05-61735	275	8/19/2005	3752S	3751S	MD50-06-63869	275	10/12/2005	4068S	4067S
50-24820	RE50-05-61446	20	8/23/2005	3786S	3785S	MD50-06-64240	20	10/20/2005	4085S	4084S
50-24820	RE50-05-61449	50	8/24/2005	3797S	3796S	MD50-06-64241	50	10/20/2005	4085S	4084S
50-24820	RE50-05-61447	100	8/25/2005	3809S	3808S	MD50-06-64242	100	10/20/2005	4085S	4084S
50-24820	RE50-05-61448	140	8/26/2005	3809S	3808S	MD50-06-64243	140	10/20/2005	4085S	4084S
50-24820	RE50-05-61450	200	8/29/2005	3827S	3821S	MD50-06-64244	200	10/19/2005	4085S	4084S
50-24820	RE50-05-61736	250	8/30/2005	3828S	3822S	MD50-06-64245	225	10/19/2005	4085S	4084S
50-24821	RE50-05-61464	20	9/1/2005	3839S	3838S	MD50-06-64248	20	11/3/2005	4108S	4109S
50-24821	RE50-05-61466	50	9/2/2005	3839S	3838S	MD50-06-64249	50	11/2/2005	4108S	4109S
50-24821	RE50-05-61465	98.4–100	9/6/2005	3858S	3855S	MD50-06-64250	100	10/28/2005	4104S	4105S
50-24821	RE50-05-61467	137.5–140	9/7/2005	3868S	—	MD50-06-64251	140	10/27/2005	4102S	4103S

Table F-2.0-3 (continued)

Location ID	1 st Round Sample ID	Depth (ft)	Collection Date	Tritium	VOCs	2 nd Round Sample ID	Depth (ft)	Collection Date	Tritium	VOCs
50-24821	RE50-05-61469	137.5–140	9/7/2005	—	3867S	MD50-06-64254	160	11/14/2005	4130S	4129S
50-24821	RE50-05-61473	160	10/11/2005	4059S	4058S	MD50-06-64252	200	10/27/2005	4102S	4103S
50-24821	RE50-05-61468	248.6–250	9/12/2005	3892S	3891S	MD50-06-64253	238.4	10/27/2005	4102S	4103S
50-24822	RE50-05-61482	20	9/14/2005	3903S	3904S	MD50-06-64928	20	10/25/2005	4097S	4096S
50-24822	RE50-05-61483	50	9/15/2005	3922S	3921S	MD50-06-64929	50	10/24/2005	4097S	4096S
50-24822	RE50-05-61484	100	9/15/2005	3922S	3921S	MD50-06-64930	100	10/24/2005	4097S	4096S
50-24822	RE50-05-61485	140	9/16/2005	3945S	3944S	MD50-06-64931	140	10/24/2005	4097S	4096S
50-24822	RE50-05-61486	200	9/19/2005	3950S	3949S	MD50-06-64932	200	10/24/2005	4090S	4091S
50-24822	RE50-05-61737	250	9/20/2005	3959S	3958S	MD50-06-64933	250	10/21/2005	4090S	4091S
50-25451	MD50-06-66691	19	7/14/2006	5568S	5567S	n.c.	n.c.	n.c.	n.c.	n.c.
50-25451	MD50-06-66690	49	7/13/2006	5568S	5567S	n.c.	n.c.	n.c.	n.c.	n.c.
50-25451	MD50-06-66689	100	7/13/2006	5568S	5567S	n.c.	n.c.	n.c.	n.c.	n.c.
50-25451	MD50-06-66688	147	7/13/2006	5568S	5567S	n.c.	n.c.	n.c.	n.c.	n.c.
50-25451	MD50-06-66687	200	7/12/2006	5568S	5567S	n.c.	n.c.	n.c.	n.c.	n.c.
50-25451	MD50-06-66686	251	4/25/2006	5079S	5075S	n.c.	n.c.	n.c.	n.c.	n.c.
50-25451	MD50-06-66685	287	4/25/2006	5079S	5076S	n.c.	n.c.	n.c.	n.c.	n.c.

^a — = Analysis not requested.^b Analytical request number.^c n.c. = Not collected.

Table F-2.1-1
Frequency of Detected Inorganic Chemicals above BV
in Surface Soil and Fill Screening-Level Samples at MDA C

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range ^a (mg/kg)	BV ^b (mg/kg)	Frequency of Detects above BV	Frequency of Nondetects above BV
Antimony	Fill	52	1	[0.04] to 0.21	0.83	0/52	0/52
Antimony	Soil	16	5	[0.04] to 0.25	0.83	0/16	0/16
Arsenic	Fill	52	49	[0.2] to 5.2	8.17	0/52	0/52
Arsenic	Soil	16	16	0.9 to 8	8.17	0/16	0/16
Barium	Fill	52	52	36 to 250	295	0/52	0/52
Barium	Soil	16	16	26 to 190	295	0/16	0/16
Beryllium	Fill	52	52	0.41 to 1.4	1.83	0/52	0/52
Beryllium	Soil	16	16	0.32 to 1.2	1.83	0/16	0/16
Cadmium	Fill	52	0	[0.4]	0.4	0/52	0/52
Cadmium	Soil	16	0	[0.4]	0.4	0/16	0/16
Chromium, Total	Fill	52	52	2.4 to 18	19.3	0/52	0/52
Chromium, Total	Soil	16	16	1.3 to 12	19.3	0/16	0/16
Lead	Fill	52	52	7 to 30	22.3	6/52	0/52
Lead	Soil	16	16	10 to 27	22.3	3/16	0/16
Mercury	Fill	9	0	[0.1]	0.1	0/9	0/9
Mercury	Soil	1	0	[0.1]	0.1	0/1	0/1
Nickel	Fill	52	52	2.3 to 14	15.4	0/52	0/52
Nickel	Soil	16	12	[2] to 8.2	15.4	0/16	0/16
Potassium	Fill	1	1	1800	3460	0/1	0/1
Potassium	Soil	1	1	1300	3460	0/1	0/1
Selenium	Fill	52	28	[0.2] to 1	1.52	0/52	0/52
Selenium	Soil	16	3	[0.2] to 0.5	1.52	0/16	0/16
Silver	Fill	52	1	[1] to 1.1	1	1/52	0/52
Silver	Soil	16	1	[1] to 6	1	1/16	0/16
Thallium	Fill	52	51	[0.04] to 0.21	0.73	0/52	0/52
Thallium	Soil	16	16	0.04 to 0.18	0.73	0/16	0/16

^a Values in square brackets indicate nondetects.

^b BVs obtained from LANL 1998, 59730.

Table F-2.1-2
Inorganic Chemicals Detected above BV in
Surface Soil and Fill Screening-Level Samples at MDA C

Sample ID	Location ID	Depth (ft)	Media	Lead (mg/kg)	Silver (mg/kg)
Soil BV (mg/kg)^a				22.3	1
AAA3143	50-08102	0.00–0.50	Soil	27	— ^b
AAA3144	50-08154	0.00–0.50	Soil	27	—
AAA3093	50-08244	0.00–0.50	Fill	—	1.1
AAA3096	50-08290	0.00–0.50	Fill	23	—
AAA3193	50-08312	0.00–0.50	Fill	30	—
AAA3098	50-08326	0.00–0.50	Fill	26	—
AAA3099	50-08328	0.00–0.50	Fill	24	—
AAA3119	50-08340	0.00–0.50	Fill	23	—
AAA3145	50-08364	0.00–0.50	Soil	24	—
AAA3146	50-08418	0.00–0.50	Soil	—	6
AAA3151	50-08486	0.00–0.50	Fill	23	—

^a Soil BV is used for both fill and soil.

^b — = Not above the BV.

Table F-2.2-1
Frequency of Inorganic Chemicals Detected or Detected above BVs in Tuff at MDA C

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range ^a (mg/kg)	BV ^b (mg/kg)	Frequency of Detects above BV	Frequency of Nondetects above BV
Aluminum	QBO	5	5	1110 to 2880	3560	0/5	0/5
Aluminum	QBT1G	14	14	929 to 7870	3560	1/14	0/14
Aluminum	QBT1V	10	10	272 to 1650	8170	0/10	0/10
Aluminum	QBT2	62	62	240 to 24300	7340	3/62	0/62
Aluminum	QBT3	184	184	180 to 51100	7340	12/184	0/184
Antimony	QBO	5	1	0.124 to [0.475]	0.5	0/5	0/5
Antimony	QBT1G	14	3	0.14 to [0.454]	0.5	0/14	0/14
Antimony	QBT1V	10	1	0.136 to [0.43]	0.5	0/10	0/10
Antimony	QBT2	62	2	0.151 to [0.444]	0.5	0/62	0/62
Antimony	QBT3	175	6	[0.1] to [11]	0.5	5/175	61/175
Arsenic	QBO	5	2	0.75 to 13.3	0.56	2/5	3/5
Arsenic	QBT1G	14	6	0.643 to 2.93	0.56	6/14	8/14
Arsenic	QBT1V	10	10	0.72 to 2.94	1.81	2/10	0/10
Arsenic	QBT2	62	62	0.676 to 4.56	2.79	3/62	0/62
Arsenic	QBT3	182	139	[0.19] to 9.8	2.79	14/182	0/182
Barium	QBO	5	5	7.35 to 29.9	25.7	2/5	0/5
Barium	QBT1G	14	14	2.39 to 33.5	25.7	2/14	0/14
Barium	QBT1V	10	10	6.21 to 16.1	26.5	0/10	0/10
Barium	QBT2	62	62	2.3 to 56.3	46	1/62	0/62
Barium	QBT3	180	180	2.8 to 258	46	12/180	0/180
Beryllium	QBO	5	5	0.109 to 0.539	1.44	0/5	0/5
Beryllium	QBT1G	14	14	0.346 to 2.07	1.44	1/14	0/14
Beryllium	QBT1V	10	10	0.397 to 0.817	1.7	0/10	0/10
Beryllium	QBT2	62	62	0.143 to 5.62	1.21	5/62	0/62
Beryllium	QBT3	184	156	[0.02] to 6.67	1.21	7/184	0/184
Cadmium	QBO	5	0	[0.534 to 11.1]	0.4	0/5	5/5
Cadmium	QBT1G	14	0	[0.519 to 0.576]	0.4	0/14	14/14
Cadmium	QBT1V	10	0	[0.04 to 0.541]	0.4	0/10	9/10
Cadmium	QBT2	62	11	[0.02] to [0.552]	1.63	0/62	0/62
Cadmium	QBT3	182	41	[0.02] to 0.82	1.63	0/182	0/182
Calcium	QBO	5	5	424 to 1560	1900	0/5	0/5
Calcium	QBT1G	14	14	216 to 999	1900	0/14	0/14
Calcium	QBT1V	10	10	167 to 705	3700	0/10	0/10
Calcium	QBT2	62	62	174 to 2560	2200	1/62	0/62
Calcium	QBT3	183	183	160 to 73900	2200	9/183	0/183
Chromium	QBO	5	5	0.538 to 998	2.6	4/5	0/5

Table F-2.2-1 (continued)

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range ^a (mg/kg)	BV ^b (mg/kg)	Frequency of Detects above BV	Frequency of Nondetects above BV
Chromium	QBT1G	13	13	0.431 to 19.4	2.6	6/13	0/13
Chromium	QBT1V	9	9	0.19 to 5.7	2.24	3/9	0/9
Chromium	QBT2	61	58	0.2 to 14.9	7.14	3/61	0/61
Chromium	QBT3	182	123	[0.16] to 29	7.14	12/182	0/182
Cobalt	QBO	5	4	0.525 to 17.4	8.89	1/5	0/5
Cobalt	QBT1G	14	2	0.23 to [0.576]	8.89	0/14	0/14
Cobalt	QBT1V	10	6	0.213 to [0.541]	1.78	0/10	0/10
Cobalt	QBT2	62	41	0.208 to 1.77	3.14	0/62	0/62
Cobalt	QBT3	182	104	[0.18] to 5.79	3.14	4/182	0/182
Copper	QBO	5	5	11.3 to 446	3.96	5/5	0/5
Copper	QBT1G	14	14	0.664 to 1.85	3.96	0/14	0/14
Copper	QBT1V	10	10	0.537 to 1.76	3.26	0/10	0/10
Copper	QBT2	62	59	0.363 to 7.75	4.66	2/62	0/62
Copper	QBT3	182	141	0.362 to 30.7	4.66	12/182	0/182
Cyanide (Total)	QBO	5	2	0.162 to 0.433	0.5	0/5	0/5
Cyanide (Total)	QBT1G	14	0	[0.241 to 0.277]	0.5	0/14	0/14
Cyanide (Total)	QBT1V	10	0	[0.19 to 0.268]	0.5	0/10	0/10
Cyanide (Total)	QBT2	62	0	[0.19 to 0.38]	0.5	0/62	0/62
Cyanide (Total)	QBT3	163	17	[0.00053] to 10.2	0.5	6/163	36/163
Iron	QBO	5	5	995 to 184000	3700	3/5	0/5
Iron	QBT1G	14	14	1490 to 7640	3700	6/14	0/14
Iron	QBT1V	10	10	3320 to 8090	9900	0/10	0/10
Iron	QBT2	62	62	659 to 12900	14500	0/62	0/62
Iron	QBT3	182	182	517 to 26500	14500	3/182	0/182
Lead	QBO	5	4	1.29 to [22.1]	13.5	0/5	1/5
Lead	QBT1G	14	14	1.87 to 81.5	13.5	3/14	0/14
Lead	QBT1V	10	10	2.23 to 13.1	18.4	0/10	0/10
Lead	QBT2	62	61	0.798 to 47.8	11.2	4/62	0/62
Lead	QBT3	182	182	0.431 to 75.2	11.2	34/182	0/182
Magnesium	QBO	5	5	287 to 1180	739	2/5	0/5
Magnesium	QBT1G	14	14	90.6 to 253	739	0/14	0/14
Magnesium	QBT1V	9	9	80.3 to 287	780	0/9	0/9
Magnesium	QBT2	61	61	67.4 to 3420	1690	2/61	0/61
Magnesium	QBT3	183	178	60.8 to 7720	1690	8/183	0/183
Manganese	QBO	5	5	35 to 1900	189	1/5	0/5
Manganese	QBT1G	13	13	51.3 to 275	189	5/13	0/13
Manganese	QBT1V	10	10	243 to 358	408	0/10	0/10

Table F-2.2-1 (continued)

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range ^a (mg/kg)	BV ^b (mg/kg)	Frequency of Detects above BV	Frequency of Nondetects above BV
Manganese	QBT2	60	60	66.8 to 453	482	0/60	0/60
Manganese	QBT3	184	184	70 to 468	482	0/184	0/184
Mercury	QBO	5	0	[0.00981 to 0.012]	0.1	0/5	0/5
Mercury	QBT1G	14	0	[0.0101 to 0.0117]	0.1	0/14	0/14
Mercury	QBT1V	10	0	[0.00976 to 0.05]	0.1	0/10	0/10
Mercury	QBT2	62	6	0.0028 to [0.05]	0.1	0/62	0/62
Mercury	QBT3	184	38	0.0025 to [0.11]	0.1	0/184	11/184
Nickel	QBO	5	5	0.404 to 4.11	2	2/5	0/5
Nickel	QBT1G	14	14	0.118 to 1.33	2	0/14	0/14
Nickel	QBT1V	10	10	0.32 to 0.779	2	0/10	0/10
Nickel	QBT2	62	62	0.194 to 3.39	6.58	0/62	0/62
Nickel	QBT3	184	125	[0.2] to 20.3	6.58	2/184	0/184
Nitrate	QBO	5	2	[0.718] to 1.02	na ^c	2/5	n/a ^d
Nitrate	QBT1G	14	10	0.468 to 1.67	na	10/14	n/a
Nitrate	QBT1V	9	8	0.399 to 1.12	na	8/9	n/a
Nitrate	QBT2	60	39	0.354 to 2.06	na	39/60	n/a
Nitrate	QBT3	105	74	0.51 to 6.99	na	74/105	n/a
Perchlorate	QBO	5	0	[0.00217 to 0.00234]	na	0/5	n/a
Perchlorate	QBT1G	14	4	0.000589 to [0.00235]	na	4/14	n/a
Perchlorate	QBT1V	9	4	0.000663 to [0.00263]	na	4/9	n/a
Perchlorate	QBT2	60	11	0.000558 to 0.048	na	11/60	n/a
Perchlorate	QBT3	105	30	0.000538 to 0.0211	na	30/105	n/a
Potassium	QBO	5	5	279 to 784	2390	0/5	0/5
Potassium	QBT1G	14	14	330 to 1150	2390	0/14	0/14
Potassium	QBT1V	10	9	[96.9] to 826	6670	0/10	0/10
Potassium	QBT2	62	61	[93.1] to 2260	3500	0/62	0/62
Potassium	QBT3	184	162	[55] to 6770	3500	1/184	0/184
Selenium	QBO	5	1	[1.61] to [33.2]	0.3	1/5	4/5
Selenium	QBT1G	14	2	[1.56] to 3.14	0.3	2/14	12/14
Selenium	QBT1V	10	0	[0.45 to 1.62]	0.3	0/10	10/10
Selenium	QBT2	62	10	[0.44] to 12	0.3	10/62	52/62
Selenium	QBT3	182	21	[0.11] to 20	0.3	20/182	135/182
Silver	QBO	5	1	[0.207] to 0.294	1	0/5	0/5
Silver	QBT1G	14	6	0.0442 to [0.227]	1	0/14	0/14
Silver	QBT1V	10	2	0.0568 to [0.214]	1	0/10	0/10
Silver	QBT2	62	8	0.0401 to [0.209]	1	0/62	0/62
Silver	QBT3	184	33	0.0412 to [2.2]	1	2/184	10/184

Table F-2.2-1 (continued)

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range ^a (mg/kg)	BV ^b (mg/kg)	Frequency of Detects above BV	Frequency of Nondetects above BV
Sodium	QBO	5	5	681 to 836	4350	0/5	0/5
Sodium	QBT1G	14	14	240 to 804	4350	0/14	0/14
Sodium	QBT1V	10	9	[49.8] to 724	6330	0/10	0/10
Sodium	QBT2	62	60	51.2 to 725	2770	0/62	0/62
Sodium	QBT3	184	173	59.5 to 924	2770	0/184	0/184
Thallium	QBO	5	1	0.135 to [0.237]	1.22	0/5	0/5
Thallium	QBT1G	14	6	0.111 to 0.385	1.22	0/14	0/14
Thallium	QBT1V	10	1	[0.198] to 0.69	1.24	0/10	0/10
Thallium	QBT2	62	9	0.0944 to [0.984]	1.1	0/62	0/62
Thallium	QBT3	184	51	0.0824 to 1.4	1.1	3/184	21/184
Vanadium	QBO	5	5	1.11 to 55.2	4.59	2/5	0/5
Vanadium	QBT1G	14	14	0.428 to 1.52	4.59	0/14	0/14
Vanadium	QBT1V	10	10	0.49 to 2.33	4.48	0/10	0/10
Vanadium	QBT2	62	62	0.618 to 16.1	17	0/62	0/62
Vanadium	QBT3	182	173	0.42 to 39.3	17	3/182	0/182
Zinc	QBO	5	5	8.82 to 54.2	40	1/5	0/5
Zinc	QBT1G	14	14	7.82 to 93.1	40	4/14	0/14
Zinc	QBT1V	10	10	28.9 to 54.7	84.6	0/10	0/10
Zinc	QBT2	62	62	5.53 to 69.7	63.5	1/62	0/62
Zinc	QBT3	182	182	10.3 to 103	63.5	4/182	0/182

^a Values in brackets indicate nondetects.^b BVs are from LANL 1998, 59730.^c na = Not available.^d n/a = Not applicable.

Table F-2.2-2
Summary of Inorganic Chemicals Detected or Detected above BVs in Tuff at MDA C

Location ID	Sample ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium
Qbt2, 3, 4 BV^a				7340	0.5	2.79	46	1.21	1.63	2200	7.14
Qbt1v BV^a				8170	0.5	1.81	26.5	1.7	0.4	3700	2.24
Qbt1g, Qct, Qbo BV^a				3560	0.5	0.56	25.7	1.44	0.4	1900	2.6
50-09100	0550-95-0362	10.60–12.60	QBT3	— ^b	—	—	—	—	—	—	—
50-09100	0550-95-0365	26.50–28.50	QBT3	—	0.73 (U)	—	—	—	—	—	—
50-09100	0550-96-0100	32.70–33.70	QBT3	—	3.3 (UJ)	—	—	—	—	—	—
50-09100	0550-95-0368	41.50–43.50	QBT3	—	0.72 (U)	—	—	—	—	—	—
50-09100	0550-95-0371	58.20–60.00	QBT3	—	0.69 (U)	—	—	—	—	—	—
50-09100	0550-95-0374	71.50–73.50	QBT2	—	—	—	—	—	—	—	—
50-09100	0550-95-0383	115.10–116.90	QBT2	—	—	—	—	—	—	—	—
50-09100	0550-95-0392	161.30–163.10	QBT1V	—	—	—	—	—	—	—	—
50-09101	0550-95-0284	15.00–17.00	QBT3	—	9.8 (U)	—	—	—	—	—	—
50-09101	0550-96-0101	26.85–27.85	QBT3	—	3.3 (UJ)	—	—	—	—	—	—
50-09101	0550-95-0289	35.00–36.20	QBT3	—	10.3 (U)	—	—	—	—	—	—
50-09101	0550-96-0102	44.00–45.10	QBT3	—	3.5 (UJ)	—	—	—	—	—	—
50-09101	0550-95-0294	55.00–55.70	QBT3	—	9.5 (U)	—	—	—	—	—	—
50-09101	0550-96-0103	62.50–63.20	QBT3	—	3.5 (UJ)	—	—	—	—	—	—
50-09101	0550-95-0299	75.00–77.00	QBT3	—	9.5 (U)	—	—	—	—	—	—
50-09101	0550-95-0304	96.00–98.00	QBT3	—	9.4 (U)	—	—	—	—	—	—
50-09101	0550-95-0309	112.00–114.50	QBT3	—	9.4 (U)	—	—	—	—	—	—
50-09102	0550-95-0004	16.00–19.00	QBT3	—	—	—	—	—	—	—	—
50-09102	0550-95-0009	37.00–40.90	QBT3	—	—	—	—	—	—	—	—
50-09102	0550-95-0014	57.00–60.00	QBT3	—	—	—	—	—	—	—	—
50-09102	0550-95-0019	73.20–76.00	QBT3	—	5.8 (U)	—	—	—	—	—	—

Table F-2.2-2 (continued)

Location ID	Sample ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium
Qbt2, 3, 4 BV^a				7340	0.5	2.79	46	1.21	1.63	2200	7.14
Qbt1v BV^a				8170	0.5	1.81	26.5	1.7	0.4	3700	2.24
Qbt1g, Qct, Qbo BV^a				3560	0.5	0.56	25.7	1.44	0.4	1900	2.6
50-09102	0550-95-0024	95.00–97.00	QBT3	—	5.8 (U)	—	—	—	—	—	—
50-09102	0550-95-0029	108.00–110.00	QBT3	—	5.6 (U)	—	—	—	—	—	—
50-09103	0550-95-0104	18.50–20.80	QBT3	—	0.69 (U)	—	—	—	—	—	—
50-09103	0550-95-0109	36.00–38.80	QBT3	—	0.71 (U)	—	—	—	—	—	—
50-09103	0550-96-0104	46.50–47.82	QBT3	—	3.5 (UJ)	—	—	—	—	—	—
50-09103	0550-95-0114	56.00–58.80	QBT3	—	0.75 (U)	—	—	—	—	—	—
50-09103	0550-95-0119	78.00–80.00	QBT3	—	0.75 (U)	—	—	—	—	—	—
50-09103	0550-95-0124	94.70–98.00	QBT3	—	0.72 (U)	—	—	—	—	—	—
50-09103	0550-95-0129	114.80–116.80	QBT3	—	0.71 (U)	—	—	—	—	—	—
50-09104	0550-95-0079	26.30–28.00	QBT3	—	—	—	—	—	—	—	—
50-09104	0550-95-0083	36.60–38.60	QBT3	—	—	—	—	1.3	—	—	—
50-09104	0550-96-0105	44.10–45.10	QBT3	—	3.6 (UJ)	3.2	—	—	—	—	—
50-09105	0550-95-0135	16.10–18.50	QBT3	—	0.72 (U)	—	—	—	—	—	—
50-09105	0550-95-0140	35.00–38.00	QBT3	—	0.69 (U)	—	—	—	—	—	—
50-09105	0550-95-0145	57.00–59.00	QBT3	—	0.72 (U)	—	—	—	—	—	—
50-09105	0550-96-0106	62.10–63.00	QBT3	—	3.4 (UJ)	3	—	—	—	—	—
50-09105	0550-95-0150	77.00–79.70	QBT3	—	0.68 (U)	—	—	—	—	—	—
50-09105	0550-95-0155	97.00–99.80	QBT3	—	0.7 (U)	—	—	—	—	—	—
50-09105	0550-95-0160	117.70–120.00	QBT3	—	0.7 (U)	—	—	—	—	—	—
50-09106	0550-95-0046	27.50–30.50	QBT3	—	0.77 (UJ)	9.8	—	—	—	—	—
50-09106	0550-95-0050	41.00–44.00	QBT3	—	0.7 (U)	—	—	—	—	—	—
50-09106	0550-95-0054	56.50–58.50	QBT3	—	0.65 (U)	—	—	—	—	—	—
50-09106	0550-95-0058	70.50–73.00	QBT3	—	0.68 (U)	—	—	—	—	—	—

Table F-2.2-2 (continued)

Location ID	Sample ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium
Qbt2, 3, 4 BV^a				7340	0.5	2.79	46	1.21	1.63	2200	7.14
Qbt1v BV^a				8170	0.5	1.81	26.5	1.7	0.4	3700	2.24
Qbt1g, Qct, Qbo BV^a				3560	0.5	0.56	25.7	1.44	0.4	1900	2.6
50-09106	0550-95-0063	86.00–88.50	QBT3	—	0.68 (U)	—	—	—	—	—	—
50-09106	0550-95-0067	102.00–104.00	QBT3	—	0.86 (J)	—	—	—	—	—	—
50-09106	0550-95-0071	115.50–118.00	QBT3	—	0.65 (U)	—	—	—	—	—	—
50-09107	0550-96-0107	46.90–48.50	QBT3	—	3.3 (UJ)	2.8	—	—	—	—	—
50-09107	0550-96-0108	66.20–67.00	QBT3	—	3.4 (UJ)	—	—	—	—	—	—
50-09108	0550-95-0195	15.00–16.80	QBT3	—	11 (UJ)	—	—	—	—	—	—
50-09108	0550-96-0109	24.50–25.50	QBT3	—	3.4 (UJ)	—	—	—	—	—	—
50-09108	0550-95-0200	37.00–38.60	QBT3	—	11 (UJ)	—	—	—	—	—	—
50-09108	0550-96-0110	44.90–45.90	QBT3	—	3.3 (UJ)	—	—	—	—	—	—
50-09108	0550-95-0205	57.00–59.00	QBT3	—	10 (UJ)	—	—	—	—	—	—
50-09108	0550-95-0210	76.60–78.60	QBT3	—	10 (UJ)	—	—	—	—	—	—
50-09108	0550-95-0215	95.50–97.50	QBT3	—	5.7 (U)	—	—	—	—	—	—
50-09108	0550-95-0220	112.00–115.00	QBT3	—	5.8 (U)	—	—	—	—	—	—
50-09109	0550-95-0226	18.20–20.20	QBT3	—	11 (UJ)	—	—	—	—	—	—
50-09109	0550-95-0231	34.10–36.00	QBT3	—	11	—	100	—	—	—	—
50-09109	0550-96-0111	46.00–47.00	QBT3	—	3.3 (UJ)	—	—	—	—	—	—
50-09109	0550-95-0236	57.80–60.00	QBT3	—	11 (UJ)	—	—	—	—	—	—
50-09109	0550-96-0112	66.00–67.00	QBT3	7900	3.6 (UJ)	—	71.6	—	—	73900	12.7
50-09109	0550-95-0246	77.40–79.70	QBT3	—	11 (U)	—	—	—	—	—	—
50-09109	0550-95-0251	88.60–88.80	QBT3	—	10 (U)	—	—	—	—	—	—
50-09109	0550-95-0241	113.00–114.70	QBT3	—	11 (U)	—	—	—	—	—	—
50-09110	0550-95-0259	17.00–19.00	QBT3	—	2.9 (U)	—	—	—	—	—	—
50-09110	0550-96-0113	24.10–24.80	QBT3	—	3.4 (UJ)	—	—	—	—	—	—

Table F-2.2-2 (continued)

Location ID	Sample ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium
Qbt2, 3, 4 BV^a				7340	0.5	2.79	46	1.21	1.63	2200	7.14
Qbt1v BV^a				8170	0.5	1.81	26.5	1.7	0.4	3700	2.24
Qbt1g, Qct, Qbo BV^a				3560	0.5	0.56	25.7	1.44	0.4	1900	2.6
50-09110	0550-95-0264	38.00–40.00	QBT3	—	3.1 (J)	—	—	—	—	—	—
50-09110	0550-96-0114	48.50–49.50	QBT3	—	3.3 (UJ)	—	—	—	—	—	—
50-09110	0550-95-0269	59.00–60.80	QBT3	—	3 (U)	—	—	—	—	—	—
50-09110	0550-95-0274	74.00–76.60	QBT3	—	2.9 (U)	—	—	—	—	—	—
50-09110	0550-95-0279	88.00–89.40	QBT3	—	2.9 (U)	—	—	—	—	—	—
50-24766	MD50-06-64604	27.50–29.20	QBT3	—	—	—	—	—	—	—	—
50-24766	MD50-06-64586	97.50–99.90	QBT2	—	—	—	—	—	—	—	—
50-24766	MD50-06-64587	122.50–124.60	QBT2	—	—	—	—	—	—	—	—
50-24766	MD50-06-64605	148.10–149.50	QBT2	—	—	—	—	—	—	—	—
50-24767	MD50-06-64635	8.00–10.00	QBT3	—	—	—	—	—	—	—	—
50-24767	MD50-06-64636	28.10–30.00	QBT3	—	—	—	—	—	—	—	—
50-24767	MD50-06-64618	58.30–59.80	QBT3	—	—	—	—	—	—	—	—
50-24767	MD50-06-64619	123.20–125.00	QBT2	16300 (J+)	—	2.93	56.3	3.4	—	—	—
50-24767	MD50-06-64637	148.30–149.80	QBT2	—	—	—	—	—	—	—	—
50-24768	MD50-06-64667	12.50–15.00	QBT3	—	—	—	—	—	—	—	—
50-24768	MD50-06-64668	27.50–29.50	QBT3	—	—	—	—	—	—	—	—
50-24768	MD50-06-64650	96.70–99.50	QBT2	—	—	—	—	—	—	—	—
50-24768	MD50-06-64651	123.20–125.00	QBT2	—	—	—	—	—	—	—	—
50-24768	MD50-06-64669	148.60–151.50	QBT2	7580 (J+)	—	—	—	1.5	—	—	—
50-24769	MD50-06-64699	18.10–20.00	QBT3	—	—	—	—	—	—	—	—
50-24769	MD50-06-64700	37.50–39.90	QBT3	—	—	—	—	—	—	—	—
50-24769	MD50-06-64682	97.50–99.30	QBT3	25400	—	4.76	87.2 (J+)	—	—	3970	14.8
50-24769	MD50-06-64683	122.50–124.50	QBT2	—	—	—	—	—	—	—	—

Table F-2.2-2 (continued)

Location ID	Sample ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium
Qbt2, 3, 4 BV^a				7340	0.5	2.79	46	1.21	1.63	2200	7.14
Qbt1v BV^a				8170	0.5	1.81	26.5	1.7	0.4	3700	2.24
Qbt1g, Qct, Qbo BV^a				3560	0.5	0.56	25.7	1.44	0.4	1900	2.6
50-24769	MD50-06-64701	147.90–149.80	QBT2	—	—	—	—	—	—	—	—
50-24770	MD50-06-64731	18.10–22.50	QBT3	15200 (J+)	—	3.45	96.2	—	—	2540 (J+)	7.84
50-24770	MD50-06-64717	24.60–25.00	QBT3	—	—	—	217	—	—	3400 (J+)	—
50-24770	MD50-06-64732	38.20–39.90	QBT3	—	—	—	—	—	—	—	—
50-24770	MD50-06-64714	98.70–100.00	QBT3	—	—	—	—	—	—	—	—
50-24770	MD50-06-64715	123.20–124.60	QBT3	—	—	—	—	—	—	—	—
50-24770	MD50-06-64733	147.50–150.00	QBT2	—	—	—	—	—	—	—	—
50-24771	MD50-06-64756	15.90–17.50	QBT3	—	—	—	—	—	—	—	—
50-24771	MD50-06-64757	38.00–40.00	QBT3	—	—	—	—	—	—	—	—
50-24771	MD50-06-64739	98.80–100.00	QBT2	—	—	—	—	—	—	—	—
50-24771	MD50-06-64740	123.60–125.00	QBT2	—	—	—	—	—	—	—	—
50-24771	MD50-06-64758	148.20–150.00	QBT2	—	—	—	—	—	—	—	—
50-24773	MD50-06-64781	20.00–22.50	QBT3	—	—	—	—	—	—	—	—
50-24773	MD50-06-64782	38.00–40.00	QBT3	—	—	—	—	—	—	—	—
50-24773	MD50-06-64764	98.50–100.00	QBT2	—	—	—	—	—	—	—	—
50-24773	MD50-06-64765	123.70–124.80	QBT2	—	—	—	—	—	—	—	—
50-24773	MD50-06-64783	150.00–152.80	QBT2	—	—	—	—	—	—	—	—
50-24782	MD50-06-64813	20.90–22.50	QBT3	—	—	—	—	—	—	—	—
50-24782	MD50-06-64814	35.30–37.10	QBT3	—	—	—	—	—	—	—	—
50-24782	MD50-06-64796	98.50–100.00	QBT3	—	—	—	—	—	—	—	—
50-24782	MD50-06-64797	123.50–125.00	QBT3	—	—	—	—	—	—	—	—
50-24782	MD50-06-64815	156.00–157.50	QBT3	—	—	—	—	—	—	—	—
50-24783	MD50-06-64838	17.50–20.00	QBT3	—	—	—	—	—	—	—	—

Table F-2.2-2 (continued)

Location ID	Sample ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium
Qbt2, 3, 4 BV^a				7340	0.5	2.79	46	1.21	1.63	2200	7.14
Qbt1v BV^a				8170	0.5	1.81	26.5	1.7	0.4	3700	2.24
Qbt1g, Qct, Qbo BV^a				3560	0.5	0.56	25.7	1.44	0.4	1900	2.6
50-24783	MD50-06-64839	35.40–37.50	QBT3	—	—	—	—	—	—	—	—
50-24783	MD50-06-64821	98.60–100.00	QBT3	—	—	—	—	—	—	—	—
50-24783	MD50-06-64822	123.30–125.00	QBT2	—	—	—	—	—	—	—	—
50-24783	MD50-06-64840	150.30–152.50	QBT2	—	—	—	—	—	—	—	—
50-24784	MD50-06-64380	8.00–10.00	QBT3	—	—	—	—	—	—	—	7.89
50-24784	MD50-06-64381	18.00–20.00	QBT3	—	—	—	—	—	—	—	—
50-24784	MD50-06-64363	46.10–47.50	QBT3	—	—	—	—	—	—	—	—
50-24784	MD50-06-64364	48.70–50.00	QBT3	51100 (J+)	0.557 (U)	7.06	258	6.67	—	6040	23.4
50-24784	MD50-06-64365	51.00–55.00	QBT3	—	—	—	—	—	—	—	—
50-24784	MD50-06-64367	98.50–100.00	QBT3	—	—	—	—	—	—	—	—
50-24784	MD50-06-64366	167.50–169.00	QBT2	—	—	—	—	—	—	—	—
50-24784	MD50-06-64369	197.90–199.20	QBT1V	—	—	1.84	—	—	0.506 (U)	—	—
50-24784	MD50-06-64368	248.00–250.00	QBT1V	—	—	2.94	—	—	0.52 (U)	—	2.29
50-24784	MD50-06-65526	273.50–275.00	QBT1G	—	—	1.57 (U)	—	—	0.524 (U)	—	—
50-24784	MD50-06-64382	298.30–299.80	QBT1G	—	—	1.62 (U)	—	—	0.541 (U)	—	19.4
50-24785	MD50-06-64412	8.50–10.00	QBT3	11800 (J+)	—	—	65.2	—	—	—	9.36 (J)
50-24785	MD50-06-64413	17.50–19.00	QBT3	—	—	—	—	—	—	—	—
50-24785	MD50-06-64395	57.50–60.00	QBT3	—	—	—	—	—	—	—	—
50-24785	MD50-06-64396	117.50–120.00	QBT2	—	—	—	—	1.39	—	—	—
50-24785	MD50-06-64397	198.70–200.00	QBT1V	—	—	—	—	—	0.502 (U)	—	—
50-24785	MD50-06-64398	248.50–250.00	QBT1G	—	—	2.93	—	—	0.575 (U)	—	4.67 (J)
50-24785	MD50-06-64414	273.80–275.00	QBT1G	—	—	0.668 (J)	—	—	0.541 (U)	—	—
50-24796	MD50-06-64457	8.00–10.00	QBT3	15100 (J+)	—	—	—	—	—	—	29

Table F-2.2-2 (continued)

Location ID	Sample ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium
Qbt2, 3, 4 BV^a				7340	0.5	2.79	46	1.21	1.63	2200	7.14
Qbt1v BV^a				8170	0.5	1.81	26.5	1.7	0.4	3700	2.24
Qbt1g, Qct, Qbo BV^a				3560	0.5	0.56	25.7	1.44	0.4	1900	2.6
50-24796	MD50-06-64458	17.50–19.30	QBT3	—	—	—	—	—	—	—	—
50-24796	MD50-06-64440	37.50–39.30	QBT3	—	—	—	—	—	—	—	—
50-24796	MD50-06-64441	97.50–100.00	QBT3	—	—	—	—	—	—	—	—
50-24796	MD50-06-64442	118.70–120.00	QBT2	—	—	—	—	—	—	—	—
50-24796	MD50-06-64459	147.50–149.40	QBT2	—	—	—	—	—	—	—	—
50-24797	MD50-06-64506	17.50–18.30	QBT3	—	—	—	—	—	—	—	—
50-24797	MD50-06-64509	37.00–38.00	QBT3	—	—	—	—	—	—	—	—
50-24797	MD50-06-64489	58.00–60.00	QBT3	—	—	—	—	—	—	—	—
50-24797	MD50-06-64490	117.00–120.00	QBT2	—	—	—	—	—	—	—	—
50-24797	MD50-06-64508	157.50–159.00	QBT2	—	—	—	—	—	—	—	—
50-24799	MD50-06-64516	13.10–15.00	QBT3	—	—	—	—	—	—	—	—
50-24799	MD50-06-64517	15.00–16.50	QBT3	9940 (J+)	—	2.82	51.2	—	—	—	7.69
50-24799	MD50-06-64531	18.00–20.00	QBT3	18000 (J+)	—	2.99	58	—	—	2330	11.5
50-24799	MD50-06-64532	30.60–32.50	QBT3	—	—	—	—	—	—	—	—
50-24799	MD50-06-64518	34.50–36.00	QBT3	22600 (J+)	—	2.96	84.1 (J+)	2.32 (J)	—	3560 (J)	11.8
50-24799	MD50-06-64519	38.50–40.00	QBT3	—	—	—	—	—	—	—	10.4
50-24799	MD50-06-64514	98.30–100.00	QBT3	—	—	—	—	—	—	—	—
50-24799	MD50-06-64515	118.40–120.00	QBT2	—	—	—	—	—	—	—	—
50-24799	MD50-06-64533	158.50–160.00	QBT2	—	—	—	—	2.67	—	—	—
50-24801	MD50-06-64863	16.80–20.00	QBT3	—	—	—	—	—	—	—	—
50-24801	MD50-06-64864	33.00–35.00	QBT3	—	—	—	—	—	—	—	—
50-24801	MD50-06-64846	78.00–80.00	QBT3	—	—	—	—	—	—	—	—
50-24801	MD50-06-64847	118.00–120.00	QBT2	—	—	—	—	—	—	—	—

Table F-2.2-2 (continued)

Location ID	Sample ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium
Qbt2, 3, 4 BV^a				7340	0.5	2.79	46	1.21	1.63	2200	7.14
Qbt1v BV^a				8170	0.5	1.81	26.5	1.7	0.4	3700	2.24
Qbt1g, Qct, Qbo BV^a				3560	0.5	0.56	25.7	1.44	0.4	1900	2.6
50-24801	MD50-06-64865	148.30–150.00	QBT2	—	—	—	—	—	—	—	—
50-24802	MD50-06-64888	12.50–16.10	QBT3	—	—	—	—	—	—	—	—
50-24802	MD50-06-64889	40.60–42.50	QBT3	—	—	—	—	—	—	—	—
50-24802	MD50-06-64871	98.20–100.00	QBT3	—	—	—	—	—	—	—	—
50-24802	MD50-06-64872	123.10–125.00	QBT2	—	—	—	—	—	—	—	—
50-24802	MD50-06-64890	157.50–159.10	QBT2	—	—	—	—	—	—	—	—
50-24803	MD50-06-64913	15.40–17.50	QBT3	—	—	—	—	—	—	—	—
50-24803	MD50-06-64914	36.00–37.50	QBT3	—	—	—	—	—	—	—	—
50-24803	MD50-06-64896	98.70–99.80	QBT3	—	—	—	—	—	—	—	—
50-24803	MD50-06-64897	123.30–124.80	QBT2	—	—	—	—	—	—	—	—
50-24803	MD50-06-64915	150.00–153.90	QBT2	—	—	—	—	—	—	—	—
50-24804	MD50-06-64965	8.60–9.80	QBT3	—	—	3.63	—	—	—	—	—
50-24804	MD50-06-64966	10.00–11.40	QBT3	12700 (J+)	—	3.82	47.8	—	—	—	—
50-24804	MD50-06-64980	15.40–17.10	QBT3	—	—	—	—	—	—	—	—
50-24804	MD50-06-64981	32.50–34.20	QBT3	—	—	—	—	—	—	—	—
50-24804	MD50-06-64963	97.80–99.20	QBT3	—	1.08	—	—	—	—	—	—
50-24804	MD50-06-64964	122.50–124.10	QBT3	—	1.01	—	—	—	—	—	—
50-24804	MD50-06-64982	147.50–149.80	QBT2	—	—	—	—	—	—	—	—
50-24810	MD50-06-65005	17.50–19.00	QBT3	—	—	—	—	—	—	—	—
50-24810	MD50-06-65006	35.50–37.10	QBT3	—	—	—	—	—	—	—	—
50-24810	MD50-06-64988	97.50–99.00	QBT3	—	—	—	—	—	—	—	—
50-24810	MD50-06-64989	122.50–123.90	QBT2	—	—	—	—	—	—	—	—
50-24810	MD50-06-65007	148.30–151.60	QBT2	—	—	—	—	—	—	—	—

Table F-2.2-2 (continued)

Location ID	Sample ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium
Qbt2, 3, 4 BV^a				7340	0.5	2.79	46	1.21	1.63	2200	7.14
Qbt1v BV^a				8170	0.5	1.81	26.5	1.7	0.4	3700	2.24
Qbt1g, Qct, Qbo BV^a				3560	0.5	0.56	25.7	1.44	0.4	1900	2.6
50-24811	MD50-06-65075	18.50–20.00	QBT3	—	—	—	—	—	—	—	—
50-24811	MD50-06-65076	38.50–40.00	QBT3	—	—	—	—	—	—	—	—
50-24811	MD50-06-65058	97.50–98.70	QBT3	—	—	—	—	—	—	—	—
50-24811	MD50-06-65059	123.20–125.00	QBT2	—	—	—	—	—	—	—	—
50-24811	MD50-06-65077	147.50–150.60	QBT2	—	—	—	—	—	—	—	—
50-24812	MD50-06-65100	8.40–10.00	QBT3	—	—	7.11	—	—	—	4850 (J)	8.08 (J)
50-24812	MD50-06-65101	33.50–35.00	QBT3	—	—	—	—	—	—	—	—
50-24812	MD50-06-65083	97.50–98.90	QBT3	—	—	—	—	—	—	—	—
50-24812	MD50-06-65084	122.50–123.70	QBT2	—	—	—	—	—	—	—	—
50-24812	MD50-06-65102	146.00–150.00	QBT2	24300 (J+)	—	4.56	—	5.62 (J)	—	2560 (J)	9.95 (J)
50-24813	MD50-06-65132	18.20–20.00	QBT3	—	—	—	—	—	—	—	—
50-24813	MD50-06-65133	30.00–31.90	QBT3	—	—	—	—	—	—	—	—
50-24813	MD50-06-65115	98.20–99.70	QBT3	—	—	—	—	—	—	—	—
50-24813	MD50-06-65116	123.50–125.00	QBT2	—	—	—	—	—	—	—	—
50-24813	MD50-06-65134	148.00–150.00	QBT2	—	—	—	—	—	—	—	—
50-24814	MD50-06-65157	7.50–9.10	QBT3	—	—	—	—	—	—	—	—
50-24814	MD50-06-65158	30.00–31.60	QBT3	—	—	—	—	1.26	—	—	—
50-24814	MD50-06-65140	96.80–99.90	QBT3	—	—	—	—	—	—	—	—
50-24814	MD50-06-65141	123.50–124.80	QBT2	—	—	—	—	—	—	—	—
50-24814	MD50-06-65159	147.50–149.50	QBT2	—	—	—	—	—	—	—	—
50-24815	MD50-06-65189	17.50–20.00	QBT3	9660 (J+)	—	—	—	—	—	—	—
50-24815	MD50-06-65190	37.80–41.50	QBT3	—	—	—	—	—	—	—	—
50-24815	MD50-06-65172	98.80–100.00	QBT3	—	—	—	—	—	—	—	—

Table F-2.2-2 (continued)

Location ID	Sample ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium
Qbt2, 3, 4 BV^a				7340	0.5	2.79	46	1.21	1.63	2200	7.14
Qbt1v BV^a				8170	0.5	1.81	26.5	1.7	0.4	3700	2.24
Qbt1g, Qct, Qbo BV^a				3560	0.5	0.56	25.7	1.44	0.4	1900	2.6
50-24815	MD50-06-65173	123.40–125.00	QBT2	—	—	—	—	—	—	—	—
50-24815	MD50-06-65191	147.80–149.70	QBT2	—	—	—	—	—	—	—	—
50-24816	MD50-06-65214	23.10–24.70	QBT3	—	—	—	—	—	—	—	—
50-24816	MD50-06-65215	32.20–34.00	QBT3	—	—	—	—	—	—	—	—
50-24816	MD50-06-65197	63.80–65.00	QBT3	—	—	—	—	1.69	—	—	—
50-24816	MD50-06-65198	118.70–120.00	QBT2	—	—	—	—	—	—	—	—
50-24816	MD50-06-65199	198.80–200.00	QBT2	—	—	—	—	—	—	—	8.14 (J)
50-24816	MD50-06-65216	223.40–225.00	QBT2	—	—	—	—	—	—	—	—
50-24817	MD50-05-63837	18.40–20.00	QBT3	—	—	—	—	—	—	—	—
50-24817	MD50-05-63838	37.00–40.00	QBT3	—	—	—	—	—	—	—	—
50-24817	RE50-05-63810	98.80–100.00	QBT3	—	—	—	—	—	—	—	—
50-24817	RE50-05-63811	138.00–140.00	QBT2	—	—	—	—	—	—	—	—
50-24817	RE50-05-63812	198.40–200.00	QBT1V	—	—	—	—	—	0.525 (U)	—	—
50-24817	MD50-05-63839	248.10–250.00	QBT1G	7870	—	2.88	31.2	2.07	0.576 (U)	—	—
50-24818	MD50-06-65229	8.50–10.00	QBT3	—	—	—	—	—	—	—	—
50-24818	MD50-06-65230	22.10–25.00	QBT3	—	—	2.86	—	—	—	—	—
50-24818	MD50-06-65261	98.50–100.00	QBT2	—	—	—	—	—	—	—	—
50-24818	MD50-06-65262	147.50–149.20	QBT2	—	—	—	—	—	—	—	—
50-24818	MD50-06-65263	189.90–190.00	QBT1V	—	—	—	—	—	0.515 (U)	—	5.7
50-24818	MD50-06-65264	247.70–249.20	QBT1G	—	—	0.762 (J)	—	—	0.531 (U)	—	—
50-24818	MD50-06-65265	280.00–282.50	QBT1G	—	—	1.61 (U)	—	—	0.537 (U)	—	7.63
50-24818	MD50-06-65266	313.50–315.00	QBT1G	—	—	1.71 (U)	—	—	0.571 (U)	—	—
50-24818	MD50-06-65267	396.00–402.00	QBO	—	—	0.75 (J)	—	—	0.534 (U)	—	4.33

Table F-2.2-2 (continued)

Location ID	Sample ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium
Qbt2, 3, 4 BV^a				7340	0.5	2.79	46	1.21	1.63	2200	7.14
Qbt1v BV^a				8170	0.5	1.81	26.5	1.7	0.4	3700	2.24
Qbt1g, Qct, Qbo BV^a				3560	0.5	0.56	25.7	1.44	0.4	1900	2.6
50-24818	MD50-06-65268	449.00–452.00	QBO	—	—	13.3	29.9	—	11.1 (U)	—	998
50-24818	MD50-06-65269	497.00–500.50	QBO	—	—	1.61 (U)	27 (J+)	—	0.538 (U)	—	3.56 (J)
50-24818	MD50-06-65270	547.00–551.50	QBO	—	—	1.63 (U)	—	—	0.545 (U)	—	2.66 (J)
50-24818	MD50-06-65271	597.00–600.40	QBO	—	—	1.72 (U)	—	—	0.572 (U)	—	—
50-24819	RE50-05-61422	18.50–20.00	QBT3	—	—	—	—	—	—	—	—
50-24819	RE50-05-61423	48.00–50.00	QBT3	—	—	—	—	—	—	—	—
50-24819	RE50-05-61424	97.50–100.00	QBT3	—	—	—	—	—	—	—	—
50-24819	RE50-05-61425	138.50–140.00	QBT2	—	—	—	—	—	—	—	—
50-24819	RE50-05-61426	198.10–200.00	QBT1V	—	—	—	—	—	0.502 (U)	—	2.68 (J)
50-24819	RE50-05-61427	246.50–250.00	QBT1V	—	—	—	—	—	0.541 (U)	—	—
50-24819	RE50-05-61428	273.00–275.00	QBT1G	—	—	1.6 (U)	—	—	0.534 (U)	—	—
50-24820	RE50-05-61438	17.50–20.00	QBT3	—	—	—	—	—	—	—	—
50-24820	RE50-05-61439	48.40–50.00	QBT3	—	—	—	—	—	—	—	—
50-24820	RE50-05-61440	97.50–100.00	QBT3	10600 (J+)	—	—	108	—	—	2410	—
50-24820	RE50-05-61441	138.70–140.00	QBT2	—	—	—	—	—	—	—	—
50-24820	RE50-05-61442	198.20–200.00	QBT1V	—	—	—	—	—	0.498 (U)	—	—
50-24820	RE50-05-61443	248.30–250.00	QBT1G	—	—	1.84	33.5	—	0.536 (U)	—	—
50-24821	RE50-05-61456	18.60–20.00	QBT3	—	—	—	—	—	—	—	—
50-24821	RE50-05-61457	48.60–50.00	QBT3	—	—	—	—	—	—	—	—
50-24821	RE50-05-61458	98.40–100.00	QBT3	—	—	—	—	—	—	—	—
50-24821	RE50-05-61460	137.50–140.00	QBT2	—	—	—	—	—	—	—	—
50-24821	RE50-05-61459	157.50–160.00	QBT2	—	—	4.21	—	—	—	—	14.9 (J)
50-24821	RE50-05-61461	248.60–250.00	QBT1G	—	—	1.56 (U)	—	—	0.519 (U)	—	3.8 (J)

Table F-2.2-2 (continued)

Location ID	Sample ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium
Qbt2, 3, 4 BV^a				7340	0.5	2.79	46	1.21	1.63	2200	7.14
Qbt1v BV^a				8170	0.5	1.81	26.5	1.7	0.4	3700	2.24
Qbt1g, Qct, Qbo BV^a				3560	0.5	0.56	25.7	1.44	0.4	1900	2.6
50-24822	RE50-05-61474	18.60–20.00	QBT3	—	—	—	—	—	—	—	—
50-24822	RE50-05-61475	47.50–49.10	QBT3	—	—	—	—	1.36	—	—	—
50-24822	RE50-05-61476	98.60–100.00	QBT3	—	—	—	—	—	—	—	—
50-24822	RE50-05-61477	137.50–139.20	QBT2	—	—	—	—	—	—	—	—
50-24822	RE50-05-61478	198.50–200.00	QBT1V	—	—	—	—	—	0.499 (U)	—	—
50-24822	RE50-05-61479	248.70–250.00	QBT1G	—	—	0.643 (J)	—	—	0.519 (U)	—	2.76
50-25451	MD50-06-66697	18.70–19.90	QBT3	—	—	—	—	—	—	—	—
50-25451	MD50-06-66698	48.10–49.90	QBT3	—	—	—	—	2.07 (J)	—	—	—
50-25451	MD50-06-66671	96.00–100.00	QBT2	—	—	—	—	—	—	—	—
50-25451	MD50-06-66672	146.00–147.50	QBT2	—	—	—	—	—	—	—	—
50-25451	MD50-06-66673	198.90–200.00	QBT2	—	—	—	—	—	—	—	—
50-25451	MD50-06-66674	251.20–252.50	QBT1G	—	—	1.56 (U)	—	—	0.519 (U)	—	—
50-25451	MD50-06-66699	298.50–300.00	QBT1G	—	—	1.61 (U)	—	—	0.538 (U)	—	2.99

Table F-2.2-2 (continued)

Location ID	Sample ID	Depth (ft)	Media	Cobalt	Copper	Cyanide (Total)	Iron	Lead	Magnesium	Manganese	Mercury
Qbt2, 3, 4 BV^a				3.14	4.66	0.5	14500	11.2	1690	482	0.1
Qbt1v BV^a				1.78	3.26	0.5	9900	18.4	780	408	0.1
Qbt1g, Qct, Qbo BV^a				8.89	3.96	0.5	3700	13.5	739	189	0.1
50-09100	0550-95-0362	10.60–12.60	QBT3	—	—	—	—	—	—	—	—
50-09100	0550-95-0365	26.50–28.50	QBT3	—	—	0.535 (U)	—	—	—	—	0.11 (U)
50-09100	0550-96-0100	32.70–33.70	QBT3	—	—	—	—	—	—	—	—
50-09100	0550-95-0368	41.50–43.50	QBT3	—	—	0.533	—	—	—	—	0.11 (U)
50-09100	0550-95-0371	58.20–60.00	QBT3	—	—	0.506 (U)	—	—	—	—	—
50-09100	0550-95-0374	71.50–73.50	QBT2	—	—	—	—	—	—	—	—
50-09100	0550-95-0383	115.10–116.90	QBT2	—	—	—	—	—	—	—	—
50-09100	0550-95-0392	161.30–163.10	QBT1V	—	—	—	—	—	—	—	—
50-09101	0550-95-0284	15.00–17.00	QBT3	—	—	10.2	—	—	—	—	—
50-09101	0550-96-0101	26.85–27.85	QBT3	—	—	—	—	—	—	—	—
50-09101	0550-95-0289	35.00–36.20	QBT3	—	—	6.2	—	—	—	—	—
50-09101	0550-96-0102	44.00–45.10	QBT3	—	—	—	—	—	—	—	—
50-09101	0550-95-0294	55.00–55.70	QBT3	—	—	0.92	—	—	—	—	—
50-09101	0550-96-0103	62.50–63.20	QBT3	—	—	—	—	—	—	—	—
50-09101	0550-95-0299	75.00–77.00	QBT3	—	—	0.55 (U)	—	—	—	—	—
50-09101	0550-95-0304	96.00–98.00	QBT3	—	—	0.54 (U)	—	—	—	—	—
50-09101	0550-95-0309	112.00–114.50	QBT3	—	—	0.54 (U)	—	—	—	—	—
50-09102	0550-95-0004	16.00–19.00	QBT3	—	—	—	—	—	—	—	—
50-09102	0550-95-0009	37.00–40.90	QBT3	—	—	—	—	—	—	—	—
50-09102	0550-95-0014	57.00–60.00	QBT3	—	—	—	—	—	—	—	—
50-09102	0550-95-0019	73.20–76.00	QBT3	—	—	0.53 (U)	—	—	—	—	—
50-09102	0550-95-0024	95.00–97.00	QBT3	—	—	0.53 (U)	—	—	—	—	—

Table F-2.2-2 (continued)

Location ID	Sample ID	Depth (ft)	Media	Cobalt	Copper	Cyanide (Total)	Iron	Lead	Magnesium	Manganese	Mercury
Qbt2, 3, 4 BV^a				3.14	4.66	0.5	14500	11.2	1690	482	0.1
Qbt1v BV^a				1.78	3.26	0.5	9900	18.4	780	408	0.1
Qbt1g, Qct, Qbo BV^a				8.89	3.96	0.5	3700	13.5	739	189	0.1
50-09102	0550-95-0029	108.00–110.00	QBT3	—	—	0.52 (U)	—	—	—	—	—
50-09103	0550-95-0104	18.50–20.80	QBT3	—	—	0.511 (U)	—	—	—	—	—
50-09103	0550-95-0109	36.00–38.80	QBT3	—	—	0.525 (U)	—	—	—	—	—
50-09103	0550-96-0104	46.50–47.82	QBT3	—	—	—	—	16.2 (J-)	—	—	—
50-09103	0550-95-0114	56.00–58.80	QBT3	—	—	0.554 (U)	—	—	—	—	—
50-09103	0550-95-0119	78.00–80.00	QBT3	—	—	0.553 (U)	—	—	—	—	—
50-09103	0550-95-0124	94.70–98.00	QBT3	—	—	0.532 (U)	—	—	—	—	—
50-09103	0550-95-0129	114.80–116.80	QBT3	—	—	0.53 (U)	—	—	—	—	—
50-09104	0550-95-0079	26.30–28.00	QBT3	—	—	—	—	13.8	—	—	—
50-09104	0550-95-0083	36.60–38.60	QBT3	—	5	—	—	50.3	—	—	—
50-09104	0550-96-0105	44.10–45.10	QBT3	—	—	—	—	—	—	—	—
50-09105	0550-95-0135	16.10–18.50	QBT3	—	—	—	—	—	—	—	—
50-09105	0550-95-0140	35.00–38.00	QBT3	—	—	—	—	—	—	—	—
50-09105	0550-95-0145	57.00–59.00	QBT3	—	—	—	—	—	—	—	—
50-09105	0550-96-0106	62.10–63.00	QBT3	—	—	—	—	—	—	—	—
50-09105	0550-95-0150	77.00–79.70	QBT3	—	—	—	—	—	—	—	0.11 (U)
50-09105	0550-95-0155	97.00–99.80	QBT3	—	—	—	—	—	—	—	—
50-09105	0550-95-0160	117.70–120.00	QBT3	—	—	0.511 (U)	—	—	—	—	—
50-09106	0550-95-0046	27.50–30.50	QBT3	—	—	0.574 (U)	—	51.1	—	—	0.11 (U)
50-09106	0550-95-0050	41.00–44.00	QBT3	—	—	0.528 (U)	—	—	—	—	—
50-09106	0550-95-0054	56.50–58.50	QBT3	—	—	0.517 (U)	—	—	—	—	—
50-09106	0550-95-0058	70.50–73.00	QBT3	—	—	0.507 (U)	—	—	—	—	—

Table F-2.2-2 (continued)

Location ID	Sample ID	Depth (ft)	Media	Cobalt	Copper	Cyanide (Total)	Iron	Lead	Magnesium	Manganese	Mercury
Qbt2, 3, 4 BV^a				3.14	4.66	0.5	14500	11.2	1690	482	0.1
Qbt1v BV^a				1.78	3.26	0.5	9900	18.4	780	408	0.1
Qbt1g, Qct, Qbo BV^a				8.89	3.96	0.5	3700	13.5	739	189	0.1
50-09106	0550-95-0063	86.00–88.50	QBT3	—	—	0.507 (U)	—	—	—	—	—
50-09106	0550-95-0067	102.00–104.00	QBT3	—	—	0.508 (U)	—	—	—	—	—
50-09106	0550-95-0071	115.50–118.00	QBT3	—	—	0.504 (U)	—	—	—	—	—
50-09107	0550-96-0107	46.90–48.50	QBT3	—	—	—	—	—	—	—	—
50-09107	0550-96-0108	66.20–67.00	QBT3	—	—	—	—	—	—	—	—
50-09108	0550-95-0195	15.00–16.80	QBT3	—	—	0.53 (U)	—	65	—	—	0.11 (U)
50-09108	0550-96-0109	24.50–25.50	QBT3	—	—	—	—	—	—	—	—
50-09108	0550-95-0200	37.00–38.60	QBT3	—	—	0.54 (U)	—	22	—	—	0.11 (U)
50-09108	0550-96-0110	44.90–45.90	QBT3	—	—	—	—	—	—	—	—
50-09108	0550-95-0205	57.00–59.00	QBT3	—	—	0.51 (U)	—	—	—	—	—
50-09108	0550-95-0210	76.60–78.60	QBT3	—	—	0.52 (U)	—	—	—	—	—
50-09108	0550-95-0215	95.50–97.50	QBT3	—	—	1	—	—	—	—	—
50-09108	0550-95-0220	112.00–115.00	QBT3	—	—	—	—	—	—	—	—
50-09109	0550-95-0226	18.20–20.20	QBT3	—	—	0.54 (U)	—	—	—	—	0.11 (U)
50-09109	0550-95-0231	34.10–36.00	QBT3	—	11	0.54 (U)	—	41	—	—	0.11 (U)
50-09109	0550-96-0111	46.00–47.00	QBT3	—	—	—	—	—	—	—	—
50-09109	0550-95-0236	57.80–60.00	QBT3	—	—	0.53 (U)	—	—	—	—	0.11 (U)
50-09109	0550-96-0112	66.00–67.00	QBT3	3.8 (J)	30.7	—	—	11.3 (J-)	2690	—	—
50-09109	0550-95-0246	77.40–79.70	QBT3	—	—	0.53 (U)	—	—	—	—	0.11 (U)
50-09109	0550-95-0251	88.60–88.80	QBT3	—	—	0.52 (U)	—	—	—	—	—
50-09109	0550-95-0241	113.00–114.70	QBT3	—	—	0.53 (U)	—	—	—	—	0.11 (U)
50-09110	0550-95-0259	17.00–19.00	QBT3	—	—	0.53 (U)	—	—	—	—	—

Table F-2.2-2 (continued)

Location ID	Sample ID	Depth (ft)	Media	Cobalt	Copper	Cyanide (Total)	Iron	Lead	Magnesium	Manganese	Mercury
Qbt2, 3, 4 BV^a				3.14	4.66	0.5	14500	11.2	1690	482	0.1
Qbt1v BV^a				1.78	3.26	0.5	9900	18.4	780	408	0.1
Qbt1g, Qct, Qbo BV^a				8.89	3.96	0.5	3700	13.5	739	189	0.1
50-09110	0550-96-0113	24.10–24.80	QBT3	—	—	—	—	—	—	—	—
50-09110	0550-95-0264	38.00–40.00	QBT3	—	—	3.9	—	—	—	—	—
50-09110	0550-96-0114	48.50–49.50	QBT3	—	—	—	—	—	—	—	—
50-09110	0550-95-0269	59.00–60.80	QBT3	—	—	0.54 (U)	—	75.2	—	—	—
50-09110	0550-95-0274	74.00–76.60	QBT3	—	—	0.53 (U)	—	—	—	—	—
50-09110	0550-95-0279	88.00–89.40	QBT3	—	—	0.53 (U)	—	—	—	—	—
50-24766	MD50-06-64604	27.50–29.20	QBT3	—	—	—	—	—	—	—	—
50-24766	MD50-06-64586	97.50–99.90	QBT2	—	—	—	—	—	—	—	—
50-24766	MD50-06-64587	122.50–124.60	QBT2	—	—	—	—	—	—	—	—
50-24766	MD50-06-64605	148.10–149.50	QBT2	—	—	—	—	—	—	—	—
50-24767	MD50-06-64635	8.00–10.00	QBT3	—	—	—	—	17.1	—	—	—
50-24767	MD50-06-64636	28.10–30.00	QBT3	—	—	—	—	18.6	—	—	—
50-24767	MD50-06-64618	58.30–59.80	QBT3	—	—	—	—	19.9	—	—	—
50-24767	MD50-06-64619	123.20–125.00	QBT2	—	4.73	—	—	—	1730 (J+)	—	—
50-24767	MD50-06-64637	148.30–149.80	QBT2	—	—	—	—	—	—	—	—
50-24768	MD50-06-64667	12.50–15.00	QBT3	—	—	—	—	—	—	—	—
50-24768	MD50-06-64668	27.50–29.50	QBT3	—	—	—	—	—	—	—	—
50-24768	MD50-06-64650	96.70–99.50	QBT2	—	—	—	—	—	—	—	—
50-24768	MD50-06-64651	123.20–125.00	QBT2	—	—	—	—	14.6	—	—	—
50-24768	MD50-06-64669	148.60–151.50	QBT2	—	—	—	—	19.7	—	—	—
50-24769	MD50-06-64699	18.10–20.00	QBT3	—	—	—	—	—	—	—	—
50-24769	MD50-06-64700	37.50–39.90	QBT3	—	—	—	—	—	—	—	—

Table F-2.2-2 (continued)

Location ID	Sample ID	Depth (ft)	Media	Cobalt	Copper	Cyanide (Total)	Iron	Lead	Magnesium	Manganese	Mercury
Qbt2, 3, 4 BV^a				3.14	4.66	0.5	14500	11.2	1690	482	0.1
Qbt1v BV^a				1.78	3.26	0.5	9900	18.4	780	408	0.1
Qbt1g, Qct, Qbo BV^a				8.89	3.96	0.5	3700	13.5	739	189	0.1
50-24769	MD50-06-64682	97.50–99.30	QBT3	3.63	9.25	—	15600	12.6	4000 (J+)	—	—
50-24769	MD50-06-64683	122.50–124.50	QBT2	—	—	—	—	—	—	—	—
50-24769	MD50-06-64701	147.90–149.80	QBT2	—	—	—	—	—	—	—	—
50-24770	MD50-06-64731	18.10–22.50	QBT3	—	7.49	—	—	24.6	2400	—	—
50-24770	MD50-06-64717	24.60–25.00	QBT3	—	—	—	—	14.1	—	—	—
50-24770	MD50-06-64732	38.20–39.90	QBT3	—	—	—	—	—	—	—	—
50-24770	MD50-06-64714	98.70–100.00	QBT3	—	—	—	—	—	—	—	—
50-24770	MD50-06-64715	123.20–124.60	QBT3	—	—	—	—	—	—	—	—
50-24770	MD50-06-64733	147.50–150.00	QBT2	—	—	—	—	—	—	—	—
50-24771	MD50-06-64756	15.90–17.50	QBT3	—	—	—	—	—	—	—	—
50-24771	MD50-06-64757	38.00–40.00	QBT3	—	—	—	—	—	—	—	—
50-24771	MD50-06-64739	98.80–100.00	QBT2	—	—	—	—	—	—	—	—
50-24771	MD50-06-64740	123.60–125.00	QBT2	—	—	—	—	—	—	—	—
50-24771	MD50-06-64758	148.20–150.00	QBT2	—	—	—	—	—	—	—	—
50-24773	MD50-06-64781	20.00–22.50	QBT3	—	—	—	—	—	—	—	—
50-24773	MD50-06-64782	38.00–40.00	QBT3	—	—	—	—	—	—	—	—
50-24773	MD50-06-64764	98.50–100.00	QBT2	—	—	—	—	—	—	—	—
50-24773	MD50-06-64765	123.70–124.80	QBT2	—	—	—	—	—	—	—	—
50-24773	MD50-06-64783	150.00–152.80	QBT2	—	—	—	—	—	—	—	—
50-24782	MD50-06-64813	20.90–22.50	QBT3	—	—	—	—	—	—	—	—
50-24782	MD50-06-64814	35.30–37.10	QBT3	—	—	—	—	—	—	—	—
50-24782	MD50-06-64796	98.50–100.00	QBT3	—	—	—	—	—	—	—	—

Table F-2.2-2 (continued)

Location ID	Sample ID	Depth (ft)	Media	Cobalt	Copper	Cyanide (Total)	Iron	Lead	Magnesium	Manganese	Mercury
Qbt2, 3, 4 BV^a				3.14	4.66	0.5	14500	11.2	1690	482	0.1
Qbt1v BV^a				1.78	3.26	0.5	9900	18.4	780	408	0.1
Qbt1g, Qct, Qbo BV^a				8.89	3.96	0.5	3700	13.5	739	189	0.1
50-24782	MD50-06-64797	123.50–125.00	QBT3	—	—	—	—	—	—	—	—
50-24782	MD50-06-64815	156.00–157.50	QBT3	—	—	—	—	—	—	—	—
50-24783	MD50-06-64838	17.50–20.00	QBT3	—	—	—	—	—	—	—	—
50-24783	MD50-06-64839	35.40–37.50	QBT3	—	—	—	—	—	—	—	—
50-24783	MD50-06-64821	98.60–100.00	QBT3	—	—	—	—	14.2	—	—	—
50-24783	MD50-06-64822	123.30–125.00	QBT2	—	—	—	—	—	—	—	—
50-24783	MD50-06-64840	150.30–152.50	QBT2	—	—	—	—	—	—	—	—
50-24784	MD50-06-64380	8.00–10.00	QBT3	—	—	—	—	—	—	—	—
50-24784	MD50-06-64381	18.00–20.00	QBT3	—	—	—	—	—	—	—	—
50-24784	MD50-06-64363	46.10–47.50	QBT3	—	—	—	—	—	—	—	—
50-24784	MD50-06-64364	48.70–50.00	QBT3	5.79	20.7	—	26500	25.8	7720	—	—
50-24784	MD50-06-64365	51.00–55.00	QBT3	—	—	—	—	—	—	—	—
50-24784	MD50-06-64367	98.50–100.00	QBT3	—	—	—	—	—	—	—	—
50-24784	MD50-06-64366	167.50–169.00	QBT2	—	—	—	—	—	—	—	—
50-24784	MD50-06-64369	197.90–199.20	QBT1V	—	—	—	—	—	—	—	—
50-24784	MD50-06-64368	248.00–250.00	QBT1V	—	—	—	—	—	—	—	—
50-24784	MD50-06-65526	273.50–275.00	QBT1G	—	—	—	—	—	—	—	—
50-24784	MD50-06-64382	298.30–299.80	QBT1G	—	—	—	—	—	—	—	—
50-24785	MD50-06-64412	8.50–10.00	QBT3	—	—	—	—	—	—	—	—
50-24785	MD50-06-64413	17.50–19.00	QBT3	—	—	—	—	—	—	—	—
50-24785	MD50-06-64395	57.50–60.00	QBT3	—	—	—	—	—	—	—	—
50-24785	MD50-06-64396	117.50–120.00	QBT2	—	—	—	—	—	—	—	—

Table F-2.2-2 (continued)

Location ID	Sample ID	Depth (ft)	Media	Cobalt	Copper	Cyanide (Total)	Iron	Lead	Magnesium	Manganese	Mercury
Qbt2, 3, 4 BV^a				3.14	4.66	0.5	14500	11.2	1690	482	0.1
Qbt1v BV^a				1.78	3.26	0.5	9900	18.4	780	408	0.1
Qbt1g, Qct, Qbo BV^a				8.89	3.96	0.5	3700	13.5	739	189	0.1
50-24785	MD50-06-64397	198.70–200.00	QBT1V	—	—	—	—	—	—	—	—
50-24785	MD50-06-64398	248.50–250.00	QBT1G	—	—	—	7640	25.6	—	275	—
50-24785	MD50-06-64414	273.80–275.00	QBT1G	—	—	—	—	81.5	—	—	—
50-24796	MD50-06-64457	8.00–10.00	QBT3	—	6.69	—	—	60.9 (J)	2530	—	—
50-24796	MD50-06-64458	17.50–19.30	QBT3	—	—	—	—	17.3 (J)	—	—	—
50-24796	MD50-06-64440	37.50–39.30	QBT3	—	—	—	—	—	—	—	—
50-24796	MD50-06-64441	97.50–100.00	QBT3	—	—	—	—	—	—	—	—
50-24796	MD50-06-64442	118.70–120.00	QBT2	—	—	—	—	—	—	—	—
50-24796	MD50-06-64459	147.50–149.40	QBT2	—	—	—	—	—	—	—	—
50-24797	MD50-06-64506	17.50–18.30	QBT3	—	—	—	—	—	—	—	—
50-24797	MD50-06-64509	37.00–38.00	QBT3	—	—	—	—	—	—	—	—
50-24797	MD50-06-64489	58.00–60.00	QBT3	—	—	—	—	—	—	—	—
50-24797	MD50-06-64490	117.00–120.00	QBT2	—	—	—	—	—	—	—	—
50-24797	MD50-06-64508	157.50–159.00	QBT2	—	—	—	—	—	—	—	—
50-24799	MD50-06-64516	13.10–15.00	QBT3	—	—	—	—	—	—	—	—
50-24799	MD50-06-64517	15.00–16.50	QBT3	—	—	—	—	—	—	—	—
50-24799	MD50-06-64531	18.00–20.00	QBT3	—	5.82	—	—	—	2550	—	—
50-24799	MD50-06-64532	30.60–32.50	QBT3	—	—	—	—	—	—	—	—
50-24799	MD50-06-64518	34.50–36.00	QBT3	—	6.19	—	17200	16	3000	—	—
50-24799	MD50-06-64519	38.50–40.00	QBT3	—	—	—	—	—	—	—	—
50-24799	MD50-06-64514	98.30–100.00	QBT3	—	—	—	—	—	—	—	—
50-24799	MD50-06-64515	118.40–120.00	QBT2	—	—	—	—	—	—	—	—

Table F-2.2-2 (continued)

Location ID	Sample ID	Depth (ft)	Media	Cobalt	Copper	Cyanide (Total)	Iron	Lead	Magnesium	Manganese	Mercury
Qbt2, 3, 4 BV^a				3.14	4.66	0.5	14500	11.2	1690	482	0.1
Qbt1v BV^a				1.78	3.26	0.5	9900	18.4	780	408	0.1
Qbt1g, Qct, Qbo BV^a				8.89	3.96	0.5	3700	13.5	739	189	0.1
50-24799	MD50-06-64533	158.50–160.00	QBT2	—	—	—	—	—	—	—	—
50-24801	MD50-06-64863	16.80–20.00	QBT3	—	—	—	—	—	—	—	—
50-24801	MD50-06-64864	33.00–35.00	QBT3	—	—	—	—	—	—	—	—
50-24801	MD50-06-64846	78.00–80.00	QBT3	—	—	—	—	—	—	—	—
50-24801	MD50-06-64847	118.00–120.00	QBT2	—	—	—	—	—	—	—	—
50-24801	MD50-06-64865	148.30–150.00	QBT2	—	—	—	—	—	—	—	—
50-24802	MD50-06-64888	12.50–16.10	QBT3	—	—	—	—	—	—	—	—
50-24802	MD50-06-64889	40.60–42.50	QBT3	—	—	—	—	—	—	—	—
50-24802	MD50-06-64871	98.20–100.00	QBT3	—	—	—	—	—	—	—	—
50-24802	MD50-06-64872	123.10–125.00	QBT2	—	—	—	—	—	—	—	—
50-24802	MD50-06-64890	157.50–159.10	QBT2	—	—	—	—	—	—	—	—
50-24803	MD50-06-64913	15.40–17.50	QBT3	—	—	—	—	—	—	—	—
50-24803	MD50-06-64914	36.00–37.50	QBT3	—	—	—	—	42.8	—	—	—
50-24803	MD50-06-64896	98.70–99.80	QBT3	—	—	—	—	—	—	—	—
50-24803	MD50-06-64897	123.30–124.80	QBT2	—	—	—	—	—	—	—	—
50-24803	MD50-06-64915	150.00–153.90	QBT2	—	—	—	—	—	—	—	—
50-24804	MD50-06-64965	8.60–9.80	QBT3	—	5.16	—	—	51.9	—	—	—
50-24804	MD50-06-64966	10.00–11.40	QBT3	—	4.95	—	—	32.4	2060	—	—
50-24804	MD50-06-64980	15.40–17.10	QBT3	—	—	—	—	68.6	—	—	—
50-24804	MD50-06-64981	32.50–34.20	QBT3	—	—	—	—	34.9	—	—	—
50-24804	MD50-06-64963	97.80–99.20	QBT3	—	—	—	—	—	—	—	—
50-24804	MD50-06-64964	122.50–124.10	QBT3	—	—	—	—	36	—	—	—

Table F-2.2-2 (continued)

Location ID	Sample ID	Depth (ft)	Media	Cobalt	Copper	Cyanide (Total)	Iron	Lead	Magnesium	Manganese	Mercury
Qbt2, 3, 4 BV^a				3.14	4.66	0.5	14500	11.2	1690	482	0.1
Qbt1v BV^a				1.78	3.26	0.5	9900	18.4	780	408	0.1
Qbt1g, Qct, Qbo BV^a				8.89	3.96	0.5	3700	13.5	739	189	0.1
50-24804	MD50-06-64982	147.50–149.80	QBT2	—	—	—	—	47.8	—	—	—
50-24810	MD50-06-65005	17.50–19.00	QBT3	—	—	—	—	—	—	—	—
50-24810	MD50-06-65006	35.50–37.10	QBT3	—	—	—	—	—	—	—	—
50-24810	MD50-06-64988	97.50–99.00	QBT3	—	—	—	—	—	—	—	—
50-24810	MD50-06-64989	122.50–123.90	QBT2	—	—	—	—	—	—	—	—
50-24810	MD50-06-65007	148.30–151.60	QBT2	—	—	—	—	—	—	—	—
50-24811	MD50-06-65075	18.50–20.00	QBT3	—	—	—	—	—	—	—	—
50-24811	MD50-06-65076	38.50–40.00	QBT3	—	—	—	—	—	—	—	—
50-24811	MD50-06-65058	97.50–98.70	QBT3	—	—	—	—	—	—	—	—
50-24811	MD50-06-65059	123.20–125.00	QBT2	—	—	—	—	—	—	—	—
50-24811	MD50-06-65077	147.50–150.60	QBT2	—	—	—	—	—	—	—	—
50-24812	MD50-06-65100	8.40–10.00	QBT3	3.56	11.4 (J)	—	—	29.8	—	—	—
50-24812	MD50-06-65101	33.50–35.00	QBT3	—	—	—	—	17.7	—	—	—
50-24812	MD50-06-65083	97.50–98.90	QBT3	—	—	—	—	—	—	—	—
50-24812	MD50-06-65084	122.50–123.70	QBT2	—	—	—	—	—	—	—	—
50-24812	MD50-06-65102	146.00–150.00	QBT2	—	7.75 (J)	—	—	11.3	3420 (J)	—	—
50-24813	MD50-06-65132	18.20–20.00	QBT3	—	—	—	—	—	—	—	—
50-24813	MD50-06-65133	30.00–31.90	QBT3	—	—	—	—	—	—	—	—
50-24813	MD50-06-65115	98.20–99.70	QBT3	—	—	—	—	—	—	—	—
50-24813	MD50-06-65116	123.50–125.00	QBT2	—	—	—	—	—	—	—	—
50-24813	MD50-06-65134	148.00–150.00	QBT2	—	—	—	—	—	—	—	—
50-24814	MD50-06-65157	7.50–9.10	QBT3	—	—	—	—	—	—	—	—

Table F-2.2-2 (continued)

Location ID	Sample ID	Depth (ft)	Media	Cobalt	Copper	Cyanide (Total)	Iron	Lead	Magnesium	Manganese	Mercury
Qbt2, 3, 4 BV^a				3.14	4.66	0.5	14500	11.2	1690	482	0.1
Qbt1v BV^a				1.78	3.26	0.5	9900	18.4	780	408	0.1
Qbt1g, Qct, Qbo BV^a				8.89	3.96	0.5	3700	13.5	739	189	0.1
50-24814	MD50-06-65158	30.00–31.60	QBT3	—	—	—	—	—	—	—	—
50-24814	MD50-06-65140	96.80–99.90	QBT3	—	—	—	—	—	—	—	—
50-24814	MD50-06-65141	123.50–124.80	QBT2	—	—	—	—	—	—	—	—
50-24814	MD50-06-65159	147.50–149.50	QBT2	—	—	—	—	—	—	—	—
50-24815	MD50-06-65189	17.50–20.00	QBT3	—	—	—	—	23.1	—	—	—
50-24815	MD50-06-65190	37.80–41.50	QBT3	—	—	—	—	—	—	—	—
50-24815	MD50-06-65172	98.80–100.00	QBT3	—	—	—	—	—	—	—	—
50-24815	MD50-06-65173	123.40–125.00	QBT2	—	—	—	—	—	—	—	—
50-24815	MD50-06-65191	147.80–149.70	QBT2	—	—	—	—	—	—	—	—
50-24816	MD50-06-65214	23.10–24.70	QBT3	—	—	—	—	15.4	—	—	—
50-24816	MD50-06-65215	32.20–34.00	QBT3	—	—	—	—	28.6	—	—	—
50-24816	MD50-06-65197	63.80–65.00	QBT3	—	—	—	—	—	—	—	—
50-24816	MD50-06-65198	118.70–120.00	QBT2	—	—	—	—	—	—	—	—
50-24816	MD50-06-65199	198.80–200.00	QBT2	—	—	—	—	—	—	—	—
50-24816	MD50-06-65216	223.40–225.00	QBT2	—	—	—	—	—	—	—	—
50-24817	MD50-05-63837	18.40–20.00	QBT3	—	—	—	—	—	—	—	—
50-24817	MD50-05-63838	37.00–40.00	QBT3	—	—	—	—	—	—	—	—
50-24817	RE50-05-63810	98.80–100.00	QBT3	—	—	—	—	—	—	—	—
50-24817	RE50-05-63811	138.00–140.00	QBT2	—	—	—	—	—	—	—	—
50-24817	RE50-05-63812	198.40–200.00	QBT1V	—	—	—	—	—	—	—	—
50-24817	MD50-05-63839	248.10–250.00	QBT1G	—	—	—	5740	—	—	243	—
50-24818	MD50-06-65229	8.50–10.00	QBT3	—	—	—	—	—	—	—	—

Table F-2.2-2 (continued)

Location ID	Sample ID	Depth (ft)	Media	Cobalt	Copper	Cyanide (Total)	Iron	Lead	Magnesium	Manganese	Mercury
Qbt2, 3, 4 BV^a				3.14	4.66	0.5	14500	11.2	1690	482	0.1
Qbt1v BV^a				1.78	3.26	0.5	9900	18.4	780	408	0.1
Qbt1g, Qct, Qbo BV^a				8.89	3.96	0.5	3700	13.5	739	189	0.1
50-24818	MD50-06-65230	22.10–25.00	QBT3	—	—	—	—	—	—	—	—
50-24818	MD50-06-65261	98.50–100.00	QBT2	—	—	—	—	—	—	—	—
50-24818	MD50-06-65262	147.50–149.20	QBT2	—	—	—	—	—	—	—	—
50-24818	MD50-06-65263	189.90–190.00	QBT1V	—	—	—	—	—	—	—	—
50-24818	MD50-06-65264	247.70–249.20	QBT1G	—	—	—	3760	—	—	—	—
50-24818	MD50-06-65265	280.00–282.50	QBT1G	—	—	—	—	—	—	—	—
50-24818	MD50-06-65266	313.50–315.00	QBT1G	—	—	—	—	13.8 (J+)	—	—	—
50-24818	MD50-06-65267	396.00–402.00	QBO	—	18.2 (J)	—	5600	—	—	—	—
50-24818	MD50-06-65268	449.00–452.00	QBO	17.4	446	—	184000	22.1 (U)	—	1900	—
50-24818	MD50-06-65269	497.00–500.50	QBO	—	14.3	—	5150	—	1180 (J+)	—	—
50-24818	MD50-06-65270	547.00–551.50	QBO	—	127	—	—	—	872 (J+)	—	—
50-24818	MD50-06-65271	597.00–600.40	QBO	—	11.3	—	—	—	—	—	—
50-24819	RE50-05-61422	18.50–20.00	QBT3	—	—	—	—	—	—	—	—
50-24819	RE50-05-61423	48.00–50.00	QBT3	—	—	—	—	—	—	—	—
50-24819	RE50-05-61424	97.50–100.00	QBT3	—	—	—	—	—	—	—	—
50-24819	RE50-05-61425	138.50–140.00	QBT2	—	—	—	—	—	—	—	—
50-24819	RE50-05-61426	198.10–200.00	QBT1V	—	—	—	—	—	—	—	—
50-24819	RE50-05-61427	246.50–250.00	QBT1V	—	—	—	—	—	—	—	—
50-24819	RE50-05-61428	273.00–275.00	QBT1G	—	—	—	—	—	—	—	—
50-24820	RE50-05-61438	17.50–20.00	QBT3	—	—	—	—	—	—	—	—
50-24820	RE50-05-61439	48.40–50.00	QBT3	—	—	—	—	—	—	—	—
50-24820	RE50-05-61440	97.50–100.00	QBT3	—	—	—	—	—	—	—	—

Table F-2.2-2 (continued)

Location ID	Sample ID	Depth (ft)	Media	Cobalt	Copper	Cyanide (Total)	Iron	Lead	Magnesium	Manganese	Mercury
Qbt2, 3, 4 BV^a				3.14	4.66	0.5	14500	11.2	1690	482	0.1
Qbt1v BV^a				1.78	3.26	0.5	9900	18.4	780	408	0.1
Qbt1g, Qct, Qbo BV^a				8.89	3.96	0.5	3700	13.5	739	189	0.1
50-24820	RE50-05-61441	138.70–140.00	QBT2	—	—	—	—	—	—	—	—
50-24820	RE50-05-61442	198.20–200.00	QBT1V	—	—	—	—	—	—	—	—
50-24820	RE50-05-61443	248.30–250.00	QBT1G	—	—	—	4660	—	—	225	—
50-24821	RE50-05-61456	18.60–20.00	QBT3	—	—	—	—	—	—	—	—
50-24821	RE50-05-61457	48.60–50.00	QBT3	—	—	—	—	—	—	—	—
50-24821	RE50-05-61458	98.40–100.00	QBT3	—	—	—	—	—	—	—	—
50-24821	RE50-05-61460	137.50–140.00	QBT2	—	—	—	—	—	—	—	—
50-24821	RE50-05-61459	157.50–160.00	QBT2	—	—	—	—	—	—	—	—
50-24821	RE50-05-61461	248.60–250.00	QBT1G	—	—	—	5260	—	—	264	—
50-24822	RE50-05-61474	18.60–20.00	QBT3	—	—	—	—	17.8	—	—	—
50-24822	RE50-05-61475	47.50–49.10	QBT3	—	—	—	—	20.3	—	—	—
50-24822	RE50-05-61476	98.60–100.00	QBT3	—	—	—	—	50.9	—	—	—
50-24822	RE50-05-61477	137.50–139.20	QBT2	—	—	—	—	—	—	—	—
50-24822	RE50-05-61478	198.50–200.00	QBT1V	—	—	—	—	—	—	—	—
50-24822	RE50-05-61479	248.70–250.00	QBT1G	—	—	—	4520	—	—	257 (J)	—
50-25451	MD50-06-66697	18.70–19.90	QBT3	—	—	—	—	—	—	—	—
50-25451	MD50-06-66698	48.10–49.90	QBT3	—	—	—	—	—	—	—	—
50-25451	MD50-06-66671	96.00–100.00	QBT2	—	—	—	—	—	—	—	—
50-25451	MD50-06-66672	146.00–147.50	QBT2	—	—	—	—	—	—	—	—
50-25451	MD50-06-66673	198.90–200.00	QBT2	—	—	—	—	—	—	—	—
50-25451	MD50-06-66674	251.20–252.50	QBT1G	—	—	—	—	—	—	—	—
50-25451	MD50-06-66699	298.50–300.00	QBT1G	—	—	—	—	—	—	—	—

Table F-2.2-2 (continued)

Location ID	Sample ID	Depth (ft)	Media	Nickel	Nitrate	Perchlorate	Potassium	Selenium	Silver	Thallium	Vanadium	Zinc
Qbt2, 3, 4 BV^a				6.58	na^c	na	3500	0.3	1	1.1	17	63.5
Qbt1v BV^a				2	na	na	6670	0.3	1	1.24	4.48	84.6
Qbt1g, Qct, Qbo BV^a				2	na	na	2390	0.3	1	1.22	4.59	40
50-09100	0550-95-0362	10.60–12.60	QBT3	—	—	—	—	0.45 (J)	—	—	—	—
50-09100	0550-95-0365	26.50–28.50	QBT3	—	—	—	—	0.79 (U)	—	1.3 (U)	—	—
50-09100	0550-96-0100	32.70–33.70	QBT3	—	—	—	—	0.47 (U)	—	—	—	—
50-09100	0550-95-0368	41.50–43.50	QBT3	—	—	—	—	0.79 (U)	—	1.3 (U)	—	—
50-09100	0550-95-0371	58.20–60.00	QBT3	—	—	—	—	0.75 (U)	—	1.3 (U)	—	—
50-09100	0550-95-0374	71.50–73.50	QBT2	—	—	—	—	0.44 (U)	—	—	—	—
50-09100	0550-95-0383	115.10–116.90	QBT2	—	—	—	—	0.44 (U)	—	—	—	—
50-09100	0550-95-0392	161.30–163.10	QBT1V	—	—	—	—	0.45 (U)	—	—	—	—
50-09101	0550-95-0284	15.00–17.00	QBT3	—	—	—	—	0.36 (U)	—	—	—	—
50-09101	0550-96-0101	26.85–27.85	QBT3	—	—	—	—	0.64 (U)	—	—	—	—
50-09101	0550-95-0289	35.00–36.20	QBT3	—	—	—	—	0.35 (U)	—	—	—	—
50-09101	0550-96-0102	44.00–45.10	QBT3	—	—	—	—	0.71 (U)	—	—	—	—
50-09101	0550-95-0294	55.00–55.70	QBT3	—	—	—	—	0.35 (U)	—	—	—	—
50-09101	0550-96-0103	62.50–63.20	QBT3	—	—	—	—	0.92 (U)	—	—	—	—
50-09101	0550-95-0299	75.00–77.00	QBT3	—	—	—	—	0.35 (U)	—	—	—	—
50-09101	0550-95-0304	96.00–98.00	QBT3	—	—	—	—	0.35	—	—	—	—
50-09101	0550-95-0309	112.00–114.50	QBT3	—	—	—	—	0.35 (U)	—	—	—	—
50-09102	0550-95-0004	16.00–19.00	QBT3	—	—	—	—	0.47 (U)	—	—	—	—
50-09102	0550-95-0009	37.00–40.90	QBT3	—	—	—	—	0.47 (U)	—	—	—	—
50-09102	0550-95-0014	57.00–60.00	QBT3	—	—	—	—	0.47 (U)	—	—	—	—
50-09102	0550-95-0019	73.20–76.00	QBT3	—	—	—	—	0.32 (U)	—	—	—	—
50-09102	0550-95-0024	95.00–97.00	QBT3	—	—	—	—	0.32 (U)	—	—	—	—
50-09102	0550-95-0029	108.00–110.00	QBT3	—	—	—	—	0.31 (U)	—	—	—	—

Table F-2.2-2 (continued)

Location ID	Sample ID	Depth (ft)	Media	Nickel	Nitrate	Perchlorate	Potassium	Selenium	Silver	Thallium	Vanadium	Zinc
Qbt2, 3, 4 BV^a				6.58	na^c	na	3500	0.3	1	1.1	17	63.5
Qbt1v BV^a				2	na	na	6670	0.3	1	1.24	4.48	84.6
Qbt1g, Qct, Qbo BV^a				2	na	na	2390	0.3	1	1.22	4.59	40
50-09103	0550-95-0104	18.50–20.80	QBT3	—	—	—	—	0.75 (U)	—	1.3 (U)	—	—
50-09103	0550-95-0109	36.00–38.80	QBT3	—	—	—	—	0.77 (U)	—	1.3 (U)	—	—
50-09103	0550-96-0104	46.50–47.82	QBT3	—	—	—	—	—	—	—	—	—
50-09103	0550-95-0114	56.00–58.80	QBT3	—	—	—	—	0.82 (U)	—	1.4 (U)	—	—
50-09103	0550-95-0119	78.00–80.00	QBT3	—	—	—	—	0.82 (U)	—	1.4 (U)	—	—
50-09103	0550-95-0124	94.70–98.00	QBT3	—	—	—	—	0.78 (U)	—	1.3 (U)	—	—
50-09103	0550-95-0129	114.80–116.80	QBT3	—	—	—	—	0.78 (U)	—	1.3 (U)	—	—
50-09104	0550-95-0079	26.30–28.00	QBT3	—	—	—	—	—	—	—	—	—
50-09104	0550-95-0083	36.60–38.60	QBT3	—	—	—	—	—	—	—	—	—
50-09104	0550-96-0105	44.10–45.10	QBT3	—	—	—	—	1.1 (U)	—	1.2	—	—
50-09105	0550-95-0135	16.10–18.50	QBT3	—	—	—	—	0.79 (U)	—	1.3 (U)	—	—
50-09105	0550-95-0140	35.00–38.00	QBT3	—	—	—	—	0.75 (U)	—	1.2 (U)	—	—
50-09105	0550-95-0145	57.00–59.00	QBT3	—	—	—	—	0.78 (U)	—	1.3 (U)	—	—
50-09105	0550-96-0106	62.10–63.00	QBT3	—	—	—	—	0.88 (U)	—	—	—	—
50-09105	0550-95-0150	77.00–79.70	QBT3	—	—	—	—	0.74 (U)	—	1.2 (U)	—	—
50-09105	0550-95-0155	97.00–99.80	QBT3	—	—	—	—	0.76 (U)	—	1.3 (U)	—	—
50-09105	0550-95-0160	117.70–120.00	QBT3	—	—	—	—	0.76 (U)	—	1.3 (U)	—	—
50-09106	0550-95-0046	27.50–30.50	QBT3	—	—	—	—	0.84 (UJ)	—	1.4 (U)	—	—
50-09106	0550-95-0050	41.00–44.00	QBT3	—	—	—	—	0.77 (U)	—	1.3 (U)	—	—
50-09106	0550-95-0054	56.50–58.50	QBT3	—	—	—	—	0.71 (U)	—	1.2 (U)	—	—
50-09106	0550-95-0058	70.50–73.00	QBT3	—	—	—	—	0.74 (U)	—	1.2 (U)	—	—
50-09106	0550-95-0063	86.00–88.50	QBT3	—	—	—	—	0.74 (U)	—	1.2 (U)	—	—
50-09106	0550-95-0067	102.00–104.00	QBT3	—	—	—	—	0.74 (U)	—	1.2 (U)	—	—

Table F-2.2-2 (continued)

Location ID	Sample ID	Depth (ft)	Media	Nickel	Nitrate	Perchlorate	Potassium	Selenium	Silver	Thallium	Vanadium	Zinc
Qbt2, 3, 4 BV^a				6.58	na^c	na	3500	0.3	1	1.1	17	63.5
Qbt1v BV^a				2	na	na	6670	0.3	1	1.24	4.48	84.6
Qbt1g, Qct, Qbo BV^a				2	na	na	2390	0.3	1	1.22	4.59	40
50-09106	0550-95-0071	115.50–118.00	QBT3	—	—	—	—	0.71 (U)	—	1.2 (J)	—	—
50-09107	0550-96-0107	46.90–48.50	QBT3	—	—	—	—	1.1	—	—	—	—
50-09107	0550-96-0108	66.20–67.00	QBT3	—	—	—	—	0.95 (U)	—	—	—	—
50-09108	0550-95-0195	15.00–16.80	QBT3	—	—	—	—	—	2.1 (U)	—	—	—
50-09108	0550-96-0109	24.50–25.50	QBT3	—	—	—	—	0.53 (U)	—	—	—	—
50-09108	0550-95-0200	37.00–38.60	QBT3	—	—	—	—	—	2.2 (U)	—	—	—
50-09108	0550-96-0110	44.90–45.90	QBT3	—	—	—	—	0.85 (U)	—	—	—	—
50-09108	0550-95-0205	57.00–59.00	QBT3	—	—	—	—	—	2 (U)	—	—	—
50-09108	0550-95-0210	76.60–78.60	QBT3	—	—	—	—	—	2.1 (U)	—	—	—
50-09108	0550-95-0215	95.50–97.50	QBT3	—	—	—	—	—	—	—	—	—
50-09108	0550-95-0220	112.00–115.00	QBT3	—	—	—	—	—	—	—	—	—
50-09109	0550-95-0226	18.20–20.20	QBT3	—	—	—	—	—	2.2 (U)	—	—	—
50-09109	0550-95-0231	34.10–36.00	QBT3	—	—	—	—	—	2.2 (U)	—	—	—
50-09109	0550-96-0111	46.00–47.00	QBT3	—	—	—	—	0.61 (U)	—	—	—	—
50-09109	0550-95-0236	57.80–60.00	QBT3	—	—	—	—	—	2.1 (U)	—	—	—
50-09109	0550-96-0112	66.00–67.00	QBT3	13.2	—	—	—	1.3	—	1.4	—	—
50-09109	0550-95-0246	77.40–79.70	QBT3	—	—	—	—	1.1 (UJ)	2.1 (U)	—	—	—
50-09109	0550-95-0251	88.60–88.80	QBT3	—	—	—	—	1 (UJ)	2.1 (U)	—	—	—
50-09109	0550-95-0241	113.00–114.70	QBT3	—	—	—	—	1.1 (UJ)	2.1 (U)	—	—	—
50-09110	0550-95-0259	17.00–19.00	QBT3	—	—	—	—	—	—	—	—	—
50-09110	0550-96-0113	24.10–24.80	QBT3	—	—	—	—	0.71 (U)	—	—	—	—
50-09110	0550-95-0264	38.00–40.00	QBT3	—	—	—	—	—	—	—	—	—
50-09110	0550-96-0114	48.50–49.50	QBT3	—	—	—	—	0.82 (U)	—	—	—	—

Table F-2.2-2 (continued)

Location ID	Sample ID	Depth (ft)	Media	Nickel	Nitrate	Perchlorate	Potassium	Selenium	Silver	Thallium	Vanadium	Zinc
Qbt2, 3, 4 BV^a				6.58	na^c	na	3500	0.3	1	1.1	17	63.5
Qbt1v BV^a				2	na	na	6670	0.3	1	1.24	4.48	84.6
Qbt1g, Qct, Qbo BV^a				2	na	na	2390	0.3	1	1.22	4.59	40
50-09110	0550-95-0269	59.00–60.80	QBT3	—	—	—	—	—	—	—	—	—
50-09110	0550-95-0274	74.00–76.60	QBT3	—	—	—	—	—	—	—	—	—
50-09110	0550-95-0279	88.00–89.40	QBT3	—	—	—	—	—	—	—	—	—
50-24766	MD50-06-64604	27.50–29.20	QBT3	—	1.76	—	—	—	—	—	—	—
50-24766	MD50-06-64586	97.50–99.90	QBT2	—	1.19	0.00101 (J)	—	0.772 (J)	—	—	—	—
50-24766	MD50-06-64587	122.50–124.60	QBT2	—	1.24	0.00728	—	0.667 (J)	—	—	—	—
50-24766	MD50-06-64605	148.10–149.50	QBT2	—	1.1	—	—	1.57 (U)	—	—	—	—
50-24767	MD50-06-64635	8.00–10.00	QBT3	—	1.32	—	—	1.56 (U)	—	—	—	—
50-24767	MD50-06-64636	28.10–30.00	QBT3	—	2.36	—	—	1.53 (U)	—	—	—	—
50-24767	MD50-06-64618	58.30–59.80	QBT3	—	1.1	—	—	1.56 (U)	—	—	—	—
50-24767	MD50-06-64619	123.20–125.00	QBT2	—	—	—	—	1.65 (U)	—	—	—	—
50-24767	MD50-06-64637	148.30–149.80	QBT2	—	—	—	—	1.53 (U)	—	—	—	—
50-24768	MD50-06-64667	12.50–15.00	QBT3	—	—	—	—	1.47 (U)	—	—	—	—
50-24768	MD50-06-64668	27.50–29.50	QBT3	—	—	—	—	1.5 (U)	—	—	—	—
50-24768	MD50-06-64650	96.70–99.50	QBT2	—	—	—	—	1.49 (U)	—	—	—	—
50-24768	MD50-06-64651	123.20–125.00	QBT2	—	—	—	—	1.45 (U)	—	—	—	—
50-24768	MD50-06-64669	148.60–151.50	QBT2	—	—	—	—	1.57 (U)	—	—	—	—
50-24769	MD50-06-64699	18.10–20.00	QBT3	—	6.99	0.00085 (J)	—	9.09	—	—	—	—
50-24769	MD50-06-64700	37.50–39.90	QBT3	—	2.9	0.000893 (J)	—	8.4	—	—	—	—
50-24769	MD50-06-64682	97.50–99.30	QBT3	—	—	0.00118 (J)	—	1.49 (U)	—	—	27.1	—
50-24769	MD50-06-64683	122.50–124.50	QBT2	—	1.22	0.00174 (J)	—	1.5 (U)	—	—	—	—
50-24769	MD50-06-64701	147.90–149.80	QBT2	—	—	—	—	1.5 (U)	—	—	—	—
50-24770	MD50-06-64731	18.10–22.50	QBT3	—	0.771 (J-)	0.00823	—	1.62 (U)	—	—	—	—

Table F-2.2-2 (continued)

Location ID	Sample ID	Depth (ft)	Media	Nickel	Nitrate	Perchlorate	Potassium	Selenium	Silver	Thallium	Vanadium	Zinc
Qbt2, 3, 4 BV^a				6.58	na^c	na	3500	0.3	1	1.1	17	63.5
Qbt1v BV^a				2	na	na	6670	0.3	1	1.24	4.48	84.6
Qbt1g, Qct, Qbo BV^a				2	na	na	2390	0.3	1	1.22	4.59	40
50-24770	MD50-06-64717	24.60–25.00	QBT3	—	0.741 (J-)	0.0209	—	1.54 (U)	—	—	—	—
50-24770	MD50-06-64732	38.20–39.90	QBT3	—	0.754 (J-)	0.00348	—	1.49 (U)	—	—	—	—
50-24770	MD50-06-64714	98.70–100.00	QBT3	—	0.786 (J)	—	—	1.51 (U)	—	—	—	—
50-24770	MD50-06-64715	123.20–124.60	QBT3	—	0.751 (J)	—	—	1.48 (U)	—	—	—	—
50-24770	MD50-06-64733	147.50–150.00	QBT2	—	0.795 (J)	—	—	1.5 (U)	—	—	—	—
50-24771	MD50-06-64756	15.90–17.50	QBT3	—	2.9	—	—	1.55 (U)	—	—	—	—
50-24771	MD50-06-64757	38.00–40.00	QBT3	—	0.828 (J)	0.000538 (J)	—	11	—	—	—	—
50-24771	MD50-06-64739	98.80–100.00	QBT2	—	2.06	0.00507	—	10.1	—	—	—	—
50-24771	MD50-06-64740	123.60–125.00	QBT2	—	0.919 (J)	0.00318	—	11.4	—	—	—	—
50-24771	MD50-06-64758	148.20–150.00	QBT2	—	0.694 (J)	—	—	12	—	—	—	—
50-24773	MD50-06-64781	20.00–22.50	QBT3	—	1.03 (J-)	0.00118 (J)	—	1.52 (U)	—	—	—	—
50-24773	MD50-06-64782	38.00–40.00	QBT3	—	1.13	—	—	1.54 (U)	—	—	—	—
50-24773	MD50-06-64764	98.50–100.00	QBT2	—	0.795 (J)	—	—	1.48 (U)	—	—	—	—
50-24773	MD50-06-64765	123.70–124.80	QBT2	—	0.693 (J)	—	—	1.45 (U)	—	—	—	—
50-24773	MD50-06-64783	150.00–152.80	QBT2	—	0.707 (J)	—	—	1.49 (U)	—	—	—	—
50-24782	MD50-06-64813	20.90–22.50	QBT3	—	1.51	0.00647	—	1.48 (U)	—	—	—	—
50-24782	MD50-06-64814	35.30–37.10	QBT3	—	2.43	0.0211	—	1.54 (U)	—	—	—	—
50-24782	MD50-06-64796	98.50–100.00	QBT3	—	—	—	—	1.46 (U)	—	—	—	—
50-24782	MD50-06-64797	123.50–125.00	QBT3	—	—	—	—	1.46 (U)	—	—	—	—
50-24782	MD50-06-64815	156.00–157.50	QBT3	—	—	—	—	1.51 (U)	—	—	—	—
50-24783	MD50-06-64838	17.50–20.00	QBT3	—	1.96	0.000591 (J)	—	1.52 (U)	—	—	—	—
50-24783	MD50-06-64839	35.40–37.50	QBT3	—	1.2	—	—	1.52 (U)	—	—	—	—
50-24783	MD50-06-64821	98.60–100.00	QBT3	—	—	—	—	1.5 (U)	—	—	—	—

Table F-2.2-2 (continued)

Location ID	Sample ID	Depth (ft)	Media	Nickel	Nitrate	Perchlorate	Potassium	Selenium	Silver	Thallium	Vanadium	Zinc
Qbt2, 3, 4 BV^a				6.58	na^c	na	3500	0.3	1	1.1	17	63.5
Qbt1v BV^a				2	na	na	6670	0.3	1	1.24	4.48	84.6
Qbt1g, Qct, Qbo BV^a				2	na	na	2390	0.3	1	1.22	4.59	40
50-24783	MD50-06-64822	123.30–125.00	QBT2	—	—	—	—	1.47 (U)	—	—	—	—
50-24783	MD50-06-64840	150.30–152.50	QBT2	—	—	—	—	1.5 (U)	—	—	—	—
50-24784	MD50-06-64380	8.00–10.00	QBT3	—	2.18 (J-)	—	—	15	—	—	—	—
50-24784	MD50-06-64381	18.00–20.00	QBT3	—	2.31	0.000758 (J)	—	6.12	—	—	—	—
50-24784	MD50-06-64363	46.10–47.50	QBT3	—	—	—	—	6.79	—	—	—	—
50-24784	MD50-06-64364	48.70–50.00	QBT3	20.3	2.48	0.00123 (J)	6770 (J+)	20	—	—	39.3	103
50-24784	MD50-06-64365	51.00–55.00	QBT3	—	0.652 (J)	—	—	1.54 (U)	—	—	—	—
50-24784	MD50-06-64367	98.50–100.00	QBT3	—	0.51 (J)	—	—	1.55 (U)	—	—	—	—
50-24784	MD50-06-64366	167.50–169.00	QBT2	—	0.498 (J-)	—	—	1.48 (U)	—	—	—	—
50-24784	MD50-06-64369	197.90–199.20	QBT1V	—	0.53 (J-)	—	—	1.52 (U)	—	—	—	—
50-24784	MD50-06-64368	248.00–250.00	QBT1V	—	0.879 (J-)	0.00201 (J)	—	1.56 (U)	—	—	—	—
50-24784	MD50-06-65526	273.50–275.00	QBT1G	—	0.658 (J)	—	—	1.57 (U)	—	—	—	—
50-24784	MD50-06-64382	298.30–299.80	QBT1G	—	0.625 (J)	—	—	1.62 (U)	—	—	—	—
50-24785	MD50-06-64412	8.50–10.00	QBT3	—	—	0.00145 (J)	—	1.76 (U)	—	—	—	—
50-24785	MD50-06-64413	17.50–19.00	QBT3	—	—	—	—	1.52 (U)	—	—	—	—
50-24785	MD50-06-64395	57.50–60.00	QBT3	—	0.893	—	—	1.54 (U)	—	—	—	—
50-24785	MD50-06-64396	117.50–120.00	QBT2	—	—	—	—	1.54 (U)	—	—	—	—
50-24785	MD50-06-64397	198.70–200.00	QBT1V	—	1.12 (J-)	—	—	1.51 (U)	—	—	—	—
50-24785	MD50-06-64398	248.50–250.00	QBT1G	—	1.67	0.000926	—	3.14	—	—	—	62
50-24785	MD50-06-64414	273.80–275.00	QBT1G	—	—	—	—	1.75	—	—	—	81.7 (J)
50-24796	MD50-06-64457	8.00–10.00	QBT3	—	4.54	0.00412	—	1.55 (U)	—	—	—	—
50-24796	MD50-06-64458	17.50–19.30	QBT3	—	1.89	0.000583 (J)	—	1.54 (U)	—	—	—	—
50-24796	MD50-06-64440	37.50–39.30	QBT3	—	0.659 (J)	—	—	1.5 (U)	—	—	—	—

Table F-2.2-2 (continued)

Location ID	Sample ID	Depth (ft)	Media	Nickel	Nitrate	Perchlorate	Potassium	Selenium	Silver	Thallium	Vanadium	Zinc
Qbt2, 3, 4 BV^a				6.58	na^c	na	3500	0.3	1	1.1	17	63.5
Qbt1v BV^a				2	na	na	6670	0.3	1	1.24	4.48	84.6
Qbt1g, Qct, Qbo BV^a				2	na	na	2390	0.3	1	1.22	4.59	40
50-24796	MD50-06-64441	97.50–100.00	QBT3	—	0.54 (J)	—	—	1.5 (U)	—	—	—	—
50-24796	MD50-06-64442	118.70–120.00	QBT2	—	0.555 (J-)	—	—	1.46 (U)	—	—	—	—
50-24796	MD50-06-64459	147.50–149.40	QBT2	—	0.629 (J-)	—	—	1.49 (U)	—	—	—	—
50-24797	MD50-06-64506	17.50–18.30	QBT3	—	1.17	—	—	1.54 (U)	—	—	—	—
50-24797	MD50-06-64509	37.00–38.00	QBT3	—	0.991 (J)	—	—	1.54 (U)	—	—	—	—
50-24797	MD50-06-64489	58.00–60.00	QBT3	—	—	—	—	1.49 (U)	—	—	—	—
50-24797	MD50-06-64490	117.00–120.00	QBT2	—	0.532 (J)	—	—	1.51 (U)	—	—	—	—
50-24797	MD50-06-64508	157.50–159.00	QBT2	—	—	—	—	1.54 (U)	—	—	—	—
50-24799	MD50-06-64516	13.10–15.00	QBT3	—	1.79	—	—	1.59 (U)	—	—	—	—
50-24799	MD50-06-64517	15.00–16.50	QBT3	—	1.73	—	—	1.56 (U)	—	—	—	—
50-24799	MD50-06-64531	18.00–20.00	QBT3	—	1.7	—	—	1.59 (U)	—	—	—	—
50-24799	MD50-06-64532	30.60–32.50	QBT3	—	1.42	—	—	1.53 (U)	—	—	—	—
50-24799	MD50-06-64518	34.50–36.00	QBT3	—	2.16	—	—	1.67 (U)	—	—	20.3	65
50-24799	MD50-06-64519	38.50–40.00	QBT3	—	1.35	0.000942 (J)	—	1.56 (U)	—	—	—	—
50-24799	MD50-06-64514	98.30–100.00	QBT3	—	3.32 (J-)	0.00069 (J)	—	1.54 (U)	—	—	—	—
50-24799	MD50-06-64515	118.40–120.00	QBT2	—	—	—	—	1.5 (U)	—	—	—	—
50-24799	MD50-06-64533	158.50–160.00	QBT2	—	—	—	—	1.58 (U)	—	—	—	—
50-24801	MD50-06-64863	16.80–20.00	QBT3	—	2	—	—	1.56 (U)	—	—	—	—
50-24801	MD50-06-64864	33.00–35.00	QBT3	—	0.974 (J)	—	—	1.61 (U)	—	—	—	—
50-24801	MD50-06-64846	78.00–80.00	QBT3	—	—	—	—	1.53 (U)	—	—	—	—
50-24801	MD50-06-64847	118.00–120.00	QBT2	—	—	—	—	1.07 (J)	—	—	—	—
50-24801	MD50-06-64865	148.30–150.00	QBT2	—	—	—	—	1.42 (J)	—	—	—	—
50-24802	MD50-06-64888	12.50–16.10	QBT3	—	—	—	—	1.5 (U)	—	—	—	—

Table F-2.2-2 (continued)

Location ID	Sample ID	Depth (ft)	Media	Nickel	Nitrate	Perchlorate	Potassium	Selenium	Silver	Thallium	Vanadium	Zinc
Qbt2, 3, 4 BV^a				6.58	na^c	na	3500	0.3	1	1.1	17	63.5
Qbt1v BV^a				2	na	na	6670	0.3	1	1.24	4.48	84.6
Qbt1g, Qct, Qbo BV^a				2	na	na	2390	0.3	1	1.22	4.59	40
50-24802	MD50-06-64889	40.60–42.50	QBT3	—	1.27	—	—	1.56 (U)	—	—	—	—
50-24802	MD50-06-64871	98.20–100.00	QBT3	—	0.708 (J)	—	—	1.55 (U)	—	—	—	—
50-24802	MD50-06-64872	123.10–125.00	QBT2	—	0.795 (J)	—	—	1.51 (U)	—	—	—	—
50-24802	MD50-06-64890	157.50–159.10	QBT2	—	0.664 (J)	—	—	1.46 (U)	—	—	—	—
50-24803	MD50-06-64913	15.40–17.50	QBT3	—	1.23	0.000538 (J)	—	1.67 (U)	—	—	—	—
50-24803	MD50-06-64914	36.00–37.50	QBT3	—	0.709 (J)	—	—	1.56 (U)	—	—	—	—
50-24803	MD50-06-64896	98.70–99.80	QBT3	—	1.18	—	—	1.56 (U)	—	—	—	—
50-24803	MD50-06-64897	123.30–124.80	QBT2	—	0.619 (J)	—	—	1.51 (U)	—	—	—	—
50-24803	MD50-06-64915	150.00–153.90	QBT2	—	0.641 (J)	—	—	1.54 (U)	—	—	—	—
50-24804	MD50-06-64965	8.60–9.80	QBT3	—	—	—	—	1.19 (J)	—	—	—	101
50-24804	MD50-06-64966	10.00–11.40	QBT3	—	—	—	—	2.49	—	—	—	—
50-24804	MD50-06-64980	15.40–17.10	QBT3	—	1.14	—	—	0.75 (J)	—	—	—	—
50-24804	MD50-06-64981	32.50–34.20	QBT3	—	1.05	—	—	1 (J)	—	—	—	—
50-24804	MD50-06-64963	97.80–99.20	QBT3	—	1.13	—	—	0.695 (J)	1.53	—	—	—
50-24804	MD50-06-64964	122.50–124.10	QBT3	—	1.06	0.00735	—	1.58 (U)	1.43	—	—	—
50-24804	MD50-06-64982	147.50–149.80	QBT2	—	1 (J)	0.00668	—	1.52 (U)	—	—	—	—
50-24810	MD50-06-65005	17.50–19.00	QBT3	—	—	—	—	1.6 (U)	—	—	—	—
50-24810	MD50-06-65006	35.50–37.10	QBT3	—	—	—	—	1.59 (U)	—	—	—	—
50-24810	MD50-06-64988	97.50–99.00	QBT3	—	—	0.000538 (J)	—	1.58 (U)	—	—	—	—
50-24810	MD50-06-64989	122.50–123.90	QBT2	—	0.847 (J)	—	—	1.59 (U)	—	—	—	—
50-24810	MD50-06-65007	148.30–151.60	QBT2	—	0.787 (J-)	—	—	1.57 (U)	—	—	—	—
50-24811	MD50-06-65075	18.50–20.00	QBT3	—	0.788 (J)	—	—	1.58 (U)	—	—	—	—
50-24811	MD50-06-65076	38.50–40.00	QBT3	—	0.805 (J)	0.000666 (J)	—	1.56 (U)	—	—	—	—

Table F-2.2-2 (continued)

Location ID	Sample ID	Depth (ft)	Media	Nickel	Nitrate	Perchlorate	Potassium	Selenium	Silver	Thallium	Vanadium	Zinc
Qbt2, 3, 4 BV^a				6.58	na^c	na	3500	0.3	1	1.1	17	63.5
Qbt1v BV^a				2	na	na	6670	0.3	1	1.24	4.48	84.6
Qbt1g, Qct, Qbo BV^a				2	na	na	2390	0.3	1	1.22	4.59	40
50-24811	MD50-06-65058	97.50–98.70	QBT3	—	0.722 (J)	—	—	1.56 (U)	—	—	—	—
50-24811	MD50-06-65059	123.20–125.00	QBT2	—	0.703 (J)	—	—	1.51 (U)	—	—	—	—
50-24811	MD50-06-65077	147.50–150.60	QBT2	—	1.25	0.000989 (J)	—	1.5 (U)	—	—	—	—
50-24812	MD50-06-65100	8.40–10.00	QBT3	—	—	—	—	0.919 (J)	—	—	—	78.7 (J-)
50-24812	MD50-06-65101	33.50–35.00	QBT3	—	—	—	—	1.44 (J)	—	—	—	—
50-24812	MD50-06-65083	97.50–98.90	QBT3	—	0.978 (J)	—	—	1.59 (U)	—	—	—	—
50-24812	MD50-06-65084	122.50–123.70	QBT2	—	0.814 (J)	—	—	1.2 (J)	—	—	—	—
50-24812	MD50-06-65102	146.00–150.00	QBT2	—	—	—	—	3.33	—	—	—	69.7 (J-)
50-24813	MD50-06-65132	18.20–20.00	QBT3	—	0.785 (J-)	—	—	1.55 (U)	—	—	—	—
50-24813	MD50-06-65133	30.00–31.90	QBT3	—	0.798 (J-)	—	—	1.54 (U)	—	—	—	—
50-24813	MD50-06-65115	98.20–99.70	QBT3	—	0.769 (J)	—	—	1.59 (U)	—	—	—	—
50-24813	MD50-06-65116	123.50–125.00	QBT2	—	0.775 (J)	0.000558 (J)	—	1.52 (U)	—	—	—	—
50-24813	MD50-06-65134	148.00–150.00	QBT2	—	0.768 (J)	0.048	—	1.59 (U)	—	—	—	—
50-24814	MD50-06-65157	7.50–9.10	QBT3	—	0.86 (J)	0.00142 (J)	—	1.52 (U)	—	—	—	—
50-24814	MD50-06-65158	30.00–31.60	QBT3	—	0.805 (J)	—	—	1.55 (U)	—	—	—	—
50-24814	MD50-06-65140	96.80–99.90	QBT3	—	0.686 (J)	—	—	1.56 (U)	—	—	—	—
50-24814	MD50-06-65141	123.50–124.80	QBT2	—	0.807 (J)	—	—	1.5 (U)	—	—	—	—
50-24814	MD50-06-65159	147.50–149.50	QBT2	—	0.668 (J)	—	—	1.56 (U)	—	—	—	—
50-24815	MD50-06-65189	17.50–20.00	QBT3	—	1.57	—	—	1.57 (U)	—	—	—	—
50-24815	MD50-06-65190	37.80–41.50	QBT3	—	1.1	—	—	1.56 (U)	—	—	—	—
50-24815	MD50-06-65172	98.80–100.00	QBT3	—	0.871 (J)	—	—	1.54 (U)	—	—	—	—
50-24815	MD50-06-65173	123.40–125.00	QBT2	—	0.757 (J)	0.00059 (J)	—	1.55 (U)	—	—	—	—
50-24815	MD50-06-65191	147.80–149.70	QBT2	—	0.767 (J)	0.00272	—	1.58 (U)	—	—	—	—

Table F-2.2-2 (continued)

Location ID	Sample ID	Depth (ft)	Media	Nickel	Nitrate	Perchlorate	Potassium	Selenium	Silver	Thallium	Vanadium	Zinc
Qbt2, 3, 4 BV^a				6.58	na^c	na	3500	0.3	1	1.1	17	63.5
Qbt1v BV^a				2	na	na	6670	0.3	1	1.24	4.48	84.6
Qbt1g, Qct, Qbo BV^a				2	na	na	2390	0.3	1	1.22	4.59	40
50-24816	MD50-06-65214	23.10–24.70	QBT3	—	—	—	—	1.69 (U)	—	—	—	—
50-24816	MD50-06-65215	32.20–34.00	QBT3	—	—	—	—	1.66 (U)	—	—	—	—
50-24816	MD50-06-65197	63.80–65.00	QBT3	—	—	—	—	1.58 (U)	—	—	—	—
50-24816	MD50-06-65198	118.70–120.00	QBT2	—	—	—	—	1.5 (U)	—	—	—	—
50-24816	MD50-06-65199	198.80–200.00	QBT2	—	—	—	—	1.46 (U)	—	—	—	—
50-24816	MD50-06-65216	223.40–225.00	QBT2	—	—	—	—	1.51 (U)	—	—	—	—
50-24817	MD50-05-63837	18.40–20.00	QBT3	—	—	—	—	1.53 (U)	—	—	—	—
50-24817	MD50-05-63838	37.00–40.00	QBT3	—	0.77 (J)	—	—	1.54 (U)	—	—	—	—
50-24817	RE50-05-63810	98.80–100.00	QBT3	—	0.945 (J)	0.000739 (J)	—	1.57 (U)	—	—	—	—
50-24817	RE50-05-63811	138.00–140.00	QBT2	—	0.846 (J)	—	—	1.57 (U)	—	—	—	—
50-24817	RE50-05-63812	198.40–200.00	QBT1V	—	0.932 (J)	—	—	1.57 (U)	—	—	—	—
50-24817	MD50-05-63839	248.10–250.00	QBT1G	—	1.38	0.000975 (J)	—	1.73 (U)	—	—	—	44.8
50-24818	MD50-06-65229	8.50–10.00	QBT3	—	4.9 (J-)	—	—	1.53 (U)	—	—	—	—
50-24818	MD50-06-65230	22.10–25.00	QBT3	—	2.48 (J-)	0.00056 (J)	—	1.57 (U)	—	—	—	—
50-24818	MD50-06-65261	98.50–100.00	QBT2	—	0.354 (J-)	—	—	5.57	—	—	—	—
50-24818	MD50-06-65262	147.50–149.20	QBT2	—	0.424 (J)	—	—	1.54 (U)	—	—	—	—
50-24818	MD50-06-65263	189.90–190.00	QBT1V	—	0.399 (J)	0.00095 (J)	—	1.55 (U)	—	—	—	—
50-24818	MD50-06-65264	247.70–249.20	QBT1G	—	0.658 (J-)	—	—	1.59 (U)	—	—	—	—
50-24818	MD50-06-65265	280.00–282.50	QBT1G	—	0.468 (J-)	—	—	1.61 (U)	—	—	—	—
50-24818	MD50-06-65266	313.50–315.00	QBT1G	—	0.584 (J)	—	—	1.71 (U)	—	—	—	93.1
50-24818	MD50-06-65267	396.00–402.00	QBO	2.87	1.02 (J)	—	—	2.13	—	—	—	—
50-24818	MD50-06-65268	449.00–452.00	QBO	—	0.74 (J-)	—	—	33.2 (U)	—	—	55.2	—
50-24818	MD50-06-65269	497.00–500.50	QBO	4.11 (J)	—	—	—	1.61 (U)	—	—	6.36 (J)	—

Table F-2.2-2 (continued)

Location ID	Sample ID	Depth (ft)	Media	Nickel	Nitrate	Perchlorate	Potassium	Selenium	Silver	Thallium	Vanadium	Zinc
Qbt2, 3, 4 BV^a				6.58	na^c	na	3500	0.3	1	1.1	17	63.5
Qbt1v BV^a				2	na	na	6670	0.3	1	1.24	4.48	84.6
Qbt1g, Qct, Qbo BV^a				2	na	na	2390	0.3	1	1.22	4.59	40
50-24818	MD50-06-65270	547.00–551.50	QBO	—	—	—	—	1.63 (U)	—	—	—	54.2
50-24818	MD50-06-65271	597.00–600.40	QBO	—	—	—	—	1.72 (U)	—	—	—	—
50-24819	RE50-05-61422	18.50–20.00	QBT3	—	1.18	—	—	1.6 (U)	—	—	—	—
50-24819	RE50-05-61423	48.00–50.00	QBT3	—	0.942 (J+)	—	—	1.53 (U)	—	—	—	—
50-24819	RE50-05-61424	97.50–100.00	QBT3	—	0.889 (J)	0.00128 (J)	—	1.53 (U)	—	—	—	—
50-24819	RE50-05-61425	138.50–140.00	QBT2	—	1.11	—	—	1.5 (U)	—	—	—	—
50-24819	RE50-05-61426	198.10–200.00	QBT1V	—	0.809 (J)	0.000663 (J-)	—	1.51 (U)	—	—	—	—
50-24819	RE50-05-61427	246.50–250.00	QBT1V	—	0.909 (J)	0.000784 (J-)	—	1.62 (U)	—	—	—	—
50-24819	RE50-05-61428	273.00–275.00	QBT1G	—	0.876 (J)	0.000589 (J-)	—	1.6 (U)	—	—	—	—
50-24820	RE50-05-61438	17.50–20.00	QBT3	—	0.898 (J)	0.000635 (J-)	—	1.52 (U)	—	—	—	—
50-24820	RE50-05-61439	48.40–50.00	QBT3	—	0.98 (J)	0.00126 (J-)	—	1.49 (U)	—	—	—	—
50-24820	RE50-05-61440	97.50–100.00	QBT3	—	0.948 (J)	—	—	1.53 (U)	—	—	—	—
50-24820	RE50-05-61441	138.70–140.00	QBT2	—	0.687 (J)	—	—	1.5 (U)	—	—	—	—
50-24820	RE50-05-61442	198.20–200.00	QBT1V	—	0.687 (J)	—	—	1.49 (U)	—	—	—	—
50-24820	RE50-05-61443	248.30–250.00	QBT1G	—	0.797 (J)	—	—	1.61 (U)	—	—	—	—
50-24821	RE50-05-61456	18.60–20.00	QBT3	—	0.692 (J)	—	—	1.54 (U)	—	—	—	—
50-24821	RE50-05-61457	48.60–50.00	QBT3	—	0.685 (J)	—	—	1.55 (U)	—	—	—	—
50-24821	RE50-05-61458	98.40–100.00	QBT3	—	—	—	—	1.58 (U)	—	—	—	—
50-24821	RE50-05-61460	137.50–140.00	QBT2	—	1.07 (J)	—	—	1.61 (U)	—	—	—	—
50-24821	RE50-05-61459	157.50–160.00	QBT2	—	0.862 (J)	—	—	1.6 (U)	—	—	—	—
50-24821	RE50-05-61461	248.60–250.00	QBT1G	—	0.708 (J)	0.00062 (J)	—	1.56 (U)	—	—	—	—
50-24822	RE50-05-61474	18.60–20.00	QBT3	—	—	0.000658 (J)	—	1.5 (U)	—	—	—	—
50-24822	RE50-05-61475	47.50–49.10	QBT3	—	—	0.00504	—	1.53 (U)	—	—	—	—

Table F-2.2-2 (continued)

Location ID	Sample ID	Depth (ft)	Media	Nickel	Nitrate	Perchlorate	Potassium	Selenium	Silver	Thallium	Vanadium	Zinc
Qbt2, 3, 4 BV^a				6.58	na^c	na	3500	0.3	1	1.1	17	63.5
Qbt1v BV^a				2	na	na	6670	0.3	1	1.24	4.48	84.6
Qbt1g, Qct, Qbo BV^a				2	na	na	2390	0.3	1	1.22	4.59	40
50-24822	RE50-05-61476	98.60–100.00	QBT3	—	—	—	—	1.51 (U)	—	—	—	—
50-24822	RE50-05-61477	137.50–139.20	QBT2	—	0.726 (J)	—	—	1.58 (U)	—	—	—	—
50-24822	RE50-05-61478	198.50–200.00	QBT1V	—	—	—	—	1.5 (U)	—	—	—	—
50-24822	RE50-05-61479	248.70–250.00	QBT1G	—	—	—	—	1.56 (U)	—	—	—	—
50-25451	MD50-06-66697	18.70–19.90	QBT3	—	—	—	—	2.17	—	—	—	—
50-25451	MD50-06-66698	48.10–49.90	QBT3	—	—	—	—	2.38	—	—	—	—
50-25451	MD50-06-66671	96.00–100.00	QBT2	—	—	—	—	1.45 (U)	—	—	—	—
50-25451	MD50-06-66672	146.00–147.50	QBT2	—	—	—	—	1.51 (U)	—	—	—	—
50-25451	MD50-06-66673	198.90–200.00	QBT2	—	—	—	—	1.48 (U)	—	—	—	—
50-25451	MD50-06-66674	251.20–252.50	QBT1G	—	—	—	—	1.56 (U)	—	—	—	—
50-25451	MD50-06-66699	298.50–300.00	QBT1G	—	—	—	—	1.61 (U)	—	—	—	—

Note: Units are mg/kg.

^a BVs are from LANL 1998, 59730.

^b — = Not detected above BV or not detected.

^c na = Not available.

Table F-2.4-1
Frequency of Radionuclides Detected or
Detected above Background/Fallout Values in Surface Soil and Fill at MDA C

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range ^a (pCi/g)	BV/FV ^b (pCi/g)	Frequency of Detects above BV/FV
Americium-241	Soil	22	18	[0.005] to 1.017	0.013 ^c	16/22
Americium-241	Fill	52	37	[0.003] to 0.292	0.013 ^c	24/52
Cesium-134	Soil	6	3	[-0.001] to 0.08	na ^d	3/6
Cesium-137	Soil	13	6	[0.07] to 1.22	1.65 ^c	0/13
Cesium-137	Fill	4	0	[0.4037 to 0.9149]	1.65 ^c	0/4
Plutonium-238	Soil	22	17	[0.001] to 0.219	0.023 ^c	11/22
Plutonium-238	Fill	52	20	[0.002] to 0.071	0.023 ^c	11/52
Plutonium-239	Soil	22	22	0.01 to 10.687	0.054 ^c	21/22
Plutonium-239	Fill	52	48	[0.003] to 2.91	0.054 ^c	30/52
Strontium-90	Soil	22	0	[-0.54 to 0.32]	1.31 ^c	0/22
Strontium-90	Fill	52	0	[-0.62 to 0.28]	1.31 ^c	0/52
Thorium-232	Soil	6	4	[2.0891] to 4.01	2.33	4/6
Thorium-232	Fill	26	11	[1.8314] to 4.7978	2.33	11/26
Tritium	Soil	12	12	0.01297 to 0.1952	na	12/12
Tritium	Fill	47	37	[1.106E-02] to 0.374	na	37/47
Uranium-234	Soil	21	21	0.67 to 1.893	2.59	0/21
Uranium-234	Fill	52	52	0.905 to 1.83	2.59	0/52
Uranium-238	Soil	21	21	0.77 to 1.99	2.29	0/21
Uranium-238	Fill	52	52	1.081 to 2.449	2.29	1/52

^a Values in brackets indicate nondetects.

^b BVs and FVs are from LANL 1998, 59730.

^c FV applies to samples collected from 0–6 in. only.

^d na = Not available.

Table F-2.4-2
Summary of Radionuclides Detected above Background/Fallout Values,
or Detected Where Fallout Values not Available in Surface Soil and Fill at MDA C

Location ID	Sample ID	Depth (ft)	Media	Americium-241	Cesium-134	Plutonium-238	Plutonium-239	Thorium-232	Tritium	Uranium-238
Soil/Fill BV/FV^a				0.013	na^b	0.023	0.054	2.33	na	2.29
50-08010	AAA3153	0.00–0.50	Fill	0.016 (J-)	— ^c	—	—	3.9669	0.159	—
50-08062	AAA3154	0.00–0.50	Fill	—	—	—	—	—	6.231E-02	—
50-08064	AAA3155	0.00–0.50	Fill	—	—	—	—	—	5.256E-02	—
50-08086	AAA2768	0.00–0.50	Soil	0.167	—	0.219	10.687	—	1.551E-02 (J)	—
50-08088	AAA2769	0.00–0.50	Soil	0.046	—	0.052	0.441	—	2.469E-02 (J)	—
50-08102	AAA3143	0.00–0.50	Soil	0.094 (J-)	—	—	0.446 (J-)	—	—	—
50-08106	AAA3156	0.00–0.50	Fill	0.023 (J-)	—	—	—	—	4.534E-02	—
50-08110	AAA3157	0.00–0.50	Fill	0.018 (J-)	—	—	0.106 (J)	3.4961	9.051E-02	—
50-08116	AAA3158	0.00–0.50	Fill	0.069 (J-)	—	0.048	0.553 (J)	—	2.744E-02	—
50-08126	AAA2797	0.00–0.50	Fill	0.081	—	0.032 (J-)	0.39 (J-)	—	0.109 (J)	—
50-08131	AAA3242	0.00–0.50	Fill	0.054 (J-)	—	0.024 (J-)	0.417 (J-)	—	4.161E-02	—
50-08134	AAA2798	0.00–0.50	Fill	0.292	—	0.071	2.91	3.73	—	—
50-08136	AAA2770	0.00–0.50	Soil	0.048	—	0.075	1.427	3.74	6.275E-02 (J)	—
50-08137	AAA3243	0.00–0.50	Fill	0.054 (J-)	—	—	0.593 (J-)	3.3221	0.109	—
50-08138	AAA2771	0.00–0.50	Soil	1.017	—	—	0.46	3.27	1.768E-02 (J-)	—
50-08139	AAA3244	0.00–0.50	Fill	0.13 (J-)	—	0.037 (J-)	2.678 (J-)	—	4.132E-02	—
50-08140	AAA2772	0.00–0.50	Soil	0.03	—	—	0.347 (J)	4.01	1.334E-02 (J)	—
50-08142	AAA2773	0.00–0.50	Soil	0.032	—	—	0.342 (J)	—	0.013 (J)	—
50-08144	AAA2774	0.00–0.50	Soil	0.036	—	—	0.276 (J)	—	6.435E-02 (J-)	—
50-08154	AAA3144	0.00–0.50	Soil	0.257 (J-)	—	0.035 (J-)	1.598 (J-)	—	—	—
50-08156	AAA3159	0.00–0.50	Fill	0.207	—	0.037	1.234 (J)	—	2.781E-02	—
50-08162	AAA3160	0.00–0.50	Fill	—	—	—	0.08 (J)	—	0.024	—

Table F-2.4-2 (continued)

Location ID	Sample ID	Depth (ft)	Media	Americium-241	Cesium-134	Plutonium-238	Plutonium-239	Thorium-232	Tritium	Uranium-238
Soil/Fill BV/FV^a				0.013	na^b	0.023	0.054	2.33	na	2.29
50-08168	AAA3189	0.00–0.50	Fill	—	—	—	0.964 (J-)	—	—	—
50-08176	AAA2799	0.00–0.50	Fill	—	—	—	—	—	5.383E-02 (J)	—
50-08180	AAA2800	0.00–0.50	Fill	—	—	—	—	—	0.125 (J)	—
50-08185	AAA3245	0.00–0.50	Fill	0.084 (J-)	—	—	0.555 (J-)	—	3.775E-02	—
50-08189	AAA3246	0.00–0.50	Fill	—	—	—	—	—	5.017E-02	—
50-08193	AAA3247	0.00–0.50	Fill	0.082 (J-)	—	0.024 (J-)	1.26 (J-)	—	7.761E-02	—
50-08194	AAA2801	0.00–0.50	Fill	0.022	—	—	0.252	—	—	2.449
50-08195	AAA3248	0.00–0.50	Fill	0.016 (J-)	—	—	0.144 (J-)	—	9.511E-02	—
50-08214	AAA3190	0.00–0.50	Fill	—	—	0.025 (J-)	0.091 (J-)	—	0.041 (J)	—
50-08216	AAA3191	0.00–0.50	Fill	—	—	—	—	3.4625	3.247E-02 (J)	—
50-08222	AAA2802	0.00–0.50	Fill	—	—	—	0.107	3.07	8.617E-02 (J)	—
50-08224	AAA2803	0.00–0.50	Fill	—	—	—	0.318	—	7.957E-02 (J)	—
50-08226	AAA2804	0.00–0.50	Fill	—	—	—	0.118	3.73	—	—
50-08228	AAA2805	0.00–0.50	Fill	—	—	—	—	—	0.087 (J)	—
50-08231	AAA3249	0.00–0.50	Fill	—	—	—	—	—	4.840E-02	—
50-08244	AAA3093	0.00–0.50	Fill	0.045 (J-)	—	—	0.314	3.3379	—	—
50-08245	AAA3250	0.00–0.50	Fill	0.09 (J-)	—	—	1.252 (J-)	—	5.756E-02	—
50-08266	AAA3192	0.00–0.50	Fill	0.034 (J-)	—	0.024 (J-)	0.232 (J-)	—	4.860E-02 (J)	—
50-08274	AAA3094	0.00–0.50	Fill	0.017 (J-)	—	—	0.199	—	0.114 (J)	—
50-08290	AAA3096	0.00–0.50	Fill	—	—	—	0.074	—	—	—
50-08312	AAA3193	0.00–0.50	Fill	0.046 (J-)	—	0.041 (J-)	0.372 (J-)	—	0.374 (J)	—
50-08326	AAA3098	0.00–0.50	Fill	0.02 (J-)	—	—	0.139	4.7978	4.797E-02 (J)	—
50-08328	AAA3099	0.00–0.50	Fill	—	—	—	0.105	—	0.178 (J)	—
50-08336	AAA3118	0.00–0.50	Fill	0.066	—	—	—	—	4.061E-02	—
50-08340	AAA3119	0.00–0.50	Fill	—	—	—	—	—	8.950E-02	—

Table F-2.4-2 (continued)

Location ID	Sample ID	Depth (ft)	Media	Americium-241	Cesium-134	Plutonium-238	Plutonium-239	Thorium-232	Tritium	Uranium-238
Soil/Fill BV/FV^a				0.013	na^b	0.023	0.054	2.33	na	2.29
50-08342	AAA3120	0.00–0.50	Fill	—	—	—	—	—	3.117E-02	—
50-08346	AAA2775	0.00–0.50	Soil	0.357	—	0.032	2.082 (J)	—	0.195 (J-)	—
50-08364	AAA3145	0.00–0.50	Soil	—	—	—	0.103 (J-)	—	—	—
50-08370	AAA3121	0.00–0.50	Fill	0.244	—	0.044	2.677	2.9623	5.043E-02	—
50-08374	AAA3122	0.00–0.50	Fill	—	—	—	0.091	—	2.916E-02	—
50-08386	AAA3123	0.00–0.50	Fill	—	—	—	—	—	5.318E-02	—
50-08396	AAA2776	0.00–0.50	Soil	0.361	—	0.033	2.499 (J)	—	9.836E-02 (J)	—
50-08432	AAA3125	0.00–0.50	Fill	—	—	—	—	—	2.351E-02	—
50-08436	AAA3147	0.00–0.50	Fill	—	—	—	—	3.5565 (J-)	—	—
50-08438	AAA3148	0.00–0.50	Fill	0.018 (J-)	—	—	0.156 (J-)	—	—	—
50-08440	AAA3149	0.00–0.50	Fill	0.044 (J-)	—	—	0.34 (J-)	—	—	—
50-08446	AAA2777	0.00–0.50	Soil	0.192	—	0.027	2.132 (J)	2.75	8.482E-02 (J)	—
50-08474	AAA2778	0.00–0.50	Soil	—	—	—	0.562 (J)	—	2.876E-02 (J)	—
50-08494	AAA2779	0.00–0.50	Soil	0.454	—	0.068	8.694 (J)	—	3.501E-02 (J)	—
50-22742	MD50-04-53250	0.00–0.50	Soil	—	0.08	—	0.36	—	—	—
50-22743	MD50-04-53251	0.00–0.50	Soil	0.05	—	0.04	1.12	—	—	—
50-22744	MD50-04-53252	0.00–0.50	Soil	—	0.08	—	0.74	—	—	—
50-22745	MD50-04-53253	0.00–0.50	Soil	0.08	0.08	0.07	0.62	—	—	—
50-22746	MD50-04-53254	0.00–0.50	Soil	—	—	—	1.84	—	—	—
50-22747	MD50-04-53255	0.00–0.50	Soil	0.1	—	0.03	3	—	—	—

Note: Units are pCi/g.

^a BVs and FVs are from LANL 1998, 59730. Soil and fill FVs apply to the 0 to 0.5 ft depth interval only.

^b na = Not available.

^c — = Not detected or not detected above BV/FV.

Table F-2.5-1
Frequency of Radionuclides Detected or Detected above BVs in Tuff at MDA C

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range ^a (pCi/g)	BV ^b (pCi/g)	Frequency of Detects above BV
Americium-241	QBO	5	0	[-0.0125 to 0.0453]	na ^c	0/5
Americium-241	QBT1G	14	0	[-0.0127 to 0.0421]	na	0/14
Americium-241	QBT1V	10	1	[-0.00856] to 0.014	na	1/10
Americium-241	QBT2	62	3	[-0.118] to 0.423	na	3/62
Americium-241	QBT3	184	36	[-0.14] to 0.183	na	36/184
Cesium-134	QBO	1	0	[0.127 to 0.127]	na	0/1
Cesium-134	QBT1G	3	0	[0.0648 to 0.129]	na	0/3
Cesium-134	QBT2	15	0	[0.0267 to 0.11]	na	0/15
Cesium-134	QBT3	80	2	[-0.026] to 0.32	na	2/80
Cesium-137	QBO	5	0	[-0.0273 to 0.0535]	na	0/5
Cesium-137	QBT1G	14	0	[-0.0624 to 0.0471]	na	0/14
Cesium-137	QBT1V	10	0	[-0.0533 to 0.0272]	na	0/10
Cesium-137	QBT2	62	0	[-0.0749 to 0.0729]	na	0/62
Cesium-137	QBT3	182	2	[-0.0459] to 0.768	na	2/182
Cobalt-60	QBO	5	0	[-0.0106 to 0.0987]	na	0/5
Cobalt-60	QBT1G	14	0	[-0.0492 to 0.0756]	na	0/14
Cobalt-60	QBT1V	10	0	[-0.0128 to 0.0318]	na	0/10
Cobalt-60	QBT2	62	0	[-0.0503 to 0.0576]	na	0/62
Cobalt-60	QBT3	183	1	[-0.0542] to 0.32	na	1/183
Europium-152	QBO	5	0	[-0.0682 to 0.062]	na	0/5
Europium-152	QBT1G	14	0	[-0.126 to 0.108]	na	0/14
Europium-152	QBT1V	10	0	[-0.204 to 0.204]	na	0/10
Europium-152	QBT2	62	0	[-0.117 to 0.134]	na	0/62
Europium-152	QBT3	168	2	[-0.178] to [0.78]	na	2/168
Plutonium-238	QBO	5	0	[-0.0164 to 0.00474]	na	0/5

Table F-2.5-1 (continued)

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range ^a (pCi/g)	BV ^b (pCi/g)	Frequency of Detects above BV
Plutonium-238	QBT1G	14	0	[-0.0123 to 0.00708]	na	0/14
Plutonium-238	QBT1V	10	0	[-0.0258 to 0.0078]	na	0/10
Plutonium-238	QBT2	62	2	[-0.0193] to 0.248	na	2/62
Plutonium-238	QBT3	181	12	[-0.0549] to 0.302	na	12/181
Plutonium-239	QBO	5	0	[-0.00825 to 0.00269]	na	0/5
Plutonium-239	QBT1G	14	0	[-0.0266 to 0.00706]	na	0/14
Plutonium-239	QBT1V	10	0	[-0.0429 to 0.00881]	na	0/10
Plutonium-239	QBT2	62	4	[-0.0578] to 0.106	na	4/62
Plutonium-239	QBT3	184	18	[-0.0494] to 0.684	na	18/184
Ruthenium-106	QBO	5	0	[-0.27 to 0.298]	na	0/5
Ruthenium-106	QBT1G	14	0	[-0.107 to 0.538]	na	0/14
Ruthenium-106	QBT1V	10	0	[-0.18 to 0.221]	na	0/10
Ruthenium-106	QBT2	61	0	[-0.44 to 0.507]	na	0/61
Ruthenium-106	QBT3	184	1	[-0.335] to [1.41]	na	1/184
Sodium-22	QBO	5	0	[-0.0393 to 0.079]	na	0/5
Sodium-22	QBT1G	14	0	[-0.0609 to 0.0572]	na	0/14
Sodium-22	QBT1V	10	0	[-0.0269 to 0.0156]	na	0/10
Sodium-22	QBT2	62	0	[-0.0609 to 0.0636]	na	0/62
Sodium-22	QBT3	184	3	[-0.0936] to 0.22	na	3/184
Strontium-90	QBO	5	0	[-0.00911 to 0.067]	na	0/5
Strontium-90	QBT1G	14	0	[-0.132 to 0.0604]	na	0/14
Strontium-90	QBT1V	10	0	[-0.0814 to 0.55]	na	0/10
Strontium-90	QBT2	62	1	[-0.117] to [0.58]	na	1/62
Strontium-90	QBT3	184	5	[-0.52] to 1.44	na	5/184
Thorium-228	QBT1V	1	1	1.501 to 1.501	3.75	0/1
Thorium-228	QBT2	2	2	1.35 to 1.694	2.52	0/2
Thorium-228	QBT3	79	78	0.083 to 1.81	2.52	0/79

Table F-2.5-1 (continued)

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range ^a (pCi/g)	BV ^b (pCi/g)	Frequency of Detects above BV
Thorium-230	QBT1V	1	1	1.111 to 1.111	3.12	0/1
Thorium-230	QBT2	2	2	0.81 to 1.226	1.98	0/2
Thorium-230	QBT3	79	72	[0.289] to 1.74	1.98	0/79
Thorium-232	QBT1V	1	1	1.501 to 1.501	3.75	0/1
Thorium-232	QBT2	2	2	1.23 to 1.661	2.52	0/2
Thorium-232	QBT3	79	77	[0.06] to 1.76	2.52	0/79
Tritium	QBT1V	1	0	[0.024 to 0.024]	na	0/1
Tritium	QBT2	2	1	[0.043] to 8.105E-02	na	1/2
Tritium	QBT3	64	62	[4.628E-02] to 34171.63	na	62/64
Uranium-234	QBO	5	5	1.98 to 2.75	4	0/5
Uranium-234	QBT1G	14	14	2.21 to 3.64	4	0/14
Uranium-234	QBT1V	10	10	0.993 to 3.18	3.12	1/10
Uranium-234	QBT2	62	62	0.51 to 2.15	1.98	1/62
Uranium-234	QBT3	169	169	0.436 to 1.53	1.98	0/169
Uranium-235	QBO	5	5	0.133 to 0.173	0.18	0/5
Uranium-235	QBT1G	14	14	0.0749 to 0.357	0.18	10/14
Uranium-235	QBT1V	10	8	0.045 to 0.238	0.14	4/10
Uranium-235	QBT2	62	45	0.02 to 0.158	0.09	7/62
Uranium-235	QBT3	169	87	[0.009] to 0.162	0.09	12/169
Uranium-238	QBO	5	5	1.98 to 2.94	3.9	0/5
Uranium-238	QBT1G	14	14	2.22 to 3.49	3.9	0/14
Uranium-238	QBT1V	10	10	0.991 to 3.52	3.05	1/10
Uranium-238	QBT2	62	62	0.59 to 2.43	1.93	1/62
Uranium-238	QBT3	169	169	0.308 to 2.36	1.93	1/169

^a Values in brackets indicate nondetects.

^b BVs are from LANL 1998, 59730.

^c na = Not available.

Table F-2-5.2
Summary of Radionuclides Detected or Detected above BVs in Tuff at MDA C

Location ID	Sample ID	Depth (ft)	Media	Americium-241	Cesium-134	Cesium-137	Cobalt-60	Europium-152	Plutonium-238	Plutonium-239	Ruthenium-106	Sodium-22	Strontium-90	Tritium	Uranium-234	Uranium-235	Uranium-238
Qbt2, 3 BV^a				na^b	na	na	na	na	na	na	na	na	na	na	1.98	0.09	1.93
Qbt1v BV^a				na	na	na	na	na	na	na	na	na	na	na	3.12	0.14	3.05
Qbt1g, Qbo BV^a				na	na	na	na	na	na	na	na	na	na	na	4	0.18	3.9
50-09100	0550-95-0362	10.60–12.60	QBT3	— ^c	—	—	—	—	—	—	—	—	—	0.7787	—	—	—
50-09100	0550-95-0365	26.50–28.50	QBT3	0.027	—	—	—	—	—	—	—	—	—	39.702	—	—	—
50-09100	0550-95-0368	41.50–43.50	QBT3	0.009	—	—	—	—	—	0.014	—	—	—	0.8553	—	—	—
50-09100	0550-95-0371	58.20–60.00	QBT3	0.007	—	—	—	—	0.005	—	—	—	—	0.2818	—	—	—
50-09100	0550-95-0374	71.50–73.50	QBT2	—	—	—	—	—	—	—	—	—	—	0.08105	—	—	—
50-09100	0550-95-0383	115.10–116.90	QBT2	0.016	—	—	—	—	0.02	—	—	—	—	—	—	—	—
50-09100	0550-95-0392	161.30–163.10	QBT1V	0.014	—	—	—	—	—	—	—	—	—	—	—	—	—
50-09101	0550-95-0284	15.00–17.00	QBT3	—	—	—	—	—	—	—	—	—	—	0.3463	—	—	—
50-09101	0550-95-0289	35.00–36.20	QBT3	0.018	—	—	—	—	—	—	—	—	—	0.6132	—	—	—
50-09101	0550-95-0294	55.00–55.70	QBT3	—	—	—	—	—	—	—	—	—	—	0.6701	—	—	—
50-09101	0550-95-0299	75.00–77.00	QBT3	—	—	—	—	—	—	—	—	—	—	0.678	—	—	—
50-09101	0550-95-0304	96.00–98.00	QBT3	—	—	—	—	—	—	—	—	—	—	0.498	—	—	—
50-09101	0550-95-0309	112.00–114.50	QBT3	—	—	—	—	—	—	—	—	—	—	3.6688	—	—	—
50-09102	0550-95-0004	16.00–19.00	QBT3	0.009	—	—	—	—	—	—	—	—	—	0.1071	—	—	—
50-09102	0550-95-0009	37.00–40.90	QBT3	0.011	—	—	—	—	0.011	—	—	—	—	0.7111	—	—	—
50-09102	0550-95-0014	57.00–60.00	QBT3	0.009	—	—	—	—	0.002	—	—	—	—	1799.645	—	—	—
50-09102	0550-95-0019	73.20–76.00	QBT3	0.113	—	—	—	—	—	—	—	—	—	473.3205	—	—	—
50-09102	0550-95-0024	95.00–97.00	QBT3	0.098	—	—	—	—	—	—	—	—	—	14.1481	—	—	—
50-09102	0550-95-0029	108.00–110.00	QBT3	0.136	—	—	—	—	—	—	—	—	—	19.1655	—	—	—
50-09103	0550-95-0104	18.50–20.80	QBT3	—	—	—	—	0.231	0.007	—	—	—	—	1.472	—	—	—
50-09103	0550-95-0109	36.00–38.80	QBT3	0.027	—	—	—	—	—	—	—	—	—	0.334	—	—	—
50-09103	0550-95-0114	56.00–58.80	QBT3	—	—	—	—	—	0.002	0.013	—	—	—	1.1043	—	—	—

Table F-2-5.2 (continued)

Location ID	Sample ID	Depth (ft)	Media	Americium-241	Cesium-134	Cesium-137	Cobalt-60	Europium-152	Plutonium-238	Plutonium-239	Ruthenium-106	Sodium-22	Strontium-90	Tritium	Uranium-234	Uranium-235	Uranium-238
Qbt2, 3 BV^a				na^b	na	na	na	na	na	na	na	na	na	na	1.98	0.09	1.93
Qbt1v BV^a				na	na	na	na	na	na	na	na	na	na	na	3.12	0.14	3.05
Qbt1g, Qbo BV^a				na	na	na	na	na	na	na	na	na	na	na	4	0.18	3.9
50-09103	0550-95-0119	78.00–80.00	QBT3	0.023	—	—	—	0.297	—	—	—	—	—	0.4488	—	—	—
50-09103	0550-95-0124	94.70–98.00	QBT3	0.009	—	—	—	—	—	—	—	—	—	0.955	—	—	—
50-09103	0550-95-0129	114.80–116.80	QBT3	0.009	—	—	—	—	0.014	—	—	—	0.599	0.1178	—	—	—
50-09104	0550-95-0075	10.90–12.90	QBT3	—	0.32	—	—	—	—	—	—	0.22	—	0.2652	—	—	—
50-09104	0550-95-0079	26.30–28.00	QBT3	—	—	—	0.32	—	—	—	—	—	—	25.6185	—	—	—
50-09104	0550-95-0083	36.60–38.60	QBT3	—	—	—	—	—	—	—	—	0.22	—	35.585	—	—	—
50-09104	0550-95-0087	58.00–60.00	QBT3	—	—	—	—	—	—	—	—	—	—	2.8521	—	—	—
50-09104	0550-95-0095	79.00–81.00	QBT3	—	—	—	—	—	—	—	—	—	—	0.3028	—	—	—
50-09104	0550-95-0099	85.00–87.00	QBT3	—	—	—	—	—	—	—	—	—	—	0.1697	—	—	—
50-09105	0550-95-0135	16.10–18.50	QBT3	0.018	—	0.768	—	—	0.011	—	—	—	—	0.2753	—	—	—
50-09105	0550-95-0140	35.00–38.00	QBT3	—	—	—	—	—	—	—	—	—	—	9.30E-02	—	—	—
50-09105	0550-95-0145	57.00–59.00	QBT3	0.038	—	—	—	—	—	—	—	—	—	30.6477	—	—	—
50-09105	0550-95-0150	77.00–79.70	QBT3	0.016	—	—	—	—	—	—	—	—	—	0.3062	—	—	—
50-09105	0550-95-0155	97.00–99.80	QBT3	0.005	—	—	—	—	—	—	—	—	—	9.89E-02	—	—	—
50-09105	0550-95-0160	117.70–120.00	QBT3	0.076	—	—	—	—	—	0.08	—	—	—	—	—	—	—
50-09106	0550-95-0046	27.50–30.50	QBT3	0.02	—	—	—	—	—	—	—	—	—	8.745	—	—	—
50-09106	0550-95-0050	41.00–44.00	QBT3	0.002	—	—	—	—	—	—	—	—	—	1958.879	—	—	—
50-09106	0550-95-0054	56.50–58.50	QBT3	—	—	—	—	—	—	—	—	—	—	161.066	—	—	—
50-09106	0550-95-0058	70.50–73.00	QBT3	—	—	—	—	—	—	—	—	—	—	0.3947	—	—	—
50-09106	0550-95-0063	86.00–88.50	QBT3	0.009	—	—	—	—	—	0.002	—	—	—	0.1163	—	—	—
50-09106	0550-95-0067	102.00–104.00	QBT3	0.02	—	—	—	—	—	—	—	—	0.48	0.4838	—	—	—
50-09106	0550-95-0071	115.50–118.00	QBT3	—	—	—	—	—	—	0.009	—	—	0.767	0.133	—	—	—
50-09107	0550-95-0166	14.00–15.80	QBT3	0.012	—	—	—	—	—	—	—	—	—	0.7013	—	—	—

Table F-2-5.2 (continued)

Location ID	Sample ID	Depth (ft)	Media	Americium-241	Cesium-134	Cesium-137	Cobalt-60	Europium-152	Plutonium-238	Plutonium-239	Ruthenium-106	Sodium-22	Strontium-90	Tritium	Uranium-234	Uranium-235	Uranium-238
Qbt2, 3 BV ^a				na ^b	na	na	na	na	na	na	na	na	na	na	1.98	0.09	1.93
Qbt1v BV ^a				na	na	na	na	na	na	na	na	na	na	na	3.12	0.14	3.05
Qbt1g, Qbo BV ^a				na	na	na	na	na	na	na	na	na	na	na	4	0.18	3.9
50-09107	0550-95-0171	36.00–39.00	QBT3	—	—	—	—	—	—	—	—	—	—	420.95	—	—	—
50-09107	0550-95-0176	57.00–59.00	QBT3	—	—	—	—	—	—	—	—	—	—	34171.63	—	—	—
50-09107	0550-95-0181	75.00–78.60	QBT3	0.007	—	—	—	—	—	—	—	—	—	12793.99	—	—	—
50-09107	0550-95-0186	95.00–97.00	QBT3	0.009	—	—	—	—	—	—	—	—	—	929.6581	—	—	—
50-09107	0550-95-0191	108.00–111.00	QBT3	0.032	—	—	—	—	—	—	—	—	—	29.963	—	—	—
50-09108	0550-95-0195	15.00–16.80	QBT3	—	—	—	—	—	—	—	—	—	—	0.179	—	—	—
50-09108	0550-96-0109	24.50–25.50	QBT3	—	0.29	—	—	—	—	—	—	—	—	—	—	—	—
50-09108	0550-95-0200	37.00–38.60	QBT3	—	—	—	—	—	—	—	—	—	—	0.863	—	—	—
50-09108	0550-95-0205	57.00–59.00	QBT3	—	—	—	—	—	—	—	—	—	—	0.2157	—	—	—
50-09108	0550-95-0210	76.60–78.60	QBT3	—	—	—	—	—	—	—	1.2	—	—	19.1763	—	—	—
50-09108	0550-95-0215	95.50–97.50	QBT3	—	—	—	—	—	0.014	—	—	—	0.44	60.519	—	—	—
50-09108	0550-95-0220	112.00–115.00	QBT3	—	—	—	—	—	—	0.005	—	—	—	106.71	—	—	—
50-09109	0550-95-0226	18.20–20.20	QBT3	0.011	—	—	—	—	—	0.005	—	—	1.44	0.3	—	—	2.36
50-09109	0550-95-0231	34.10–36.00	QBT3	0.029	—	—	—	—	0.002	—	—	—	—	0.6843	—	—	—
50-09109	0550-95-0236	57.80–60.00	QBT3	0.025	—	—	—	—	—	0.005	—	—	—	0.6544	—	—	—
50-09109	0550-95-0246	77.40–79.70	QBT3	0.018	—	—	—	—	0.005	0.005	—	—	—	0.2692	—	—	—
50-09109	0550-95-0251	88.60–88.80	QBT3	—	—	—	—	—	—	0.007	—	—	—	196.623	—	—	—
50-09109	0550-95-0241	113.00–114.70	QBT3	—	—	—	—	—	—	—	0.056	—	—	0.3577	—	—	—
50-09110	0550-95-0259	17.00–19.00	QBT3	0.088	—	—	—	—	—	—	—	—	—	13.167	—	—	—
50-09110	0550-95-0264	38.00–40.00	QBT3	0.183	—	—	—	—	—	—	—	—	—	2106.878	—	—	—
50-09110	0550-95-0269	59.00–60.80	QBT3	0.064	—	—	—	—	—	—	—	—	—	413.0435	—	—	—
50-09110	0550-95-0274	74.00–76.60	QBT3	0.093	—	—	—	—	—	—	—	—	—	3.1636	—	—	—
50-09110	0550-95-0279	88.00–89.40	QBT3	0.09	—	—	—	—	—	—	—	—	—	—	—	—	—

Table F-2-5.2 (continued)

Location ID	Sample ID	Depth (ft)	Media	Americium-241	Cesium-134	Cesium-137	Cobalt-60	Europium-152	Plutonium-238	Plutonium-239	Ruthenium-106	Sodium-22	Strontium-90	Tritium	Uranium-234	Uranium-235	Uranium-238
Qbt2, 3 BV^a				na^b	na	na	na	na	na	na	na	na	na	na	1.98	0.09	1.93
Qbt1v BV^a				na	na	na	na	na	na	na	na	na	na	na	3.12	0.14	3.05
Qbt1g, Qbo BV^a				na	na	na	na	na	na	na	na	na	na	na	4	0.18	3.9
50-24766	MD50-06-64587	122.50–124.60	QBT2	—	—	—	—	—	—	—	—	—	0.0688	—	—	—	—
50-24767	MD50-06-64636	28.10–30.00	QBT3	—	—	—	—	—	—	0.278	—	—	—	—	—	—	—
50-24767	MD50-06-64619	123.20–125.00	QBT2	—	—	—	—	—	—	0.0682	—	—	—	—	—	—	—
50-24768	MD50-06-64668	27.50–29.50	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	0.118	—
50-24768	MD50-06-64669	148.60–151.50	QBT2	0.0872	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24769	MD50-06-64699	18.10–20.00	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	0.0957	—
50-24771	MD50-06-64756	15.90–17.50	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	0.0945	—
50-24771	MD50-06-64757	38.00–40.00	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	0.162	—
50-24771	MD50-06-64740	123.60–125.00	QBT2	—	—	—	—	—	—	—	—	—	—	—	—	0.137	—
50-24771	MD50-06-64758	148.20–150.00	QBT2	—	—	—	—	—	—	—	—	—	—	—	—	0.105	—
50-24773	MD50-06-64782	38.00–40.00	QBT3	—	—	0.131	—	—	—	—	—	—	—	—	—	—	—
50-24782	MD50-06-64813	20.90–22.50	QBT3	—	—	—	—	—	—	0.029	—	—	—	—	—	—	—
50-24782	MD50-06-64797	123.50–125.00	QBT3	—	—	—	—	—	0.302	0.684	—	—	—	—	—	—	—
50-24782	MD50-06-64815	156.00–157.50	QBT3	—	—	—	—	—	0.0883	0.0478	—	—	—	—	—	—	—
50-24783	MD50-06-64840	150.30–152.50	QBT2	0.423	—	—	—	—	0.248	0.106	—	—	—	—	—	—	—
50-24784	MD50-06-64368	248.00–250.00	QBT1V	—	—	—	—	—	—	—	—	—	—	—	—	0.151	—
50-24784	MD50-06-64382	298.30–299.80	QBT1G	—	—	—	—	—	—	—	—	—	—	—	—	0.211	—
50-24785	MD50-06-64412	8.50–10.00	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	0.101	—
50-24785	MD50-06-64413	17.50–19.00	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	0.148	—
50-24785	MD50-06-64398	248.50–250.00	QBT1G	—	—	—	—	—	—	—	—	—	—	—	—	0.357	—
50-24785	MD50-06-64414	273.80–275.00	QBT1G	—	—	—	—	—	—	—	—	—	—	—	—	0.236	—
50-24796	MD50-06-64458	17.50–19.30	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	0.0903	—
50-24796	MD50-06-64440	37.50–39.30	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	0.116	—

Table F-2-5.2 (continued)

Location ID	Sample ID	Depth (ft)	Media	Americium-241	Cesium-134	Cesium-137	Cobalt-60	Europium-152	Plutonium-238	Plutonium-239	Ruthenium-106	Sodium-22	Strontium-90	Tritium	Uranium-234	Uranium-235	Uranium-238
Qbt2, 3 BV^a				na^b	na	na	na	na	na	na	na	na	na	na	1.98	0.09	1.93
Qbt1v BV^a				na	na	na	na	na	na	na	na	na	na	na	3.12	0.14	3.05
Qbt1g, Qbo BV^a				na	na	na	na	na	na	na	na	na	na	na	4	0.18	3.9
50-24799	MD50-06-64515	118.40–120.00	QBT2	—	—	—	—	—	—	—	—	—	—	—	—	0.145	—
50-24799	MD50-06-64533	158.50–160.00	QBT2	—	—	—	—	—	—	—	—	—	—	—	—	0.158	—
50-24801	MD50-06-64847	118.00–120.00	QBT2	—	—	—	—	—	—	—	—	—	—	—	—	0.105	—
50-24811	MD50-06-65075	18.50–20.00	QBT3	—	—	—	—	—	—	0.0463	—	—	—	—	—	—	—
50-24811	MD50-06-65076	38.50–40.00	QBT3	—	—	—	—	—	—	0.252	—	—	—	—	—	—	—
50-24811	MD50-06-65058	97.50–98.70	QBT3	—	—	—	—	—	—	0.132	—	—	—	—	—	—	—
50-24811	MD50-06-65059	123.20–125.00	QBT2	—	—	—	—	—	—	0.0651	—	—	—	—	—	—	—
50-24812	MD50-06-65083	97.50–98.90	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	0.0913	—
50-24814	MD50-06-65157	7.50–9.10	QBT3	—	—	—	—	—	—	0.241	—	—	—	—	—	—	—
50-24816	MD50-06-65214	23.10–24.70	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	0.115	—
50-24816	MD50-06-65198	118.70–120.00	QBT2	—	—	—	—	—	—	—	—	—	—	—	—	0.113	—
50-24816	MD50-06-65199	198.80–200.00	QBT2	—	—	—	—	—	—	—	—	—	—	—	2.15	—	2.43
50-24817	RE50-05-63810	98.80–100.00	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	0.15	—
50-24817	RE50-05-63811	138.00–140.00	QBT2	—	—	—	—	—	—	—	—	—	—	—	—	0.0984	—
50-24817	MD50-05-63839	248.10–250.00	QBT1G	—	—	—	—	—	—	—	—	—	—	—	—	0.233	—
50-24818	MD50-06-65265	280.00–282.50	QBT1G	—	—	—	—	—	—	—	—	—	—	—	—	0.209	—
50-24818	MD50-06-65266	313.50–315.00	QBT1G	—	—	—	—	—	—	—	—	—	—	—	—	0.244	—
50-24819	RE50-05-61424	97.50–100.00	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	0.119	—
50-24819	RE50-05-61426	198.10–200.00	QBT1V	—	—	—	—	—	—	—	—	—	—	—	3.18	0.216	3.52
50-24819	RE50-05-61427	246.50–250.00	QBT1V	—	—	—	—	—	—	—	—	—	—	—	—	0.201	—
50-24819	RE50-05-61428	273.00–275.00	QBT1G	—	—	—	—	—	—	—	—	—	—	—	—	0.272	—
50-24820	RE50-05-61443	248.30–250.00	QBT1G	—	—	—	—	—	—	—	—	—	—	—	—	0.245	—
50-24821	RE50-05-61461	248.60–250.00	QBT1G	—	—	—	—	—	—	—	—	—	—	—	—	0.272	—

Table F-2-5.2 (continued)

Location ID	Sample ID	Depth (ft)	Media	Americium-241	Cesium-134	Cesium-137	Cobalt-60	Europium-152	Plutonium-238	Plutonium-239	Ruthenium-106	Sodium-22	Strontium-90	Tritium	Uranium-234	Uranium-235	Uranium-238
Qbt2, 3 BV ^a				na ^b	na	na	na	na	na	na	na	na	na	na	1.98	0.09	1.93
Qbt1v BV ^a				na	na	na	na	na	na	na	na	na	na	na	3.12	0.14	3.05
Qbt1g, Qbo BV ^a				na	na	na	na	na	na	na	na	na	na	na	4	0.18	3.9
50-24822	RE50-05-61478	198.50–200.00	QBT1V	—	—	—	—	—	—	—	—	—	—	—	—	0.238	—
50-24822	RE50-05-61479	248.70–250.00	QBT1G	—	—	—	—	—	—	—	—	—	—	—	—	0.312	—
50-25451	MD50-06-66672	146.00–147.50	QBT2	—	—	—	—	—	—	0.0269	—	—	—	—	—	—	—

Note: Units are pCi/g.

^a BVs from LANL 1998, 59730.

^b na = Not available.

^c — = Not detected above BV or not detected.

Table F-2.6-1
Frequency of Tritium Detected in Pore Gas at MDA C

Samples	Number of Analyses	Number of Detects	Number of Detected Locations	Concentration Range* (pCi/L)	Location of Maximum Detected	Maximum Detect (pCi/L)
1 st Round	210	197	33	[80.72442] to 1E+08	50-24783 (20 ft)	100000000
2 nd Round	168	162	30	[-834.6982] to 9.25E+07	50-24783 (20 ft)	92500000

*Values in brackets indicate nondetects.

Table F-2.6-2
Summary of Tritium Detected in Pore Gas at MDA C

Location ID	1 st Round Sample ID	Depth (ft)	Concentration (pCi/L)	2 nd Round Sample ID	Depth (ft)	Concentration (pCi/L)
50-09100	MD50-06-70880	20	85500	n.c. ^a	n.c.	n.c.
50-09100	MD50-06-70881	50	216000	n.c.	n.c.	n.c.
50-09100	MD50-06-70882	90	47200	n.c.	n.c.	n.c.
50-09100	MD50-06-70883	103	27300	n.c.	n.c.	n.c.
50-09100	MD50-06-70884	120	13440	n.c.	n.c.	n.c.
50-09100	MD50-06-70885	160	4820	n.c.	n.c.	n.c.
50-09100	MD50-06-70886	200	1870	n.c.	n.c.	n.c.
50-09100	MD50-06-70887	233	2200	n.c.	n.c.	n.c.
50-09100	MD50-06-70888	260	2120	n.c.	n.c.	n.c.
50-10131	MD50-06-70868	25	5160	n.c.	n.c.	n.c.
50-10131	MD50-06-70869	50	7150	n.c.	n.c.	n.c.
50-10131	MD50-06-70870	75	6440	n.c.	n.c.	n.c.
50-10131	MD50-06-70871	100	5950	n.c.	n.c.	n.c.
50-10131	MD50-06-70872	125	9050	n.c.	n.c.	n.c.
50-10131	MD50-06-70873	150	7260	n.c.	n.c.	n.c.
50-10131	MD50-06-70874	175	6990	n.c.	n.c.	n.c.
50-10131	MD50-06-70875	200	9280	n.c.	n.c.	n.c.
50-10131	MD50-06-70876	225	6060	n.c.	n.c.	n.c.
50-10131	MD50-06-70877	250	7840	n.c.	n.c.	n.c.
50-24766	MD50-06-64597	17	1700	MD50-06-65331	17	6050
50-24766	MD50-06-64596	29	2670	MD50-06-65330	29	5150
50-24766	MD50-06-64595	99	5700	MD50-06-65329	99	8060
50-24766	MD50-06-64594	124	5020	MD50-06-65328	124	10320
50-24766	MD50-06-64593	149	1380	MD50-06-65327	149	7020
50-24767	MD50-06-64625	10	500	MD50-06-65362	10	1590
50-24767	MD50-06-64626	30	700	MD50-06-65361	30	1180
50-24767	MD50-06-64627	60	2250	MD50-06-65360	60	2140
50-24767	MD50-06-64628	124	600	MD50-06-65359	124	670
50-24767	MD50-06-64629	149	340	MD50-06-65358	149	830
50-24768	MD50-06-64661	14	538	MD50-06-65370	14	1040
50-24768	MD50-06-64660	29	1290	MD50-06-65369	29	1000
50-24768	MD50-06-64659	99	1110	MD50-06-65368	99	368
50-24768	MD50-06-64658	125	950	MD50-06-65367	125	209
50-24768	MD50-06-64657	150	1230	MD50-06-65366	150	264
50-24769	MD50-06-64693	20	24800	MD50-06-65378	20	41900
50-24769	MD50-06-64692	39	122200	MD50-06-65377	39	152600
50-24769	MD50-06-64691	99	1728000	MD50-06-65376	99	2410000

Table F-2.6-2 (continued)

Location ID	1 st Round Sample ID	Depth (ft)	Concentration (pCi/L)	2 nd Round Sample ID	Depth (ft)	Concentration (pCi/L)
50-24769	MD50-06-64690	124	107200	MD50-06-65375	124	80800
50-24769	MD50-06-64689	149	64400	MD50-06-65374	149	33500
50-24770	MD50-06-64738	20	197000	MD50-06-65387	20	233000
50-24770	MD50-06-64725	25	318000	MD50-06-65386	25	325000
50-24770	MD50-06-64724	39	296000	MD50-06-65385	39	371000
50-24770	MD50-06-64723	100	10200	MD50-06-65384	100	32700
50-24770	MD50-06-64722	124	13600	MD50-06-65383	124	18300
50-24770	MD50-06-64721	150	19400	MD50-06-65382	148	24100
50-24771	MD50-06-64750	17	22100	MD50-06-65394	17	19900
50-24771	MD50-06-64749	40	40000	MD50-06-65393	40	24300
50-24771	MD50-06-64748	100	22000	MD50-06-65392	100	32600
50-24771	MD50-06-64747	125	28000	MD50-06-65391	125	29000
50-24771	MD50-06-64746	150	32000	MD50-06-65390	149	25000
50-24773	MD50-06-64775	20	132800	MD50-06-65405	20	88300
50-24773	MD50-06-64774	40	169100	MD50-06-65404	40	229000
50-24773	MD50-06-64773	100	39100	MD50-06-65403	100	65300
50-24773	MD50-06-64776	125	46200	MD50-06-65402	125	38300
50-24773	MD50-06-64772	150	137900	MD50-06-65401	149	43300
50-24782	MD50-06-64803	20	1167000	MD50-06-65413	21	943000
50-24782	MD50-06-64804	40	1500000	MD50-06-65412	40	1097000
50-24782	MD50-06-64805	100	130000	MD50-06-65411	100	76100
50-24782	MD50-06-64806	125	160000	MD50-06-65410	125	89600
50-24782	MD50-06-64807	155	590000	MD50-06-65409	151	114200
50-24783	MD50-06-64832	20	1E+08	MD50-06-65421	20	9.25E+07
50-24783	MD50-06-64831	36	5.79E+07	MD50-06-65420	36	6.02E+07
50-24783	MD50-06-64830	100	3350000	MD50-06-65419	100	4630000
50-24783	MD50-06-64829	125	1810000	MD50-06-65418	125	2780000
50-24783	MD50-06-64828	151	887000	MD50-06-65417	148	446000
50-24784	MD50-06-64374	10	2180	MD50-06-70724	10	6420
50-24784	MD50-06-64373	20	2230	MD50-06-70723	20	7350
50-24784	MD50-06-64372	47	2410	MD50-06-70722	47	7630
50-24784	MD50-06-64371	49	2640	MD50-06-70721	49	5940
50-24784	MD50-06-64370	55	2180	MD50-06-65292	55	5460
50-24784	MD50-06-64375	100	913	MD50-06-65291	100	4620
50-24784	MD50-06-64379	168	1970	MD50-06-65290	168	7260
50-24784	MD50-06-64378	199	894	MD50-06-65289	199	6820
50-24784	MD50-06-64377	250	2290	MD50-06-65288	250	5890
50-24784	MD50-06-64376	268	3170	MD50-06-65287	265	7140

Table F-2.6-2 (continued)

Location ID	1 st Round Sample ID	Depth (ft)	Concentration (pCi/L)	2 nd Round Sample ID	Depth (ft)	Concentration (pCi/L)
50-24785	MD50-06-64402	10	630	MD50-06-66783	10	6750
50-24785	MD50-06-64403	19	1200	MD50-06-65300	19	8780
50-24785	MD50-06-64408	60	3530	MD50-06-65299	60	10700
50-24785	MD50-06-64407	120	4830	MD50-06-65298	120	9210
50-24785	MD50-06-64404	200	4360	MD50-06-65297	200	7250
50-24785	MD50-06-64405	250	3270	MD50-06-65296	250	8170
50-24785	MD50-06-64406	275	— ^b	MD50-06-65295	256	9520
50-24796	MD50-06-64448	10	5620	MD50-06-65308	10	6590
50-24796	MD50-06-64447	20	4140	MD50-06-65307	20	3750
50-24796	MD50-06-64449	40	20035	MD50-06-65306	40	7190
50-24796	MD50-06-64450	100	31800	MD50-06-65305	100	6760
50-24796	MD50-06-64451	120	2910	MD50-06-65304	120	8710
50-24796	MD50-06-64452	150	10900	MD50-06-65303	144	9450
50-24797	MD50-06-64496	18.3	28400	MD50-06-65315	18.3	488000
50-24797	MD50-06-64497	38	3950000	MD50-06-65314	38	3150000
50-24797	MD50-06-66198	60	168000	MD50-06-65313	60	346000
50-24797	MD50-06-64498	120	46000	MD50-06-65312	120	17100
50-24797	MD50-06-64500	160	12200	MD50-06-65311	154	11920
50-24799	MD50-06-66197	15	29300	MD50-06-65323	20	14462.38
50-24799	MD50-06-64521	17.5	1150	MD50-06-65322	32.5	19147.83
50-24799	MD50-06-64522	20	2140	MD50-06-65321	100	549330.3
50-24799	MD50-06-64523	32.5	2050	MD50-06-65320	120	193000
50-24799	MD50-06-64538	37.5	2370	MD50-06-65319	160	7260
50-24799	MD50-06-64524	40.5	2550	n.c.	n.c.	n.c.
50-24799	MD50-06-64525	100	622000	n.c.	n.c.	n.c.
50-24799	MD50-06-64526	120	397000	n.c.	n.c.	n.c.
50-24799	MD50-06-64527	160	26900	n.c.	n.c.	n.c.
50-24801	MD50-06-64853	20	1640	MD50-06-65429	20	11500
50-24801	MD50-06-64870	35	3690	MD50-06-65428	35	16160
50-24801	MD50-06-64856	80	2410	MD50-06-65427	80	10460
50-24801	MD50-06-64855	120	4930	MD50-06-65426	120	9070
50-24801	MD50-06-64854	150	—	MD50-06-65425	150	10400
50-24802	MD50-06-64878	15	18800	MD50-06-65437	15	18000
50-24802	MD50-06-64879	42	7880	MD50-06-65436	42	20800
50-24802	MD50-06-64880	99.4	2280	MD50-06-65435	99	6060
50-24802	MD50-06-64881	124.4	2760	MD50-06-65434	124	7680
50-24802	MD50-06-64882	156.4	2250	MD50-06-65433	156	7990
50-24803	MD50-06-64904	16	920	MD50-06-65445	16	6170

Table F-2.6-2 (continued)

Location ID	1 st Round Sample ID	Depth (ft)	Concentration (pCi/L)	2 nd Round Sample ID	Depth (ft)	Concentration (pCi/L)
50-24803	MD50-06-64903	37	910	MD50-06-65444	37	6800
50-24803	MD50-06-64905	99.5	890	MD50-06-65443	99.5	7790
50-24803	MD50-06-64906	124	2310	MD50-06-65442	124	5810
50-24803	MD50-06-64907	151	1840	MD50-06-65441	150	5890
50-24804	MD50-06-64970	10	450	MD50-06-65454	10	1053.526
50-24804	MD50-06-64971	16	1160	MD50-06-65453	16	1280
50-24804	MD50-06-64972	33	2390	MD50-06-65452	33	1630
50-24804	MD50-06-64973	99	1060	MD50-06-65451	99	1080
50-24804	MD50-06-64974	124	1250	MD50-06-65450	124	658
50-24804	MD50-06-64975	149	1970	MD50-06-65449	149	1310
50-24810	MD50-06-64999	19	4160	MD50-06-65461	19	1980
50-24810	MD50-06-64998	37	4450	MD50-06-65460	37	1160
50-24810	MD50-06-64997	99	26200	MD50-06-65459	99	2160
50-24810	MD50-06-64996	123	2970	MD50-06-65458	123	1340
50-24810	MD50-06-64995	150	4450	MD50-06-65457	150	1460
50-24811	MD50-06-65069	20	143000	MD50-06-65469	20	177000
50-24811	MD50-06-65068	40	233000	MD50-06-65468	40	295000
50-24811	MD50-06-65067	98	9430	MD50-06-65467	98	4560
50-24811	MD50-06-65066	125	8360	MD50-06-65466	125	2150
50-24811	MD50-06-65065	150	9990	MD50-06-65465	150	1670
50-24812	MD50-06-65094	10	186000	MD50-06-65477	10	91900
50-24812	MD50-06-65093	35	184000	MD50-06-65476	35	159300
50-24812	MD50-06-65092	98	211000	MD50-06-65474	98	323000
50-24812	MD50-06-65091	123	58200	MD50-06-65475	123	82500
50-24812	MD50-06-65090	150	14080	MD50-06-65473	150	5990
50-24813	MD50-06-65126	20	9730	MD50-06-65485	20	2590
50-24813	MD50-06-65125	30	8330	MD50-06-65484	30	3870
50-24813	MD50-06-65124	99	21400	MD50-06-65483	99	12270
50-24813	MD50-06-65123	125	32700	MD50-06-65482	125	28000
50-24813	MD50-06-65122	150	123700	MD50-06-65481	150	105000
50-24814	MD50-06-65151	10	4620	MD50-06-65493	10	12520
50-24814	MD50-06-65150	30	9840	MD50-06-65492	30	26300
50-24814	MD50-06-65149	99	32800	MD50-06-65491	99	35200
50-24814	MD50-06-65148	124	255000	MD50-06-65490	124	322000
50-24814	MD50-06-65147	149	12890	MD50-06-65489	149	68100
50-24815	MD50-06-65183	30	2190 (J)	MD50-06-65501	30	9990
50-24815	MD50-06-65182	40	5300	MD50-06-65500	40	1240
50-24815	MD50-06-65181	100	45000	MD50-06-65499	100	1450

Table F-2.6-2 (continued)

Location ID	1 st Round Sample ID	Depth (ft)	Concentration (pCi/L)	2 nd Round Sample ID	Depth (ft)	Concentration (pCi/L)
50-24815	MD50-06-65180	125	2310	MD50-06-65498	125	1610
50-24815	MD50-06-65179	149	2010	MD50-06-65497	149	380
50-24816	MD50-06-65204	25	3590	MD50-06-65510	25	430
50-24816	MD50-06-65205	35	520	MD50-06-65509	35	1710
50-24816	MD50-06-65209	65	3580	MD50-06-65508	65	1630
50-24816	MD50-06-65206	120	2150	MD50-06-65507	120	2380
50-24816	MD50-06-65208	200	1660	MD50-06-65506	200	1980
50-24816	MD50-06-65207	225	3070	MD50-06-65505	215.8	1780
50-24817	MD50-05-63841	20	42207.4	MD50-06-65903	20	158762.4
50-24817	MD50-05-63842	40	26379.04	MD50-06-65904	50	239224.6
50-24817	RE50-05-63816	100	594712.7	MD50-06-65905	100	144361.8
50-24817	RE50-05-63817	140	164431.9	MD50-06-65906	140	210408.2
50-24817	RE50-05-63818	200	43858.57	MD50-06-65907	200	67430.69
50-24817	MD50-05-63843	250	5775.625	MD50-06-65908	240.9	17468.42
50-24818	MD50-06-65232	10	5170 (J-)	n.c.	n.c.	n.c.
50-24818	MD50-06-65233	25	222000 (J-)	n.c.	n.c.	n.c.
50-24818	MD50-06-65234	100	18000	n.c.	n.c.	n.c.
50-24818	MD50-06-65235	150	2580	n.c.	n.c.	n.c.
50-24818	MD50-06-65236	190	830	n.c.	n.c.	n.c.
50-24818	MD50-06-65237	250	1360	n.c.	n.c.	n.c.
50-24818	MD50-06-65238	280	880	n.c.	n.c.	n.c.
50-24818	MD50-06-65239	315	—	n.c.	n.c.	n.c.
50-24818	MD50-06-65240	414	86600	n.c.	n.c.	n.c.
50-24818	MD50-06-65242	452	860	n.c.	n.c.	n.c.
50-24818	MD50-06-65245	500	17000	n.c.	n.c.	n.c.
50-24818	MD50-06-65244	548	12440	n.c.	n.c.	n.c.
50-24818	MD50-06-65243	591	19100	n.c.	n.c.	n.c.
50-24819	RE50-05-61430	20	706.6125	MD50-06-63863	20	712.3844
50-24819	RE50-05-61431	50	1065.137	MD50-06-63864	50	1665.723
50-24819	RE50-05-61432	100	1301.632	MD50-06-63865	100	1679.623
50-24819	RE50-05-61732	138.5–140	2381.198	MD50-06-63866	140	885.1116
50-24819	RE50-05-61733	200	2842.315	MD50-06-63867	200	421.4547
50-24819	RE50-05-61734	250	3588.609	MD50-06-63868	250	516.7961
50-24819	RE50-05-61735	275	1691.828	MD50-06-63869	275	1831.413
50-24820	RE50-05-61446	20	390.0208 (J-)	MD50-06-64240	20	672.7979
50-24820	RE50-05-61449	50	359.6045	MD50-06-64241	50	103578.5
50-24820	RE50-05-61447	100	—	MD50-06-64242	100	719.1368
50-24820	RE50-05-61448	140	334.2696	MD50-06-64243	140	1159.63

Table F-2.6-2 (continued)

Location ID	1 st Round Sample ID	Depth (ft)	Concentration (pCi/L)	2 nd Round Sample ID	Depth (ft)	Concentration (pCi/L)
50-24820	RE50-05-61450	200	486.7444	MD50-06-64244	200	1368.229
50-24820	RE50-05-61736	250	405.2511	MD50-06-64245	225	2826.375
50-24821	RE50-05-61464	20	—	MD50-06-64248	20	782.3138
50-24821	RE50-05-61466	50	—	MD50-06-64249	50	965.7689
50-24821	RE50-05-61465	98.4–100	392.6594	MD50-06-64250	100	—
50-24821	RE50-05-61467	137.5–140	358.7596	MD50-06-64251	140	—
50-24821	RE50-05-61473	160	340.2377	MD50-06-64254	160	1611.617
50-24821	RE50-05-61468	248.6–250	—	MD50-06-64252	200	—
n.c.	n.c.	n.c.	n.c.	MD50-06-64253	238.4	1236.753
50-24822	RE50-05-61482	20	—	MD50-06-64928	20	44183.52
50-24822	RE50-05-61483	50	—	MD50-06-64929	50	—
50-24822	RE50-05-61484	100	—	MD50-06-64930	100	—
50-24822	RE50-05-61485	140	—	MD50-06-64931	140	6700.99
50-24822	RE50-05-61486	200	—	MD50-06-64932	200	—
50-24822	RE50-05-61737	250	—	MD50-06-64933	250	950.975
50-25451	MD50-06-66691	19	14690	n.c.	n.c.	n.c.
50-25451	MD50-06-66690	49	9400	n.c.	n.c.	n.c.
50-25451	MD50-06-66689	100	7330	n.c.	n.c.	n.c.
50-25451	MD50-06-66688	147	9060	n.c.	n.c.	n.c.
50-25451	MD50-06-66687	200	10940	n.c.	n.c.	n.c.
50-25451	MD50-06-66686	251	5830	n.c.	n.c.	n.c.
50-25451	MD50-06-66685	287	4380	n.c.	n.c.	n.c.

^a n.c. = Sample not collected.^b — = Not detected.

Table F-2.8-1
Frequency of Organic Chemicals Detected in Surface Soil and Fill at MDA C

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range* (mg/kg)	Frequency of Detects
Acenaphthene	Soil	16	1	0.11 to [0.35]	1/16
Acenaphthene	Fill	43	1	[0.17] to 0.96	1/43
Aroclor-1254	Fill	43	3	[0.03] to 1	3/43
Aroclor-1254	Soil	16	0	[0.03] to [0.03]	0/16
Aroclor-1260	Fill	43	4	[0.03] to 0.15	4/43
Aroclor-1260	Soil	16	0	[0.03] to [0.03]	0/16

*Values in brackets indicate nondetects.

Table F-2.8-2
Summary of Organic Chemicals Detected in Surface Soil and Fill at MDA C

Location ID	Sample ID	Depth (ft)	Media	Acenaphthene	Aroclor-1254	Aroclor-1260
50-08064	AAA3155	0.00–0.50	Fill	—*	—	0.04
50-08106	AAA3156	0.00–0.50	Fill	—	—	0.03
50-08110	AAA3157	0.00–0.50	Fill	—	—	0.07
50-08116	AAA3158	0.00–0.50	Fill	—	—	0.04
50-08138	AAA2771	0.00–0.50	Soil	0.11 (J)	—	—
50-08312	AAA3193	0.00–0.50	Fill	0.96	—	—
50-08326	AAA3098	0.00–0.50	Fill	—	1	—
50-08486	AAA3151	0.00–0.50	Fill	—	0.07	—
50-08492	AAA3152	0.00–0.50	Fill	—	0.17	—

Note: Units are mg/kg.

*— = Not detected.

Table F-2.9-1
Frequency of Organic Chemicals Detected in Tuff at MDA C

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range* (mg/kg)	Frequency of Detects
Acenaphthene	QBT3	168	1	0.0143 to [0.39]	1/168
Acenaphthylene	QBT3	168	1	0.0109 to [0.39]	1/168
Acetone	QBO	3	2	0.00374 to 0.0098	2/3
Acetone	QBT3	58	9	0.003 to 0.055	9/58
Anthracene	QBT1G	14	1	0.0076 to [0.0392]	1/14
Anthracene	QBT1V	10	1	0.0078 to [0.34]	1/10
Anthracene	QBT3	168	2	0.00945 to [0.39]	2/168
Aroclor-1242	QBT1G	14	1	[0.0011] to [0.00391]	1/14
Aroclor-1242	QBT2	60	1	[0.00335] to [0.0704]	1/60
Aroclor-1242	QBT3	159	1	[0.00336] to [0.038]	1/159
Aroclor-1254	QBT1G	14	1	[0.0011] to [0.00391]	1/14
Aroclor-1254	QBT2	60	4	0.0022 to 0.369	4/60
Aroclor-1254	QBT3	159	3	0.00091 to [0.038]	3/159
Aroclor-1260	QBT2	60	4	0.0031 to 0.129	4/60
Aroclor-1260	QBT3	159	1	[0.00336] to [0.038]	1/159
Benzo(a)pyrene	QBT1G	14	1	[0.035] to 0.113	1/14
Benzo(a)pyrene	QBT1V	10	1	[0.0337] to [0.34]	1/10
Benzo(b)fluoranthene	QBT1G	14	1	[0.035] to 0.122	1/14
Benzo(b)fluoranthene	QBT1V	10	1	[0.0337] to [0.34]	1/10
Benzo(b)fluoranthene	QBT2	62	1	[0.0335] to [0.35]	1/62
Benzo(b)fluoranthene	QBT3	168	1	0.0117 to [0.39]	1/168
Benzo(k)fluoranthene	QBT3	168	1	0.0126 to [0.39]	1/168
Benzoic acid	QBT1G	14	1	0.605 to [0.783]	1/14
Benzoic acid	QBT2	60	1	[0.449] to [3.5]	1/60
Benzoic acid	QBT3	162	1	[0.459] to [3.6]	1/162
Bis(2-ethylhexyl)phthalate	QBT1G	14	2	0.128 to [0.392]	2/14

Table F-2.9-1 (continued)

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range* (mg/kg)	Frequency of Detects
Bis(2-ethylhexyl)phthalate	QBT1V	10	1	0.114 to [0.36]	1/10
Bis(2-ethylhexyl)phthalate	QBT2	62	1	0.11 to [0.36]	1/62
Bis(2-ethylhexyl)phthalate	QBT3	168	8	0.037 to [0.46]	8/168
Chloronaphthalene[2-]	QBT3	168	1	0.0134 to [0.39]	1/168
Chrysene	QBT3	168	2	0.0114 to [0.39]	2/168
Dichloroethene[1,1-]	QBT3	58	4	[0.00103] to [0.006]	4/58
Di-n-butylphthalate	QBT1G	14	1	0.106 to [0.392]	1/14
Di-n-octylphthalate	QBT1V	10	1	0.178 to [0.438]	1/10
Di-n-octylphthalate	QBT2	62	1	0.308 to [0.392]	1/62
Fluoranthene	QBT1G	14	1	0.0228 to [0.0392]	1/14
Fluoranthene	QBT2	62	1	0.0167 to [0.35]	1/62
Fluoranthene	QBT3	168	1	0.0138 to [0.39]	1/168
Fluorene	QBT3	167	1	0.0136 to [0.39]	1/167
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	QBT1G	5	1	[7.43E-08] to 5.85E-07	1/5
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	QBT2	22	3	[3.91E-08] to 7.66E-07	3/22
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	QBT3	61	10	[3.65E-08] to 8.67E-07	10/61
Heptachlorodibenzodioxins (Total)	QBT1G	5	1	[7.43E-08] to 1.01E-06	1/5
Heptachlorodibenzodioxins (Total)	QBT2	22	3	[3.91E-08] to 0.0000017	3/22
Heptachlorodibenzodioxins (Total)	QBT3	61	10	[3.65E-08] to 1.86E-06	10/61
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	QBT3	61	3	[2.82E-08] to 6.41E-07	3/61
Heptachlorodibenzofurans (Total)	QBT3	61	4	[2.86E-08] to 6.41E-07	4/61
Hexachlorodibenzodioxins (Total)	QBT3	61	2	[3.32E-08] to 8.97E-07	2/61
Hexachlorodibenzofuran[1,2,3,4,7,8-]	QBT3	61	3	[1.77E-08] to 2.89E-07	3/61
Hexachlorodibenzofuran[2,3,4,6,7,8-]	QBT3	61	1	[1.52E-08] to [1.33E-07]	1/61
Hexachlorodibenzofurans (Total)	QBT1G	5	1	[3.53E-08] to [8.59E-08]	1/5
Hexachlorodibenzofurans (Total)	QBT3	61	5	[1.96E-08] to 7.06E-07	5/61

Table F-2.9-1 (continued)

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range* (mg/kg)	Frequency of Detects
Indeno(1,2,3-cd)pyrene	QBT3	168	1	[0.0249] to [0.39]	1/168
Methylene chloride	QBT3	58	1	[0.004] to [0.016]	1/58
Methylnaphthalene[2-]	QBT3	168	2	0.00903 to [0.39]	2/168
Methylphenol[2-]	QBT3	168	1	[0.16] to [0.454]	1/168
Nitrotoluene[2-]	QBT3	60	1	0.135 to [0.5]	1/60
Nitrotoluene[3-]	QBT3	60	1	0.346 to [0.5]	1/60
Nitrotoluene[4-]	QBT3	60	1	0.389 to [0.5]	1/60
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	QBT1G	5	1	[1.81E-07] to 0.0000113	1/5
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	QBT2	22	6	[1.5E-07] to 4.52E-06	6/22
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	QBT3	61	20	[1.62E-07] to 0.0000129	20/61
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	QBT1G	5	1	[1.96E-07] to 5.32E-07	1/5
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	QBT2	22	1	[4.43E-08] to [7.25E-07]	1/22
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	QBT3	61	7	[3.87E-08] to [0.0000012]	7/61
Pentachlorodibenzodioxins (Total)	QBT3	61	1	[3.09E-08] to [2.44E-07]	1/61
Pentachlorodibenzofuran[1,2,3,7,8-]	QBT2	22	1	[2.17E-08] to 3.13E-07	1/22
Pentachlorodibenzofuran[1,2,3,7,8-]	QBT3	61	1	[2.19E-08] to [2.8E-07]	1/61
Pentachlorodibenzofuran[2,3,4,7,8-]	QBT3	61	1	[2.12E-08] to [2.66E-07]	1/61
Pentachlorodibenzofurans (Totals)	QBT2	22	1	[2.08E-08] to 3.13E-07	1/22
Pentachlorodibenzofurans (Totals)	QBT3	61	1	[2.16E-08] to 7.17E-07	1/61
Phenanthrene	QBT2	62	1	0.0113 to [0.35]	1/62
Phenanthrene	QBT3	168	1	0.0169 to [0.39]	1/168
Pyrene	QBT1G	14	1	0.0317 to [0.0392]	1/14
Pyrene	QBT2	62	2	0.0118 to [0.35]	2/62
Pyrene	QBT3	168	2	0.0148 to [0.39]	2/168
RDX	QBT3	60	1	0.165 to [0.5]	1/60
Tetrachlorodibenzofuran[2,3,7,8-]	QBT3	61	1	[2.39E-08] to [2.15E-07]	1/61

Table F-2.9-1 (continued)

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range* (mg/kg)	Frequency of Detects
Tetrachlorodibenzofurans (Total)	QBT3	55	2	[2.39E-08] to [2.15E-07]	2/55
Toluene	QBT3	58	1	[0.00103] to [0.006]	1/58
Trichloroethene	QBT1G	1	1	0.00199 to 0.00199	1/1

*Values in brackets indicate nondetects.

Table F-2.9-2
Summary of Organic Chemicals Detected in Tuff at MDA C

Location ID	Sample ID	Depth (ft)	Media	Acenaphthene	Acenaphthylene	Acetone	Anthracene	Aroclor-1242	Aroclor-1254	Aroclor-1260	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene
50-09101	0550-95-0289	35.00–36.20	QBT3	—*	—	—	—	—	—	—	—	—	—
50-09101	0550-95-0294	55.00–55.70	QBT3	—	—	—	—	—	—	—	—	—	—
50-09101	0550-95-0299	75.00–77.00	QBT3	—	—	—	—	—	—	—	—	—	—
50-09103	0550-95-0109	36.00–38.80	QBT3	—	—	—	—	—	—	—	—	—	—
50-09103	0550-95-0119	78.00–80.00	QBT3	—	—	—	—	—	—	—	—	—	—
50-09103	0550-95-0124	94.70–98.00	QBT3	—	—	0.009 (J)	—	—	—	—	—	—	—
50-09103	0550-95-0129	114.80–116.80	QBT3	—	—	0.055	—	—	—	—	—	—	—
50-09104	0550-95-0099	85.00–87.00	QBT3	—	—	—	—	—	—	—	—	—	—
50-09105	0550-95-0145	57.00–59.00	QBT3	—	—	—	—	—	—	—	—	—	—
50-09106	0550-95-0046	27.50–30.50	QBT3	—	—	0.013 (J)	—	—	—	—	—	—	—
50-09106	0550-95-0054	56.50–58.50	QBT3	—	—	0.009 (J)	—	—	—	—	—	—	—
50-09108	0550-95-0200	37.00–38.60	QBT3	—	—	0.028	—	—	—	—	—	—	—
50-09108	0550-95-0210	76.60–78.60	QBT3	—	—	—	—	—	—	—	—	—	—
50-09108	0550-95-0215	95.50–97.50	QBT3	—	—	—	—	—	—	—	—	—	—
50-09109	0550-95-0226	18.20–20.20	QBT3	—	—	0.024	—	—	—	—	—	—	—
50-09109	0550-95-0231	34.10–36.00	QBT3	—	—	0.03	—	—	—	—	—	—	—
50-09110	0550-95-0264	38.00–40.00	QBT3	—	—	—	—	—	—	—	—	—	—
50-09110	0550-95-0279	88.00–89.40	QBT3	—	—	0.003 (J)	—	—	—	—	—	—	—
50-24766	MD50-06-64603	15.60–17.10	QBT3	—	—	—	—	—	—	—	—	—	—
50-24766	MD50-06-64604	27.50–29.20	QBT3	—	—	—	—	—	—	—	—	—	—
50-24766	MD50-06-64586	97.50–99.90	QBT2	—	—	—	—	—	—	—	—	—	—
50-24767	MD50-06-66770	29.50–30.00	QBT3	—	—	0.00887	—	—	—	—	—	—	—
50-24768	MD50-06-64651	123.20–125.00	QBT2	—	—	—	—	—	—	—	—	—	—
50-24769	MD50-06-64699	18.10–20.00	QBT3	—	—	—	—	—	—	—	—	—	—

Table F-2.9-2 (continued)

Location ID	Sample ID	Depth (ft)	Media	Acenaphthene	Acenaphthylene	Acetone	Anthracene	Aroclor-1242	Aroclor-1254	Aroclor-1260	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene
50-24769	MD50-06-64700	37.50–39.90	QBT3	—	—	—	—	—	—	—	—	—	—
50-24769	MD50-06-64701	147.90–149.80	QBT2	—	—	—	—	—	—	—	—	—	—
50-24770	MD50-06-64731	18.10–22.50	QBT3	—	—	—	—	—	—	—	—	—	—
50-24770	MD50-06-64733	147.50–150.00	QBT2	—	—	—	—	—	—	—	—	—	—
50-24773	MD50-06-64782	38.00–40.00	QBT3	—	—	—	—	—	—	—	—	—	—
50-24773	MD50-06-64783	150.00–152.80	QBT2	—	—	—	—	0.02	0.0055	0.0032 (J)	—	—	—
50-24783	MD50-06-64838	17.50–20.00	QBT3	—	—	—	—	—	—	—	—	—	—
50-24783	MD50-06-64839	35.40–37.50	QBT3	—	—	—	—	—	—	—	—	—	—
50-24783	MD50-06-64821	98.60–100.00	QBT3	—	—	—	—	—	0.00091 (J)	—	—	—	—
50-24784	MD50-06-64381	18.00–20.00	QBT3	—	—	—	—	—	—	—	—	—	—
50-24784	MD50-06-64382	298.30–299.80	QBT1G	—	—	—	—	—	—	—	—	—	—
50-24785	MD50-06-64413	17.50–19.00	QBT3	—	—	—	—	—	—	—	—	—	—
50-24796	MD50-06-64457	8.00–10.00	QBT3	—	—	—	—	—	—	—	—	—	—
50-24796	MD50-06-64458	17.50–19.30	QBT3	—	—	—	—	—	—	—	—	—	—
50-24796	MD50-06-64442	118.70–120.00	QBT2	—	—	—	—	—	—	—	—	—	—
50-24796	MD50-06-64459	147.50–149.40	QBT2	—	—	—	—	—	—	—	—	—	—
50-24797	MD50-06-64509	37.00–38.00	QBT3	—	—	—	—	—	—	—	—	—	—
50-24799	MD50-06-64516	13.10–15.00	QBT3	—	—	—	—	—	—	—	—	—	—
50-24799	MD50-06-64517	15.00–16.50	QBT3	—	—	—	—	—	0.0021 (J)	—	—	—	—
50-24802	MD50-06-64888	12.50–16.10	QBT3	—	—	—	—	—	—	—	—	—	—
50-24802	MD50-06-64889	40.60–42.50	QBT3	—	—	—	—	—	—	—	—	—	—
50-24802	MD50-06-64872	123.10–125.00	QBT2	—	—	—	—	—	0.0022 (J)	—	—	—	—
50-24802	MD50-06-64890	157.50–159.10	QBT2	—	—	—	—	—	—	—	—	—	—
50-24803	MD50-06-64913	15.40–17.50	QBT3	—	—	—	—	0.0134	0.0098 (J)	0.0065	—	—	—
50-24804	MD50-06-64980	15.40–17.10	QBT3	—	—	—	—	—	—	—	—	—	—

Table F-2.9-2 (continued)

Location ID	Sample ID	Depth (ft)	Media	Acenaphthene	Acenaphthylene	Acetone	Anthracene	Aroclor-1242	Aroclor-1254	Aroclor-1260	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene
50-24804	MD50-06-64982	147.50–149.80	QBT2	—	—	—	—	—	—	—	—	—	—
50-24810	MD50-06-65005	17.50–19.00	QBT3	—	—	—	—	—	—	—	—	—	—
50-24812	MD50-06-65100	8.40–10.00	QBT3	—	—	—	—	—	—	—	—	—	—
50-24812	MD50-06-65102	146.00–150.00	QBT2	—	—	—	—	—	—	—	—	—	—
50-24813	MD50-06-65116	123.50–125.00	QBT2	—	—	—	—	—	0.007	0.0031 (J)	—	—	—
50-24814	MD50-06-65157	7.50–9.10	QBT3	—	—	—	—	—	—	—	—	—	—
50-24814	MD50-06-65158	30.00–31.60	QBT3	—	—	—	—	—	—	—	—	—	—
50-24815	MD50-06-65191	147.80–149.70	QBT2	—	—	—	—	—	—	—	—	—	—
50-24816	MD50-06-65214	23.10–24.70	QBT3	—	—	—	0.00945 (J)	—	—	—	—	—	—
50-24816	MD50-06-65198	118.70–120.00	QBT2	—	—	—	—	—	0.369	0.129	—	—	—
50-24816	MD50-06-65216	223.40–225.00	QBT2	—	—	—	—	—	—	—	—	—	—
50-24817	MD50-05-63838	37.00–40.00	QBT3	—	—	—	—	—	—	—	—	—	—
50-24818	MD50-06-65229	8.50–10.00	QBT3	—	—	—	—	—	—	—	—	—	—
50-24818	MD50-06-65230	22.10–25.00	QBT3	—	—	—	—	—	—	—	—	—	—
50-24818	MD50-06-65264	247.70–249.20	QBT1G	—	—	—	—	0.0028 (J)	0.0023 (J)	—	—	—	—
50-24818	MD50-06-66760	312.90–313.00	QBT1G	—	—	—	—	—	—	—	—	—	—
50-24818	MD50-06-66761	397.90–398.00	QBO	—	—	0.0098	—	—	—	—	—	—	—
50-24818	MD50-06-66762	498.40–498.50	QBO	—	—	0.00374 (J)	—	—	—	—	—	—	—
50-24820	RE50-05-61441	138.70–140.00	QBT2	—	—	—	—	—	—	—	—	0.113	—
50-24820	RE50-05-61442	198.20–200.00	QBT1V	—	—	—	0.0078 (J)	—	—	—	0.103	0.112	—
50-24820	RE50-05-61443	248.30–250.00	QBT1G	—	—	—	0.0076 (J)	—	—	—	0.113	0.122	—
50-24821	RE50-05-61458	98.40–100.00	QBT3	0.0143 (J)	0.0109 (J)	—	0.0142 (J)	—	—	—	—	0.0117 (J)	0.0126 (J)
50-24822	RE50-05-61475	47.50–49.10	QBT3	—	—	—	—	—	—	—	—	—	—
50-24822	RE50-05-61477	137.50–139.20	QBT2	—	—	—	—	—	—	0.0118	—	—	—
50-25451	MD50-06-66697	18.70–19.90	QBT3	—	—	—	—	—	—	—	—	—	—

Table F-2.9-2 (continued)

Location ID	Sample ID	Depth (ft)	Media	Benzoic acid	Bis(2-ethylhexyl)phthalate	Chloronaphthalene[2-]	Chrysene	Dichloroethene[1,1-]	Di-n-butylphthalate	Di-n-octylphthalate	Fluoranthene	Fluorene
50-09101	0550-95-0289	35.00–36.20	QBT3	—	0.037 (J)	—	—	—	—	—	—	—
50-09101	0550-95-0294	55.00–55.70	QBT3	—	0.072 (J)	—	—	—	—	—	—	—
50-09101	0550-95-0299	75.00–77.00	QBT3	—	0.041 (J)	—	—	—	—	—	—	—
50-09103	0550-95-0109	36.00–38.80	QBT3	—	—	—	—	0.003 (J)	—	—	—	—
50-09103	0550-95-0119	78.00–80.00	QBT3	—	0.3 (J)	—	—	0.004 (J)	—	—	—	—
50-09103	0550-95-0124	94.70–98.00	QBT3	—	—	—	—	0.006	—	—	—	—
50-09103	0550-95-0129	114.80–116.80	QBT3	—	—	—	—	0.004 (J)	—	—	—	—
50-09104	0550-95-0099	85.00–87.00	QBT3	—	—	—	—	—	—	—	—	—
50-09105	0550-95-0145	57.00–59.00	QBT3	—	0.14 (J)	—	—	—	—	—	—	—
50-09106	0550-95-0046	27.50–30.50	QBT3	—	—	—	—	—	—	—	—	—
50-09106	0550-95-0054	56.50–58.50	QBT3	—	—	—	—	—	—	—	—	—
50-09108	0550-95-0200	37.00–38.60	QBT3	—	—	—	—	—	—	—	—	—
50-09108	0550-95-0210	76.60–78.60	QBT3	—	—	—	—	—	—	—	—	—
50-09108	0550-95-0215	95.50–97.50	QBT3	—	0.19 (J)	—	—	—	—	—	—	—
50-09109	0550-95-0226	18.20–20.20	QBT3	—	—	—	—	—	—	—	—	—
50-09109	0550-95-0231	34.10–36.00	QBT3	—	—	—	—	—	—	—	—	—
50-09110	0550-95-0264	38.00–40.00	QBT3	—	0.047 (J)	—	—	—	—	—	—	—
50-09110	0550-95-0279	88.00–89.40	QBT3	—	—	—	—	—	—	—	—	—
50-24766	MD50-06-64603	15.60–17.10	QBT3	—	—	—	—	—	—	—	—	—
50-24766	MD50-06-64604	27.50–29.20	QBT3	—	—	—	—	—	—	—	—	—
50-24766	MD50-06-64586	97.50–99.90	QBT2	—	—	—	—	—	—	0.308 (J)	—	—
50-24767	MD50-06-66770	29.50–30.00	QBT3	—	—	—	—	—	—	—	—	—
50-24768	MD50-06-64651	123.20–125.00	QBT2	—	—	—	—	—	—	—	—	—
50-24769	MD50-06-64699	18.10–20.00	QBT3	—	—	—	—	—	—	—	—	—
50-24769	MD50-06-64700	37.50–39.90	QBT3	—	—	—	—	—	—	—	—	—

Table F-2.9-2 (continued)

Location ID	Sample ID	Depth (ft)	Media	Benzoic acid	Bis(2-ethylhexyl)phthalate	Chloronaphthalene[2-]	Chrysene	Dichloroethene[1,1-]	Di-n-butylphthalate	Di-n-octylphthalate	Fluoranthene	Fluorene
50-24769	MD50-06-64701	147.90–149.80	QBT2	—	—	—	—	—	—	—	—	—
50-24770	MD50-06-64731	18.10–22.50	QBT3	—	—	—	—	—	—	—	—	—
50-24770	MD50-06-64733	147.50–150.00	QBT2	—	—	—	—	—	—	—	—	—
50-24773	MD50-06-64782	38.00–40.00	QBT3	—	—	—	—	—	—	—	—	—
50-24773	MD50-06-64783	150.00–152.80	QBT2	—	—	—	—	—	—	—	—	—
50-24783	MD50-06-64838	17.50–20.00	QBT3	—	—	—	—	—	—	—	—	—
50-24783	MD50-06-64839	35.40–37.50	QBT3	—	—	—	—	—	—	—	—	—
50-24783	MD50-06-64821	98.60–100.00	QBT3	—	—	—	—	—	—	—	—	—
50-24784	MD50-06-64381	18.00–20.00	QBT3	—	—	—	—	—	—	—	—	—
50-24784	MD50-06-64382	298.30–299.80	QBT1G	—	0.366	—	—	—	0.106 (J)	—	0.0228 (J)	—
50-24785	MD50-06-64413	17.50–19.00	QBT3	—	—	—	—	—	—	—	—	—
50-24796	MD50-06-64457	8.00–10.00	QBT3	—	—	—	—	—	—	—	—	—
50-24796	MD50-06-64458	17.50–19.30	QBT3	—	—	—	—	—	—	—	—	—
50-24796	MD50-06-64442	118.70–120.00	QBT2	0.541 (J)	—	—	—	—	—	—	—	—
50-24796	MD50-06-64459	147.50–149.40	QBT2	—	—	—	—	—	—	—	—	—
50-24797	MD50-06-64509	37.00–38.00	QBT3	—	—	—	—	—	—	—	—	—
50-24799	MD50-06-64516	13.10–15.00	QBT3	0.58 (J)	—	—	—	—	—	—	—	—
50-24799	MD50-06-64517	15.00–16.50	QBT3	—	—	—	—	—	—	—	—	—
50-24802	MD50-06-64888	12.50–16.10	QBT3	—	—	—	—	—	—	—	—	—
50-24802	MD50-06-64889	40.60–42.50	QBT3	—	—	—	—	—	—	—	—	—
50-24802	MD50-06-64872	123.10–125.00	QBT2	—	—	—	—	—	—	—	—	—
50-24802	MD50-06-64890	157.50–159.10	QBT2	—	—	—	—	—	—	—	—	—
50-24803	MD50-06-64913	15.40–17.50	QBT3	—	—	—	—	—	—	—	—	—
50-24804	MD50-06-64980	15.40–17.10	QBT3	—	—	—	—	—	—	—	—	—
50-24804	MD50-06-64982	147.50–149.80	QBT2	—	—	—	—	—	—	—	—	—

Table F-2.9-2 (continued)

Location ID	Sample ID	Depth (ft)	Media	Benzoic acid	Bis(2-ethylhexyl)phthalate	Chloronaphthalene[2-]	Chrysene	Dichloroethene[1,1-]	Di-n-butylphthalate	Di-n-octylphthalate	Fluoranthene	Fluorene
50-24810	MD50-06-65005	17.50–19.00	QBT3	—	—	—	—	—	—	—	—	—
50-24812	MD50-06-65100	8.40–10.00	QBT3	—	—	—	—	—	—	—	—	—
50-24812	MD50-06-65102	146.00–150.00	QBT2	—	—	—	—	—	—	—	—	—
50-24813	MD50-06-65116	123.50–125.00	QBT2	—	—	—	—	—	—	—	—	—
50-24814	MD50-06-65157	7.50–9.10	QBT3	—	—	—	—	—	—	—	—	—
50-24814	MD50-06-65158	30.00–31.60	QBT3	—	—	—	—	—	—	—	—	—
50-24815	MD50-06-65191	147.80–149.70	QBT2	—	—	—	—	—	—	—	—	—
50-24816	MD50-06-65214	23.10–24.70	QBT3	—	0.0868 (J)	—	0.0114 (J)	—	—	—	—	—
50-24816	MD50-06-65198	118.70–120.00	QBT2	—	—	—	—	—	—	—	—	—
50-24816	MD50-06-65216	223.40–225.00	QBT2	—	—	—	—	—	—	—	—	—
50-24817	MD50-05-63838	37.00–40.00	QBT3	—	—	—	—	—	—	—	—	—
50-24818	MD50-06-65229	8.50–10.00	QBT3	—	—	—	—	—	—	—	—	—
50-24818	MD50-06-65230	22.10–25.00	QBT3	—	—	—	—	—	—	—	—	—
50-24818	MD50-06-65264	247.70–249.20	QBT1G	—	—	—	—	—	—	—	—	—
50-24818	MD50-06-66760	312.90–313.00	QBT1G	—	—	—	—	—	—	—	—	—
50-24818	MD50-06-66761	397.90–398.00	QBO	—	—	—	—	—	—	—	—	—
50-24818	MD50-06-66762	498.40–498.50	QBO	—	—	—	—	—	—	—	—	—
50-24820	RE50-05-61441	138.70–140.00	QBT2	—	0.11 (J)	—	—	—	—	—	0.0167 (J)	—
50-24820	RE50-05-61442	198.20–200.00	QBT1V	—	0.114 (J)	—	—	—	—	0.178 (J)	—	—
50-24820	RE50-05-61443	248.30–250.00	QBT1G	0.605 (J)	0.128 (J)	—	—	—	—	—	—	—
50-24821	RE50-05-61458	98.40–100.00	QBT3	—	—	0.0134 (J)	0.0188 (J-)	—	—	—	0.0138 (J)	0.0136 (J)
50-24822	RE50-05-61475	47.50–49.10	QBT3	—	—	—	—	—	—	—	—	—
50-24822	RE50-05-61477	137.50–139.20	QBT2	—	—	—	—	—	—	—	—	—
50-25451	MD50-06-66697	18.70–19.90	QBT3	—	—	—	—	—	—	—	—	—

Table F-2.9-2 (continued)

Location ID	Sample ID	Depth (ft)	Media	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Heptachlorodibenzodioxins (Total)	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	Heptachlorodibenzofurans (Total)	Hexachlorodibenzodioxins (Total)	Hexachlorodibenzofuran[1,2,3,4,7,8-]	Hexachlorodibenzofuran[2,3,4,6,7,8-]	Hexachlorodibenzofurans (Total)	Indeno(1,2,3-cd)pyrene
50-09101	0550-95-0289	35.00–36.20	QBT3	—	—	—	—	—	—	—	—	—
50-09101	0550-95-0294	55.00–55.70	QBT3	—	—	—	—	—	—	—	—	—
50-09101	0550-95-0299	75.00–77.00	QBT3	—	—	—	—	—	—	—	—	—
50-09103	0550-95-0109	36.00–38.80	QBT3	—	—	—	—	—	—	—	—	—
50-09103	0550-95-0119	78.00–80.00	QBT3	—	—	—	—	—	—	—	—	—
50-09103	0550-95-0124	94.70–98.00	QBT3	—	—	—	—	—	—	—	—	—
50-09103	0550-95-0129	114.80–116.80	QBT3	—	—	—	—	—	—	—	—	—
50-09104	0550-95-0099	85.00–87.00	QBT3	—	—	—	—	—	—	—	—	—
50-09105	0550-95-0145	57.00–59.00	QBT3	—	—	—	—	—	—	—	—	—
50-09106	0550-95-0046	27.50–30.50	QBT3	—	—	—	—	—	—	—	—	—
50-09106	0550-95-0054	56.50–58.50	QBT3	—	—	—	—	—	—	—	—	—
50-09108	0550-95-0200	37.00–38.60	QBT3	—	—	—	—	—	—	—	—	—
50-09108	0550-95-0210	76.60–78.60	QBT3	—	—	—	—	—	—	—	—	—
50-09108	0550-95-0215	95.50–97.50	QBT3	—	—	—	—	—	—	—	—	—
50-09109	0550-95-0226	18.20–20.20	QBT3	—	—	—	—	—	—	—	—	—
50-09109	0550-95-0231	34.10–36.00	QBT3	—	—	—	—	—	—	—	—	—
50-09110	0550-95-0264	38.00–40.00	QBT3	—	—	—	—	—	—	—	—	—
50-09110	0550-95-0279	88.00–89.40	QBT3	—	—	—	—	—	—	—	—	—
50-24766	MD50-06-64603	15.60–17.10	QBT3	—	—	—	—	—	—	—	—	—
50-24766	MD50-06-64604	27.50–29.20	QBT3	—	—	—	—	—	—	—	—	—

Table F-2.9-2 (continued)

Location ID	Sample ID	Depth (ft)	Media	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Heptachlorodibenzodioxins (Total)	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	Heptachlorodibenzofurans (Total)	Hexachlorodibenzodioxins (Total)	Hexachlorodibenzofuran[1,2,3,4,7,8-]	Hexachlorodibenzofuran[2,3,4,6,7,8-]	Hexachlorodibenzofurans (Total)	Indeno(1,2,3-cd)pyrene
50-24766	MD50-06-64586	97.50–99.90	QBT2	—	—	—	—	—	—	—	—	—
50-24767	MD50-06-66770	29.50–30.00	QBT3	—	—	—	—	—	—	—	—	—
50-24768	MD50-06-64651	123.20–125.00	QBT2	—	—	—	—	—	—	—	—	—
50-24769	MD50-06-64699	18.10–20.00	QBT3	—	—	—	—	—	—	—	—	—
50-24769	MD50-06-64700	37.50–39.90	QBT3	—	—	—	—	—	—	—	—	—
50-24769	MD50-06-64701	147.90–149.80	QBT2	—	—	—	—	—	—	—	—	—
50-24770	MD50-06-64731	18.10–22.50	QBT3	5.65E-07 (J)	1.07E-06	5.41E-07 (J)	5.41E-07	—	1.36E-07 (J)	—	2.32E-07	—
50-24770	MD50-06-64733	147.50–150.00	QBT2	—	—	—	—	—	—	—	—	—
50-24773	MD50-06-64782	38.00–40.00	QBT3	—	—	—	—	—	—	—	—	—
50-24773	MD50-06-64783	150.00–152.80	QBT2	—	—	—	—	—	—	—	—	—
50-24783	MD50-06-64838	17.50–20.00	QBT3	—	—	—	—	—	—	—	—	—
50-24783	MD50-06-64839	35.40–37.50	QBT3	—	—	—	—	—	—	—	—	—
50-24783	MD50-06-64821	98.60–100.00	QBT3	—	—	—	—	—	—	—	—	—
50-24784	MD50-06-64381	18.00–20.00	QBT3	4.49E-07 (J)	4.49E-07	—	—	8.97E-07	—	—	1.39E-07	—
50-24784	MD50-06-64382	298.30–299.80	QBT1G	5.85E-07 (J)	1.01E-06	—	—	—	—	—	7.52E-08	—
50-24785	MD50-06-64413	17.50–19.00	QBT3	—	—	—	—	—	—	—	—	—
50-24796	MD50-06-64457	8.00–10.00	QBT3	1.3E-07 (J)	1.3E-07	—	—	—	—	—	—	—
50-24796	MD50-06-64458	17.50–19.30	QBT3	3.4E-07 (J)	6.46E-07	—	—	—	—	—	—	—
50-24796	MD50-06-64442	118.70–120.00	QBT2	—	—	—	—	—	—	—	—	—
50-24796	MD50-06-64459	147.50–149.40	QBT2	7.66E-07 (J)	0.0000017	—	—	—	—	—	—	—

Table F-2.9-2 (continued)

Location ID	Sample ID	Depth (ft)	Media	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Heptachlorodibenzodioxins (Total)	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	Heptachlorodibenzofurans (Total)	Hexachlorodibenzodioxins (Total)	Hexachlorodibenzofuran[1,2,3,4,7,8-]	Hexachlorodibenzofuran[2,3,4,6,7,8-]	Hexachlorodibenzofurans (Total)	Indeno(1,2,3-cd)pyrene
50-24797	MD50-06-64509	37.00–38.00	QBT3	3.01E-07 (J)	5.7E-07	—	—	—	—	—	—	—
50-24799	MD50-06-64516	13.10–15.00	QBT3	—	—	—	—	—	—	—	—	—
50-24799	MD50-06-64517	15.00–16.50	QBT3	—	—	—	—	—	—	—	—	—
50-24802	MD50-06-64888	12.50–16.10	QBT3	5.03E-07 (J)	5.03E-07	—	3.26E-07	—	—	—	5.62E-08	—
50-24802	MD50-06-64889	40.60–42.50	QBT3	1.82E-07 (J)	3.04E-07	3.84E-07 (J)	3.84E-07	—	2.89E-07 (J)	9.89E-08 (J)	7.06E-07	—
50-24802	MD50-06-64872	123.10–125.00	QBT2	—	—	—	—	—	—	—	—	—
50-24802	MD50-06-64890	157.50–159.10	QBT2	1.92E-07 (J)	1.92E-07	—	—	—	—	—	—	—
50-24803	MD50-06-64913	15.40–17.50	QBT3	—	—	—	—	—	—	—	—	—
50-24804	MD50-06-64980	15.40–17.10	QBT3	—	—	—	—	—	—	—	—	—
50-24804	MD50-06-64982	147.50–149.80	QBT2	1.02E-07 (J)	1.02E-07	—	—	—	—	—	—	—
50-24810	MD50-06-65005	17.50–19.00	QBT3	—	—	—	—	—	—	—	—	—
50-24812	MD50-06-65100	8.40–10.00	QBT3	—	—	6.41E-07 (J)	6.41E-07	—	—	—	—	—
50-24812	MD50-06-65102	146.00–150.00	QBT2	—	—	—	—	—	—	—	—	—
50-24813	MD50-06-65116	123.50–125.00	QBT2	—	—	—	—	—	—	—	—	—
50-24814	MD50-06-65157	7.50–9.10	QBT3	8.67E-07 (J)	1.86E-06	—	—	—	—	—	—	—
50-24814	MD50-06-65158	30.00–31.60	QBT3	2.2E-07 (J)	2.2E-07	—	—	—	—	—	—	—
50-24815	MD50-06-65191	147.80–149.70	QBT2	—	—	—	—	—	—	—	—	—
50-24816	MD50-06-65214	23.10–24.70	QBT3	—	—	—	—	—	—	—	—	—
50-24816	MD50-06-65198	118.70–120.00	QBT2	—	—	—	—	—	—	—	—	—
50-24816	MD50-06-65216	223.40–225.00	QBT2	—	—	—	—	—	—	—	—	—

Table F-2.9-2 (continued)

Location ID	Sample ID	Depth (ft)	Media	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Heptachlorodibenzodioxins (Total)	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	Heptachlorodibenzofurans (Total)	Hexachlorodibenzodioxins (Total)	Hexachlorodibenzofuran[1,2,3,4,7,8-]	Hexachlorodibenzofuran[2,3,4,6,7,8-]	Hexachlorodibenzofurans (Total)	Indeno(1,2,3-cd)pyrene
50-24817	MD50-05-63838	37.00–40.00	QBT3	—	—	—	—	—	—	—	—	—
50-24818	MD50-06-65229	8.50–10.00	QBT3	—	—	—	—	—	—	—	—	—
50-24818	MD50-06-65230	22.10–25.00	QBT3	—	—	—	—	—	—	—	—	—
50-24818	MD50-06-65264	247.70–249.20	QBT1G	—	—	—	—	—	—	—	—	—
50-24818	MD50-06-66760	312.90–313.00	QBT1G	—	—	—	—	—	—	—	—	—
50-24818	MD50-06-66761	397.90–398.00	QBO	—	—	—	—	—	—	—	—	—
50-24818	MD50-06-66762	498.40–498.50	QBO	—	—	—	—	—	—	—	—	—
50-24820	RE50-05-61441	138.70–140.00	QBT2	—	—	—	—	—	—	—	—	—
50-24820	RE50-05-61442	198.20–200.00	QBT1V	—	—	—	—	—	—	—	—	—
50-24820	RE50-05-61443	248.30–250.00	QBT1G	—	—	—	—	—	—	—	—	—
50-24821	RE50-05-61458	98.40–100.00	QBT3	—	—	—	—	—	—	—	—	0.149
50-24822	RE50-05-61475	47.50–49.10	QBT3	3.58E-07 (J)	6.46E-07	—	—	4.88E-07	3.97E-08 (J)	—	3.97E-08	—
50-24822	RE50-05-61477	137.50–139.20	QBT2	—	—	—	—	—	—	—	—	—
50-25451	MD50-06-66697	18.70–19.90	QBT3	—	—	—	—	—	—	—	—	—

Table F-2.9-2 (continued)

Location ID	Sample ID	Depth (ft)	Media	Methylene Chloride	Methylnaphthalene[2-]	Methylphenol[2-]	Nitrotoluene[2-]	Nitrotoluene[3-]	Nitrotoluene[4-]	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	Pentachlorodibenzodioxins (Total)
50-09101	0550-95-0289	35.00–36.20	QBT3	—	—	—	—	—	—	—	—	—
50-09101	0550-95-0294	55.00–55.70	QBT3	—	—	—	—	—	—	—	—	—
50-09101	0550-95-0299	75.00–77.00	QBT3	—	—	—	—	—	—	—	—	—
50-09103	0550-95-0109	36.00–38.80	QBT3	—	—	—	—	—	—	—	—	—
50-09103	0550-95-0119	78.00–80.00	QBT3	—	—	—	—	—	—	—	—	—
50-09103	0550-95-0124	94.70–98.00	QBT3	—	—	—	—	—	—	—	—	—
50-09103	0550-95-0129	114.80–116.80	QBT3	—	—	—	—	—	—	—	—	—
50-09104	0550-95-0099	85.00–87.00	QBT3	—	—	0.35	—	—	—	—	—	—
50-09105	0550-95-0145	57.00–59.00	QBT3	—	—	—	—	—	—	—	—	—
50-09106	0550-95-0046	27.50–30.50	QBT3	—	—	—	—	—	—	—	—	—
50-09106	0550-95-0054	56.50–58.50	QBT3	—	—	—	—	—	—	—	—	—
50-09108	0550-95-0200	37.00–38.60	QBT3	—	—	—	—	—	—	—	—	—
50-09108	0550-95-0210	76.60–78.60	QBT3	0.0063	—	—	—	—	—	—	—	—
50-09108	0550-95-0215	95.50–97.50	QBT3	—	—	—	—	—	—	—	—	—
50-09109	0550-95-0226	18.20–20.20	QBT3	—	—	—	—	—	—	—	—	—
50-09109	0550-95-0231	34.10–36.00	QBT3	—	—	—	—	—	—	—	—	—
50-09110	0550-95-0264	38.00–40.00	QBT3	—	—	—	—	—	—	—	—	—
50-09110	0550-95-0279	88.00–89.40	QBT3	—	—	—	—	—	—	—	—	—
50-24766	MD50-06-64603	15.60–17.10	QBT3	—	—	—	—	—	0.389 (J)	2.65E-07 (J)	1.35E-07 (J)	—
50-24766	MD50-06-64604	27.50–29.20	QBT3	—	—	—	—	—	—	4.27E-07 (J)	—	—

Table F-2.9-2 (continued)

Location ID	Sample ID	Depth (ft)	Media	Methylene Chloride	Methylnaphthalene[2-]	Methylphenol[2-]	Nitrotoluene[2-]	Nitrotoluene[3-]	Nitrotoluene[4-]	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	Pentachlorodibenzodioxins (Total)
50-24766	MD50-06-64586	97.50–99.90	QBT2	—	—	—	—	—	—	—	—	—
50-24767	MD50-06-66770	29.50–30.00	QBT3	—	—	—	—	—	—	—	—	—
50-24768	MD50-06-64651	123.20–125.00	QBT2	—	—	—	—	—	—	—	—	—
50-24769	MD50-06-64699	18.10–20.00	QBT3	—	—	—	—	—	—	6.98E-07 (J)	—	—
50-24769	MD50-06-64700	37.50–39.90	QBT3	—	—	—	—	—	—	3.68E-07 (J)	—	—
50-24769	MD50-06-64701	147.90–149.80	QBT2	—	—	—	—	—	—	3.52E-07 (J)	—	—
50-24770	MD50-06-64731	18.10–22.50	QBT3	—	—	—	—	—	—	—	—	—
50-24770	MD50-06-64733	147.50–150.00	QBT2	—	—	—	—	—	—	8.17E-07 (J)	—	—
50-24773	MD50-06-64782	38.00–40.00	QBT3	—	—	—	—	—	—	2.07E-07 (J)	—	—
50-24773	MD50-06-64783	150.00–152.80	QBT2	—	—	—	—	—	—	—	—	—
50-24783	MD50-06-64838	17.50–20.00	QBT3	—	—	—	—	—	—	4.49E-07 (J)	—	—
50-24783	MD50-06-64839	35.40–37.50	QBT3	—	—	—	—	—	—	6.12E-07 (J)	—	—
50-24783	MD50-06-64821	98.60–100.00	QBT3	—	—	—	—	—	—	—	—	—
50-24784	MD50-06-64381	18.00–20.00	QBT3	—	—	—	—	—	—	6.78E-07 (J)	—	—
50-24784	MD50-06-64382	298.30–299.80	QBT1G	—	—	—	—	—	—	0.0000113	5.32E-07 (J)	—
50-24785	MD50-06-64413	17.50–19.00	QBT3	—	—	—	—	—	—	5.37E-07 (J)	—	—
50-24796	MD50-06-64457	8.00–10.00	QBT3	—	—	—	—	—	—	—	—	—
50-24796	MD50-06-64458	17.50–19.30	QBT3	—	—	—	—	—	—	2.45E-06 (J)	4.65E-07 (J)	—
50-24796	MD50-06-64442	118.70–120.00	QBT2	—	—	—	—	—	—	—	—	—
50-24796	MD50-06-64459	147.50–149.40	QBT2	—	—	—	—	—	—	4.52E-06 (J)	—	—

Table F-2.9-2 (continued)

Location ID	Sample ID	Depth (ft)	Media	Methylene Chloride	Methylnaphthalene[2-]	Methylphenol[2-]	Nitrotoluene[2-]	Nitrotoluene[3-]	Nitrotoluene[4-]	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	Pentachlorodibenzodioxins (Total)
50-24797	MD50-06-64509	37.00–38.00	QBT3	—	—	—	—	—	—	—	1.69E-07 (J)	—
50-24799	MD50-06-64516	13.10–15.00	QBT3	—	—	—	—	—	—	—	—	—
50-24799	MD50-06-64517	15.00–16.50	QBT3	—	—	—	—	—	—	—	—	—
50-24802	MD50-06-64888	12.50–16.10	QBT3	—	—	—	—	—	—	5.29E-06	4.76E-07 (J)	—
50-24802	MD50-06-64889	40.60–42.50	QBT3	—	—	—	—	—	—	6.35E-07 (J)	4.01E-07 (J)	—
50-24802	MD50-06-64872	123.10–125.00	QBT2	—	—	—	—	—	—	—	—	—
50-24802	MD50-06-64890	157.50–159.10	QBT2	—	—	—	—	—	—	3.44E-06 (J)	2.51E-07 (J)	—
50-24803	MD50-06-64913	15.40–17.50	QBT3	—	—	—	—	—	—	3.77E-07 (J)	—	—
50-24804	MD50-06-64980	15.40–17.10	QBT3	—	—	—	—	—	—	3.03E-07 (J)	—	—
50-24804	MD50-06-64982	147.50–149.80	QBT2	—	—	—	—	—	—	—	—	—
50-24810	MD50-06-65005	17.50–19.00	QBT3	—	—	—	—	0.346 (J+)	—	—	—	—
50-24812	MD50-06-65100	8.40–10.00	QBT3	—	—	—	—	—	—	1.53E-06 (J)	—	—
50-24812	MD50-06-65102	146.00–150.00	QBT2	—	—	—	—	—	—	—	—	—
50-24813	MD50-06-65116	123.50–125.00	QBT2	—	—	—	—	—	—	—	—	—
50-24814	MD50-06-65157	7.50–9.10	QBT3	—	—	—	—	—	—	0.0000117 (J)	7.88E-07 (J)	—
50-24814	MD50-06-65158	30.00–31.60	QBT3	—	—	—	—	—	—	—	—	—
50-24815	MD50-06-65191	147.80–149.70	QBT2	—	—	—	—	—	—	3.36E-07 (J)	—	—
50-24816	MD50-06-65214	23.10–24.70	QBT3	—	0.00903 (J)	—	—	—	—	4.58E-07 (J)	—	—
50-24816	MD50-06-65198	118.70–120.00	QBT2	—	—	—	—	—	—	—	—	—
50-24816	MD50-06-65216	223.40–225.00	QBT2	—	—	—	—	—	—	6.95E-07 (J)	—	—

Table F-2.9-2 (continued)

Location ID	Sample ID	Depth (ft)	Media	Methylene Chloride	Methylnaphthalene[2-]	Methylphenol[2-]	Nitrotoluene[2-]	Nitrotoluene[3-]	Nitrotoluene[4-]	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	Pentachlorodibenzodioxins (Total)
50-24817	MD50-05-63838	37.00–40.00	QBT3	—	—	—	—	—	—	1.12E-06 (J)	—	—
50-24818	MD50-06-65229	8.50–10.00	QBT3	—	—	—	—	—	—	5.85E-07 (J)	—	—
50-24818	MD50-06-65230	22.10–25.00	QBT3	—	—	—	—	—	—	—	—	—
50-24818	MD50-06-65264	247.70–249.20	QBT1G	—	—	—	—	—	—	—	—	—
50-24818	MD50-06-66760	312.90–313.00	QBT1G	—	—	—	—	—	—	—	—	—
50-24818	MD50-06-66761	397.90–398.00	QBO	—	—	—	—	—	—	—	—	—
50-24818	MD50-06-66762	498.40–498.50	QBO	—	—	—	—	—	—	—	—	—
50-24820	RE50-05-61441	138.70–140.00	QBT2	—	—	—	—	—	—	—	—	—
50-24820	RE50-05-61442	198.20–200.00	QBT1V	—	—	—	—	—	—	—	—	—
50-24820	RE50-05-61443	248.30–250.00	QBT1G	—	—	—	—	—	—	—	—	—
50-24821	RE50-05-61458	98.40–100.00	QBT3	—	0.014 (J)	—	—	—	—	—	—	—
50-24822	RE50-05-61475	47.50–49.10	QBT3	—	—	—	—	—	—	0.0000129	2.65E-07 (J)	7.64E-08
50-24822	RE50-05-61477	137.50–139.20	QBT2	—	—	—	—	—	—	—	—	—
50-25451	MD50-06-66697	18.70–19.90	QBT3	—	—	—	0.135 (J)	—	—	—	—	—

Table F-2.9-2 (continued)

Location ID	Sample ID	Depth (ft)	Media	Pentachlorodibenzofuran[1,2,3,7,8-]	Pentachlorodibenzofuran[2,3,4,7,8-]	Pentachlorodibenzofurans (Totals)	Phenanthrene	Pyrene	RDX	Tetrachlorodibenzofuran[2,3,7,8-]	Tetrachlorodibenzofurans (Total)	Toluene	Trichloroethene
50-09101	0550-95-0289	35.00–36.20	QBT3	—	—	—	—	—	—	—	—	—	—
50-09101	0550-95-0294	55.00–55.70	QBT3	—	—	—	—	—	—	—	—	—	—
50-09101	0550-95-0299	75.00–77.00	QBT3	—	—	—	—	—	—	—	—	—	—
50-09103	0550-95-0109	36.00–38.80	QBT3	—	—	—	—	—	—	—	—	—	—
50-09103	0550-95-0119	78.00–80.00	QBT3	—	—	—	—	—	—	—	—	—	—
50-09103	0550-95-0124	94.70–98.00	QBT3	—	—	—	—	—	—	—	—	—	—
50-09103	0550-95-0129	114.80–116.80	QBT3	—	—	—	—	—	—	—	—	—	—
50-09104	0550-95-0099	85.00–87.00	QBT3	—	—	—	—	—	—	—	—	—	—
50-09105	0550-95-0145	57.00–59.00	QBT3	—	—	—	—	—	—	—	—	0.003 (J)	—
50-09106	0550-95-0046	27.50–30.50	QBT3	—	—	—	—	—	—	—	—	—	—
50-09106	0550-95-0054	56.50–58.50	QBT3	—	—	—	—	—	—	—	—	—	—
50-09108	0550-95-0200	37.00–38.60	QBT3	—	—	—	—	—	—	—	—	—	—
50-09108	0550-95-0210	76.60–78.60	QBT3	—	—	—	—	—	—	—	—	—	—
50-09108	0550-95-0215	95.50–97.50	QBT3	—	—	—	—	—	—	—	—	—	—
50-09109	0550-95-0226	18.20–20.20	QBT3	—	—	—	—	—	—	—	—	—	—
50-09109	0550-95-0231	34.10–36.00	QBT3	—	—	—	—	—	—	—	—	—	—
50-09110	0550-95-0264	38.00–40.00	QBT3	—	—	—	—	—	—	—	—	—	—
50-09110	0550-95-0279	88.00–89.40	QBT3	—	—	—	—	—	—	—	—	—	—
50-24766	MD50-06-64603	15.60–17.10	QBT3	—	—	—	—	—	—	—	—	—	—
50-24766	MD50-06-64604	27.50–29.20	QBT3	—	—	—	—	—	0.165 (J)	—	—	—	—
50-24766	MD50-06-64586	97.50–99.90	QBT2	—	—	—	—	—	—	—	—	—	—

Table F-2.9-2 (continued)

Location ID	Sample ID	Depth (ft)	Media	Pentachlorodibenzofuran[1,2,3,7,8-]	Pentachlorodibenzofuran[2,3,4,7,8-]	Pentachlorodibenzofurans (Totals)	Phenanthrene	Pyrene	RDX	Tetrachlorodibenzofuran[2,3,7,8-]	Tetrachlorodibenzofurans (Total)	Toluene	Trichloroethene
50-24767	MD50-06-66770	29.50–30.00	QBT3	—	—	—	—	—	—	—	—	—	—
50-24768	MD50-06-64651	123.20–125.00	QBT2	—	—	—	—	0.0119 (J)	—	—	—	—	—
50-24769	MD50-06-64699	18.10–20.00	QBT3	—	—	—	—	—	—	—	—	—	—
50-24769	MD50-06-64700	37.50–39.90	QBT3	—	—	—	—	—	—	—	—	—	—
50-24769	MD50-06-64701	147.90–149.80	QBT2	—	—	—	—	—	—	—	—	—	—
50-24770	MD50-06-64731	18.10–22.50	QBT3	—	—	—	—	—	—	—	—	—	—
50-24770	MD50-06-64733	147.50–150.00	QBT2	—	—	—	—	—	—	—	—	—	—
50-24773	MD50-06-64782	38.00–40.00	QBT3	—	—	—	—	—	—	—	—	—	—
50-24773	MD50-06-64783	150.00–152.80	QBT2	—	—	—	—	—	—	—	—	—	—
50-24783	MD50-06-64838	17.50–20.00	QBT3	—	—	—	—	—	—	—	—	—	—
50-24783	MD50-06-64839	35.40–37.50	QBT3	—	—	—	—	—	—	—	—	—	—
50-24783	MD50-06-64821	98.60–100.00	QBT3	—	—	—	—	—	—	—	—	—	—
50-24784	MD50-06-64381	18.00–20.00	QBT3	—	—	—	—	—	—	—	2.04E-07	—	—
50-24784	MD50-06-64382	298.30–299.80	QBT1G	—	—	—	—	0.0317 (J)	—	—	—	—	—
50-24785	MD50-06-64413	17.50–19.00	QBT3	—	—	—	—	—	—	1.05E-07 (J)	1.05E-07	—	—
50-24796	MD50-06-64457	8.00–10.00	QBT3	—	—	—	—	—	—	—	—	—	—
50-24796	MD50-06-64458	17.50–19.30	QBT3	—	—	—	—	—	—	—	—	—	—
50-24796	MD50-06-64442	118.70–120.00	QBT2	—	—	—	—	—	—	—	—	—	—
50-24796	MD50-06-64459	147.50–149.40	QBT2	—	—	—	—	—	—	—	—	—	—
50-24797	MD50-06-64509	37.00–38.00	QBT3	—	—	—	—	—	—	—	—	—	—
50-24799	MD50-06-64516	13.10–15.00	QBT3	—	—	—	—	—	—	—	—	—	—

Table F-2.9-2 (continued)

Location ID	Sample ID	Depth (ft)	Media	Pentachlorodibenzofuran[1,2,3,7,8-]	Pentachlorodibenzofuran[2,3,4,7,8-]	Pentachlorodibenzofurans (Totals)	Phenanthrene	Pyrene	RDX	Tetrachlorodibenzofuran[2,3,7,8-]	Tetrachlorodibenzofurans (Total)	Toluene	Trichloroethene
50-24799	MD50-06-64517	15.00–16.50	QBT3	—	—	—	—	—	—	—	—	—	—
50-24802	MD50-06-64888	12.50–16.10	QBT3	—	—	—	—	—	—	—	—	—	—
50-24802	MD50-06-64889	40.60–42.50	QBT3	1.21E-07 (J)	1.11E-07 (J)	7.17E-07	—	—	—	—	—	—	—
50-24802	MD50-06-64872	123.10–125.00	QBT2	—	—	—	—	—	—	—	—	—	—
50-24802	MD50-06-64890	157.50–159.10	QBT2	—	—	—	—	—	—	—	—	—	—
50-24803	MD50-06-64913	15.40–17.50	QBT3	—	—	—	—	—	—	—	—	—	—
50-24804	MD50-06-64980	15.40–17.10	QBT3	—	—	—	—	—	—	—	—	—	—
50-24804	MD50-06-64982	147.50–149.80	QBT2	—	—	—	—	—	—	—	—	—	—
50-24810	MD50-06-65005	17.50–19.00	QBT3	—	—	—	—	—	—	—	—	—	—
50-24812	MD50-06-65100	8.40–10.00	QBT3	—	—	—	—	—	—	—	—	—	—
50-24812	MD50-06-65102	146.00–150.00	QBT2	3.13E-07 (J)	—	3.13E-07	—	—	—	—	—	—	—
50-24813	MD50-06-65116	123.50–125.00	QBT2	—	—	—	—	—	—	—	—	—	—
50-24814	MD50-06-65157	7.50–9.10	QBT3	—	—	—	—	—	—	—	—	—	—
50-24814	MD50-06-65158	30.00–31.60	QBT3	—	—	—	—	—	—	—	—	—	—
50-24815	MD50-06-65191	147.80–149.70	QBT2	—	—	—	—	—	—	—	—	—	—
50-24816	MD50-06-65214	23.10–24.70	QBT3	—	—	—	—	—	—	—	—	—	—
50-24816	MD50-06-65198	118.70–120.00	QBT2	—	—	—	—	—	—	—	—	—	—
50-24816	MD50-06-65216	223.40–225.00	QBT2	—	—	—	—	—	—	—	—	—	—
50-24817	MD50-05-63838	37.00–40.00	QBT3	—	—	—	—	—	—	—	—	—	—
50-24818	MD50-06-65229	8.50–10.00	QBT3	—	—	—	—	—	—	—	—	—	—
50-24818	MD50-06-65230	22.10–25.00	QBT3	—	—	—	—	0.0148 (J)	—	—	—	—	—

Table F-2.9-2 (continued)

Location ID	Sample ID	Depth (ft)	Media	Pentachlorodibenzofuran[1,2,3,7,8-]	Pentachlorodibenzofuran[2,3,4,7,8-]	Pentachlorodibenzofurans (Totals)	Phenanthrene	Pyrene	RDX	Tetrachlorodibenzofuran[2,3,7,8-]	Tetrachlorodibenzofurans (Total)	Toluene	Trichloroethene
50-24818	MD50-06-65264	247.70–249.20	QBT1G	—	—	—	—	—	—	—	—	—	—
50-24818	MD50-06-66760	312.90–313.00	QBT1G	—	—	—	—	—	—	—	—	—	0.00199
50-24818	MD50-06-66761	397.90–398.00	QBO	—	—	—	—	—	—	—	—	—	—
50-24818	MD50-06-66762	498.40–498.50	QBO	—	—	—	—	—	—	—	—	—	—
50-24820	RE50-05-61441	138.70–140.00	QBT2	—	—	—	0.0113 (J)	0.0118 (J)	—	—	—	—	—
50-24820	RE50-05-61442	198.20–200.00	QBT1V	—	—	—	—	—	—	—	—	—	—
50-24820	RE50-05-61443	248.30–250.00	QBT1G	—	—	—	—	—	—	—	—	—	—
50-24821	RE50-05-61458	98.40–100.00	QBT3	—	—	—	0.0169 (J)	0.0148 (J)	—	—	—	—	—
50-24822	RE50-05-61475	47.50–49.10	QBT3	—	—	—	—	—	—	—	—	—	—
50-24822	RE50-05-61477	137.50–139.20	QBT2	—	—	—	—	—	—	—	—	—	—
50-25451	MD50-06-66697	18.70–19.90	QBT3	—	—	—	—	—	—	—	—	—	—

Note: Units are mg/kg.

*— = Not detected.

Table F-2.10-1
Frequency of Organic Chemicals (VOCs) Detected in First Round of Pore Gas at MDA C

Analyte	Number of Analyses	Number of Detects	Number of Detected Locations	Concentration Range* (µg/m³)	Location of Maximum Detected	Maximum Detect (µg/m³)
Acetone	210	98	26	[7.9] to [680]	50-24799 (37.5 ft)	390
Benzene	210	29	13	[0.64] to [180]	50-24820 (140 ft)	60
Butadiene[1,3-]	44	21	7	[1.7] to 230	50-24817 (200 ft)	230
Butanol[1-]	44	6	4	[9.6] to [210]	50-24799 (120 ft)	65
Butanone[2-]	210	33	15	[2.6] to [840]	50-24799 (37.5 ft)	160
Carbon disulfide	210	24	11	[2.5] to [890]	50-24817 (200 ft)	89
Carbon tetrachloride	210	174	34	[1.3] to 7200	50-24812 (10 ft)	7200
Chlorodifluoromethane	44	1	1	[11] to [250]	50-24799 (160 ft)	61
Chloroform	210	209	34	1.8 to 3900	50-24811 (150 ft)	3900
Chloromethane	210	13	7	0.82 to [240]	50-24818 (500 ft)	2.3
Cyclohexane	44	7	4	[2.8] to [60]	50-24822 (20 ft)	30
Dichloro-1,1,2,2-tetrafluoroethane[1,2-]	210	25	9	[1.4] to 500	50-25451 (49 ft)	500
Dichlorodifluoromethane	210	208	34	3.9 to 2600	50-24813 (150 ft)	2600
Dichloroethane[1,1-]	210	15	7	[0.81 to 230]	50-24817 (50 ft)	50
Dichloroethane[1,2-]	210	54	24	[0.81] to 270	50-24771 (150 ft)	270
Dichloroethene[1,1-]	210	11	6	[0.79] to [230]	50-24817 (200 ft)	110
Dichloroethene[cis-1,2-]	210	163	34	[0.79] to 840	50-24812 (150 ft)	840
Dichloropropane[1,2-]	210	94	21	[0.92] to 860	50-24817 (200 ft)	860
Dioxane[1,4-]	44	2	1	[11] to 2300	50-24799 (100 ft)	2300
Ethanol	44	1	1	[6] to [130]	50-24799 (40.5 ft)	7.2
Ethylbenzene	210	25	13	[0.87] to [250]	50-24817 (100 ft)	33
Ethyltoluene[4-]	210	13	10	[2] to [280]	50-24817 (100 ft)	22
Hexane	44	20	8	[2.8] to 170	50-24817 (100 ft)	170
Hexanone[2-]	210	7	4	[1.6] to [1200]	50-24799 (37.5 ft)	18

Table F-2.10-1 (continued)

Analyte	Number of Analyses	Number of Detects	Number of Detected Locations	Concentration Range* ($\mu\text{g}/\text{m}^3$)	Location of Maximum Detected	Maximum Detect ($\mu\text{g}/\text{m}^3$)
Methanol	44	1	1	[100] to [2300]	50-24799 (40.5 ft)	130
Methyl-2-pentanone[4-]	210	6	2	[1.6] to [1200]	50-24818 (500 ft)	26
Methylene chloride	210	157	34	[0.69] to 1900	50-24812 (150 ft)	1900
n-Heptane	44	10	6	[3.2] to 86	50-24821 (160 ft)	86
Propylene	44	21	6	[5.4] to 760	50-24821 (50 ft)	760
Styrene	210	2	2	[0.85] to [240]	50-24817 (100 ft)	17
Tetrachloroethene	210	209	34	2.4 to 24000	50-24770 (20 ft)	24000
Toluene	210	76	22	[1.1] to 750	50-24818 (150 ft)	750
Trichloro-1,2,2-trifluoroethane[1,1,2-]	210	140	28	[3.1] to 2900	50-24768 (125 ft)	2900
Trichloroethane[1,1,1-]	210	99	21	[1.1] to 530	50-24817 (200 ft)	530
Trichloroethane[1,1,2-]	210	14	8	[1.1] to [310]	50-24813 (150 ft)	190
Trichloroethene	210	210	34	18 to 54000	50-24813 (150 ft)	54000
Trichlorofluoromethane	210	32	13	[2.2] to [320]	50-24797 (38 ft)	130
Trimethylbenzene[1,2,4-]	210	13	9	[2] to [280]	50-24767 (149 ft)	30
Trimethylbenzene[1,3,5-]	210	4	3	[2] to [280]	50-24797 (18.3 ft)	10
Xylene (Total)	166	30	11	[2.2] to 1100	50-09100 (50 ft)	1100
Xylene[1,2-]	210	29	13	[0.87] to [250]	50-24803 (124 ft)	33

*Values in brackets indicate nondetects.

Table F-2.10-2
Frequency of Organic Chemicals (VOCs) Detected in Second Round of Pore Gas at MDA C

Analyte	Number of Analyses	Number of Detects	Number of Detected Locations	Concentration Range ($\mu\text{g}/\text{m}^3$)	Location of Maximum Detected	Maximum Detect ($\mu\text{g}/\text{m}^3$)
Acetone	168	71	24	[8.3]* to [520]	50-24820 (20 ft)	250
Benzene	168	9	5	[0.64] to [140]	50-24769 (149 ft) & 50-24796 (20 ft)	11
Butanone[2-]	168	5	2	[2.6] to [640]	50-24796 (40 ft)	78
Carbon tetrachloride	168	139	29	2.2 to 3600	50-24770 (148 ft)	3600
Chlorodibromomethane	168	1	1	[1.7] to [2100]	50-24804 (99 ft)	110
Chlorodifluoromethane	12	1	1	[12] to [61]	50-24819 (200 ft)	20
Chloroform	168	168	30	2.5 to 4600	50-24770 (148 ft)	4600
Chloromethane	168	10	6	[0.82] to [180]	50-24817 (100 ft)	2.1
Dichloro-1,1,2,2-tetrafluoroethane[1,2-]	168	16	10	[1.4] to 430	50-24811 (20 ft)	430
Dichlorobenzene[1,2-]	168	1	1	[1.2] to [260]	50-24817 (50 ft)	5.7
Dichlorodifluoromethane	168	165	30	3.6 to 3900	50-24770 (148 ft)	3900
Dichloroethane[1,1-]	168	9	6	[0.81] to [180]	50-24821 (100 ft)	120
Dichloroethane[1,2-]	168	35	17	[0.81] to 430	50-24771 (149 ft)	430
Dichloroethene[1,1-]	168	11	6	[0.79] to 400	50-24821 (100 ft)	400
Dichloroethene[cis-1,2-]	168	147	30	[0.79] to 790	50-24771 (149 ft)	790
Dichloropropane[1,2-]	168	95	20	[0.92] to 460	50-24797 (154 ft)	460
Ethylbenzene	168	11	6	[0.87] to 240	50-24769 (39 ft)	240
Ethyltoluene[4-]	168	3	3	[2] to [220]	50-24812 (150 ft)	25
Methylene chloride	168	139	30	[0.69] to 1600	50-24771 (149 ft)	1600
n-Heptane	12	3	2	[3.5] to 220	50-24819 (200 ft)	220
Styrene	168	2	2	[0.85] to [190]	50-24769 (39 ft)	76
Tetrachloroethene	168	164	30	2.8 to 14000	50-24770 (20 ft)	14000
Toluene	168	24	11	[1.1] to 610	50-24769 (39 ft)	610
Trichloro-1,2,2-trifluoroethane[1,1,2-]	168	107	23	[3.1] to 1900	50-24767 (60 ft)	1900

Table F-2.10-2 (continued)

Analyte	Number of Analyses	Number of Detects	Number of Detected Locations	Concentration Range ($\mu\text{g}/\text{m}^3$)	Location of Maximum Detected	Maximum Detect ($\mu\text{g}/\text{m}^3$)
Trichloroethane[1,1,1-]	168	83	20	[1.1] to 300	50-24770 (148 ft)	300
Trichloroethane[1,1,2-]	168	13	7	[1.1] to [240]	50-24815 (100 ft)	120
Trichloroethene	168	168	30	24 to 77000	50-24771 (149 ft)	77000
Trichlorofluoromethane	168	38	13	2.4 to [250]	50-24797 (18.3 ft)	190
Trimethylbenzene[1,2,4-]	168	3	3	[2] to [220]	50-24769 (39 ft)	29
Trimethylbenzene[1,3,5-]	168	3	3	[2] to [220]	50-24812 (150 ft)	16
Xylene (Total)	156	21	9	[2.2] to 240	50-24769 (39 ft)	240
Xylene[1,2-]	168	12	8	[0.87] to [190]	50-24769 (39 ft)	39
Xylene[1,3-]+Xylene[1,4-]	12	5	2	[3.7] to 35	50-24819 (200 ft)	35

*Values in brackets indicate nondetects.

Table F-2.10-3
Summary of Organic Chemicals (VOCs) Detected in First Round of Pore Gas at MDA C

Location ID	Sample ID	Depth (ft)	Acetone	Benzene	Butadiene[1,3-]	Butanol[1-]	Butanone[2-]	Carbon Disulfide	Carbon Tetrachloride	Chlorodifluoromethane	Chloroform	Chloromethane	Cyclohexane	Dichloro-1,1,2,2-tetrafluoroethane[1,2-]	Dichlorodifluoromethane	Dichloroethane[1,1-]
50-09100	MD50-06-70880	20	—*	—	—	—	—	—	—	—	300	—	—	—	130	—
50-09100	MD50-06-70881	50	86	—	—	—	—	—	28	—	120	—	—	—	38	—
50-09100	MD50-06-70882	90	28	—	—	—	—	—	76	—	360	—	—	—	160	—
50-09100	MD50-06-70883	103	—	—	—	—	—	—	160	—	820	—	—	—	390	—
50-09100	MD50-06-70884	120	—	—	—	—	—	—	150	—	870	—	—	—	480	—
50-09100	MD50-06-70885	160	—	—	—	—	—	—	—	—	820	—	—	—	440	—
50-09100	MD50-06-70886	200	—	—	—	—	—	—	590	—	1300	—	—	—	800	—
50-09100	MD50-06-70887	233	—	—	—	—	—	—	—	—	310	—	—	—	200	—
50-09100	MD50-06-70888	260	100	—	—	—	—	—	78	—	290	—	—	—	200	—
50-10131	MD50-06-70868	25	—	—	—	—	—	—	66	—	890	—	—	—	150	—
50-10131	MD50-06-70869	50	—	—	—	—	—	—	87	—	810	—	—	—	200	—
50-10131	MD50-06-70870	75	—	—	—	—	—	—	90	—	920	—	—	—	200	—
50-10131	MD50-06-70871	100	—	—	—	—	—	—	—	—	590	—	—	—	130	—
50-10131	MD50-06-70872	125	—	—	—	—	—	—	52	—	660	—	—	—	190	—
50-10131	MD50-06-70873	150	—	—	—	—	—	—	33	—	310	—	—	61	110	—
50-10131	MD50-06-70874	175	—	—	—	—	—	—	100	—	620	—	—	—	230	—
50-10131	MD50-06-70875	200	—	—	—	—	—	—	110	—	400	—	—	110	220	—
50-10131	MD50-06-70876	225	—	—	—	—	—	—	95	—	760	—	—	67	250	—
50-10131	MD50-06-70877	250	—	—	—	—	—	—	100	—	570	—	—	—	210	—
50-24766	MD50-06-64597	17	99	—	—	—	—	—	14	—	63	—	—	38	110	—
50-24766	MD50-06-64596	29	140	—	—	—	—	—	29	—	99	—	—	89	220	—
50-24766	MD50-06-64595	99	—	—	—	—	—	—	450	—	190	—	—	—	210	—
50-24766	MD50-06-64594	124	190	—	—	—	—	—	14	—	100	—	—	43	47	7.3

Table F-2.10-3 (continued)

Location ID	Sample ID	Depth (ft)	Acetone	Benzene	Butadiene[1,3-]	Butanol[1-]	Butanone[2-]	Carbon Disulfide	Carbon Tetrachloride	Chlorodifluoromethane	Chloroform	Chloromethane	Cyclohexane	Dichloro-1,1,2,2-tetrafluoroethane[1,2-]	Dichlorodifluoromethane	Dichloroethane[1,1-]
50-24766	MD50-06-64593	149	62	—	—	—	—	—	41	—	190	—	—	—	84	14
50-24767	MD50-06-64625	10	—	11	—	—	—	—	—	—	160	—	—	—	100	—
50-24767	MD50-06-64626	30	52	24	—	—	—	—	16	—	120	—	—	—	74	—
50-24767	MD50-06-64627	60	32	3	—	—	—	—	6.8	—	40	—	—	—	23	—
50-24767	MD50-06-64628	124	—	—	—	—	—	—	—	—	73	—	—	—	64	—
50-24767	MD50-06-64629	149	—	—	—	—	—	—	—	—	240	—	—	—	150	—
50-24768	MD50-06-64661	14	31	—	—	—	—	—	7.2	—	35	—	—	—	36	—
50-24768	MD50-06-64660	29	35	—	—	—	—	—	—	—	22	—	—	—	17	—
50-24768	MD50-06-64659	99	—	—	—	—	—	—	—	—	390	—	—	—	390	—
50-24768	MD50-06-64658	125	—	—	—	—	—	—	—	—	320	—	—	—	470	—
50-24768	MD50-06-64657	150	—	—	—	—	—	—	—	—	290	—	—	—	450	—
50-24769	MD50-06-64693	20	34	—	—	—	—	3.2	8	—	21	—	—	25	25	—
50-24769	MD50-06-64692	39	44	—	—	—	3	—	7.4	—	33	1.7	—	18	23	—
50-24769	MD50-06-64691	99	—	—	—	—	—	—	440	—	1900	—	—	—	2000	—
50-24769	MD50-06-64690	124	—	—	—	—	—	—	170	—	1300	—	—	—	1100	—
50-24769	MD50-06-64689	149	—	—	—	—	—	—	—	—	2300	—	—	—	2400	—
50-24770	MD50-06-64738	20	—	—	—	—	—	—	2100 (J)	—	1700	—	—	—	1700	—
50-24770	MD50-06-64725	25	—	—	—	—	—	—	2500 (J)	—	1900	—	—	—	1700	—
50-24770	MD50-06-64724	39	—	—	—	—	—	—	2700 (J)	—	2100	—	—	—	1800	—
50-24770	MD50-06-64723	100	—	—	—	—	—	—	1800 (J)	—	1900	—	—	—	1500	—
50-24770	MD50-06-64722	124	—	—	—	—	—	—	2900 (J)	—	3200	—	—	—	2400	—
50-24770	MD50-06-64721	150	—	—	—	—	—	—	720 (J)	—	1000	—	—	—	850	—
50-24771	MD50-06-64750	17	—	—	—	—	—	—	1600 (J)	—	1600	—	—	—	710	—
50-24771	MD50-06-64749	40	—	—	—	—	—	—	2500 (J)	—	2300	—	—	—	1100	—

Table F-2.10-3 (continued)

Location ID	Sample ID	Depth (ft)	Acetone	Benzene	Butadiene[1,3-]	Butanol[1-]	Butanone[2-]	Carbon Disulfide	Carbon Tetrachloride	Chlorodifluoromethane	Chloroform	Chloromethane	Cyclohexane	Dichloro-1,1,2,2-tetrafluoroethane[1,2-]	Dichlorodifluoromethane	Dichloroethane[1,1-]
50-24771	MD50-06-64748	100	31	—	—	—	—	—	99	—	190	—	—	—	64	—
50-24771	MD50-06-64747	125	—	—	—	—	—	—	1200	—	2300	—	—	—	440	—
50-24771	MD50-06-64746	150	—	—	—	—	—	—	2400	—	3600	—	—	—	1200	—
50-24773	MD50-06-64775	20	—	—	—	—	—	—	350	—	940	—	—	—	340	—
50-24773	MD50-06-64774	40	—	—	—	—	—	—	450	—	1200	—	—	—	430	—
50-24773	MD50-06-64773	100	—	—	—	—	—	—	490	—	1300	—	—	—	410	—
50-24773	MD50-06-64776	125	—	—	—	—	—	—	1000	—	2300	—	—	—	870	—
50-24773	MD50-06-64772	150	—	—	—	—	—	—	1800 (J)	—	3000	—	—	—	950	—
50-24782	MD50-06-64803	20	—	—	—	—	—	—	—	—	520	—	—	—	170	—
50-24782	MD50-06-64804	40	—	—	—	—	—	—	110	—	980	—	—	—	290	—
50-24782	MD50-06-64805	100	—	—	—	—	—	—	100	—	710	—	—	—	210	—
50-24782	MD50-06-64806	125	—	—	—	—	—	—	320	—	1500	—	—	—	500	—
50-24782	MD50-06-64807	155	82	—	—	—	—	—	50	—	240	—	—	—	94	—
50-24783	MD50-06-64832	20	—	—	—	—	—	—	180	—	1100	—	—	—	360	—
50-24783	MD50-06-64831	36	—	—	—	—	—	—	—	—	200	—	—	—	85	—
50-24783	MD50-06-64830	100	—	—	—	—	—	—	—	—	140	—	—	—	42	—
50-24783	MD50-06-64829	125	—	—	—	—	—	—	360	—	830	—	—	—	240	—
50-24783	MD50-06-64828	151	—	—	—	—	—	—	410	—	1000	—	—	—	370	—
50-24784	MD50-06-64374	10	—	—	—	—	—	—	32	—	73	—	—	—	30	—
50-24784	MD50-06-64373	20	—	—	—	—	—	—	5	—	14	0.93	—	—	6.9	—
50-24784	MD50-06-64372	47	41 (J)	—	—	—	—	48	140	—	190	—	—	—	79	—
50-24784	MD50-06-64371	49	58 (J)	—	—	—	—	—	130	—	200	—	—	—	69	—
50-24784	MD50-06-64370	55	80 (J)	4.6	—	—	—	22	120	—	210	—	—	—	66	—
50-24784	MD50-06-64375	100	21 (J)	3.7	—	—	—	—	51	—	100	—	—	—	34	—

Table F-2.10-3 (continued)

Location ID	Sample ID	Depth (ft)	Acetone	Benzene	Butadiene[1,3-]	Butanol[1-]	Butanone[2-]	Carbon Disulfide	Carbon Tetrachloride	Chlorodifluoromethane	Chloroform	Chloromethane	Cyclohexane	Dichloro-1,1,2,2-tetrafluoroethane[1,2-]	Dichlorodifluoromethane	Dichloroethane[1,1-]
50-24784	MD50-06-64379	168	29 (J)	—	—	—	—	—	190	—	90	—	—	—	83	—
50-24784	MD50-06-64378	199	170	9.5	—	—	4.7	3.4	63	—	46	0.94	—	—	31	1.6
50-24784	MD50-06-64377	250	140	12	—	—	—	—	170	—	58	—	—	—	78	—
50-24784	MD50-06-64376	268	—	—	—	—	—	—	300	—	70	—	—	—	210	—
50-24785	MD50-06-64402	10	20	—	—	—	—	8.7	—	—	76	—	11	—	4.8	—
50-24785	MD50-06-64403	19	19	—	3	—	3.8	—	9.2	—	350	—	—	—	13	—
50-24785	MD50-06-64408	60	—	—	—	—	—	—	130	—	3000	—	—	—	130	—
50-24785	MD50-06-64407	120	—	—	—	—	—	—	170	—	940	—	—	—	140	—
50-24785	MD50-06-64404	200	—	—	—	—	—	—	330	—	470	—	—	—	200	—
50-24785	MD50-06-64405	250	—	—	—	—	—	—	600 (J)	—	160	—	—	—	260	—
50-24785	MD50-06-64406	275	47	4.7	—	—	—	—	11	—	23	—	—	—	7.1	—
50-24796	MD50-06-64448	10	120	4.4	—	—	33	14	—	—	1.8	1.9	—	—	6	—
50-24796	MD50-06-64447	20	73	10	—	—	12	6.5	5.6	—	44	1.1	—	—	38	0.81
50-24796	MD50-06-64449	40	41	—	—	—	—	—	28	—	200	—	—	—	220	—
50-24796	MD50-06-64450	100	—	—	—	—	—	—	—	—	680	—	—	—	840	—
50-24796	MD50-06-64451	120	38	1.8	—	—	—	—	4.7	—	27	1.3	—	—	26	—
50-24796	MD50-06-64452	150	83	10	—	—	—	—	92	—	290	—	—	—	220	—
50-24797	MD50-06-64496	18.3	42 (J)	3.2	—	—	7.5	—	11 (J)	—	49	1.2	—	3.7	180 (J)	2
50-24797	MD50-06-64497	38	31 (J)	—	—	—	—	—	28 (J)	—	180	—	—	—	400 (J)	—
50-24797	MD50-06-66198	60	—	—	—	—	—	—	—	—	180	—	—	—	350	—
50-24797	MD50-06-64498	120	49	—	—	—	—	—	41	—	210	—	—	—	260	—
50-24797	MD50-06-64500	160	—	—	—	—	—	—	200	—	460	—	—	—	620	45
50-24799	MD50-06-66197	15	120	—	—	—	—	—	—	—	61	—	—	—	31	—
50-24799	MD50-06-64521	17.5	56	2.7	—	—	12	—	—	—	4	1.3	—	—	4.5	—

Table F-2.10-3 (continued)

Location ID	Sample ID	Depth (ft)	Acetone	Benzene	Butadiene[1,3-]	Butanol[1-]	Butanone[2-]	Carbon Disulfide	Carbon Tetrachloride	Chlorodifluoromethane	Chloroform	Chloromethane	Cyclohexane	Dichloro-1,1,2,2-tetrafluoroethane[1,2-]	Dichlorodifluoromethane	Dichloroethane[1,1-]
50-24799	MD50-06-64522	20	89	5.1	—	—	20	—	—	—	5.1	1.4	—	—	5.4	—
50-24799	MD50-06-64523	32.5	290 (J)	27	—	—	110	—	—	—	68	—	—	—	38 (J)	—
50-24799	MD50-06-64538	37.5	390 (J)	21	—	—	160	—	8.7 (J)	—	95	—	—	—	43 (J)	5.2
50-24799	MD50-06-64524	40.5	330	—	—	32	120	3.9	5.7	—	76	—	—	—	35	3.7
50-24799	MD50-06-64525	100	26	—	13	—	—	—	—	—	11	—	—	—	—	—
50-24799	MD50-06-64526	120	60	—	1.8	65	9.7	—	5.4	—	40	—	—	—	17	—
50-24799	MD50-06-64527	160	—	—	22	—	—	—	110	61	440	—	—	—	160	18
50-24801	MD50-06-64853	20	35	—	—	—	—	—	—	—	69	—	—	—	18	—
50-24801	MD50-06-64870	35	27	—	—	—	—	—	—	—	140	—	—	—	34	—
50-24801	MD50-06-64856	80	—	—	—	—	—	—	370 (J)	—	720	—	—	—	340	—
50-24801	MD50-06-64855	120	—	—	—	—	—	—	51 (J)	—	260	—	—	—	120	—
50-24801	MD50-06-64854	150	50	—	—	—	—	—	25	—	130	—	—	—	25	—
50-24802	MD50-06-64878	15	—	—	—	—	—	—	—	—	350	—	—	—	130	—
50-24802	MD50-06-64879	42	—	—	—	—	—	—	—	—	690	—	—	—	250	—
50-24802	MD50-06-64880	99.4	—	—	—	—	—	—	—	—	360	—	—	—	130	—
50-24802	MD50-06-64881	124.4	—	—	—	—	—	—	78 (J)	—	490	—	—	—	210	—
50-24802	MD50-06-64882	156.4	—	—	—	—	—	—	85 (J)	—	480	—	—	—	210	—
50-24803	MD50-06-64904	16	28 (J)	—	—	—	—	20	16	—	36	—	—	—	12	3
50-24803	MD50-06-64903	37	19 (J)	5.1	—	—	—	—	40	—	93	—	—	—	27	2.8
50-24803	MD50-06-64905	99.5	42	—	—	—	—	—	—	—	230	—	—	—	70	—
50-24803	MD50-06-64906	124	—	—	—	—	—	—	51	—	290	—	—	—	120	—
50-24803	MD50-06-64907	151	—	—	—	—	—	—	—	—	140	—	—	—	54	—
50-24804	MD50-06-64970	10	150	2.9	—	—	—	—	22	—	49	—	—	150	47	—
50-24804	MD50-06-64971	16	70	—	—	—	—	—	64	—	230	—	—	150	160	—

Table F-2.10-3 (continued)

Location ID	Sample ID	Depth (ft)	Acetone	Benzene	Butadiene[1,3-]	Butanol[1-]	Butanone[2-]	Carbon Disulfide	Carbon Tetrachloride	Chlorodifluoromethane	Chloroform	Chloromethane	Cyclohexane	Dichloro-1,1,2,2-tetrafluoroethane[1,2-]	Dichlorodifluoromethane	Dichloroethane[1,1-]
50-24804	MD50-06-64972	33	90	—	—	—	—	—	110	—	240	—	—	—	72	—
50-24804	MD50-06-64973	99	—	—	—	—	—	—	130	—	560	—	—	—	200	—
50-24804	MD50-06-64974	124	—	—	—	—	—	—	310	—	990	—	—	—	370	—
50-24804	MD50-06-64975	149	—	—	—	—	—	—	240	—	860	—	—	—	330	—
50-24810	MD50-06-64999	19	30 (J)	—	—	—	—	—	49	—	71	—	—	—	30	—
50-24810	MD50-06-64998	37	27	—	—	—	—	—	41	—	180	—	—	—	70	—
50-24810	MD50-06-64997	99	24 (J)	—	—	—	—	—	57	—	140	—	—	—	39	—
50-24810	MD50-06-64996	123	—	—	—	—	—	—	160	—	400	—	—	—	170	—
50-24810	MD50-06-64995	150	—	—	—	—	—	—	170	—	540	—	—	—	200	—
50-24811	MD50-06-65069	20	—	—	—	—	—	—	1500	—	2500	—	—	—	440	—
50-24811	MD50-06-65068	40	—	—	—	—	—	—	1700	—	2900	—	—	—	610	—
50-24811	MD50-06-65067	98	—	—	—	—	—	—	580	—	1400	—	—	—	300	—
50-24811	MD50-06-65066	125	—	—	—	—	—	—	410	—	750	—	—	—	250	—
50-24811	MD50-06-65065	150	—	—	—	—	—	—	2000	—	3900	—	—	—	1000	—
50-24812	MD50-06-65094	10	—	—	—	—	—	—	7200	—	2900	—	—	—	1400	—
50-24812	MD50-06-65093	35	—	—	—	—	—	—	1800	—	830	—	—	—	95	—
50-24812	MD50-06-65092	98	—	—	—	—	—	—	5200	—	2800	—	—	—	1200	—
50-24812	MD50-06-65091	123	—	—	—	—	—	—	2900	—	2300	—	—	—	980	—
50-24812	MD50-06-65090	150	—	—	—	—	—	—	3800	—	3800	—	—	—	2000	—
50-24813	MD50-06-65126	20	—	—	—	—	—	—	490	—	540	—	—	—	630	—
50-24813	MD50-06-65125	30	—	—	—	—	—	—	1100	—	1000	—	—	65	1000	—
50-24813	MD50-06-65124	99	—	—	—	—	—	—	1200	—	1300	—	—	—	1100	—
50-24813	MD50-06-65123	125	—	—	—	—	—	—	1900	—	2400	—	—	—	1900	—
50-24813	MD50-06-65122	150	—	—	—	—	—	—	2100	—	3700	—	—	—	2600	—

Table F-2.10-3 (continued)

Location ID	Sample ID	Depth (ft)	Acetone	Benzene	Butadiene[1,3-]	Butanol[1-]	Butanone[2-]	Carbon Disulfide	Carbon Tetrachloride	Chlorodifluoromethane	Chloroform	Chloromethane	Cyclohexane	Dichloro-1,1,2,2-tetrafluoroethane[1,2-]	Dichlorodifluoromethane	Dichloroethane[1,1-]
50-24814	MD50-06-65151	10	—	—	—	—	—	—	67	—	220	—	—	51	380	—
50-24814	MD50-06-65150	30	42	—	—	—	—	—	57	—	170	—	—	45	280	—
50-24814	MD50-06-65149	99	62	—	—	—	—	—	30	—	72	—	—	38	72	—
50-24814	MD50-06-65148	124	—	—	—	—	—	—	140	—	340	—	—	—	400	—
50-24814	MD50-06-65147	149	—	—	—	—	—	—	72	—	320	—	—	—	240	—
50-24815	MD50-06-65183	30	96 (J)	—	—	—	—	—	37	—	120	—	—	33	77	—
50-24815	MD50-06-65182	40	58	—	—	—	—	—	34	—	270	—	—	28 (J)	260	—
50-24815	MD50-06-65181	100	51 (J)	—	—	—	—	—	15	—	60	—	—	14	35	—
50-24815	MD50-06-65180	125	75 (J)	—	—	—	5.2	—	4.2	—	23	0.93	—	8.9	11	—
50-24815	MD50-06-65179	149	110	—	—	—	—	—	72	—	310	—	—	24	150	—
50-24816	MD50-06-65204	25	25	—	2.2	18	6.8	3.1	—	—	—	—	5	—	—	—
50-24816	MD50-06-65205	35	30	—	4.7	21	6.7	—	—	—	12	—	2.9	—	3.9	—
50-24816	MD50-06-65209	65	—	—	—	—	—	—	320	—	270	—	—	—	170	—
50-24816	MD50-06-65206	120	43	—	—	—	—	—	40	—	140	—	—	—	34 (J)	—
50-24816	MD50-06-65208	200	67	—	—	—	—	—	250	—	92	—	—	—	130	—
50-24816	MD50-06-65207	225	—	—	—	—	—	—	440	—	130	—	—	—	200	—
50-24817	MD50-05-63841	20	96	—	14	—	11	6.9	10	—	9.8	—	14	—	64	—
50-24817	MD50-05-63842	40	65	11	16	21	9.3	10	46	—	48	—	—	—	210	—
50-24817	RE50-05-63816	100	62	—	200	—	—	21	150	—	210	—	—	—	500	28
50-24817	RE50-05-63817	140	210	—	33	—	24	13	210	—	300	—	—	—	580	36
50-24817	RE50-05-63818	200	—	—	230	—	—	89	390	—	400	—	—	—	640	50
50-24817	MD50-05-63843	250	—	—	20	—	—	—	510	—	240	—	—	—	550	34
50-24818	MD50-06-65232	10	33	9.1	—	—	6.5	8.8	1.5	—	5.7	0.82	—	—	5.4	—
50-24818	MD50-06-65233	25	56	9	—	—	—	71	35	—	180	—	—	—	68	—

Table F-2.10-3 (continued)

Location ID	Sample ID	Depth (ft)	Acetone	Benzene	Butadiene[1,3-]	Butanol[1-]	Butanone[2-]	Carbon Disulfide	Carbon Tetrachloride	Chlorodifluoromethane	Chloroform	Chloromethane	Cyclohexane	Dichloro-1,1,2,2-tetrafluoroethane[1,2-]	Dichlorodifluoromethane	Dichloroethane[1,1-]
50-24818	MD50-06-65234	100	—	—	—	—	—	—	330 (J)	—	1500	—	—	—	600	—
50-24818	MD50-06-65235	150	—	—	—	—	—	—	—	—	1900	—	—	—	610	—
50-24818	MD50-06-65236	190	—	—	—	—	—	—	—	—	390	—	—	—	79	—
50-24818	MD50-06-65237	250	—	—	—	—	—	—	370	—	1000	—	—	—	500	—
50-24818	MD50-06-65238	280	—	—	—	—	—	—	390	—	830	—	—	—	480	—
50-24818	MD50-06-65239	315	—	—	—	—	—	—	290 (J)	—	430	—	—	—	310	—
50-24818	MD50-06-65240	414	160	9.9	—	—	12	7.5	2.7	—	3.2	2.1	—	—	6.2	—
50-24818	MD50-06-65242	452	65	—	—	—	—	—	26	—	8.1	—	—	—	44	—
50-24818	MD50-06-65245	500	190	1.6	—	—	18	9.2	9.4	—	11	2.3	—	—	6.4	—
50-24818	MD50-06-65244	548	70	—	—	—	8.5	—	6.9	—	3.9	—	—	—	12	—
50-24818	MD50-06-65243	591	120	—	—	—	—	9.6	9.4	—	10	—	—	—	8	—
50-24819	RE50-05-61430	20	60	—	—	—	6.2	—	8.9	—	23	—	—	—	13	—
50-24819	RE50-05-61431	50	58	—	—	—	5.6	—	25	—	77	—	—	—	34	—
50-24819	RE50-05-61432	100	54	—	—	—	5.1	—	31	—	110	—	—	—	40	—
50-24819	RE50-05-61732	138.5–140	32	—	—	—	—	—	140	—	260	—	—	—	150	—
50-24819	RE50-05-61733	200	55	—	8.9	—	13	—	160	—	250	—	—	—	160	—
50-24819	RE50-05-61734	250	—	—	—	—	—	—	190	—	220	—	—	—	180	—
50-24819	RE50-05-61735	275	—	—	9.8	—	—	—	150	—	170	—	—	—	140	—
50-24820	RE50-05-61446	20	55	—	4.4	—	9.2	—	91	—	140	—	—	—	70	—
50-24820	RE50-05-61449	50	92	—	17	—	14	—	160	—	240	—	—	—	110	—
50-24820	RE50-05-61447	100	140	15	29	—	12	7.9	85	—	180	—	—	—	74	—
50-24820	RE50-05-61448	140	300	60	19	—	29	—	470	—	670	—	—	—	340	—
50-24820	RE50-05-61450	200	—	—	—	—	—	—	720	—	920	—	—	—	500	—
50-24820	RE50-05-61736	250	—	—	—	—	—	—	760	—	890	—	—	—	510	—

Table F-2.10-3 (continued)

Location ID	Sample ID	Depth (ft)	Acetone	Benzene	Butadiene[1,3-]	Butanol[1-]	Butanone[2-]	Carbon Disulfide	Carbon Tetrachloride	Chlorodifluoromethane	Chloroform	Chloromethane	Cyclohexane	Dichloro-1,1,2,2-tetrafluoroethane[1,2-]	Dichlorodifluoromethane	Dichloroethane[1,1-]
50-24821	RE50-05-61464	20	84	5.2	5.8	—	4.4	3.2	54	—	68	—	—	—	76	—
50-24821	RE50-05-61466	50	76	58	91	—	—	22	190	—	320	—	—	—	250	—
50-24821	RE50-05-61465	98.4–100	—	—	30	—	—	—	190	—	380	—	—	—	270	—
50-24821	RE50-05-61469	137.5–140	180	—	—	—	—	29	220	—	350	—	—	—	270	—
50-24821	RE50-05-61473	160	—	—	—	—	—	—	510	—	610	—	—	—	620	—
50-24821	RE50-05-61468	248.6–250	—	—	—	—	—	—	340	—	450	—	—	—	450	—
50-24822	RE50-05-61482	20	180	—	—	—	6.2	—	11	—	72	—	30	—	74	—
50-24822	RE50-05-61483	50	54	—	—	—	—	—	64	—	340	—	—	—	400	—
50-24822	RE50-05-61484	100	100	—	—	13	—	—	—	—	36	—	17	—	30	—
50-24822	RE50-05-61485	140	120	—	—	—	—	—	84	—	380	—	—	—	460	—
50-24822	RE50-05-61486	200	110	—	—	—	—	—	43	—	160	—	28	—	180	—
50-24822	RE50-05-61737	250	59	—	—	—	—	—	43	—	150	—	—	—	140	—
50-25451	MD50-06-66691	19	55	2.3	—	—	3.2	—	4.6	—	3.4	—	—	33	8.5	—
50-25451	MD50-06-66690	49	30	—	—	—	—	—	56	—	40	—	—	500	92	—
50-25451	MD50-06-66689	100	34	—	—	—	—	—	35	—	33	—	—	240	55	—
50-25451	MD50-06-66688	147	49	—	—	—	—	—	25	—	26	—	—	200	41	—
50-25451	MD50-06-66687	200	62	—	—	—	—	—	86 (J)	—	63	—	—	490	250	—
50-25451	MD50-06-66686	251	—	—	—	—	—	—	120	—	100	—	—	—	120	—
50-25451	MD50-06-66685	287	—	—	—	—	—	—	98	—	90	—	—	—	210	—

Table F-2.10-3 (continued)

Location ID	Sample ID	Depth (ft)	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Dioxane[1,4-]	Ethanol	Ethylbenzene	Ethyltoluene[4-]	Hexane	Hexanone[2-]	Methanol	Methyl-2-pentanone[4-]	Methylene Chloride	n-Heptane
50-09100	MD50-06-70880	20	—	—	33	—	—	—	—	—	—	—	—	—	25	—
50-09100	MD50-06-70881	50	—	—	19	—	—	—	11	—	—	—	—	—	21	—
50-09100	MD50-06-70882	90	13	—	68	17	—	—	—	—	—	—	—	—	61	—
50-09100	MD50-06-70883	103	—	—	140	—	—	—	—	—	—	—	—	—	150	—
50-09100	MD50-06-70884	120	—	—	190	—	—	—	—	—	—	—	—	—	290	—
50-09100	MD50-06-70885	160	—	—	220	—	—	—	—	—	—	—	—	—	490	—
50-09100	MD50-06-70886	200	29	—	360	67	—	—	—	—	—	—	—	—	710	—
50-09100	MD50-06-70887	233	—	—	96	—	—	—	—	—	—	—	—	—	240	—
50-09100	MD50-06-70888	260	—	—	98	—	—	—	—	—	—	—	—	—	250	—
50-10131	MD50-06-70868	25	—	—	—	120	—	—	—	—	—	—	—	—	31	—
50-10131	MD50-06-70869	50	—	—	—	130	—	—	—	—	—	—	—	—	30	—
50-10131	MD50-06-70870	75	28	—	—	130	—	—	—	—	—	—	—	—	34	—
50-10131	MD50-06-70871	100	—	—	—	99	—	—	—	—	—	—	—	—	41	—
50-10131	MD50-06-70872	125	22	—	24	120	—	—	—	—	—	—	—	—	57	—
50-10131	MD50-06-70873	150	—	—	—	73	—	—	—	—	—	—	—	—	27	—
50-10131	MD50-06-70874	175	—	—	34	130	—	—	—	—	—	—	—	—	81	—
50-10131	MD50-06-70875	200	—	—	—	110	—	—	—	—	—	—	—	—	57	—
50-10131	MD50-06-70876	225	—	—	31	91	—	—	—	—	—	—	—	—	70	—
50-10131	MD50-06-70877	250	—	—	—	120	—	—	—	—	—	—	—	—	66	—
50-24766	MD50-06-64597	17	—	—	—	16	—	—	—	—	—	—	—	—	—	—
50-24766	MD50-06-64596	29	—	—	—	26	—	—	—	—	—	—	—	—	—	—
50-24766	MD50-06-64595	99	—	—	—	64	—	—	—	—	—	—	—	—	36	—
50-24766	MD50-06-64594	124	7.3	—	17	60	—	—	—	—	—	—	—	—	18	—
50-24766	MD50-06-64593	149	16	9.8	37	130	—	—	—	—	—	—	—	—	50	—

Table F-2.10-3 (continued)

Location ID	Sample ID	Depth (ft)	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Dioxane[1,4-]	Ethanol	Ethylbenzene	Ethyltoluene[4-]	Hexane	Hexanone[2-]	Methanol	Methyl-2-pentanone[4-]	Methylene Chloride	n-Heptane
50-24767	MD50-06-64625	10	—	—	29	—	—	—	—	—	—	—	—	—	16	—
50-24767	MD50-06-64626	30	—	—	24	—	—	—	12	10	—	—	—	—	—	—
50-24767	MD50-06-64627	60	—	2.9	8.4	—	—	—	2.6	—	—	—	—	—	3.2	—
50-24767	MD50-06-64628	124	—	—	15	—	—	—	—	—	—	—	—	—	17	—
50-24767	MD50-06-64629	149	—	—	67	—	—	—	—	—	—	—	—	—	110	—
50-24768	MD50-06-64661	14	—	—	5.9	—	—	—	—	—	—	—	—	—	—	—
50-24768	MD50-06-64660	29	—	—	3.8	—	—	—	—	—	—	—	—	—	—	4.8
50-24768	MD50-06-64659	99	—	—	90	—	—	—	—	—	—	—	—	—	69	—
50-24768	MD50-06-64658	125	—	—	100	—	—	—	—	—	—	—	—	—	120	—
50-24768	MD50-06-64657	150	—	—	91	—	—	—	—	—	—	—	—	—	130	—
50-24769	MD50-06-64693	20	—	—	1.9	—	—	—	—	—	—	—	—	—	—	—
50-24769	MD50-06-64692	39	0.88	—	4.8	1	—	—	—	—	—	—	—	—	0.91	—
50-24769	MD50-06-64691	99	—	—	330	—	—	—	—	—	—	—	—	—	—	—
50-24769	MD50-06-64690	124	—	—	240	—	—	—	—	—	—	—	—	—	—	—
50-24769	MD50-06-64689	149	—	—	420	—	—	—	—	—	—	—	—	—	—	—
50-24770	MD50-06-64738	20	—	—	160	—	—	—	—	—	—	—	—	—	—	—
50-24770	MD50-06-64725	25	—	—	190	—	—	—	—	—	—	—	—	—	49	—
50-24770	MD50-06-64724	39	—	—	220	—	—	—	—	—	—	—	—	—	—	—
50-24770	MD50-06-64723	100	56	—	280	—	—	—	—	—	—	—	—	—	120	—
50-24770	MD50-06-64722	124	—	—	490	—	—	—	—	—	—	—	—	—	310	—
50-24770	MD50-06-64721	150	—	—	210	—	—	—	—	—	—	—	—	—	240	—
50-24771	MD50-06-64750	17	—	—	110	—	—	—	—	—	—	—	—	—	58	—
50-24771	MD50-06-64749	40	94	—	230	—	—	—	—	—	—	—	—	—	84	—
50-24771	MD50-06-64748	100	18	—	32	—	—	—	—	—	—	—	—	—	29	—

Table F-2.10-3 (continued)

Location ID	Sample ID	Depth (ft)	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Dioxane[1,4-]	Ethanol	Ethylbenzene	Ethyltoluene[4-]	Hexane	Hexanone[2-]	Methanol	Methyl-2-pentanone[4-]	Methylene Chloride	n-Heptane
50-24771	MD50-06-64747	125	180	—	330	120	—	—	—	—	—	—	—	—	320	—
50-24771	MD50-06-64746	150	270	—	680	—	—	—	—	—	—	—	—	—	1200	—
50-24773	MD50-06-64775	20	—	—	110	—	—	—	—	—	—	—	—	—	110	—
50-24773	MD50-06-64774	40	75	—	160	—	—	—	—	—	—	—	—	—	100	—
50-24773	MD50-06-64773	100	120	—	210	—	—	—	—	—	—	—	—	—	270	—
50-24773	MD50-06-64776	125	200	—	430	160	—	—	—	—	—	—	—	—	700	—
50-24773	MD50-06-64772	150	260	—	520	—	—	—	—	—	—	—	—	—	1100	—
50-24782	MD50-06-64803	20	—	—	62	—	—	—	—	—	—	—	—	—	58	—
50-24782	MD50-06-64804	40	35	—	110	50	—	—	—	—	—	—	—	—	56	—
50-24782	MD50-06-64805	100	54	—	110	58	—	—	—	—	—	—	—	—	130	—
50-24782	MD50-06-64806	125	86	—	260	110	—	—	—	—	—	—	—	—	450	—
50-24782	MD50-06-64807	155	—	—	40	42	—	—	—	—	—	—	—	—	52	—
50-24783	MD50-06-64832	20	120	—	250	130	—	—	—	—	—	—	—	—	930	—
50-24783	MD50-06-64831	36	—	—	25	38	—	—	—	—	—	—	—	—	—	—
50-24783	MD50-06-64830	100	—	—	23	23	—	—	—	—	—	—	—	—	49	—
50-24783	MD50-06-64829	125	58	—	130	150	—	—	—	—	—	—	—	—	170	—
50-24783	MD50-06-64828	151	—	—	190	170	—	—	—	—	—	—	—	—	470	—
50-24784	MD50-06-64374	10	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24784	MD50-06-64373	20	—	—	—	—	—	—	0.96	—	—	—	—	—	—	—
50-24784	MD50-06-64372	47	—	—	—	31	—	—	—	—	—	—	—	—	11	—
50-24784	MD50-06-64371	49	—	—	—	36	—	—	—	—	—	—	—	—	11	—
50-24784	MD50-06-64370	55	4.9	—	8.5	39	—	—	7.7	—	—	—	—	—	11	—
50-24784	MD50-06-64375	100	3.5	—	4.8	22	—	—	—	—	—	—	—	—	6.9	—
50-24784	MD50-06-64379	168	—	—	12	28	—	—	—	—	—	—	—	—	18	—

Table F-2.10-3 (continued)

Location ID	Sample ID	Depth (ft)	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Dioxane[1,4-]	Ethanol	Ethylbenzene	Ethyltoluene[4-]	Hexane	Hexanone[2-]	Methanol	Methyl-2-pentanone[4-]	Methylene Chloride	n-Heptane
50-24784	MD50-06-64378	199	1.5	—	6	22 (J)	—	—	8.7	2	—	1.8 (J)	—	—	9.5	—
50-24784	MD50-06-64377	250	—	—	9.1	20 (J)	—	—	9.7	—	—	—	—	—	19	—
50-24784	MD50-06-64376	268	—	—	—	—	—	—	—	—	—	—	—	—	37	—
50-24785	MD50-06-64402	10	—	—	—	—	—	—	7.2	12	49	—	—	—	—	15
50-24785	MD50-06-64403	19	5.6	—	—	7.8	—	—	19	15	4.8	—	—	—	—	13
50-24785	MD50-06-64408	60	44	—	—	110	—	—	—	—	—	—	—	—	—	—
50-24785	MD50-06-64407	120	38	—	19	150	—	—	—	—	—	—	—	—	24	—
50-24785	MD50-06-64404	200	—	—	35	160	—	—	—	—	—	—	—	—	49	—
50-24785	MD50-06-64405	250	—	—	—	86	—	—	—	—	—	—	—	—	49	—
50-24785	MD50-06-64406	275	—	—	—	6.9 (J)	—	—	—	—	—	—	—	—	7	—
50-24796	MD50-06-64448	10	—	—	—	—	—	—	2	2 (J)	—	3 (J)	—	—	—	—
50-24796	MD50-06-64447	20	—	—	2	21	—	—	5	—	—	1.7 (J)	—	—	0.8	—
50-24796	MD50-06-64449	40	—	—	9.1	110	—	—	—	—	—	—	—	—	—	—
50-24796	MD50-06-64450	100	—	—	63	420	—	—	—	—	—	—	—	—	71 (J)	—
50-24796	MD50-06-64451	120	2.5	0.91	2.4	19	—	—	—	—	—	—	—	—	2.9	—
50-24796	MD50-06-64452	150	25	15	37	280	—	—	—	—	—	—	—	—	49	—
50-24797	MD50-06-64496	18.3	—	—	2.5	18	—	—	3 (J)	19 (J)	—	—	—	—	—	—
50-24797	MD50-06-64497	38	—	—	14	99	—	—	—	—	—	—	—	—	—	—
50-24797	MD50-06-66198	60	—	—	24	160	—	—	—	—	—	—	—	—	—	—
50-24797	MD50-06-64498	120	—	—	38 (J+)	200	—	—	—	—	—	—	—	—	35	—
50-24797	MD50-06-64500	160	—	65	94 (J+)	460	—	—	—	—	—	—	—	—	120	—
50-24799	MD50-06-66197	15	—	—	8	24 (J)	—	—	—	—	—	—	—	—	4	—
50-24799	MD50-06-64521	17.5	—	—	—	—	—	—	1.7 (J)	—	—	—	—	—	—	—
50-24799	MD50-06-64522	20	—	—	—	—	—	—	2.8 (J)	2.7 (J)	—	2.1 (J)	—	—	—	—

Table F-2.10-3 (continued)

Location ID	Sample ID	Depth (ft)	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Dioxane[1,4-]	Ethanol	Ethylbenzene	Ethyltoluene[4-]	Hexane	Hexanone[2-]	Methanol	Methyl-2-pentanone[4-]	Methylene Chloride	n-Heptane
50-24799	MD50-06-64523	32.5	—	—	5.7	17	—	—	11 (J)	—	—	11 (J)	—	—	—	—
50-24799	MD50-06-64538	37.5	—	—	8.9	26	—	—	7.5 (J)	—	—	18 (J)	—	—	—	—
50-24799	MD50-06-64524	40.5	—	—	—	—	—	7.2	—	—	12	—	130	7.6	—	11
50-24799	MD50-06-64525	100	—	—	—	—	2300	—	—	—	—	—	—	—	—	—
50-24799	MD50-06-64526	120	4.9	—	8.7 (J+)	16	980	—	—	—	—	—	—	—	11	—
50-24799	MD50-06-64527	160	42	—	100 (J+)	230	—	—	—	—	—	—	—	—	220	—
50-24801	MD50-06-64853	20	—	—	—	9.5 (J)	—	—	—	—	—	—	—	—	—	—
50-24801	MD50-06-64870	35	—	—	11	24 (J)	—	—	—	—	—	—	—	—	—	—
50-24801	MD50-06-64856	80	51	—	120	210	—	—	—	—	—	—	—	—	170	—
50-24801	MD50-06-64855	120	16	—	41	71	—	—	—	—	—	—	—	—	32	—
50-24801	MD50-06-64854	150	17	—	24	42 (J)	—	—	—	—	—	—	—	—	65	—
50-24802	MD50-06-64878	15	—	—	48	55	—	—	—	—	—	—	—	—	73	—
50-24802	MD50-06-64879	42	—	—	97	110	—	—	—	—	—	—	—	—	140	—
50-24802	MD50-06-64880	99.4	—	—	59	60	—	—	—	—	—	—	—	—	79	—
50-24802	MD50-06-64881	124.4	41	—	88	75	—	—	—	—	—	—	—	—	260	—
50-24802	MD50-06-64882	156.4	—	—	67	81	—	—	—	—	—	—	—	—	150	—
50-24803	MD50-06-64904	16	—	—	4.2	3.6	—	—	4.3	—	—	—	—	—	2.6	—
50-24803	MD50-06-64903	37	5.3	—	14	13	—	—	3.2	—	—	—	—	—	5.7	—
50-24803	MD50-06-64905	99.5	15	—	41	21	—	—	—	—	—	—	—	—	55	—
50-24803	MD50-06-64906	124	—	—	49	32	—	—	—	—	—	—	—	—	97	—
50-24803	MD50-06-64907	151	—	—	25	18	—	—	—	—	—	—	—	—	91	—
50-24804	MD50-06-64970	10	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24804	MD50-06-64971	16	—	—	22	—	—	—	—	—	—	—	—	—	16	—
50-24804	MD50-06-64972	33	—	—	28	23	—	—	—	—	—	—	—	—	13	—

Table F-2.10-3 (continued)

Location ID	Sample ID	Depth (ft)	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Dioxane[1,4-]	Ethanol	Ethylbenzene	Ethyltoluene[4-]	Hexane	Hexanone[2-]	Methanol	Methyl-2-pentanone[4-]	Methylene Chloride	n-Heptane
50-24804	MD50-06-64973	99	—	—	88	61	—	—	—	—	—	—	—	—	86	—
50-24804	MD50-06-64974	124	48	—	160	74	—	—	—	—	—	—	—	—	250	—
50-24804	MD50-06-64975	149	67	—	150	93	—	—	—	—	—	—	—	—	480	—
50-24810	MD50-06-64999	19	—	—	6.3	—	—	—	—	—	—	—	—	—	—	—
50-24810	MD50-06-64998	37	—	—	24	—	—	—	—	—	—	—	—	—	21	—
50-24810	MD50-06-64997	99	9	—	21	13	—	—	—	—	—	—	—	—	21	—
50-24810	MD50-06-64996	123	—	—	57	34	—	—	—	—	—	—	—	—	110	—
50-24810	MD50-06-64995	150	41	—	91	46	—	—	—	—	—	—	—	—	200	—
50-24811	MD50-06-65069	20	—	—	84	—	—	—	—	—	—	—	—	—	43	—
50-24811	MD50-06-65068	40	—	—	160	—	—	—	—	—	—	—	—	—	63	—
50-24811	MD50-06-65067	98	43	—	140	—	—	—	—	—	—	—	—	—	130	—
50-24811	MD50-06-65066	125	—	—	89	—	—	—	—	—	—	—	—	—	130	—
50-24811	MD50-06-65065	150	230	—	660	—	—	—	—	—	—	—	—	—	1800	—
50-24812	MD50-06-65094	10	—	—	270	—	—	—	—	—	—	—	—	—	180	—
50-24812	MD50-06-65093	35	—	—	66	—	—	—	—	—	—	—	—	—	41	—
50-24812	MD50-06-65092	98	88	—	330	—	—	—	—	—	—	—	—	—	270	—
50-24812	MD50-06-65091	123	80	—	310	—	—	—	—	—	—	—	—	—	310	—
50-24812	MD50-06-65090	150	140	—	840	—	—	—	—	—	—	—	—	—	1900	—
50-24813	MD50-06-65126	20	—	—	76	—	—	—	—	—	—	—	—	—	32	—
50-24813	MD50-06-65125	30	—	—	170	—	—	—	—	—	—	—	—	—	40	—
50-24813	MD50-06-65124	99	—	—	240	—	—	—	—	—	—	—	—	—	110	—
50-24813	MD50-06-65123	125	57	—	470	—	—	—	—	—	—	—	—	—	220	—
50-24813	MD50-06-65122	150	120	—	820	—	—	—	—	—	—	—	—	—	960	—
50-24814	MD50-06-65151	10	—	—	38	—	—	—	—	—	—	—	—	—	17	—

Table F-2.10-3 (continued)

Location ID	Sample ID	Depth (ft)	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Dioxane[1,4-]	Ethanol	Ethylbenzene	Ethyltoluene[4-]	Hexane	Hexanone[2-]	Methanol	Methyl-2-pentanone[4-]	Methylene Chloride	n-Heptane
50-24814	MD50-06-65150	30	—	—	32	—	—	—	—	—	—	—	—	—	11	—
50-24814	MD50-06-65149	99	—	—	12	—	—	—	—	—	—	—	—	—	—	—
50-24814	MD50-06-65148	124	—	—	79	—	—	—	—	—	—	—	—	—	50	—
50-24814	MD50-06-65147	149	—	—	77	—	—	—	—	—	—	—	—	—	110	—
50-24815	MD50-06-65183	30	—	—	17	—	—	—	—	—	—	—	—	—	—	—
50-24815	MD50-06-65182	40	—	—	51	—	—	—	—	—	—	—	—	—	13	—
50-24815	MD50-06-65181	100	—	—	8.8	—	—	—	—	—	—	—	—	—	—	—
50-24815	MD50-06-65180	125	1.1	—	3.4	—	—	—	—	—	—	—	—	—	1	—
50-24815	MD50-06-65179	149	20	—	61	—	—	—	—	—	—	—	—	—	28	—
50-24816	MD50-06-65204	25	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24816	MD50-06-65205	35	—	—	—	—	—	—	—	—	4.3	—	—	—	—	—
50-24816	MD50-06-65209	65	—	—	—	140	—	—	—	—	—	—	—	—	—	—
50-24816	MD50-06-65206	120	—	—	—	55	—	—	—	—	—	—	—	—	—	—
50-24816	MD50-06-65208	200	—	—	17	63	—	—	—	—	—	—	—	—	23	—
50-24816	MD50-06-65207	225	—	—	—	88	—	—	—	—	—	—	—	—	31	—
50-24817	MD50-05-63841	20	—	—	—	—	—	—	4.2	4.6	6.9	—	—	—	—	—
50-24817	MD50-05-63842	40	—	8.8	—	18	—	—	3.9	—	7.2	—	—	—	—	3.6
50-24817	RE50-05-63816	100	—	73	39	280	—	—	33	22	170	—	—	—	30	66
50-24817	RE50-05-63817	140	—	78	62 (J+)	430	—	—	—	—	13	—	—	—	59	—
50-24817	RE50-05-63818	200	—	110	120 (J+)	860	—	—	—	—	100	—	—	—	130	37
50-24817	MD50-05-63843	250	—	88	110	630	—	—	—	—	—	—	—	—	110	—
50-24818	MD50-06-65232	10	—	—	—	—	—	—	2.8	3	—	—	—	—	—	—
50-24818	MD50-06-65233	25	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24818	MD50-06-65234	100	—	—	200	—	—	—	—	—	—	—	—	—	92	—

Table F-2.10-3 (continued)

Location ID	Sample ID	Depth (ft)	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Dioxane[1,4-]	Ethanol	Ethylbenzene	Ethyltoluene[4-]	Hexane	Hexanone[2-]	Methanol	Methyl-2-pentanone[4-]	Methylene Chloride	n-Heptane
50-24818	MD50-06-65235	150	—	—	340	—	—	—	—	—	—	—	—	—	270	—
50-24818	MD50-06-65236	190	—	—	90	—	—	—	—	—	—	—	—	—	240	—
50-24818	MD50-06-65237	250	—	—	270	—	—	—	—	—	—	—	—	—	760	—
50-24818	MD50-06-65238	280	—	—	220	—	—	—	—	—	—	—	—	—	760	—
50-24818	MD50-06-65239	315	—	—	120	—	—	—	—	—	—	—	—	—	370	—
50-24818	MD50-06-65240	414	—	—	—	—	—	—	—	—	—	—	—	9.2	3.9	—
50-24818	MD50-06-65242	452	—	—	—	—	—	—	—	—	—	—	—	11	4.8	—
50-24818	MD50-06-65245	500	—	—	—	—	—	—	—	—	—	4.9	—	26	1.5	—
50-24818	MD50-06-65244	548	—	—	—	—	—	—	—	—	—	—	—	8.6	—	—
50-24818	MD50-06-65243	591	—	—	—	—	—	—	—	—	—	—	—	8.1	—	—
50-24819	RE50-05-61430	20	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24819	RE50-05-61431	50	—	—	5	14	—	—	—	—	—	—	—	—	—	—
50-24819	RE50-05-61432	100	6.4	—	14	56	—	—	—	—	5.4	—	—	—	20	—
50-24819	RE50-05-61732	138.5–140	14	12	38	140	—	—	—	—	—	—	—	—	67	—
50-24819	RE50-05-61733	200	—	—	47	160	—	—	—	—	—	—	—	—	120	—
50-24819	RE50-05-61734	250	—	—	55	140	—	—	—	—	—	—	—	—	160	—
50-24819	RE50-05-61735	275	—	—	43	110	—	—	—	—	—	—	—	—	160	—
50-24820	RE50-05-61446	20	—	—	11	—	—	—	—	8.6 (J-)	—	—	—	—	—	—
50-24820	RE50-05-61449	50	—	—	29	—	—	—	—	—	9.9	—	—	—	16	—
50-24820	RE50-05-61447	100	11	—	32	—	—	—	7.7	—	15	—	—	—	43	6.6
50-24820	RE50-05-61448	140	34	—	120	—	—	—	—	—	45	—	—	—	200	—
50-24820	RE50-05-61450	200	—	—	220	—	—	—	—	—	—	—	—	—	790	—
50-24820	RE50-05-61736	250	—	—	260	—	—	—	—	—	—	—	—	—	1100	—
50-24821	RE50-05-61464	20	—	—	9.2	—	—	—	—	—	3.1	—	—	—	—	—

Table F-2.10-3 (continued)

Location ID	Sample ID	Depth (ft)	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Dioxane[1,4-]	Ethanol	Ethylbenzene	Ethyltoluene[4-]	Hexane	Hexanone[2-]	Methanol	Methyl-2-pentanone[4-]	Methylene Chloride	n-Heptane
50-24821	RE50-05-61466	50	—	—	72	—	—	—	20	—	50	—	—	—	—	20
50-24821	RE50-05-61465	98.4–100	—	—	97	—	—	—	—	—	26	—	—	—	64 (J+)	—
50-24821	RE50-05-61469	137.5–140	—	—	91	—	—	—	—	—	44	—	—	—	100	—
50-24821	RE50-05-61473	160	—	—	210 (J+)	—	—	—	—	—	60	—	—	—	390	86
50-24821	RE50-05-61468	248.6–250	—	—	180	—	—	—	—	—	120	—	—	—	610	—
50-24822	RE50-05-61482	20	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24822	RE50-05-61483	50	—	—	63	—	—	—	—	—	—	—	—	—	34 (J+)	—
50-24822	RE50-05-61484	100	—	—	—	—	—	—	5	10	3.6	—	—	—	—	—
50-24822	RE50-05-61485	140	—	—	87	—	—	—	—	—	—	—	—	—	80	—
50-24822	RE50-05-61486	200	—	—	48	—	—	—	—	18	—	—	—	—	100	—
50-24822	RE50-05-61737	250	—	—	45	—	—	—	—	—	—	—	—	—	120	—
50-25451	MD50-06-66691	19	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-25451	MD50-06-66690	49	—	—	—	—	—	—	—	—	—	—	—	—	8.1	—
50-25451	MD50-06-66689	100	—	—	6.6	—	—	—	—	—	—	—	—	—	8.9	—
50-25451	MD50-06-66688	147	—	—	5.7	—	—	—	—	—	—	—	—	—	9.8	—
50-25451	MD50-06-66687	200	—	—	19	—	—	—	—	—	—	—	—	—	48	—
50-25451	MD50-06-66686	251	—	—	33	—	—	—	—	—	—	—	—	—	82	—
50-25451	MD50-06-66685	287	—	—	—	—	—	—	—	—	—	—	—	—	72	—

Table F-2.10-3 (continued)

Location ID	Sample ID	Depth (ft)	Propylene	Styrene	Tetrachloroethene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene (Total)	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
50-09100	MD50-06-70880	20	—	—	210	—	500	77	—	4100	—	—	—	—	—	—
50-09100	MD50-06-70881	50	—	—	77	—	87	21	—	1800	—	—	—	1100	—	—
50-09100	MD50-06-70882	90	—	—	200	—	390	79	—	4400	—	—	—	—	—	—
50-09100	MD50-06-70883	103	—	—	600	—	1100	190	—	14000	—	—	—	—	—	—
50-09100	MD50-06-70884	120	—	—	730	—	1300	160	—	17000	—	—	—	—	—	—
50-09100	MD50-06-70885	160	—	—	730	—	960	—	—	19000	—	—	—	—	—	—
50-09100	MD50-06-70886	200	—	—	990	—	1600	250	—	29000	64	—	—	—	—	—
50-09100	MD50-06-70887	233	—	—	300	—	370	—	—	8800	—	—	—	—	—	—
50-09100	MD50-06-70888	260	—	—	240	—	280	—	—	7900	—	—	—	—	—	—
50-10131	MD50-06-70868	25	—	—	8300	—	170	89	—	6600	—	—	—	—	—	—
50-10131	MD50-06-70869	50	—	—	6000	—	210	87	—	5700	—	—	—	—	—	—
50-10131	MD50-06-70870	75	—	—	6000	—	220	90	—	5500	—	—	—	—	—	—
50-10131	MD50-06-70871	100	—	—	5400	85	160	51	—	4700	—	—	—	—	—	—
50-10131	MD50-06-70872	125	—	—	3800	130	270	70	—	3900	—	—	—	—	—	—
50-10131	MD50-06-70873	150	—	—	2700	—	130	36	—	2700	—	—	—	—	—	—
50-10131	MD50-06-70874	175	—	—	5400	80	270	83	—	5700	—	—	—	—	—	—
50-10131	MD50-06-70875	200	—	—	4800	24	190	57	—	5500	—	—	—	—	—	—
50-10131	MD50-06-70876	225	—	—	6700	—	220	83	—	6100	—	—	—	—	—	—
50-10131	MD50-06-70877	250	—	—	7500	—	180	70	—	7200	—	—	—	—	—	—
50-24766	MD50-06-64597	17	—	—	1200	—	70	28	—	1100	—	—	—	—	—	—
50-24766	MD50-06-64596	29	—	—	1500	—	140	42	—	1900	36	—	—	—	—	—
50-24766	MD50-06-64595	99	—	—	3000	—	86	62	—	5400	—	—	—	—	—	—
50-24766	MD50-06-64594	124	—	—	350	—	43	24	—	1300	—	—	—	—	—	—
50-24766	MD50-06-64593	149	—	—	580	—	130	59	—	3100	—	—	—	—	—	—

Table F-2.10-3 (continued)

Location ID	Sample ID	Depth (ft)	Propylene	Styrene	Tetrachloroethene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene (Total)	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
50-24767	MD50-06-64625	10	—	—	140	29	390	62	—	1900	—	—	—	19	—	—
50-24767	MD50-06-64626	30	—	—	100	59	260	51	—	1500	—	—	—	53	13	—
50-24767	MD50-06-64627	60	—	—	26	8.4	72	18	—	490	—	—	—	13	3.3	—
50-24767	MD50-06-64628	124	—	—	55	26	450	64	—	1400	—	—	—	—	—	—
50-24767	MD50-06-64629	149	—	—	140	55	730	120	—	4300	—	30	—	63	—	—
50-24768	MD50-06-64661	14	—	—	46	—	150	38	—	930	—	—	—	11	—	—
50-24768	MD50-06-64660	29	—	—	27	4	59	16	—	480	—	—	—	—	—	11
50-24768	MD50-06-64659	99	—	—	490	—	2500	410	—	13000	—	—	—	—	—	—
50-24768	MD50-06-64658	125	—	—	260	—	2900	440	—	14000	—	—	—	—	—	—
50-24768	MD50-06-64657	150	—	—	210	—	2600	380	—	13000	—	—	—	—	—	—
50-24769	MD50-06-64693	20	—	—	19	—	9.1	1.8	1.5	320	5.1	—	—	—	—	—
50-24769	MD50-06-64692	39	—	—	19	—	7.1	1.7	3.6	460	4.4	—	—	—	—	—
50-24769	MD50-06-64691	99	—	—	1300	—	840	—	—	31000	—	—	—	—	—	—
50-24769	MD50-06-64690	124	—	—	600	—	360	—	—	18000	—	—	—	—	—	—
50-24769	MD50-06-64689	149	—	—	1100	—	940	—	—	43000	—	—	—	—	—	—
50-24770	MD50-06-64738	20	—	—	24000	—	500	—	—	15000	—	—	—	—	—	—
50-24770	MD50-06-64725	25	—	—	19000	—	540	—	—	16000	—	—	—	—	—	—
50-24770	MD50-06-64724	39	—	—	14000	—	570	120	—	19000	—	—	—	—	—	—
50-24770	MD50-06-64723	100	—	—	2600	—	450	100	75	16000	—	—	—	—	—	—
50-24770	MD50-06-64722	124	—	—	3800	—	870	190	—	37000	—	—	—	—	—	—
50-24770	MD50-06-64721	150	—	—	890	—	310	—	—	16000	—	—	—	—	—	—
50-24771	MD50-06-64750	17	—	—	840	—	260	—	—	11000	—	—	—	—	—	—
50-24771	MD50-06-64749	40	—	—	1100	—	420	—	—	16000	—	—	—	—	—	—
50-24771	MD50-06-64748	100	—	—	80	—	—	—	—	1900	—	—	—	—	—	—

Table F-2.10-3 (continued)

Location ID	Sample ID	Depth (ft)	Propylene	Styrene	Tetrachloroethene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene (Total)	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
50-24771	MD50-06-64747	125	—	—	1000	—	—	—	—	21000	—	—	—	—	—	—
50-24771	MD50-06-64746	150	—	—	1800	—	—	—	—	50000	—	—	—	—	—	—
50-24773	MD50-06-64775	20	—	—	470	—	190	—	—	6500	—	—	—	—	—	—
50-24773	MD50-06-64774	40	—	—	840	—	250	—	—	12000	—	—	—	—	—	—
50-24773	MD50-06-64773	100	—	—	880	—	270	—	—	15000	—	—	—	—	—	—
50-24773	MD50-06-64776	125	—	—	1700	—	510	—	—	29000	—	—	—	—	—	—
50-24773	MD50-06-64772	150	—	—	2100	—	380	—	—	43000	—	—	—	—	—	—
50-24782	MD50-06-64803	20	—	—	770	—	100	—	—	5000	—	—	—	—	—	—
50-24782	MD50-06-64804	40	—	—	1200	—	180	49	—	7100	—	—	—	—	—	—
50-24782	MD50-06-64805	100	—	—	840	—	130	—	—	8400	—	—	—	—	—	—
50-24782	MD50-06-64806	125	—	—	1300	—	350	—	—	16000	—	—	—	—	—	—
50-24782	MD50-06-64807	155	—	—	460	40	66	35	—	3800	—	—	—	36	—	—
50-24783	MD50-06-64832	20	—	—	1500	—	—	—	—	23000	—	—	—	—	—	—
50-24783	MD50-06-64831	36	—	—	450	—	54	33	—	3100	—	—	—	—	—	—
50-24783	MD50-06-64830	100	—	—	270	—	46	—	—	2700	—	—	—	—	—	—
50-24783	MD50-06-64829	125	—	—	1300	—	180	73	—	14000	—	—	—	—	—	—
50-24783	MD50-06-64828	151	—	—	1600	—	190	—	—	19000	—	—	—	—	—	—
50-24784	MD50-06-64374	10	—	—	1100	—	40	120	—	520	—	—	—	—	—	—
50-24784	MD50-06-64373	20	—	—	190	—	6.9	19	—	77	2.4	—	—	4.9	0.91	—
50-24784	MD50-06-64372	47	—	—	1600	—	78	56	—	2300	—	—	—	—	—	—
50-24784	MD50-06-64371	49	—	—	1700	12	77	57	—	2200	—	—	—	—	—	—
50-24784	MD50-06-64370	55	—	—	1700	28	72	64	—	1500	13	—	—	37	8.9	—
50-24784	MD50-06-64375	100	—	—	680	10	43	28	—	1000	—	—	—	16	3.8	—
50-24784	MD50-06-64379	168	—	—	1400	—	65	40	—	2700	—	—	—	—	—	—

Table F-2.10-3 (continued)

Location ID	Sample ID	Depth (ft)	Propylene	Styrene	Tetrachloroethene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene (Total)	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
50-24784	MD50-06-64378	199	—	—	370	33	12	17	—	760	5	—	—	27	5.4	—
50-24784	MD50-06-64377	250	—	—	850	34	29	24	—	2100	—	—	—	53	12	—
50-24784	MD50-06-64376	268	—	—	1900	—	76	40	—	3900	—	—	—	—	—	—
50-24785	MD50-06-64402	10	—	—	270	54	—	—	—	140	—	14	4.5	—	10	24
50-24785	MD50-06-64403	19	—	—	1200	120	10	13	—	610	—	15	4.5	—	20	59
50-24785	MD50-06-64408	60	—	—	7900	—	140	120	—	4900	—	—	—	—	—	—
50-24785	MD50-06-64407	120	—	—	4900	—	160	85	—	4900	—	—	—	—	—	—
50-24785	MD50-06-64404	200	—	—	5400	—	190	92	—	7600	—	—	—	—	—	—
50-24785	MD50-06-64405	250	—	—	4600	—	130	79	—	7700	—	—	—	—	—	—
50-24785	MD50-06-64406	275	—	—	130	260	—	—	—	330	—	—	—	—	—	—
50-24796	MD50-06-64448	10	—	—	180	12	—	—	—	19	—	2.1	—	4.8	1.6	—
50-24796	MD50-06-64447	20	—	2.2	300	27	19	7.9	—	420	5.4	—	—	11	3.7	—
50-24796	MD50-06-64449	40	—	—	1200	15	110	37	—	2000	25	—	—	—	—	—
50-24796	MD50-06-64450	100	—	—	3000	—	900	180	—	6000	84	—	—	—	—	—
50-24796	MD50-06-64451	120	—	—	110	5.9	13	5.3	—	270	3.9	—	—	2.7	—	—
50-24796	MD50-06-64452	150	—	—	1200	25	320	100	—	2200	—	—	—	—	—	—
50-24797	MD50-06-64496	18.3	—	—	300	34	56	20	—	550	66	29	10	26 (J)	9.6 (J)	—
50-24797	MD50-06-64497	38	—	—	1000	—	160	57	—	2400	130	—	—	—	—	—
50-24797	MD50-06-66198	60	—	—	920	—	190	66	—	3000	58	—	—	—	—	—
50-24797	MD50-06-64498	120	—	—	780	—	180	66	—	3200	35	—	—	—	—	—
50-24797	MD50-06-64500	160	—	—	2300	—	700	490	—	9600	87	—	—	—	—	—
50-24799	MD50-06-66197	15	—	—	590	—	20	11	—	920	—	—	—	13	5.4	—
50-24799	MD50-06-64521	17.5	—	—	83	8.2	—	—	—	46	—	2.2	—	6.3 (J)	2.2 (J)	—
50-24799	MD50-06-64522	20	—	—	98	15	—	—	—	62	—	2.9	—	10 (J)	2.9 (J)	—

Table F-2.10-3 (continued)

Location ID	Sample ID	Depth (ft)	Propylene	Styrene	Tetrachloroethene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene (Total)	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
50-24799	MD50-06-64523	32.5	—	—	1600	54	26	14	—	1100	—	—	—	26 (J)	—	—
50-24799	MD50-06-64538	37.5	—	—	1800	34	30	19	—	1300	—	—	—	—	—	—
50-24799	MD50-06-64524	40.5	—	—	1100	15	18	12	—	960	—	—	—	—	—	6.1
50-24799	MD50-06-64525	100	—	—	43	10	—	—	—	95	—	—	—	—	—	—
50-24799	MD50-06-64526	120	13	—	80	5.7	8.3	4.8	—	450	—	—	—	—	—	—
50-24799	MD50-06-64527	160	210	—	1000	20	140	72	—	7600	—	—	—	—	—	—
50-24801	MD50-06-64853	20	—	—	250	—	—	30	—	910	—	—	—	—	—	—
50-24801	MD50-06-64870	35	—	—	440	—	—	49	—	1900	—	—	—	—	—	—
50-24801	MD50-06-64856	80	—	—	1700	—	270	93	—	14000	—	—	—	—	—	—
50-24801	MD50-06-64855	120	—	—	600	32	66	34	—	3800	12	—	—	—	—	—
50-24801	MD50-06-64854	150	—	—	160	32	—	—	—	1900	—	—	—	—	—	—
50-24802	MD50-06-64878	15	—	—	600	—	81	—	—	5500	—	—	—	—	—	—
50-24802	MD50-06-64879	42	—	—	1200	—	170	—	—	11000	—	—	—	—	—	—
50-24802	MD50-06-64880	99.4	—	—	560	—	73	—	—	5400	—	—	—	—	—	—
50-24802	MD50-06-64881	124.4	—	—	760	—	110	—	—	9400	—	—	—	—	—	—
50-24802	MD50-06-64882	156.4	—	—	770	—	130	—	—	8600	—	—	—	—	—	—
50-24803	MD50-06-64904	16	—	—	56	5.2	—	3.2	—	570	—	—	—	23	5.6	—
50-24803	MD50-06-64903	37	—	—	120	11	13	6.9	6	1100	3.5	—	—	15	3.6	—
50-24803	MD50-06-64905	99.5	—	—	160	—	26	—	—	2100	—	—	—	20	20	—
50-24803	MD50-06-64906	124	—	—	350	—	57	—	—	4600	—	—	—	33	33	—
50-24803	MD50-06-64907	151	—	—	190	—	—	—	—	2700	—	—	—	—	—	—
50-24804	MD50-06-64970	10	—	—	44	6.5	16	—	—	500	18	—	—	—	—	—
50-24804	MD50-06-64971	16	—	—	320	—	53	—	—	3300	—	—	—	—	—	—
50-24804	MD50-06-64972	33	—	—	270	—	—	—	—	4000	—	—	—	—	—	—

Table F-2.10-3 (continued)

Location ID	Sample ID	Depth (ft)	Propylene	Styrene	Tetrachloroethene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene (Total)	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
50-24804	MD50-06-64973	99	—	—	600	—	81	—	—	7500	—	—	—	—	—	—
50-24804	MD50-06-64974	124	—	—	840	—	160	—	—	11000	—	—	—	—	—	—
50-24804	MD50-06-64975	149	—	—	1200	—	130	—	—	16000	—	—	—	—	—	—
50-24810	MD50-06-64999	19	—	—	92	8.5	—	—	—	1200	—	—	—	18	—	—
50-24810	MD50-06-64998	37	—	—	150	—	24	—	—	1700	—	—	—	55	17	—
50-24810	MD50-06-64997	99	—	—	120	37	—	—	—	1900	—	—	—	—	—	—
50-24810	MD50-06-64996	123	—	—	480	—	68	—	—	6200	—	—	—	—	—	—
50-24810	MD50-06-64995	150	—	—	550	—	74	—	—	8100	—	—	—	—	—	—
50-24811	MD50-06-65069	20	—	—	730	—	—	—	—	6100	—	—	—	—	—	—
50-24811	MD50-06-65068	40	—	—	750	—	—	—	—	10000	—	—	—	—	—	—
50-24811	MD50-06-65067	98	—	—	290	—	—	—	—	6300	—	—	—	—	—	—
50-24811	MD50-06-65066	125	—	—	340	—	—	—	—	7300	—	—	—	—	—	—
50-24811	MD50-06-65065	150	—	—	1400	—	—	—	—	36000	—	—	—	—	—	—
50-24812	MD50-06-65094	10	—	—	1100	—	—	—	—	23000	—	—	—	—	—	—
50-24812	MD50-06-65093	35	—	—	380	—	—	—	—	4600	—	—	—	—	—	—
50-24812	MD50-06-65092	98	—	—	810	—	—	—	—	23000	—	—	—	—	—	—
50-24812	MD50-06-65091	123	—	—	570	—	—	—	92	13000	—	—	—	—	—	—
50-24812	MD50-06-65090	150	—	—	1100	—	—	—	—	51000	—	—	—	—	—	—
50-24813	MD50-06-65126	20	—	—	150	—	—	—	—	4800	—	—	—	—	—	—
50-24813	MD50-06-65125	30	—	—	310	—	—	—	—	11000	—	—	—	—	—	—
50-24813	MD50-06-65124	99	—	—	270	—	—	—	—	11000	—	—	—	—	—	—
50-24813	MD50-06-65123	125	—	—	520	—	—	—	100	26000	—	—	—	—	—	—
50-24813	MD50-06-65122	150	—	—	900	—	—	—	190	54000	—	—	—	—	—	—
50-24814	MD50-06-65151	10	—	—	57	—	—	—	—	3700	—	—	—	—	—	—

Table F-2.10-3 (continued)

Location ID	Sample ID	Depth (ft)	Propylene	Styrene	Tetrachloroethene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene (Total)	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
50-24814	MD50-06-65150	30	—	—	84	32	—	—	—	2500	—	—	—	—	—	—
50-24814	MD50-06-65149	99	—	—	14	—	—	—	—	1300	—	—	—	—	—	—
50-24814	MD50-06-65148	124	—	—	93	—	—	—	—	6000	—	—	—	—	—	—
50-24814	MD50-06-65147	149	—	—	72	39	—	—	25	4800	—	—	—	—	—	—
50-24815	MD50-06-65183	30	—	—	24	—	—	—	16	1600	—	—	—	—	—	—
50-24815	MD50-06-65182	40	—	—	41	—	25	—	12	1900	—	—	—	—	—	—
50-24815	MD50-06-65181	100	—	—	10	—	—	—	7.7	660	—	—	—	—	—	—
50-24815	MD50-06-65180	125	—	—	5.1	—	—	—	4.4	230	3	—	—	—	—	—
50-24815	MD50-06-65179	149	—	—	67	—	—	—	69	3700	—	—	—	—	—	—
50-24816	MD50-06-65204	25	—	—	26	6.1	—	—	—	18	—	—	—	—	—	3.8
50-24816	MD50-06-65205	35	—	—	62	11	—	—	—	47	—	—	—	—	—	4.6
50-24816	MD50-06-65209	65	—	—	3800	—	220	98	—	4700	—	—	—	—	—	—
50-24816	MD50-06-65206	120	—	—	860	—	46	28	—	1100	—	—	—	—	—	—
50-24816	MD50-06-65208	200	—	—	2000	—	110	45	—	3800	—	—	—	—	—	—
50-24816	MD50-06-65207	225	—	—	3900	—	170	75	—	6500	—	—	—	—	—	—
50-24817	MD50-05-63841	20	110	—	150	20	130	40	—	210	16	4.4	—	—	4.4	12
50-24817	MD50-05-63842	40	99	—	480	17	470	140	—	1000	39	—	—	—	6.7	8
50-24817	RE50-05-63816	100	—	17	1300	140	1400	390	—	4600	—	—	—	—	24	49
50-24817	RE50-05-63817	140	—	—	1700	54	1800	450	—	6700	68	—	—	—	—	33
50-24817	RE50-05-63818	200	—	—	2300	140	1900	530	—	9900	—	—	—	—	—	44
50-24817	MD50-05-63843	250	—	—	2400	41	1200	390	—	9800	62	—	—	—	—	—
50-24818	MD50-06-65232	10	—	—	11	17	11	2.2	—	81	—	3.4	—	12	3.3	—
50-24818	MD50-06-65233	25	—	—	260	360	230	51	—	3000	—	—	—	—	—	—
50-24818	MD50-06-65234	100	—	—	2000	—	2200	440	—	27000	—	—	—	—	—	—

Table F-2.10-3 (continued)

Location ID	Sample ID	Depth (ft)	Propylene	Styrene	Tetrachloroethene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene (Total)	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
50-24818	MD50-06-65235	150	—	—	2100	750	1500	310	—	37000	—	—	—	—	—	—
50-24818	MD50-06-65236	190	—	—	280	530	79	—	—	7600	—	—	—	—	—	—
50-24818	MD50-06-65237	250	—	—	1700	490	640	—	—	37000	—	—	—	—	—	—
50-24818	MD50-06-65238	280	—	—	1600	190	410	—	—	36000	—	—	—	—	—	—
50-24818	MD50-06-65239	315	—	—	1000	110	220	—	—	23000	—	—	—	—	—	—
50-24818	MD50-06-65240	414	—	—	4.9	3.8	—	—	—	170	—	2.3	2.3	6.9	1.6	—
50-24818	MD50-06-65242	452	—	—	25	—	—	—	—	840	—	—	—	—	—	—
50-24818	MD50-06-65245	500	—	—	51	5.3	—	—	—	470	—	—	—	16	3	—
50-24818	MD50-06-65244	548	—	—	18	3.1	—	—	—	210	—	—	—	5.6	—	—
50-24818	MD50-06-65243	591	—	—	32	—	—	—	—	360	—	—	—	—	—	—
50-24819	RE50-05-61430	20	12	—	210	—	17	8.2	—	420	—	—	—	—	—	—
50-24819	RE50-05-61431	50	27	—	450	5.8	42	20	—	1200	—	—	—	—	—	—
50-24819	RE50-05-61432	100	50	—	430	4.1	51	22	—	1600	6.1	—	—	—	—	—
50-24819	RE50-05-61732	138.5–140	—	—	1400	—	280	85	—	5100	19	—	—	—	—	—
50-24819	RE50-05-61733	200	66	—	1400	—	250	79	—	5900	22	—	—	—	—	—
50-24819	RE50-05-61734	250	52	—	1500	—	210	70	—	7800	—	—	—	—	—	—
50-24819	RE50-05-61735	275	89	—	1200	—	120	46	—	6400	—	—	—	—	—	—
50-24820	RE50-05-61446	20	31	—	91	21	—	—	—	2000	—	9.5	—	—	—	21
50-24820	RE50-05-61449	50	170	—	140	23	—	—	—	3400	—	—	—	—	—	14
50-24820	RE50-05-61447	100	280	—	68	23	—	—	11	2200	—	—	—	—	8.3	20
50-24820	RE50-05-61448	140	180	—	360	140	—	—	—	10000	—	—	—	—	—	76
50-24820	RE50-05-61450	200	160	—	780	82	—	—	—	25000	—	—	—	—	—	—
50-24820	RE50-05-61736	250	—	—	1100	—	—	—	—	35000	—	—	—	—	—	—
50-24821	RE50-05-61464	20	50	—	33	13	—	—	—	1600	—	—	—	—	—	6.8

Table F-2.10-3 (continued)

Location ID	Sample ID	Depth (ft)	Propylene	Styrene	Tetrachloroethene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene (Total)	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
50-24821	RE50-05-61466	50	760	—	120	100	—	—	—	6600	—	—	—	—	16	32
50-24821	RE50-05-61465	98.4–100	250	—	120	27	—	—	—	7200	—	—	—	—	—	—
50-24821	RE50-05-61469	137.5–140	730	—	140	54	—	—	—	7600	—	—	—	—	—	—
50-24821	RE50-05-61473	160	—	—	350	—	—	—	—	21000	—	—	—	—	—	—
50-24821	RE50-05-61468	248.6–250	—	—	310	250	—	—	—	22000	—	—	—	—	—	160
50-24822	RE50-05-61482	20	17	—	18	—	—	—	—	1700	—	—	—	—	—	—
50-24822	RE50-05-61483	50	—	—	81	—	48	—	—	9100	—	—	—	—	—	—
50-24822	RE50-05-61484	100	14	—	—	19	—	—	—	680	—	10	—	—	7.3	20
50-24822	RE50-05-61485	140	—	—	100	31	58	200	—	13000	—	—	—	—	—	—
50-24822	RE50-05-61486	200	—	—	33	33	—	—	—	7100	—	21	—	—	—	31
50-24822	RE50-05-61737	250	—	—	29	—	—	—	—	7300	—	—	—	—	—	—
50-25451	MD50-06-66691	19	—	—	2.4	3.3	—	—	—	79	6	—	—	—	—	—
50-25451	MD50-06-66690	49	—	—	19	—	—	—	—	870	65	—	—	—	—	—
50-25451	MD50-06-66689	100	—	—	14	—	—	—	—	720	33	—	—	—	—	—
50-25451	MD50-06-66688	147	—	—	12	—	13	—	—	560	29	—	—	—	—	—
50-25451	MD50-06-66687	200	—	—	41	—	40	—	—	1900	68	—	—	—	—	—
50-25451	MD50-06-66686	251	—	—	130	—	—	—	—	6400	—	—	—	—	—	—
50-25451	MD50-06-66685	287	—	—	170	—	—	—	—	7300	—	—	—	—	—	—

Note: Units are µg/m³.

*— = Not detected.

Table F-2.10-4
Summary of Organic Chemicals (VOCs) Detected in Second Round of Pore Gas at MDA C

Location ID	Sample ID	Depth (ft)	Acetone	Benzene	Butanone[2-]	Carbon Tetrachloride	Chlorodibromomethane	Chlorodifluoromethane	Chloroform	Chloromethane	Dichloro-1,1,2,2-tetrafluoroethane[1,2-]	Dichlorobenzene[1,2-]	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]
50-24766	MD50-06-65331	17	34	—*	—	7.3	—	—	27	—	12	—	38	—	—	—	—	8
50-24766	MD50-06-65330	29	27	—	—	23	—	—	86	—	—	—	79	—	—	—	12	38
50-24766	MD50-06-65329	99	93	—	—	22	—	—	74	—	—	—	62	—	—	—	13	35
50-24766	MD50-06-65328	124	53	—	—	64	—	—	150	—	52	—	130	13	—	15	29	87
50-24766	MD50-06-65327	149	—	—	—	250 (J)	—	—	450	—	88	—	370	—	—	—	110	230
50-24767	MD50-06-65362	10	—	—	—	—	—	—	380	—	—	—	270	—	—	—	67	—
50-24767	MD50-06-65361	30	—	—	—	—	—	—	380	—	—	—	270	—	—	—	69	—
50-24767	MD50-06-65360	60	—	—	—	—	—	—	420	—	—	—	300	—	—	—	76	—
50-24767	MD50-06-65359	124	—	—	—	—	—	—	240	—	—	—	160	—	—	—	61	—
50-24767	MD50-06-65358	149	—	—	—	—	—	—	190	—	—	—	60	—	—	—	63	—
50-24768	MD50-06-65370	14	17	—	—	7.2	—	—	31	—	240	—	46	—	—	—	—	—
50-24768	MD50-06-65369	29	17	—	—	4.4	—	—	20	1.4	82	—	19	—	—	—	—	—
50-24768	MD50-06-65368	99	40	—	—	3.3	—	—	16	1.4	42	—	14	—	—	—	1	—
50-24768	MD50-06-65367	125	100	—	—	—	—	—	51	—	56	—	45	—	—	—	8.9	—
50-24768	MD50-06-65366	150	93	—	—	—	—	—	81	—	100	—	85	—	—	—	24	—
50-24769	MD50-06-65378	20	25	—	—	77 (J)	—	—	370	—	—	—	380	—	—	—	58	—
50-24769	MD50-06-65377	39	42	—	—	—	—	—	38	—	—	—	42	—	—	—	—	—
50-24769	MD50-06-65376	99	52	0.76	—	8.6	—	—	40	0.92	5.2	—	24	—	1.2	—	5.9	1.5
50-24769	MD50-06-65375	124	41	6.7	—	—	—	—	150	—	—	—	120	—	—	—	33	—
50-24769	MD50-06-65374	149	240	11	—	—	—	—	180	—	—	—	130	—	—	—	44	—
50-24770	MD50-06-65387	20	—	—	—	1400	—	—	1300	—	—	—	1100	—	—	—	160	—
50-24770	MD50-06-65386	25	—	—	—	1500	—	—	1300	—	—	—	1100	—	—	—	150	—
50-24770	MD50-06-65385	39	—	—	—	2000	—	—	1700	—	—	—	1300	—	—	—	210	—

Table F-2.10-4 (continued)

Location ID	Sample ID	Depth (ft)	Acetone	Benzene	Butanone[2-]	Carbon Tetrachloride	Chlorodibromomethane	Chlorodifluoromethane	Chloroform	Chloromethane	Dichloro-1,1,2,2-tetrafluoroethane[1,2-]	Dichlorobenzene[1,2-]	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]
50-24770	MD50-06-65384	100	—	—	—	1900	—	—	1900	—	—	—	1500	—	—	—	280	—
50-24770	MD50-06-65383	124	—	—	—	1700	—	—	1900	—	—	—	1400	—	—	—	290	—
50-24770	MD50-06-65382	148	—	—	—	3600 (J)	—	—	4600	—	—	—	3900	—	—	—	770	—
50-24771	MD50-06-65394	17	—	—	—	1400 (J)	—	—	1200	—	—	—	640	—	—	—	71	—
50-24771	MD50-06-65393	40	—	—	—	1900 (J)	—	—	1700	—	—	—	800	—	54	—	130	52
50-24771	MD50-06-65392	100	55	—	—	200 (J)	—	—	440	—	19	—	170	—	27	—	57	17
50-24771	MD50-06-65391	125	—	—	—	1100	—	—	2300	—	—	—	640	—	160	—	370	100
50-24771	MD50-06-65390	149	—	—	—	2200	—	—	3800	—	—	—	1500	—	430	—	790	240
50-24773	MD50-06-65405	20	—	—	—	220	—	—	520	—	—	—	210	—	—	—	54	—
50-24773	MD50-06-65404	40	—	—	—	1100 (J)	—	—	1500	—	—	—	600	—	56	—	140	57
50-24773	MD50-06-65403	100	—	—	—	450 (J)	—	—	750	—	—	—	260	—	51	—	87	43
50-24773	MD50-06-65402	125	—	—	—	1100 (J)	—	—	1500	—	—	—	680	—	90	—	210	81
50-24773	MD50-06-65401	149	—	—	—	930	—	—	2400	—	—	—	730	—	200	—	440	130
50-24782	MD50-06-65413	21	67	—	—	19	—	—	310	—	—	—	120	—	—	—	29	11
50-24782	MD50-06-65412	40	160	—	—	—	—	—	310	—	—	—	98	—	—	—	33	20
50-24782	MD50-06-65411	100	40	—	—	17	—	—	240	—	—	—	79	—	14	—	41	13
50-24782	MD50-06-65410	125	100	—	—	130	—	—	640	—	—	—	210	—	40	—	110	43
50-24782	MD50-06-65409	151	—	—	—	440	—	—	1700	—	—	—	—	—	130	—	350	130
50-24783	MD50-06-65421	20	—	—	—	—	—	—	250	—	—	—	110	—	—	—	34	35
50-24783	MD50-06-65420	36	34	—	—	—	—	—	84	—	—	—	29	—	—	—	11	9.8
50-24783	MD50-06-65419	100	56	—	—	—	—	—	140	—	17	—	57	—	9.1	—	24	22
50-24783	MD50-06-65418	125	—	—	—	99	—	—	540	—	—	—	210	—	—	—	91	81
50-24783	MD50-06-65417	148	—	—	—	—	—	—	490	—	—	—	210	—	—	—	100	76
50-24784	MD50-06-70724	10	38	—	—	160	—	—	180	—	—	—	87	—	—	—	—	28
50-24784	MD50-06-70723	20	29	—	—	120	—	—	170	—	—	—	68	—	—	—	—	19

Table F-2.10-4 (continued)

Location ID	Sample ID	Depth (ft)	Acetone	Benzene	Butanone[2,-]	Carbon Tetrachloride	Chlorodibromomethane	Chlorodifluoromethane	Chloroform	Chloromethane	Dichloro-1,1,2,2-tetrafluoroethane[1,2,-]	Dichlorobenzene[1,2,-]	Dichlorodifluoromethane	Dichloroethane[1,1,-]	Dichloroethane[1,2,-]	Dichloroethene[1,1,-]	Dichloroethene[cis-1,2,-]	Dichloropropane[1,2,-]
50-24784	MD50-06-70722	47	29	6.7	—	160	—	—	160	—	—	—	49	—	—	—	—	25
50-24784	MD50-06-70721	49	—	—	—	160	—	—	210	—	—	—	89	—	—	—	—	34
50-24784	MD50-06-65292	55	62	—	—	130	—	—	290	—	—	—	78	—	—	—	9	50
50-24784	MD50-06-65291	100	11	—	—	74	—	—	200	—	—	—	48	—	5.8	—	6.7	33
50-24784	MD50-06-65290	168	39	—	—	130	—	—	140	—	—	—	75	—	—	7	11	33
50-24784	MD50-06-65289	199	—	—	—	18	—	—	21	—	—	—	14	—	—	—	—	4.3
50-24784	MD50-06-65288	250	—	—	—	140	—	—	85	—	—	—	67	—	—	—	9.6	24
50-24784	MD50-06-65287	265	—	—	—	220	—	—	82	—	—	—	110	—	—	—	13	27
50-24785	MD50-06-66783	10	—	—	—	—	—	—	1000	—	—	—	64	—	—	—	—	24
50-24785	MD50-06-65300	19	—	—	—	—	—	—	980	—	—	—	66	—	—	—	—	24
50-24785	MD50-06-65299	60	—	—	—	70	—	—	1300	—	—	—	84	—	30	—	—	70
50-24785	MD50-06-65298	120	—	—	—	190	—	—	1200	—	—	—	160	—	30	—	21	120
50-24785	MD50-06-65297	200	—	—	—	230	—	—	340	—	—	—	150	—	—	—	20	75
50-24785	MD50-06-65296	250	—	—	—	360	—	—	210	—	—	—	220	—	—	—	—	59
50-24785	MD50-06-65295	256	70	—	—	62	—	—	220	—	18	—	180	17	—	—	34	100
50-24796	MD50-06-65308	10	9.9	2.4	—	7	—	—	32	1.1	—	—	46	0.86	1.3	1.2	2.2	23
50-24796	MD50-06-65307	20	21	11	—	11	—	—	44	0.95	—	—	62	1.1	1.8	1.2	3	28
50-24796	MD50-06-65306	40	27	5.6	78	27	—	—	120	1.4	—	—	150	3.2	5.8	4.2	9.3	85
50-24796	MD50-06-65305	100	—	—	—	24	—	—	210	—	—	—	250	—	9.5	—	25	110
50-24796	MD50-06-65304	120	25	—	—	52	—	—	150	—	—	—	180	—	9.6	—	21	120
50-24796	MD50-06-65303	144	—	—	—	37	—	—	200	—	—	—	230	—	—	—	34	180
50-24797	MD50-06-65315	18.3	48	—	—	29 (J)	—	—	140	—	—	—	550	—	—	—	11	87
50-24797	MD50-06-65314	38	—	—	—	26 (J)	—	—	180	—	—	—	370	—	—	—	22	150
50-24797	MD50-06-65313	60	34	—	—	—	—	—	170	—	—	—	290	8.1	—	—	27	110
50-24797	MD50-06-65312	120	—	—	—	65	—	—	290	—	—	—	410	—	—	—	55	260

Table F-2.10-4 (continued)

Location ID	Sample ID	Depth (ft)	Acetone	Benzene	Butanone[2-]	Carbon Tetrachloride	Chlorodibromomethane	Chlorodifluoromethane	Chloroform	Chloromethane	Dichloro-1,1,2,2-tetrafluoroethane[1,2-]	Dichlorobenzene[1,2-]	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]
50-24797	MD50-06-65311	154	—	—	—	98	—	—	380	—	—	—	430	—	—	—	100	460
50-24799	MD50-06-65323	20	57	—	—	—	—	—	140	—	—	—	94	—	—	—	22	39
50-24799	MD50-06-65322	32.5	—	—	—	—	—	—	310	—	—	—	190	—	—	—	47	92
50-24799	MD50-06-65321	100	—	—	—	—	—	—	73	—	—	—	45	—	—	—	12	25
50-24799	MD50-06-65320	120	—	—	—	—	—	—	88	—	—	—	44	—	—	—	—	36
50-24799	MD50-06-65319	160	—	—	—	98	—	—	220	—	—	—	130	—	—	—	53	93
50-24801	MD50-06-65429	20	50	—	—	9.6	—	—	64	—	—	—	25	—	—	—	7.2	12
50-24801	MD50-06-65428	35	—	—	—	34 (J)	—	—	310	—	—	—	140	—	—	—	45	66
50-24801	MD50-06-65427	80	—	—	—	48 (J)	—	—	370	—	—	—	160	—	—	—	57	79
50-24801	MD50-06-65426	120	—	—	—	180 (J)	—	—	510	—	—	—	220	—	—	—	88	120
50-24801	MD50-06-65425	150	—	—	—	380	—	—	760	—	—	—	310	—	—	—	160	190
50-24802	MD50-06-65437	15	54	—	—	12	—	—	35	—	—	—	13	—	—	—	3	5.2
50-24802	MD50-06-65436	42	—	—	—	53	—	—	240	—	—	—	89	—	—	—	34	31
50-24802	MD50-06-65435	99	—	—	—	73	—	—	320	—	—	—	110	—	—	—	49	41
50-24802	MD50-06-65434	124	—	—	—	150	—	—	440	—	—	—	180	—	—	—	60	53
50-24802	MD50-06-65433	156	—	—	—	100	—	—	310	—	—	—	—	—	23	—	50	47
50-24803	MD50-06-65445	16	—	—	—	20	—	—	79	—	—	—	30	—	—	—	12	—
50-24803	MD50-06-65444	37	25	—	—	57	—	—	130	—	—	—	45	—	—	—	19	13
50-24803	MD50-06-65443	99.5	36	—	—	54	—	—	140	—	—	—	38	—	8.9	—	21	15
50-24803	MD50-06-65442	124	—	—	—	58	—	—	160	—	—	—	57	—	—	—	23	18
50-24803	MD50-06-65441	150	52	—	—	56	—	—	190	—	—	—	46	—	16	—	33	23
50-24804	MD50-06-65454	10	35	1.4	—	2.2 (J)	—	—	2.5	0.98	5.9	—	3.6	—	—	—	—	—
50-24804	MD50-06-65453	16	38	—	—	66	—	—	120	—	—	—	37	—	—	—	13	—
50-24804	MD50-06-65452	33	38	—	—	24	—	—	52	—	—	—	20	—	—	—	—	—
50-24804	MD50-06-65451	99	62	—	—	56	110	—	140	—	—	—	36	—	8.7	—	22	15

Table F-2.10-4 (continued)

Location ID	Sample ID	Depth (ft)	Acetone	Benzene	Butanone[2-]	Carbon Tetrachloride	Chlorodibromomethane	Chlorodifluoromethane	Chloroform	Chloromethane	Dichloro-1,1,2,2-tetrafluoroethane[1,2-]	Dichlorobenzene[1,2-]	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]
50-24804	MD50-06-65450	124	—	—	—	—	—	—	410	—	—	—	150	—	—	—	—	—
50-24804	MD50-06-65449	149	—	—	—	220	—	—	530	—	—	—	180	—	—	—	86	49
50-24810	MD50-06-65461	19	21	—	—	57	—	—	77	—	—	—	31	—	—	—	8.6	—
50-24810	MD50-06-65460	37	26	—	—	48	—	—	90	—	—	—	29	—	—	—	10	—
50-24810	MD50-06-65459	99	68	—	—	35	—	—	91	—	—	—	19	—	6.2	—	12	8.6
50-24810	MD50-06-65458	123	—	—	—	230	—	—	450	—	—	—	180	—	—	—	62	—
50-24810	MD50-06-65457	150	70	—	—	140	—	—	190	—	—	—	76	—	—	—	29	21
50-24811	MD50-06-65469	20	—	—	—	1100 (J)	—	—	1000	—	430	—	320	—	—	—	32	—
50-24811	MD50-06-65468	40	—	—	—	2100 (J)	—	—	1800	—	—	—	370	—	—	—	96	—
50-24811	MD50-06-65467	98	—	—	—	2200 (J)	—	—	2100	—	—	—	460	—	64	—	200	—
50-24811	MD50-06-65466	125	—	—	—	1900 (J)	—	—	1600	—	—	—	460	—	68	—	180	—
50-24811	MD50-06-65465	150	—	—	—	1600	—	—	2100	—	—	—	580	—	120	—	300	—
50-24812	MD50-06-65477	10	—	—	—	1300	—	—	510	—	—	—	230	—	—	—	43	—
50-24812	MD50-06-65476	35	—	—	—	2400	—	—	1100	—	—	—	450	—	—	—	110	—
50-24812	MD50-06-65474	98	—	—	—	1100	—	—	600	—	—	—	200	—	—	—	58	—
50-24812	MD50-06-65475	123	—	—	—	1000	—	—	500	—	—	—	190	—	19	—	59	11
50-24812	MD50-06-65473	150	43	—	—	460	—	—	320	—	—	—	110	—	12	—	37	—
50-24813	MD50-06-65485	20	27	—	—	150	—	—	110	—	—	—	72	—	—	—	11	—
50-24813	MD50-06-65484	30	39	—	—	130	—	—	97	—	—	—	100	—	—	—	10	—
50-24813	MD50-06-65483	99	49	—	—	170	—	—	220	—	—	—	140	—	—	—	37	—
50-24813	MD50-06-65482	125	—	—	—	2100	—	—	1800	—	—	—	1400	—	—	—	340	—
50-24813	MD50-06-65481	150	—	—	—	1800	—	—	2000	—	—	—	1300	—	—	—	440	—
50-24814	MD50-06-65493	10	—	—	—	200	—	—	350	—	—	—	440	—	—	—	69	—
50-24814	MD50-06-65492	30	54	—	—	24	—	—	50	1.1	13	—	53	—	—	—	6.6	—
50-24814	MD50-06-65491	99	74	—	—	47	—	—	140	—	—	—	150	—	—	—	30	—

Table F-2.10-4 (continued)

Location ID	Sample ID	Depth (ft)	Acetone	Benzene	Butanone[2-]	Carbon Tetrachloride	Chlorodibromomethane	Chlorodifluoromethane	Chloroform	Chloromethane	Dichloro-1,1,2,2-tetrafluoroethane[1,2-]	Dichlorobenzene[1,2-]	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]
50-24814	MD50-06-65490	124	—	—	—	200	—	—	370	—	—	—	450	—	—	—	79	—
50-24814	MD50-06-65489	149	—	—	—	420	—	—	820	—	—	—	810	—	—	—	180	—
50-24815	MD50-06-65501	30	—	—	—	380	—	—	1300	—	—	—	1400	—	—	—	230	—
50-24815	MD50-06-65500	40	—	—	—	680 (J)	—	—	1700	—	—	—	2000	—	—	—	240	—
50-24815	MD50-06-65499	100	—	—	—	710 (J)	—	—	1900	—	—	—	2100	—	—	—	270	—
50-24815	MD50-06-65498	125	—	—	—	500 (J)	—	—	1400	—	—	—	1700	—	—	—	230	—
50-24815	MD50-06-65497	149	—	—	—	260 (J)	—	—	820	—	—	—	940	—	—	—	140	—
50-24816	MD50-06-65510	25	56	—	—	—	—	—	210	—	—	—	49	—	—	—	—	30
50-24816	MD50-06-65509	35	23	—	—	68	—	—	360	—	—	—	92	—	—	—	—	53
50-24816	MD50-06-65508	65	50	—	11	63	—	—	160	—	—	—	54	—	5.1	8.6	7.3	58
50-24816	MD50-06-65507	120	71	—	7.1	150	—	—	180	—	—	—	86	—	8.5	—	14	92
50-24816	MD50-06-65506	200	51	—	10	280	—	—	130	—	—	—	110	—	—	—	18	89
50-24816	MD50-06-65505	215.8	100	—	11	250	—	—	120	—	—	—	110	—	—	7.3	18	84
50-24817	MD50-06-65903	20	—	—	—	39	—	—	38	—	—	—	130	4.3	—	8.5	5	44
50-24817	MD50-06-65904	50	130 (J)	0.68	—	15	—	—	15	1.2	2.2	5.7	51	1.6	—	3	2.5	17
50-24817	MD50-06-65905	100	210 (J)	—	—	10	—	—	15	2.1	—	—	22	—	—	2.3	2.1	19
50-24817	MD50-06-65906	140	—	—	—	320	—	—	170	—	—	—	410	—	—	—	65	420
50-24817	MD50-06-65907	200	—	—	—	420	—	—	140	—	—	—	420	—	—	—	68	400
50-24817	MD50-06-65908	240.9	—	—	—	220	—	—	140	—	—	—	310	—	—	—	46	310
50-24819	MD50-06-63863	20	24 (J)	—	—	57	—	—	110	—	—	—	58	—	—	—	—	30
50-24819	MD50-06-63864	50	73 (J)	—	—	79	—	—	130	—	—	—	81	—	—	—	14	61
50-24819	MD50-06-63865	100	—	—	—	52	—	—	93	—	—	—	59	—	—	—	12	50
50-24819	MD50-06-63866	140	24 (J)	—	—	43	—	—	61	—	—	—	45	—	—	—	9	35
50-24819	MD50-06-63867	200	49	—	—	61	—	20	85	—	—	—	68	—	6.7	—	22 (J+)	57
50-24819	MD50-06-63868	250	—	—	—	100	—	—	100	—	—	—	110	—	—	—	34 (J+)	69

Table F-2.10-4 (continued)

Location ID	Sample ID	Depth (ft)	Acetone	Benzene	Butanone[2-]	Carbon Tetrachloride	Chlorodibromomethane	Chlorodifluoromethane	Chloroform	Chloromethane	Dichloro-1,1,2,2-tetrafluoroethane[1,2-]	Dichlorobenzene[1,2-]	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]
50-24819	MD50-06-63869	275	71	—	—	120	—	—	140	—	—	—	120	—	—	—	42 (J+)	95
50-24820	MD50-06-64240	20	250	—	—	170	—	—	220	—	—	—	120	—	—	—	31	—
50-24820	MD50-06-64241	50	—	—	—	340	—	—	410	—	—	—	230	—	—	—	67	—
50-24820	MD50-06-64242	100	230 (J)	—	—	110	—	—	170	—	—	—	73	—	10	—	27	—
50-24820	MD50-06-64243	140	—	—	—	630	—	—	710	—	—	—	440	—	—	—	160	—
50-24820	MD50-06-64244	200	—	—	—	630	—	—	750	—	—	—	450	—	—	—	190	—
50-24820	MD50-06-64245	225	—	—	—	650	—	—	760	—	—	—	450	—	—	—	200	—
50-24821	MD50-06-64248	20	—	—	—	330	—	—	350	—	—	—	500	—	—	—	93	—
50-24821	MD50-06-64249	50	—	—	—	340	—	—	350	—	—	—	510	—	—	—	100	—
50-24821	MD50-06-64250	100	—	—	—	—	—	—	38	—	—	—	—	120	—	400	89	—
50-24821	MD50-06-64251	140	—	—	—	280	—	—	400	—	—	—	520	—	—	—	100	—
50-24821	MD50-06-64254	160	—	—	—	410	—	—	420	—	—	—	560	—	—	—	150	—
50-24821	MD50-06-64252	200	—	—	—	270	—	—	460	—	—	—	530	—	—	—	170	—
50-24821	MD50-06-64253	238.4	—	—	—	360	—	—	520	—	—	—	720	—	—	—	190	—
50-24822	MD50-06-64928	20	95 (J)	—	—	16	—	—	68	—	—	—	88	—	—	—	—	—
50-24822	MD50-06-64929	50	—	—	—	—	—	—	130	—	—	—	190	—	—	—	23	—
50-24822	MD50-06-64930	100	—	—	—	19	—	—	62	—	—	—	95	—	—	—	9.8	—
50-24822	MD50-06-64931	140	150 (J)	—	—	—	—	—	35	—	—	—	33	—	—	—	6.2	—
50-24822	MD50-06-64932	200	—	—	—	—	—	—	120	—	—	—	160	—	—	—	33	—
50-24822	MD50-06-64933	250	—	—	—	—	—	—	240	—	—	—	300	—	—	—	66	—

Table F-2.10-4 (continued)

Location ID	Sample ID	Depth (ft)	Ethylbenzene	Ethyltoluene[4-]	Methylene Chloride	n-Heptane	Styrene	Tetrachloroethene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene (Total)	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
50-24766	MD50-06-65331	17	—	—	—	—	—	600	—	30	15	—	440	—	—	—	—	—	—
50-24766	MD50-06-65330	29	—	—	—	—	—	660	—	84	42	—	1400	—	—	—	—	—	—
50-24766	MD50-06-65329	99	—	—	11	—	—	340	—	76	37	—	1100	—	—	—	—	—	—
50-24766	MD50-06-65328	124	—	—	27	—	—	600	—	230	85	—	2700	—	—	—	—	—	—
50-24766	MD50-06-65327	149	—	—	160	—	—	1400	—	500	150	—	8200	—	—	—	—	—	—
50-24767	MD50-06-65362	10	—	—	40	—	—	460	—	1700	270	—	5500	—	—	—	—	—	—
50-24767	MD50-06-65361	30	—	—	39	—	—	450	—	1800	270	—	5900	—	—	—	—	—	—
50-24767	MD50-06-65360	60	—	—	48	—	—	330	—	1900	280	—	4500	—	—	—	—	—	—
50-24767	MD50-06-65359	124	—	—	76	—	—	160	—	1100	160	—	3600	—	—	—	—	—	—
50-24767	MD50-06-65358	149	—	—	120	—	—	70	—	180	33	—	2900	—	—	—	—	—	—
50-24768	MD50-06-65370	14	—	—	—	—	—	2.8	1.9	17	1.3	—	24	29	—	—	—	—	—
50-24768	MD50-06-65369	29	—	—	—	—	—	6.2	—	14	3.6	—	90	13	—	—	—	—	—
50-24768	MD50-06-65368	99	—	—	0.76	—	—	6.1	—	16	4	—	150	8.5	—	—	—	—	—
50-24768	MD50-06-65367	125	—	—	9.4	—	—	24	—	120	32	—	1100	—	—	—	—	—	—
50-24768	MD50-06-65366	150	—	—	36	—	—	27	—	190	38	—	1400	14	—	—	—	—	—
50-24769	MD50-06-65378	20	—	—	8.8	—	—	200	7.8	95	26	15	3600	—	—	—	—	—	—
50-24769	MD50-06-65377	39	240	22	—	—	76	—	610	—	—	—	430	—	29	11	240	39	—
50-24769	MD50-06-65376	99	1.3	—	1	—	—	16	1.7	6.7	2.1	4.5	510	2.7	—	—	7.4	1.7	—
50-24769	MD50-06-65375	124	—	—	—	—	—	50	12	32	—	11	1100	—	—	—	27	—	—
50-24769	MD50-06-65374	149	11	—	—	—	—	47	90	38	—	11	1600	—	—	—	32	8.9	—
50-24770	MD50-06-65387	20	—	—	—	—	—	14000	—	350	—	—	13000	—	—	—	—	—	—
50-24770	MD50-06-65386	25	—	—	—	—	—	12000	—	370	—	—	13000	—	—	—	—	—	—
50-24770	MD50-06-65385	39	—	—	—	—	—	8200	—	460	—	—	17000	—	—	—	—	—	—
50-24770	MD50-06-65384	100	—	—	130	—	—	2400	—	550	—	—	21000	—	—	—	—	—	—
50-24770	MD50-06-65383	124	—	—	250	—	—	2100	—	530	—	—	25000	—	—	—	—	—	—

Table F-2.10-4 (continued)

Location ID	Sample ID	Depth (ft)	Ethylbenzene	Ethyltoluene[4-]	Methylene Chloride	n-Heptane	Styrene	Tetrachloroethene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene (Total)	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
50-24770	MD50-06-65382	148	—	—	920	—	—	3500	—	1400	300	—	57000	—	—	—	—	—	—
50-24771	MD50-06-65394	17	—	—	42	—	—	550	—	210	46 (J)	—	6700	—	—	—	—	—	—
50-24771	MD50-06-65393	40	—	—	50	—	—	730	—	280	60 (J)	—	10000	—	—	—	—	—	—
50-24771	MD50-06-65392	100	—	—	40	—	—	110	—	36	16 (J)	11	2300	—	—	—	—	—	—
50-24771	MD50-06-65391	125	—	—	460	—	—	830	—	260	—	—	16000	—	—	—	—	—	—
50-24771	MD50-06-65390	149	—	—	1600	—	—	2300	—	520	—	—	77000	—	—	—	—	—	—
50-24773	MD50-06-65405	20	—	—	44	—	—	330	—	120	—	—	4800	—	—	—	—	—	—
50-24773	MD50-06-65404	40	—	—	65	—	—	690	—	280	58 (J)	—	11000	—	—	—	—	—	—
50-24773	MD50-06-65403	100	—	—	91	—	—	310	—	97	—	—	6400	—	—	—	—	—	—
50-24773	MD50-06-65402	125	—	—	240	—	—	1200	—	390	81 (J)	—	19000	—	—	—	—	—	—
50-24773	MD50-06-65401	149	—	—	1100	—	—	1100	—	360	—	—	22000	—	—	—	—	—	—
50-24782	MD50-06-65413	21	—	—	20	—	—	310	—	65	14	—	1800	14	—	—	—	—	—
50-24782	MD50-06-65412	40	—	—	20	—	—	430	53	54	—	—	3000	—	—	—	—	—	—
50-24782	MD50-06-65411	100	—	—	55	—	—	150	—	31	—	—	1600	—	—	—	—	—	—
50-24782	MD50-06-65410	125	—	—	180	—	—	510	77	130	—	—	6100	—	—	—	—	—	—
50-24782	MD50-06-65409	151	—	—	1100	—	—	1500	—	260	—	—	22000	—	—	—	—	—	—
50-24783	MD50-06-65421	20	—	—	38	—	—	410	—	69	38	—	3100	—	—	—	—	—	—
50-24783	MD50-06-65420	36	—	—	12	—	—	120	—	16	12	—	860	—	—	—	—	—	—
50-24783	MD50-06-65419	100	—	—	31	—	—	160	—	31	—	—	1500	—	—	—	—	—	—
50-24783	MD50-06-65418	125	—	—	140	—	—	910	—	150	—	—	8300	—	—	—	—	—	—
50-24783	MD50-06-65417	148	—	—	300	—	—	720	—	120	—	—	8600	—	—	—	—	—	—
50-24784	MD50-06-70724	10	—	—	12	—	—	2000	—	88	92	—	2600	—	—	—	—	—	—
50-24784	MD50-06-70723	20	—	—	—	—	—	2000	—	79	110	—	1900	—	—	—	—	—	—
50-24784	MD50-06-70722	47	—	—	13	—	—	1500	71	69	48	—	2000	15	—	—	21	—	—
50-24784	MD50-06-70721	49	—	—	8.4	—	—	1900	—	80	59	—	2200	15	—	—	11	—	—

Table F-2.10-4 (continued)

Location ID	Sample ID	Depth (ft)	Ethylbenzene	Ethyltoluene[4-]	Methylene Chloride	n-Heptane	Styrene	Tetrachloroethene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene (Total)	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
50-24784	MD50-06-65292	55	—	—	11	—	—	2500	—	110	75	—	2900	—	—	—	—	—	—
50-24784	MD50-06-65291	100	—	—	6.2	—	—	1300	3.6	70	49	—	1700	9.4	—	—	—	—	5.4
50-24784	MD50-06-65290	168	8.6	—	14	9.8	—	1200	9	70	33	—	2300	11	—	—	—	9.8	31
50-24784	MD50-06-65289	199	—	—	—	—	—	230	—	10	4.8	—	370	—	—	—	—	—	—
50-24784	MD50-06-65288	250	—	—	14	—	—	1100	—	42	30	—	2200	10	—	—	—	—	—
50-24784	MD50-06-65287	265	—	—	22	—	—	1400	—	54	27	—	3200	14	—	—	—	—	—
50-24785	MD50-06-66783	10	—	—	22	—	—	3900	—	76	49	—	2100	—	—	—	—	—	—
50-24785	MD50-06-65300	19	—	—	24	—	—	3300	—	74	39	—	1900	—	—	—	—	—	—
50-24785	MD50-06-65299	60	—	—	18	—	—	3700	—	92	59	—	2800	—	—	—	—	—	—
50-24785	MD50-06-65298	120	—	—	26	—	—	3900	—	180	100	—	3900	26	—	—	—	—	—
50-24785	MD50-06-65297	200	—	—	34	—	—	2600	—	91	59	—	4100	—	—	—	—	—	—
50-24785	MD50-06-65296	250	—	—	43	—	—	3000	—	94	62	—	5100	—	—	—	—	—	—
50-24785	MD50-06-65295	256	—	—	21	—	—	1100	—	240	120	—	3400	23	—	—	—	—	—
50-24796	MD50-06-65308	10	1.1	—	1.8	—	—	210	33	33	9.3	—	300	6.1	—	—	5.7	1.4	—
50-24796	MD50-06-65307	20	20	9.1 (J)	2.1	—	—	320	60	38	12	—	440	7.7	7.3	3	120	30	—
50-24796	MD50-06-65306	40	2.7	—	6.4	—	—	590	16	110	32	—	1300	17	—	—	14	3.1	—
50-24796	MD50-06-65305	100	—	—	39	—	—	680	—	270	52	—	1600	20	—	—	—	—	—
50-24796	MD50-06-65304	120	—	—	28	—	—	690	69	290	67	—	1900	20	—	—	14	—	—
50-24796	MD50-06-65303	144	—	—	55	—	—	970	47	420	82	—	3000	21	—	—	31	—	—
50-24797	MD50-06-65315	18.3	—	—	—	—	—	1100	—	180	66 (J)	—	1900	190	—	—	—	—	—
50-24797	MD50-06-65314	38	—	—	13	—	—	960	—	200	73 (J)	—	2600	75	—	—	—	—	—
50-24797	MD50-06-65313	60	—	—	23	—	—	620	—	200	49	—	1800	45	—	—	—	—	—
50-24797	MD50-06-65312	120	—	—	84	—	—	1400	—	640	130	—	5700	—	—	—	—	—	—
50-24797	MD50-06-65311	154	—	—	210	—	—	1600	—	470	120	—	9100	—	—	—	—	—	—
50-24799	MD50-06-65323	20	—	—	21	—	—	1100	—	87	30	—	2400	—	—	—	—	—	—

Table F-2.10-4 (continued)

Location ID	Sample ID	Depth (ft)	Ethylbenzene	Ethyltoluene[4-]	Methylene Chloride	n-Heptane	Styrene	Tetrachloroethene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene (Total)	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
50-24799	MD50-06-65322	32.5	—	—	39	—	—	1700	—	180	62	—	5200	—	—	—	—	—	—
50-24799	MD50-06-65321	100	—	—	15	—	—	340	—	—	12	—	1200	—	—	—	—	—	—
50-24799	MD50-06-65320	120	—	—	22	—	—	290	—	35	—	—	1400	—	—	—	—	—	—
50-24799	MD50-06-65319	160	—	—	99	—	—	600	—	97	37	—	4800	—	—	—	—	—	—
50-24801	MD50-06-65429	20	—	—	—	—	—	160	—	—	22	—	800	—	—	—	—	—	—
50-24801	MD50-06-65428	35	—	—	31	—	—	760	—	110	40	—	3800	—	—	—	—	—	—
50-24801	MD50-06-65427	80	—	—	45	—	—	780	—	120	46	—	4100	—	—	—	—	—	—
50-24801	MD50-06-65426	120	—	—	110	—	—	1000	—	180	61	—	6700	—	—	—	—	—	—
50-24801	MD50-06-65425	150	—	—	340	—	—	1400	—	270	—	—	13000	—	—	—	—	—	—
50-24802	MD50-06-65437	15	—	—	3.4	—	—	48	—	—	9.3	—	540	—	—	—	—	—	—
50-24802	MD50-06-65436	42	—	—	31	—	—	360	32	48	—	—	3600	—	—	—	—	—	—
50-24802	MD50-06-65435	99	—	—	56	—	—	430	—	57	—	—	4600	—	—	—	—	—	—
50-24802	MD50-06-65434	124	—	—	110	—	—	630	—	110	—	—	7400	—	—	—	—	—	—
50-24802	MD50-06-65433	156	—	—	120	—	—	310	—	—	—	—	4700	—	—	—	—	—	—
50-24803	MD50-06-65445	16	—	—	—	—	—	110	—	—	—	—	1300	—	—	—	—	—	—
50-24803	MD50-06-65444	37	—	—	8.8	—	—	150	—	17	—	—	1900	—	—	—	—	—	—
50-24803	MD50-06-65443	99.5	—	—	14	—	—	120	—	—	—	—	1700	—	—	—	—	—	—
50-24803	MD50-06-65442	124	—	—	35	—	—	130	—	—	—	—	2200	—	—	—	—	—	—
50-24803	MD50-06-65441	150	—	—	75	—	—	130	—	—	—	—	2400	—	—	—	—	—	—
50-24804	MD50-06-65454	10	1.7	—	—	—	—	8.4	4.4	—	—	—	55	2.4	—	—	9.8	3.6	—
50-24804	MD50-06-65453	16	—	—	7.4	—	—	150	—	—	—	—	1900	—	—	—	—	—	—
50-24804	MD50-06-65452	33	—	—	—	—	—	53	—	—	—	—	800	—	—	—	—	—	—
50-24804	MD50-06-65451	99	—	—	18	—	—	170	—	—	—	—	1800	—	—	—	13	—	—
50-24804	MD50-06-65450	124	—	—	100	—	—	420	—	—	—	—	6500	—	—	—	—	—	—
50-24804	MD50-06-65449	149	—	—	210	—	—	460	—	70	—	—	8400	—	—	—	—	—	—

Table F-2.10-4 (continued)

Location ID	Sample ID	Depth (ft)	Ethylbenzene	Ethyltoluene[4-]	Methylene Chloride	n-Heptane	Styrene	Tetrachloroethene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene (Total)	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
50-24810	MD50-06-65461	19	—	—	—	—	—	75	19	—	—	—	1100	—	—	—	—	—	—
50-24810	MD50-06-65460	37	—	—	—	—	—	90	—	—	—	—	1400	—	—	—	—	—	—
50-24810	MD50-06-65459	99	—	—	8.5	—	—	53	—	—	—	—	980	—	—	—	24	6	—
50-24810	MD50-06-65458	123	—	—	97	—	—	480	—	—	—	—	7500	—	—	—	—	—	—
50-24810	MD50-06-65457	150	—	—	48	—	—	180	—	28	—	—	3100	—	—	—	—	—	—
50-24811	MD50-06-65469	20	—	—	—	—	—	380	—	—	—	—	3000	51	—	—	—	—	—
50-24811	MD50-06-65468	40	—	—	33	—	—	520	—	—	—	—	6800	—	—	—	—	—	—
50-24811	MD50-06-65467	98	—	—	140	—	—	500	—	—	—	—	10000	—	—	—	—	—	—
50-24811	MD50-06-65466	125	—	—	190	—	—	470	—	—	—	—	10000	—	—	—	—	—	—
50-24811	MD50-06-65465	150	—	—	840	—	—	820	—	—	—	—	27000	—	—	—	—	—	—
50-24812	MD50-06-65477	10	—	—	24	—	—	230	—	—	—	—	3500	—	—	—	—	—	—
50-24812	MD50-06-65476	35	—	—	51	—	—	390	—	—	—	—	7500	—	—	—	—	—	—
50-24812	MD50-06-65474	98	—	—	24	—	—	210	—	—	—	—	3700	—	—	—	—	—	—
50-24812	MD50-06-65475	123	—	—	44	—	—	150	—	—	—	25	4000	—	—	—	—	—	—
50-24812	MD50-06-65473	150	—	25	46	—	—	86	—	—	—	17	2100	—	17	16	34	9.9	—
50-24813	MD50-06-65485	20	—	—	—	—	—	30	—	—	—	—	1300	—	—	—	9	—	—
50-24813	MD50-06-65484	30	—	—	—	—	—	28	—	—	—	—	1200	—	—	—	16	—	—
50-24813	MD50-06-65483	99	—	—	12	—	—	32	—	—	—	14	2200	—	—	—	10	—	—
50-24813	MD50-06-65482	125	—	—	140	—	—	430	—	—	—	—	25000	—	—	—	—	—	—
50-24813	MD50-06-65481	150	—	—	480	—	—	460	—	—	—	100	31000	—	—	—	—	—	—
50-24814	MD50-06-65493	10	—	—	—	—	—	73	—	—	—	—	6500	—	—	—	—	—	—
50-24814	MD50-06-65492	30	—	—	1.2	—	—	10	—	—	—	2.5	890	3.9	—	—	—	—	—
50-24814	MD50-06-65491	99	—	—	8.5	—	—	26	—	—	—	—	2000	—	—	—	—	—	—
50-24814	MD50-06-65490	124	—	—	44	—	—	78	—	—	—	—	6700	—	—	—	—	—	—
50-24814	MD50-06-65489	149	—	—	190	—	—	170	—	—	—	—	16000	—	—	—	—	—	—

Table F-2.10-4 (continued)

Location ID	Sample ID	Depth (ft)	Ethylbenzene	Ethyltoluene[4-]	Methylene Chloride	n-Heptane	Styrene	Tetrachloroethene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene (Total)	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
50-24815	MD50-06-65501	30	—	—	—	—	—	340	—	—	—	—	23000	—	—	—	—	—	—
50-24815	MD50-06-65500	40	—	—	64	—	—	460	—	160	—	110	24000	—	—	—	—	—	—
50-24815	MD50-06-65499	100	—	—	78	—	—	500	—	—	—	120	29000	—	—	—	—	—	—
50-24815	MD50-06-65498	125	—	—	86	—	—	320	—	—	—	—	22000	—	—	—	—	—	—
50-24815	MD50-06-65497	149	—	—	56	—	—	180	—	—	—	—	12000	—	—	—	—	—	—
50-24816	MD50-06-65510	25	—	—	—	—	—	1900	—	54	30	—	1100	24	—	—	—	—	—
50-24816	MD50-06-65509	35	—	—	—	—	—	3500	—	120	47	—	2000	34	—	—	—	—	—
50-24816	MD50-06-65508	65	—	—	4.7	—	—	1300	—	83	27	—	1600	14	—	—	—	—	—
50-24816	MD50-06-65507	120	—	—	11	—	—	1800	—	120	58	—	2600	18	—	—	—	—	—
50-24816	MD50-06-65506	200	—	—	22	—	—	2100	—	110	62	—	3800	20	—	—	—	—	—
50-24816	MD50-06-65505	215.8	—	—	19	—	—	1600	—	98	56	—	3300	18	—	—	—	—	—
50-24817	MD50-06-65903	20	—	—	5.4	—	—	250	—	260	81	—	1000	23 (J)	—	—	—	—	—
50-24817	MD50-06-65904	50	9.8	—	2.1	—	—	96	3.1	94	32	—	370	9.6 (J)	—	—	39 (J)	13	—
50-24817	MD50-06-65905	100	6	—	3.8	—	—	61	5.6	59	22	—	300	6.9	—	—	32	—	—
50-24817	MD50-06-65906	140	—	—	94	—	—	1600	—	950	260	—	5800	49	—	—	—	—	—
50-24817	MD50-06-65907	200	—	—	84	—	—	1500	—	760	220	—	5900	51	—	—	—	—	—
50-24817	MD50-06-65908	240.9	—	—	60	—	—	1100	—	980	220	—	4400	—	—	—	—	—	—
50-24819	MD50-06-63863	20	—	—	9.9	—	—	790	—	95	42	—	2300	—	—	—	—	—	—
50-24819	MD50-06-63864	50	—	—	29	—	—	710	—	140	47	—	2800	—	—	—	—	—	—
50-24819	MD50-06-63865	100	—	—	25	—	—	430	—	92	31	—	1900	—	—	—	—	—	—
50-24819	MD50-06-63866	140	—	—	27	—	—	270	—	66	21	—	1400	—	—	—	—	—	—
50-24819	MD50-06-63867	200	9.6	—	65	220	—	400	10	57	22	—	2500	7.3	—	—	—	10	35
50-24819	MD50-06-63868	250	—	—	100	140	—	570	—	78	30	—	4000	—	—	—	—	—	20
50-24819	MD50-06-63869	275	—	—	130	—	—	860	35	87	35	—	5200	—	—	—	—	—	28
50-24820	MD50-06-64240	20	—	—	30	—	—	140	—	—	—	—	4000	—	—	—	29	—	—

Table F-2.10-4 (continued)

Location ID	Sample ID	Depth (ft)	Ethylbenzene	Ethyltoluene[4-]	Methylene Chloride	n-Heptane	Styrene	Tetrachloroethene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene (Total)	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
50-24820	MD50-06-64241	50	—	—	69	—	—	240	—	—	—	—	7400	—	—	—	—	—	—
50-24820	MD50-06-64242	100	—	—	51	—	—	81	—	—	—	—	2900	—	—	—	—	—	—
50-24820	MD50-06-64243	140	—	—	370	—	—	470	—	—	—	—	18000	—	—	—	—	—	—
50-24820	MD50-06-64244	200	—	—	590	—	—	600	—	—	—	—	24000	—	—	—	—	—	—
50-24820	MD50-06-64245	225	—	—	620	—	—	690	—	—	—	—	26000	—	—	—	—	—	—
50-24821	MD50-06-64248	20	—	—	150	—	—	220	—	—	—	—	9800	—	—	—	—	—	—
50-24821	MD50-06-64249	50	—	—	180	—	—	230	—	—	—	—	10000	—	—	—	—	—	—
50-24821	MD50-06-64250	100	—	—	—	—	70	1800	—	—	11	29	8200	—	—	—	—	—	—
50-24821	MD50-06-64251	140	—	—	120	—	—	230	—	—	—	—	13000	—	—	—	—	—	—
50-24821	MD50-06-64254	160	—	—	450	—	—	360	—	—	—	—	20000	—	—	—	—	—	—
50-24821	MD50-06-64252	200	—	—	450	—	—	270	—	—	—	—	23000	—	—	—	—	—	—
50-24821	MD50-06-64253	238.4	—	—	560	—	—	370	—	—	—	—	31000	—	—	—	—	—	—
50-24822	MD50-06-64928	20	—	—	—	—	—	15	—	—	—	—	1900	—	—	—	—	—	—
50-24822	MD50-06-64929	50	—	—	—	—	—	31	—	—	—	—	4000	—	—	—	—	—	—
50-24822	MD50-06-64930	100	—	—	9.8	—	—	15	—	—	—	—	2100	—	—	—	—	—	—
50-24822	MD50-06-64931	140	—	—	11	—	—	—	5.8	—	—	—	1100	—	—	—	—	—	—
50-24822	MD50-06-64932	200	—	—	72	—	—	—	—	—	—	—	5500	—	—	—	—	—	—
50-24822	MD50-06-64933	250	—	—	140	—	—	—	—	—	—	—	12000	—	—	—	—	—	—

Note: Units are µg/m³.

* — = Not detected.

Table F-2.12-1
Summary of Samples Collected for
Evaluating Correlation of VOC Distribution in Tuff and Pore Gas

Location ID	Sample ID	Depth (ft)	Media	Collection Date	Tritium	VOC
50-26823	MD50-06-72711	19.7–20	QBT3	8/7/2006	— ^a	5697S ^b
50-26823	MD50-06-72730	20	GAS	8/14/2006	5828S	5827S
50-26823	MD50-06-72712	37.2–37.5	QBT3	8/7/2006	—	5697S
50-26823	MD50-06-72729	37.5	GAS	8/14/2006	5828S	5827S
50-26823	MD50-06-72713	69.7–70	QBT3	8/7/2006	—	5697S
50-26823	MD50-06-72728	70	GAS	8/14/2006	5828S	5827S
50-26823	MD50-06-72714	98.9–99.2	QBT3	8/8/2006	—	5723S
50-26823	MD50-06-72727	99	GAS	8/11/2006	5757S	5756S
50-26823	MD50-06-72715	148.3–148.5	QBT2	8/8/2006	—	5723S
50-26823	MD50-06-72726	148.5	GAS	8/11/2006	5757S	5756S
50-26823	MD50-06-72716	199.7–200	QBT1V	8/8/2006	—	5723S
50-26823	MD50-06-72725	200	GAS	8/10/2006	5736S	5735S
50-26823	MD50-06-72717	249.7–250	QBT1G	8/8/2006	—	5723S
50-26823	MD50-06-72724	250	GAS	8/10/2006	5736S	5735S
50-26823	MD50-06-72718	299.7–300	QBT1G	8/9/2006	—	5723S
50-26823	MD50-06-72723	300	GAS	8/9/2006	5736S	5735S
50-26824	MD50-06-72739	19.7–20	QBT3	8/3/2006	—	5692S
50-26824	MD50-06-72751	20	GAS	8/16/2006	5830S	5829S
50-26824	MD50-06-72740	37.2–37.5	QBT3	8/3/2006	—	5692S
50-26824	MD50-06-72750	37.5	GAS	8/16/2006	5830S	5829S
50-26824	MD50-06-72741	69.6–70	QBT3	8/3/2006	—	5692S
50-26824	MD50-06-72749	70	GAS	8/16/2006	5830S	5829S
50-26824	MD50-06-72742	99.7–100	QBT3	8/3/2006	—	5692S
50-26824	MD50-06-72748	100	GAS	8/15/2006	5830S	5829S
50-26824	MD50-06-72743	149.7–150	QBT2	8/3/2006	—	5692S
50-26824	MD50-06-72747	150	GAS	8/15/2006	5830S	5829S
50-26824	MD50-06-72744	195.5–200	QBT1V	8/3/2006	—	5692S
50-26824	MD50-06-72746	200	GAS	8/15/2006	5830S	5829S
50-26825	MD50-06-72757	19.5–20	QBT3	7/31/2006	—	5664S
50-26825	MD50-06-72770	20	GAS	8/18/2006	5872S	5871S
50-26825	MD50-06-72758	36.8–37.5	QBT3	7/31/2006	—	5664S
50-26825	MD50-06-72768	37.5	GAS	8/18/2006	5872S	5871S
50-26825	MD50-06-72759	69–69.3	QBT3	8/1/2006	—	5668S
50-26825	MD50-06-72767	69	GAS	8/17/2006	5872S	5871S
50-26825	MD50-06-72760	99.4–99.7	QBT3	8/1/2006	—	5668S
50-26825	MD50-06-72766	99.5	GAS	8/17/2006	5872S	5871S

Table F-2.12-1 (continued)

Location ID	Sample ID	Depth (ft)	Media	Collection Date	Tritium	VOC
50-26825	MD50-06-72761	148.7–149	QBT2	8/1/2006	—	5668S
50-26825	MD50-06-72765	149	GAS	8/17/2006	5872S	5871S
50-26825	MD50-06-72762	199.7–200	QBT1V	8/2/2006	—	5670S
50-26825	MD50-06-72764	200	GAS	8/17/2006	5872S	5871S

^a — = Analysis not requested.

^b Analytical request number.

Table F-2.12-2
Frequency of Organic Chemicals (VOCs) Detected in Tuff for
Evaluating Correlation of VOC Distribution in Tuff and Pore Gas

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range* (mg/kg)	Frequency of Detect	Maximum Detect (mg/kg)
Acetone	QBT1V	3	1	0.00322 to [0.00641]	1/3	0.00322
Acetone	QBT2	3	1	0.00329 to [0.00639]	1/3	0.00329
Acetone	QBT3	12	2	0.00302 to [0.0061]	2/12	0.00422
Chloroform	QBT1G	2	1	0.000381 to [0.00156]	1/2	0.000381
Chloroform	QBT3	12	1	[0.000252] to [0.00119]	1/12	0.000524
Methylene Chloride	QBT3	12	3	0.00447 to [0.00595]	3/12	0.00592
Trichloroethene	QBT1G	2	1	[0.00156] to 0.00235	1/2	0.00235
Trichloroethene	QBT3	12	1	[0.00102] to 0.00182	1/12	0.00182

*Values in brackets indicate nondetects.

Table F-2.12-3
Summary of Organic Chemicals (VOCs) Detected in Tuff for
Evaluating Correlation of VOC Distribution in Tuff and Pore Gas

Location ID	Sample ID	Depth (ft)	Media	Acetone	Chloroform	Methylene Chloride	Trichloroethene
50-26823	MD50-06-72711	19.70–20.00	QBT3	—*	—	0.00592 (J)	—
50-26823	MD50-06-72712	37.20–37.50	QBT3	—	—	0.00447 (J)	—
50-26823	MD50-06-72713	69.70–70.00	QBT3	—	—	0.00541 (J)	—
50-26823	MD50-06-72718	299.70–300.00	QBT1G	—	0.000381 (J)	—	0.00235
50-26824	MD50-06-72739	19.70–20.00	QBT3	—	0.000524 (J)	—	0.00182
50-26825	MD50-06-72759	69.00–69.30	QBT3	0.00422 (J)	—	—	—
50-26825	MD50-06-72760	99.40–99.70	QBT3	0.00302 (J)	—	—	—
50-26825	MD50-06-72761	148.70–149.00	QBT2	0.00329 (J)	—	—	—
50-26825	MD50-06-72762	199.70–200.00	QBT1V	0.00322 (J)	—	—	—

Note: Units are mg/kg.

*— = Not detected.

Table F-2.12-4
Frequency of Organic Chemicals (VOCs) Detected in Pore Gas for Evaluating Correlation of VOC Distribution in Tuff and Pore Gas

Analyte	Number of Analyses	Number of Detects	Number of Detected Locations	Concentration Range (µg/m³)	Location of Maximum Detected	Maximum Detect (µg/m³)
Acetone	20	3	2	26 to [1000]*	50-26825 (69 ft)	78
Benzene	20	1	1	2.3 to [280]	50-26825 (69 ft)	2.3
Butanone[2-]	20	1	1	6.3 to [1300]	50-26825 (69 ft)	6.3
Carbon tetrachloride	20	18	3	1.9 to 3200	50-26823 (99 ft)	3200
Chloroform	20	19	3	[0.97] to 3200	50-26823 (99 & 148.5 ft)	3200
Chloromethane	20	1	1	2.3 to [360]	50-26825 (99 ft)	2.3
Dichlorodifluoromethane	20	20	3	8.3 to 1200	50-26823 (200 ft)	1200
Dichloroethane[1,2-]	20	1	1	[0.81] to [360]	50-26823 (37.5 ft)	63
Dichloroethene[cis-1,2-]	20	19	3	[0.79] to 700	50-26823 (200 ft)	700
Dichloropropane[1,2-]	20	10	2	[0.92] to [410]	50-26825 (200 ft)	250
Ethylbenzene	20	1	1	1.6 to [380]	50-26825 (69 ft)	1.6
Methylene chloride	20	18	3	[6.7] to 2200	50-26823 (200 & 250 ft)	2200
Styrene	20	1	1	5.8 to [380]	50-26825 (69 ft)	5.8
Tetrachloroethene	20	20	3	2.9 to 1800	50-26823 (99 & 148.5 ft)	1800
Toluene	20	1	1	[7.5] to [330]	50-26825 (69 ft)	14
Trichloro-1,2,2-trifluoroethane[1,1,2-]	20	14	3	[3.1] to [680]	50-26823 (99 ft)	540
Trichloroethane[1,1,1-]	20	8	2	[1.1] to [480]	50-26824 (37.5 ft)	120
Trichloroethene	20	19	3	6.9 to 64000	50-26823 (200 ft)	64000
Trichlorofluoromethane	20	4	1	4.1 to [500]	50-26825 (20 ft)	49
Trimethylbenzene[1,2,4-]	20	1	1	2 to [430]	50-26825 (69 ft)	2
Xylene (Total)	20	1	1	7.8 to [390]	50-26825 (69 ft)	7.8
Xylene[1,2-]	20	1	1	2.1 to [390]	50-26825 (69 ft)	2.1

*Values in brackets indicate nondetects.

Table F-2.12-5

Summary of Organic Chemicals (VOCs) Detected in Pore Gas for Evaluating Correlation of VOC Distribution in Tuff and Pore Gas

Location ID	Sample ID	Depth (ft)	Acetone	Benzene	Butanone[2-]	Carbon Tetrachloride	Chloroform	Chloromethane	Dichlorodifluoromethane	Dichloroethane[1,2-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Ethylbenzene	Methylene Chloride	Styrene	Tetrachloroethene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Xylene (Total)	Xylene[1,2-]
50-26823	MD50-06-72730	20	—*	—	—	1000	1200	—	440	—	130	—	—	120	—	630	—	200	—	11000	—	—	—	—
50-26823	MD50-06-72729	37.5	—	—	—	1400	1700	—	540	63	190	—	—	130	—	760	—	270	—	15000	—	—	—	—
50-26823	MD50-06-72728	70	—	—	—	850	1300	—	380	—	190	—	—	170	—	500	—	160	—	12000	—	—	—	—
50-26823	MD50-06-72727	99	—	—	—	3200	3200	—	1000 (J)	—	500	—	—	470	—	1800	—	540	—	38000	—	—	—	—
50-26823	MD50-06-72726	148.5	—	—	—	2300	3200	—	1100 (J)	—	680	—	—	1400	—	1800	—	—	—	51000	—	—	—	—
50-26823	MD50-06-72725	200	—	—	—	1800	2700	—	1200	—	700	—	—	2200	—	1700	—	—	—	64000	—	—	—	—
50-26823	MD50-06-72724	250	—	—	—	1300	2200	—	950	—	580	—	—	2200	—	1400	—	—	—	56000	—	—	—	—
50-26823	MD50-06-72723	300	—	—	—	1300	1900	—	900	—	510	—	—	2100	—	1500	—	—	—	54000	—	—	—	—
50-26824	MD50-06-72751	20	26	—	—	28	180	—	54 (J)	—	21	20 (J)	—	10	—	390	—	40	66	2500	—	—	—	—
50-26824	MD50-06-72750	37.5	—	—	—	—	460	—	140 (J)	—	55	58 (J)	—	—	—	980	—	110	120	6500	—	—	—	—
50-26824	MD50-06-72749	70	—	—	—	—	550	—	150 (J)	—	82	79 (J)	—	53	—	970	—	130	59	7600	—	—	—	—
50-26824	MD50-06-72748	100	—	—	—	78	500	—	150 (J)	—	77	76 (J)	—	87	—	850	—	120	—	7500	—	—	—	—
50-26824	MD50-06-72747	150	—	—	—	120	440	—	150 (J)	—	91	68 (J)	—	200	—	700	—	120	—	—	—	—	—	—
50-26824	MD50-06-72746	200	—	—	—	180	600	—	260 (J)	—	170	—	—	580	—	1100	—	—	—	16000	—	—	—	—
50-26825	MD50-06-72770	20	—	—	—	48	100	—	470	—	8	120	—	—	—	610	—	210	63	1900	49	—	—	—
50-26825	MD50-06-72768	37.5	50	—	—	43	120	—	450	—	17	120 (J)	—	7	—	650	—	250	56	2100	37 (J)	—	—	—
50-26825	MD50-06-72767	69	78	2.3	6.3	1.9	—	2.3	8.3	—	—	—	1.6	11	5.8	2.9	14	—	—	6.9	4.1	2	7.8	2.1
50-26825	MD50-06-72766	99.5	—	—	—	43	200	—	370	—	35	190 (J)	—	38	—	870	—	470	90	3400	32 (J)	—	—	—
50-26825	MD50-06-72765	149	—	—	—	110	200	—	290	—	57	210 (J)	—	88	—	1100	—	440	91	5300	—	—	—	—
50-26825	MD50-06-72764	200	—	—	—	170	220	—	340	—	80	250 (J)	—	130	—	1400	—	450	100	7600	—	—	—	—

Note: Units are $\mu\text{g}/\text{m}^3$.

*— = Not detected.

Table F-2.12-6
VOC Distribution in Tuff and Pore Gas

Colocated VOCs	Location ID	Depth (ft)	C _{tuff} (mg/kg)	C _{gas} (ug/m ³)
Acetone	50-26825	69	0.00422 (J)	78
Chloroform	50-26823	300	0.000381 (J)	1900
Chloroform	50-26824	20	0.000524 (J)	180
Methylene chloride	50-26823	20	0.00592 (J)	120
Methylene chloride	50-26823	37.5	0.00447 (J)	130
Methylene chloride	50-26823	70	0.00541 (J)	170
Trichloroethene	50-26823	300	0.00235	54000
Trichloroethene	50-26824	20	0.00182	2500

Table F-2.12-7
Frequency of Tritium Detected in Pore Gas for
Evaluating Correlation of VOC Distribution in Tuff and Pore Gas

Analyte	Number of Analyses	Number of Detects	Number of Detected Locations	Concentration Range (pCi/L)	Location of Maximum Detected	Maximum Detect (pCi/L)
Tritium	20	20	3	6394.157 to 1060320	50-26824 (37.5 ft)	1060320.25

Table F-2.12-8
Summary of Tritium Detected in Pore Gas for
Evaluating Correlation of VOC Distribution in Tuff and Pore Gas

Location ID	Sample ID	Depth (ft)	Tritium (pCi/L)
50-26823	MD50-06-72730	20	41111.09
50-26823	MD50-06-72729	37.5	122862.2
50-26823	MD50-06-72728	70	46559.7
50-26823	MD50-06-72727	99	22097.76
50-26823	MD50-06-72726	148.5	6394.157
50-26823	MD50-06-72725	200	6522.976
50-26823	MD50-06-72724	250	7163.889
50-26823	MD50-06-72723	300	7379.862
50-26824	MD50-06-72751	20	876535.5
50-26824	MD50-06-72750	37.5	1060320
50-26824	MD50-06-72749	70	94035.18
50-26824	MD50-06-72748	100	147738.6
50-26824	MD50-06-72747	150	9876.582
50-26824	MD50-06-72746	200	10211.09
50-26825	MD50-06-72770	20	10673.75 (J-)
50-26825	MD50-06-72768	37.5	10053.18 (J-)
50-26825	MD50-06-72767	69	10502.63 (J-)
50-26825	MD50-06-72766	99.5	8622.005 (J-)
50-26825	MD50-06-72765	149	9772.161 (J-)
50-26825	MD50-06-72764	200	10779.75 (J-)

Appendix G

Risk Assessments

EXECUTIVE SUMMARY

This appendix presents the results of the human health and ecological risk screening assessments conducted for Material Disposal Area (MDA) C, Solid Waste Management Unit 50-009, at Los Alamos National Laboratory. The results of historical and current sample analyses indicated inorganic, organic, and radionuclide chemicals of potential concern (COPCs) in the surface and subsurface soil, fill, and tuff at MDA C. The purpose of the risk screenings is to determine the potential risk posed by the COPCs at MDA C to human and ecological receptors. To determine if these COPCs represent a potential unacceptable risk or dose, exposure point concentrations (the 95% upper confidence limit of the mean or maximum detected concentrations) were compared with screening levels representing the industrial and residential (for informational purposes only) scenarios as well as ecological receptors potentially present at the site. The risk screening for the industrial scenario includes the area within the fenced area of MDA C as well as slightly outside the fence to a depth of 0.5 ft deep. The scope of the ecological risk screening includes the same area and extends to a depth of 5 ft.

The risk screening assessment for human health under the industrial scenario resulted in a carcinogenic risk of approximately 2×10^{-7} , a hazard index (HI) of approximately 0.01, and a total dose of 10 mrem/yr. The results of the risk screening assessment indicate no potential unacceptable risk, hazard, or dose under an industrial scenario at MDA C.

Several chemicals of potential ecological concern (COPECs) were identified. All of the COPECs were eliminated either because the HIs were less than 1.0 or the COPECs were detected infrequently at low concentrations resulting in relatively low HIs for a couple of receptors. The results of the ecological risk screening assessment do not indicate a potential risk to ecological receptors at MDA C.

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G-1.0 INTRODUCTION

This appendix presents the human health and ecological risk screening assessments conducted for Material Disposal Area (MDA) C, Solid Waste Management Unit (SWMU) 50-009, at Los Alamos National Laboratory (LANL or the Laboratory). MDA C is an inactive 11.8-acre fenced site located in Technical Area (TA) 50, in the east-central portion of the Laboratory on Mesita del Buey at the head of Ten Site Canyon (Figure 1.1-1 of the investigation report).

G-2.0 BACKGROUND

MDA C was established in May 1948 as a disposal area and decommissioned in April 1974. It consists of 7 pits and 108 shafts. Information regarding the dimensions of each pit and shaft, as well as dates of operations, is presented in the Resource Conservation and Recovery Act (RCRA) facility investigation (RFI) work plan for Operable Unit 1147 (LANL 1992, 07672, pp. 2-41 to 2-55) and the approved investigation work plan (LANL 2005, 91547). In 1984, a surface cover was emplaced, and the area was recontoured and seeded (LANL 1990, 07513, Section 50-009).

G-2.1 Site Description

The topography at MDA C slopes gently from west to northeast, gradually becoming steeper across the northeastern quadrant of the site toward Ten Site Canyon. The surface vegetation at MDA C consists of a native grama grass mixture that was established after the 1984 addition of the fill and topsoil cover placed over the pits and shafts. In 2002, localized surface subsidence on the north boundary of Pit 6 was observed. The subsidence may have promoted infiltration of stormwater and snowmelt into Pit 6 because it resulted in a hole along an asphalt drainage that carries runoff into Ten Site Canyon. The subsidence has since been mitigated (LANL 2005, 91547, p. 16).

The site was used for Laboratory waste management activities and has been decommissioned since 1974. The waste disposal activities conducted from 1948 to 1974 at MDA C are the source of contamination. Contaminants may have been released to the surface during deposition of the wastes into the pits and shafts, to the subsurface once wastes were deposited within the pits and shafts, and to the surface from burning of wastes and subsequent deposition of airborne particles. Waste previously emplaced remains, and no additional waste has been added since decommissioning. The site is fenced, and only Laboratory employees or contractors enter for management operations, such as emplacing erosion controls or collecting environmental samples.

G-2.2 Investigation Sampling and Determination of Chemicals of Potential Concern

Historical investigation and sampling at MDA C to ascertain the presence and scale of potential environmental contamination at MDA C fall into one of three categories:

1. pre-RFI activities conducted from 1956 to 1989 that included water infiltration tests, several surface radiation surveys, surface soil sampling, and pore-gas sampling.
2. Phase I RFI activities conducted from 1993 to 2003 that included geophysical surveys, biota screening and sampling, surface sampling (1993), and subsurface investigations (1995 core sampling and 2001–2003 pore-gas sampling).
3. recent investigation activities conducted from May 2004 to August 2006 that included sampling surface soil east of MDA C, drilling 36 boreholes, and sampling subsurface tuff and pore gas.

A review of the sampling results is provided in Appendix F. All detected organic chemicals were retained as chemicals of potential concern (COPCs) for the risk screening assessments. Radionuclides and inorganic chemicals were retained as COPCs for the risk screening assessments if they were

- detected at concentrations above their respective background value (BV) or fallout value (FV), and were above the maximum concentration in the background data set (LANL 1998, 59730), or
- detected if no BV or FV is available or applicable.

Tables G-2.2-1 and G-2.2-2 summarize the COPCs evaluated in the MDA C risk screening assessments, which are a subset of the COPCs presented in Appendix F because of the depth intervals used in the risk screening assessments (i.e., COPCs identified in Appendix F are based on data from all depths). The industrial and the ecological risk screening assessments are based on exposure to COPCs in the 0–0.5 ft below ground surface (bgs) and 0–5 ft bgs depths, respectively. However, at MDA C, the data sets for evaluating potential industrial and ecological risks and doses are identical because the only shallow samples collected were from the 0–0.5 ft bgs depth interval. The residential scenario, presented for informational purposes only, is evaluated using data from the 0–10 ft bgs depth interval. The residential data set includes the surface samples mentioned above as well as a sample collected from the 1–10-ft bgs depth from each of the following boreholes locations: 50-24767, 50-24784, 50-24785, 50-24796, 50-24804, 50-24812, 50-24814, and 50-24818.

Organic chemicals retained as COPCs and evaluated in the risk screening assessment for the industrial scenario are acenaphthene, Aroclor-1254, and Aroclor-1260. Organic chemicals retained as COPCs and evaluated in the risk screening assessment for the residential scenario (evaluated for informational purposes only) are acenaphthene; Aroclor-1254; Aroclor-1260; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; and 1,2,3,4,6,7,8,9-octachlorodibenzofuran.

Radionuclides retained as COPCs and evaluated in the risk screening assessment for the industrial scenario are americium-241, cesium-134, plutonium-238, plutonium-239, thorium-232, tritium, and uranium-238. Radionuclides retained as COPCs and evaluated in the risk screening assessment for the residential scenario (evaluated for informational purposes only) are americium-241, cesium-134, plutonium-238, plutonium-239, thorium-232, tritium, uranium-235, and uranium-238.

The surface sample results for inorganic chemicals were analyzed by the Laboratory's Chemistry, Science, and Technology Division (CST) (i.e., CST Onsite vintage data), and no documentation (i.e., quality assurance, quality control information) is available to support the results. Therefore, these data are screening level only, and no surface inorganic chemical data from an off-site analytical laboratory are available for the industrial scenario (see section G-5.1.1). Inorganic chemicals retained as COPCs and evaluated in the risk screening assessment for the residential scenario (evaluated for informational purposes only) are aluminum, arsenic, barium, chromium, cobalt, copper, lead, nitrate, perchlorate, selenium, and zinc. Calcium and magnesium were each detected in one sample from the 0–10 ft bgs depth interval. These inorganic chemicals were not retained as COPCs for the risk screening assessment because they are essential nutrients and were detected infrequently at concentrations either within the range of background concentrations or approximately twice the maximum background concentration.

As described above for the industrial scenario, no surface inorganic chemical data from an off-site analytical laboratory are available for the ecological risk screening assessment (see section G-6.5.3). The COPCs evaluated in ecological risk screening assessment are acenaphthene, Aroclor-1254, Aroclor-1260, americium-241, cesium-134, plutonium-238, plutonium-239, thorium-232, tritium, and uranium-238.

G-3.0 CONCEPTUAL SITE MODEL

G-3.1 Receptors and Exposure Pathways

The conceptual site model for human receptors at MDA C is presented in Figure G-3.1-1. The primary exposure to human receptors is surface soil and subsurface soil/tuff that may be brought to the surface through site activities. Human receptors may be exposed through direct contact with soil or suspended particulates by ingestion, inhalation, dermal contact, and external irradiation pathways. Based on the current and reasonably foreseeable future land use (i.e., industrial) of the site, these exposure pathways apply to industrial workers. The residential scenario, which has the same exposure pathways as the industrial scenario, is evaluated for informational purposes only. Surface water was not evaluated in the human health screening assessment because no perennial surface water exists at the site.

The conceptual site model for ecological receptors is presented in Figure G-3.1-1 and in Attachment G-1. Several exposure pathways apply to the exposure of ecological receptors to contaminants. Plants may be exposed through root uptake. Dermal contact and external irradiation are exposure pathways for invertebrates but less so for wildlife, which are generally protected by fur and feathers. Dietary exposures include soil ingestion and food-web transport and are the primary pathways for wildlife. Inhalation of airborne contaminants is also a potential pathway for burrowing animals.

G-3.2 Environmental Fate and Transport

The evaluation of environmental fate addresses the chemical processes affecting the persistence of a chemical in the environment, and the evaluation of transport addresses the physical processes affecting mobility along a migration pathway. Transport through soil and tuff depends on soil pH, precipitation or snowmelt, soil moisture, and soil hydraulic properties. Chemical and physical properties of COPCs are presented in Tables G-3.1-1, G-3.1-2, and G-3.1-3 and are from New Mexico Environment Department (NMED) guidance (NMED 2006, 92513, Table B-1), U.S. Environmental Protection Agency (EPA) Region 6 guidance (EPA 2005, 91002), the EPA Superfund Chemical Data Matrix (SCDM) (<http://www.epa.gov/superfund/sites/npl/hrsres/tools/scdm.htm>), or the Risk Assessment Information System (RAIS) toxicity and chemical-specific factors database (<http://rais.ornl.gov/>). For COPCs without readily available chemical and physical values, surrogate chemicals were used based on structural similarity or because the COPC is a breakdown product (NMED 2003, 81172).

MDA C lies on a dry mesa top approximately 1300 ft above the regional aquifer (LANL 1998, 59599). As described in section 4.6 of the investigation report, saturated conditions do not exist beneath MDA C. The U.S. Geological Survey conducted water-infiltration tests at MDA C from 1956 to 1961 (LANL 1992, 07672, p. 2-57). The study concluded that in the presence of a continuous and consistent hydraulic head in the shallow pit, subsurface moisture preferentially moved laterally in the soil profile rather than downward into tuff. The study further concluded that the downward movement through soil and tuff is slow and inefficient, requiring more hydraulic head than is typically present at MDA C (LANL 1992, 07672, p. 2-57).

Current measurements of the gravimetric water content indicate that soils and tuff on the mesa are relatively dry and that no evidence exists of a saturated subsurface zone. Downward migration of contaminants in the vadose zone is limited by a lack of hydrostatic pressure. The lack of saturated conditions in the area restricts both horizontal and vertical migration. Volumetric water-content profiles collected across MDA C in 2006 indicate percent saturations below 25%, and many of those indicate water contents substantially lower. Vadose zone fluxes and residence times were also measured using a chloride mass-balance approach. This approach involves measuring chloride concentrations in vadose zone pore water with depth. Relatively low chloride contents indicate a high downward flux because water

is able to move through the vadose zone at a fast enough rate to flush chloride from the vadose zone. At MDA C, all of the boreholes measured had substantial inventories of chloride, which qualitatively indicates that fluxes are low and residence times are long. Residence times for a packet of water to travel 150 ft in the vadose zone at MDA C was estimated to be greater than 1000 yr for the majority of the boreholes measured, and two of the borehole results were greater than 10,000 yr. Additional details of the 2006 moisture measurements and chloride-based flux estimates are provided in Appendix L.

No perched aquifers have been identified in the area beneath MDA C, nor are there springs or seeps nearby that would indicate the presence of perched aquifers. Without sufficient moisture, little or no potential migration occurs through the vadose zone to groundwater. Therefore, a complete pathway to the groundwater, including the regional aquifer, which is located approximately 1300 ft bgs from the mesa top (LANL 1998, 59599), is unlikely.

G-3.2.1 Inorganic Chemicals

In addition to the presence of saturated conditions, physical and chemical factors that determine the distribution of inorganic COPCs within the soil and tuff are the soil-water partition coefficient (K_d) of the inorganic chemical, the pH of the soil, soil characteristic (such as sand or clay content), and redox potential. The interaction of these factors is complex, but the K_d s can provide a general assessment of the potential for migration through the subsurface. Chemicals with K_d s greater than 40 cm³/g are very unlikely to migrate through soil towards the water table (Kincaid et al. 1998, 93270). Table G-3.1-1 presents the K_d s for the inorganic COPCs at MDA C; these values match the EPA K_d s recommended for the default pH of 6.8 for evaluation of Superfund sites (EPA 1996, 59902). These K_d s represent conservative values applicable to a wide range of sites. Based on this K_d criterion, aluminum, antimony, barium, beryllium, cadmium, chromium, cobalt, lead, manganese, mercury, nickel, sodium, thallium, vanadium, and zinc have a very low potential for migration to groundwater at MDA C.

The K_d values in Table G-3.1-1 for arsenic, copper, cyanide, iron, nitrate, perchlorate, selenium, and silver indicate that these inorganic chemicals may be relatively mobile in soil. Other factors besides the K_d values, such as speciation in soil and oxidation/reduction potential (Eh) potential, also play a role in the likelihood that inorganic chemicals will migrate. Information about the fate and transport properties of inorganic chemicals, some of which is summarized below, was obtained from individual chemical profiles published by the Agency for Toxic Substances and Disease Registry (ATSDR) and is available from the ATSDR website at <http://www.atsdr.cdc.gov/toxprofiles>.

Arсенic. Many arsenic compounds tend to partition to soil or sediment under oxidizing conditions; therefore, leaching usually does not result in the transport of arsenic to any great depth. The extent of arsenic is defined and migration to groundwater has not occurred.

Copper. Most copper deposited in soil is strongly adsorbed and remains in the upper few centimeters of soil. In general, the copper adsorbs to organic matter, carbonate minerals, clay minerals, or hydrous iron and manganese oxides. Soils at MDA C are close to neutral pH, and do not exhibit a high rate of leaching for copper. The extent of copper is defined and migration to groundwater has not occurred.

Cyanide. In soil, cyanide at low concentrations biodegrades under aerobic conditions with the initial formation of ammonia, which is converted to nitrite and nitrate in the presence of nitrifying bacteria. Under anaerobic conditions, the cyanide ion denitrifies to gaseous nitrogen. At MDA C, the soil may be aerobic or anaerobic in different places, depending upon the presence of bacteria. The extent of cyanide is defined, and migration to groundwater has not occurred.

Iron. Iron is naturally occurring in soil and tuff and may be relatively mobile under reducing conditions. The extent of iron is defined, and migration to groundwater has not occurred.

Nitrate and perchlorate. Nitrate and perchlorate are highly soluble in water and may migrate with water molecules in saturated soils. However, subsurface soils below MDA C have a low moisture content, which causes nitrate and perchlorate to be relatively immobile. The extent of nitrate and perchlorate is defined, and migration to groundwater has not occurred.

Selenium. The determining factors for the transport and partitioning of selenium in soils are pH and Eh. In soils with pH above 7.5, selenates, which have high solubility and a low tendency to adsorb onto soil particles, are the major selenium species and are very mobile. The soil pH at MDA C is generally lower than 7.5 and indicates that selenium is not likely to migrate in these soils.

Silver. Silver sorbs onto soil and sediments and tends to form complexes with inorganic chemicals and humic substances in soils. The presence of organic matter complexes with silver and reduces its mobility. Silver compounds tend to leach from well-drained soils, and if sufficient hydrostatic pressure exists, silver could potentially migrate into the subsurface. However, the extent of silver is defined and migration to groundwater has not occurred.

G-3.2.2 Radionuclides

For radionuclides, in addition to the presence of saturated conditions, an examination of K_d values also provides an assessment of whether a radionuclide is likely to be mobile in the subsurface at MDA C. K_d values for radionuclides COPCs at MDA C are presented in Table G-3.1-2 and are from the EPA SCDM (EPA 1996, 64708). Radionuclides with K_d s greater than $40 \text{ cm}^3/\text{g}$ very likely will not migrate to groundwater (Kincaid et al. 1998, 93270). Based on K_d values, cesium-137, europium-152, plutonium-238, plutonium-239, ruthenium-106, sodium-22, uranium-234, uranium-235, and uranium-238 have a very low potential to migrate towards groundwater at MDA C.

The K_d values for strontium-90 and tritium presented in Table G-3.1-2 indicate these radionuclides may be relatively mobile in soil.

Strontium-90. A major portion of stable and radioactive strontium in soil dissolves in water, so it may move deeper into the subsurface. However, the K_d value of 35 indicates that strontium-90 is relatively immobile in the subsurface. In addition, strontium-90 was detected in only five borehole locations (a total of six samples) to a depth of approximately 125 ft bgs. MDA C is therefore not a major source of strontium-90, and the extent of strontium-90 indicates little migration towards groundwater.

Tritium. Tritium's initial behavior in the environment is determined by the source. If it is released to the atmosphere as a gas or vapor, substantial dispersion can be expected and the rapidity of deposition depends on climatic factors. If tritium is released in liquid form, the tritium is subject to physical dispersion, percolation, and evaporation (Whicker and Schultz 1982, 58209, p. 147). At depth, local factors (vadose or saturated) and media characteristics (porosity, for example) govern its mobility. Because tritium migrates with moisture, the low moisture content of the MDA C subsurface limits the potential for tritium to migrate to groundwater.

G-3.2.3 Organic Chemicals

For organic chemicals, in addition to the presence of saturated conditions, an examination of solubility values provides an assessment of whether an organic chemical is likely to be mobile in the subsurface at MDA C. The physical/chemical properties (organic carbon/water partition coefficient [K_{oc}], logarithm to the

base octanol/water partition coefficient [$\log K_{ow}$], and solubility) of the organic COPCs are presented in Table G-3.1-3. Other information presented to illustrate some aspects of the fate and transport tendencies of the COPCs was obtained from Ney (1995, 58210).

Water solubility is an important chemical characteristic to indicate the mobility of organic chemicals. The higher the water solubility of a chemical, the more likely it is to be mobile and the less likely it is to accumulate, bioaccumulate, volatilize, or persist in the environment. A highly soluble chemical (water solubility above 1000 mg/L) is prone to biodegradation and metabolism that may detoxify the parent chemical. Table G-3.1-3 shows that acetone, benzoic acid, 1,1-dichloroethene, methylene chloride, 2-nitrotoluene, 3-nitrotoluene, and 4-nitrotoluene have solubilities above 1000 mg/L. The remaining organic COPCs are relatively insoluble and are likely immobilized by adsorption. Chemicals with lower water solubilities tend to be more likely to accumulate or bioaccumulate and persist in the environment, to be slightly prone to biodegradation, and to be metabolized in plants and animals.

Chemicals with high vapor pressures (above 0.01 mmHg) are likely to volatilize, and therefore, their concentrations at the site are reduced over time; vapors of these chemicals are more likely to travel toward the atmosphere and less likely to migrate towards groundwater. Acetone, 1,1-dichloroethene, methylene chloride, 2-methylnaphthalene, 2-nitrotoluene, 3-nitrotoluene, 4-nitrotoluene, toluene, and trichloroethene have vapor pressures above 0.01 mmHg (Table G-3.1-3). Acetone, 1,1-dichloroethene, methylene chloride, toluene, and trichloroethene have vapor pressures substantially above 0.01 mmHg and are considered volatile.

The soil organic carbon-water partition coefficient (K_{oc}) measures the tendency of a chemical to adsorb to organic carbon in soil. K_{oc} values above 500 cm^3/g indicate a strong tendency to adsorb to soil (NMED 2006, 92513). Table G-3.1-3 provides the K_{oc} values for organic COPCs at MDA C. Approximately 80% of the organic COPCs have K_{oc} values above 500 cm^3/g and therefore have a very low potential to migrate toward groundwater. The remaining organic COPCs have K_{oc} values less than 500 cm^3/g , indicating a tendency to not adsorb to soil, and therefore, potentially to be more mobile.

The octanol water partition coefficient (K_{ow}) is an indicator of a chemical's potential to bioaccumulate or bioconcentrate in the fatty tissues of living organisms. The unitless K_{ow} value is an indicator of water solubility, mobility, sorption, and bioaccumulation. The higher the K_{ow} value above 1000 (equal to a $\log K_{ow}$ of 3), the greater the affinity the chemical has for bioaccumulation/bioconcentration in the food chain, the greater its potential for sorption in the soil, and the lower its mobility (Ney 1995, 58210). Table G-3.1-3 shows the $\log K_{ow}$ for organic COPCs at MDA C. The majority organic COPCs have a $\log K_{ow}$ above 3, indicating they are likely to sorb to soil and are relatively immobile. Most of the organic chemicals with a $\log K_{ow}$ less than 3 have a $\log K_{ow}$ between 2 and 3, except for acetone, methylene chloride, and RDX (research department explosive [also hexahydro-1,3,5-trinitro-1,3,5-triazine]). Acetone and methylene chloride are volatile chemicals and RDX was detected in only one sample. Similarly, most of the organic COPCs with a $\log K_{ow}$ between 2 and 3 were detected in only one sample; 1,1-dichloroethene was detected in four samples.

G-3.2.4 Summary

Saturation is the primary factor in determining the potential for COPCs to migrate to groundwater. Based on investigation results, saturated conditions are not present within the MDA C site. The lack of saturated conditions and hydrostatic pressure severely limits the movement of contamination toward groundwater at MDA C. Without sufficient moisture, little or no potential migration of materials occurs through the vadose zone to groundwater. The relative solubilities and/or the partitioning properties also limit the mobility of the COPCs at MDA C. In addition, the nature and extent of contamination at MDA C are defined: the results

from the deepest samples collected showed either no detected concentrations of COPCs or low- or trace-level concentrations of only a few inorganic, radionuclide, and/or organic COPCs in tuff. Because vertical extent is defined and limited for MDA C, no migration to groundwater is apparent. As a result, the potential for COPC migration to groundwater is very low, based on the site conditions, the physical/chemical properties of the COPCs, and the distance to the regional aquifer below the site.

G-3.3 Evaluation of Pore-Gas Screening Levels

Volatile organic compound (VOC) results from pore-gas samples were screened to evaluate whether concentrations of VOCs in the subsurface pore-gas are of concern as a potential source of groundwater contamination. Because no screening levels (SLs) for pore-gas are available that address the potential for groundwater contamination, the screening evaluation is based on groundwater cleanup levels contained in the March 1, 2005, Compliance Order on Consent (the Consent Order) and Henry's Law constants that describe the equilibrium relationship between vapor and water concentrations. The source of the Henry's Law constants is the NMED technical background document (NMED 2006, 92513). If Henry's Law constants were not available from this source, they were obtained from the Pennsylvania Department of Environmental Protection chemical and physical properties database (<http://www.dep.state.pa.us/physicalproperties/Default.htm>). The following dimensionless form of Henry's Law constant was used:

$$H' = \frac{C_{air}}{C_{water}} \quad \text{Equation 1}$$

where C_{air} is the volumetric concentration of contaminant in air and C_{water} is the volumetric concentration of contaminant in water. Equation 1 can be used to calculate the following screening value:

$$SV = \frac{C_{air}}{1,000 \times H' \times SL} \quad \text{Equation 2}$$

where C_{air} is the concentration of VOC in the pore-gas sample ($\mu\text{g}/\text{m}^3$), H' is the dimensionless Henry's Law constant, SL is the screening level ($\mu\text{g}/\text{L}$), 1000 is a conversion factor from L to m^3 , and SV is the screening value.

The SLs are groundwater cleanup levels specified in the Consent Order. These are the EPA maximum contaminant level (MCL) or New Mexico Water Quality Control Commission (NMWQCC) groundwater standard, whichever is lower. As specified in the Consent Order, if no MCL or NMWQCC standard exists, the EPA Region 6 tap water SL is used (adjusted to 10^{-5} risk for carcinogens). The numerator in Equation 2 is the actual concentration of VOC in pore gas and the denominator represents the concentration in pore gas needed to exceed the SL. Therefore, if SV is less than 1, the concentration of VOC in pore gas is not sufficiently high to cause the water SL to be exceeded, even if the VOCs are in contact with groundwater.

Equation 2 was used to screen the maximum detected concentrations of VOCs in pore-gas samples from the investigation at MDA C. As shown in Table G-3.3-1, 43 VOCs having MCLs, NMWQCC standards, or tap water SLs were detected in pore gas at MDA C. For each of these VOCs, screening was performed using the maximum detected concentration from both the first and second round of pore-gas sampling. These results show that the SVs are below 1 for all but eight VOCs: carbon tetrachloride; 1,2-dichloroethane; 1,2-dichloropropane; 1,4-dioxane; methylene chloride; tetrachloroethane; 1,1,2-trichloroethane; and trichloroethene.

Because the SVs exceeded 1 for some VOCs using the maximum detected concentration, a second screening was performed using the concentration for each VOC from the deepest depth that it was analyzed; for most VOCs this concentration was in borehole location 50-24818 at 591 ft bgs, but for the few VOCs not reported by the Severn Trent Laboratory, the deepest concentrations were from borehole location 50-24819 at 275 ft bgs. The deepest depth was used because it is closest to the regional aquifer. The SVs from this analysis are less than 1 (Table G-3.3-2). The results of the screening indicate that VOCs in subsurface pore gas at MDA C are not a potential source of groundwater contamination.

G-4.0 SCREENING LEVELS

G-4.1 Soil Screening Levels

For nonradionuclide COPCs, soil screening levels (SSLs) from NMED guidance (NMED 2006, 92513) were used. The NMED SSLs are based on a target noncarcinogenic hazard quotient (HQ) of 1.0 and a target carcinogenic risk of 1×10^{-5} (NMED 2006, 92513). For COPCs for which no NMED SSL is available, EPA Region 6 SSLs (EPA 2005, 91002) were used. The EPA SSLs for carcinogens were multiplied by 10 to adjust the SSLs to the NMED target level of 1×10^{-5} . Radionuclide screening action levels (SALs) are used for comparison with radionuclide COPC concentrations and are derived using the residual radioactive (RESRAD) model, Version 6.21 (LANL 2005, 88493). The radionuclide SALs are based on a 15 mrem/yr dose per U.S. Department of Energy (DOE) guidance (DOE 2000, 67153). Exposure parameters used to calculate the SSLs and SALs for the industrial and residential scenarios are provided in Tables G-4.0-1 and G-4.0-2, respectively.

Ecological screening levels (ESLs) were obtained from the ECORISK Database, Version 2.2 (LANL 2005, 90032), as presented in Table G-4.0-3. The ESLs are derived for a set of receptors where information was available from experimentally determined no-observed-adverse-effect levels (NOAELs), lowest-observed-adverse-effect levels, or doses determined lethal to 50% of the test population. Information relevant to the calculation of ESLs, including concentration equations, dose equations, bioconcentration factors, transfer factors, and toxicity reference values are presented in the ECORISK Database, Version 2.2 (LANL 2005, 90032).

G-4.2 Exposure Point Concentration Calculations

For each COPC, the maximum detected concentration, the 95% upper confidence level (UCL) of the arithmetic mean, and the distribution upon which the UCL was calculated are provided in Tables G-2.2-1 and G-2.2-2. An exposure point concentration (EPC), either a 95% UCL or maximum detected concentration, was determined for each COPC for the industrial scenario and ecological assessment (Table G-2.2-1) and for the residential scenario (Table G-2.2-2). If the 95% UCL was above the maximum concentration or if the number of sampling results for a particular COPC was less than 10 samples, the maximum detected concentration was used as the EPC for that COPC.

Calculation of the 95% UCLs is based on EPA guidance (EPA 2002, 85640), which is also the basis for the EPA software ProUCL (EPA 2004, 90033). The choice of UCL calculation method is based on the distribution of the data (Tables G-2.2-1 and G-2.2-2). If the p-value indicates that the untransformed data are not significantly different from normal ($p > 0.05$), then the normal distribution is assumed. If the p-value is less than 0.05, then normality is rejected and log normality is considered. If the log transformed data are not significantly different from normal ($p > 0.05$), then log normality is assumed. If the p-value is less than 0.05, then log normality is rejected and a nonparametric (distribution free) UCL is used. For normal data, the UCL is based on the Student *t*-statistic. For lognormal data, the Land method using the H-statistic (H-UCL) is used, unless the sample size and skew of the data indicate that the Land method is

not appropriate. In that case, the Chebyshev inequality using minimum variance unbiased estimates of the lognormal parameters is used. If the distribution is neither normal nor lognormal, then a nonparametric estimate based on the Chebyshev inequality using the mean and standard deviation is used. In calculating the 95% UCLs, nondetects were included in the data set as one-half the detection limit for that sample result.

G-5.0 HUMAN HEALTH RISK ASSESSMENT RESULTS

The EPC for each COPC in soil was compared with the SSLs for the industrial and residential scenarios. For carcinogenic COPCs, the EPC was divided by the SSL and then multiplied by 1×10^{-5} . The sum of the carcinogenic risks was compared with the NMED target level of 1×10^{-5} (NMED 2006, 92513). For noncarcinogenic chemicals, an HQ was generated for each COPC by dividing the EPC by the SSL. The HQs were summed to generate a hazard index (HI). The HI was compared with the NMED target level of 1.0 (NMED 2006, 92513). For radionuclides, the EPC was divided by the SAL and multiplied by 15 mrem/yr to calculate the dose. The total dose was compared with the DOE target dose of 15 mrem/yr (DOE 2000, 67153).

As stated in the conceptual site model in section G-3.0, the industrial scenario is the current and reasonably foreseeable future land use of this site. Table G-5.0-1 shows the carcinogenic risk from COPCs under an industrial scenario. The total estimated excess cancer risk is approximately 2×10^{-7} , which is less than the NMED target level of 1×10^{-5} . Table G-5.0-2 shows the HQs and HI for the industrial scenario. The HI is approximately 0.01, which is less than the NMED target level of 1.0. Table G-5.0-3 presents the total dose from radionuclide COPCs at the site. The total dose for an industrial worker is approximately 10 mrem/yr, which is less than the DOE target dose of 15 mrem/yr.

MDA C was also evaluated for the residential scenario for informational purposes only. Congeners of dioxins and furans were detected in the 0–10 ft interval (dioxin and furan congeners were not COPCs for the industrial worker scenario). Table G-5.0-4 presents the estimated residential EPC for the detected congeners, using the toxicity equivalency factor (TEF) method (epa.gov/ncea/pdfs/dioxin/part2/drich9.pdf). The congener concentrations are converted to an equivalent concentration of dioxin (2,3,7,8-tetrachlorodibenzodioxin or TCDD) by multiplying the concentrations by a TEF to derive a toxic equivalent TCDD concentration. The toxic equivalent concentration was compared to the dioxin SSL from EPA Region 6 (EPA 2005, 91002). Table G-5.0-5 presents the total estimated excess cancer risk for a resident. The total estimated excess cancer risk is approximately 2×10^{-5} , which is slightly above the NMED target level of 1×10^{-5} . The residential HQs and HI for noncarcinogens are presented Table G-5.0-6. The residential HI is approximately 0.9, which is below the NMED target level of 1.0. Table G-5.0-7 presents the total dose from radionuclide COPCs for the residential scenario. The total dose for the residential scenario is approximately 12 mrem/yr, which is less than the DOE target dose of 15 mrem/yr.

G-5.1 Uncertainty Analysis

The analyses presented in human health risk screening assessments are subject to varying degrees and types of uncertainty. Aspects of data evaluation and COPC identification, exposure assessment, toxicity assessment, and the additive approach all contribute to uncertainties in the risk assessment process.

G-5.1.1 Data Evaluation and COPC Identification Process

A primary uncertainty associated with the COPC identification process is the possibility that a chemical may be inappropriately identified as a COPC when it is actually not a COPC or that a chemical may not be identified as a COPC when it actually should be identified as a COPC. Organic chemicals were appropriately identified as COPCs because all detected organic chemicals were retained for analysis.

Inorganic chemical data for the surface of MDA C were determined to be of screening-level quality, and therefore, no inorganic chemical data were included in the risk screening assessments. The surface soil inorganic chemical data are presented in the approved investigation work plan (LANL 2005, 91547) and in Appendix F. The data show that only lead and silver were detected at concentrations above their respective BVs. Out of 68 samples collected, 1 sample had a lead concentration (30 mg/kg) that was slightly above the maximum soil lead background concentration (28 mg/kg) and 2 samples had silver concentrations (1.1 and 6 mg/kg) slightly above the soil BV for silver (1 mg/kg) (LANL 1998, 59730). The maximum detected concentrations resulted in an HQ of 0.04 for lead and an HQ of 0.001 for silver. The sum of these HQs equals 0.041, which is less than the NMED target level of an HI of 1.0 and does not substantially change the HIs presented in Tables G-5.0-2 and G-5.0-6. Because the remainder of the surface inorganic chemical data indicated background concentrations for the other inorganic chemicals analyzed, the uncertainty associated with lack of surface analytical inorganic chemical data in the risk screening assessments does not substantially underestimate the potential risk for MDA C.

G-5.1.2 Exposure Assessment

Three main uncertainties were identified in the exposure assessment process: the activity patterns of a worker assumed under the industrial scenario, the upper-bound values used in exposure assumptions, and the 95% UCL or maximum detected concentration used as the EPC.

1. *Identification of Receptors.* The current and reasonably foreseeable future land use is industrial. The assumptions for the SSLs are that the potentially exposed individual is an industrial worker who is outside on-site for 8 h/d for 225 d/yr (NMED 2006, 92513). Laboratory workers are not outside and on-site at MDA C for 8 h/d and do not spend 225 d/yr at the site. By using the industrial scenario, the exposure and risk/dose are overestimated, and the scenario is protective of a Laboratory worker.
2. *Exposure Pathways.* A number of assumptions are made relative to exposure, including input parameters, whether or not a given pathway is complete, the contaminated media to which an individual may be exposed, and intake rates for different routes of exposure. In the absence of site-specific data, the exposure assumptions used were consistent with default values (NMED 2006, 92513). When several upper-bound values (NMED 2006, 92513) are combined to estimate exposure for any one pathway, the resulting risk estimate can exceed the 99th percentile and therefore can exceed the range of risk that may be reasonably expected.
3. *Derivation of EPCs.* Some uncertainty is introduced in the concentration aggregation of data for estimating the EPCs at the site. Risk from a single location or area with relatively high COPC concentrations may be underestimated by using a representative MDA C-wide value. However, the use of the 95% UCL is intended to provide a protective, upper-bound (i.e., conservative) COPC concentration at the site, which may lead to an overestimation of the concentration representative of average exposure to a COPC across the entire site. Using the maximum detected concentration for the EPC also overestimates the exposure to contamination because receptors are not exposed to the maximum concentration across the site.

G-5.1.3 Toxicity Assessment

The primary uncertainty associated with the SSLs is related to the derivation of toxicity values used in their calculation. Toxicity values (reference doses [RfDs] and slope factors [SFs]) were used to derive the SSLs used in the risk screening assessment (NMED 2006, 92513). Uncertainties were identified in the following areas with respect to the toxicity values: extrapolation from animals to humans; extrapolation from one route of exposure to another route of exposure; individual variability in the human population, the derivation of RfDs and Sfs; and the chemical form of the COPC.

1. *Extrapolation from Animals to Humans.* The SFs and RfDs are often determined by extrapolation from animal data to humans, which may result in uncertainties in toxicity values because differences exist in chemical absorption, metabolism, excretion, and toxic responses between animals and humans. Differences in body weight, surface area, and pharmacokinetic relationships between animals and humans are taken into account to address these uncertainties in the dose-response relationship; however, conservatism is usually incorporated in each of these steps, resulting in the overestimation of potential risk.
2. *Extrapolation from One Route of Exposure to Another Route of Exposure.* The SFs and RfDs often contain extrapolations from one exposure route to another that result in additional conservatism in the risk calculations. The extrapolation from the oral route to the inhalation and/or the dermal route is used in the derivation of some SSLs (NMED 2006, 92513). Differences between the two exposure pathways contribute to the uncertainty in the estimation of potential risk at this site.
3. *Individual Variability in the Human Population.* For noncarcinogenic effects, the degree of variability in human physical characteristics is important both in determining the risks that can be expected at low exposures and in defining the NOAEL. The NOAEL uncertainty factor approach incorporates a 10-fold factor to reflect individual variability within the human population that can contribute to uncertainty in the risk assessment; this factor of 10 is generally considered to result in a conservative estimate of risk to noncarcinogenic COPCs.
4. *Derivation of RfDs and SFs.* The RfDs and SFs for different chemicals are derived from experiments conducted by different laboratories that may have different accuracy and precision standards, leading to an over- or underestimation of the risk. The uncertainty associated with the toxicity factors for noncarcinogens is measured by the uncertainty factor, the modifying factor, and the confidence level. For carcinogens, the weight of evidence classification indicates the likelihood that a contaminant is a human carcinogen. Toxicity values with high uncertainties may change as new information is evaluated.
5. *Chemical form of the COPC.* COPCs may be bound to the environment matrix and not available for absorption into the human body. However, it is assumed that the COPCs are bioavailable. This assumption can lead to an overestimation of the total risk.

G-5.1.4 Additive Approach

For noncarcinogens, the effects of exposure to multiple chemicals are generally not known, and possible interactions may be synergistic or antagonistic, resulting in either an over- or underestimation of the potential risk. Additionally, RfDs used in the risk calculations typically are not based on the same endpoints with respect to severity, effects, or target organs. Therefore, the potential for noncarcinogenic effects may be overestimated for individual COPCs that act by different mechanisms and on different target organs but are addressed additively.

G-5.2 Interpretation

MDA C was evaluated for potential risk using SSLs and SALs for an industrial scenario. The potential carcinogenic risk of approximately 2×10^{-7} , HI of approximately 0.01, and dose of approximately 10 mrem/yr are less than the applicable target levels (NMED 2006, 92513; DOE 2000, 67153). In addition, the total dose corresponds to a radiological risk of approximately 2×10^{-6} based on a comparison to EPA radionuclide preliminary remediation goals (PRGs) for an outdoor worker (epa-prgs.ornl.gov/radionuclides/download.shtml). The results of the human health risk screening assessment do not indicate a potential unacceptable risk, hazard, or dose under an industrial scenario at MDA C.

G-6.0 ECOLOGICAL RISK SCREENING ASSESSMENT

G-6.1 Introduction

The approach for conducting ecological assessments is described in the "Screening Level Ecological Risk Assessment Methods, Revision 2" (LANL 2004, 87630). The assessment consists of the following four parts: a scoping evaluation, a screening evaluation, an uncertainty analysis, and an interpretation of the results.

G-6.2 Scoping Evaluation

The scoping evaluation establishes the breadth and focus of the screening assessment. The ecological scoping checklist, which is included as Attachment G-1, is a useful tool for organizing existing ecological information. The information was used to determine whether ecological receptors might be affected, to identify the types of receptors that might be present, and to develop the ecological conceptual site model for MDA C (Figure G-3.1-1 and Attachment G-1).

MDA C is located on a relatively flat area and occurs in the transition zone between piñon-juniper woodland and ponderosa pine (*Pinus ponderosa*) forest. Grasses and forbs, including blue grama (*Bouteloua gracilis*), sage (*Artemisia* spp.), and chamisa (*Chrysothamnus* sp), represent most ground cover. A lack of trees on-site obviates a roosting habitat for the Mexican spotted owl, but foraging may occur.

Surface water runoff flows to the north to an asphalt diversion channel. Transport to groundwater is unlikely because of the depth to the regional aquifer (approximately 1300 ft bgs) (LANL 1998, 59599), and the semiarid environment of this region provides minimal hydrologic head. The potential contact with contaminants is by root uptake, food-web transport, soil ingestion, external irradiation, dermal contact, and inhalation.

The scoping portion of the assessment indicated that terrestrial receptors were appropriate for evaluating the concentrations of contaminants in soil and tuff. Aquatic receptors were not evaluated because no aquatic communities are present at MDA C. This process evaluated eight terrestrial receptors representing several trophic levels. These receptors included

- plants
- soil dwelling invertebrates (represented by the earthworm)
- the deer mouse (mammalian omnivore)
- the Montane shrew (mammalian insectivore)

- the desert cottontail (mammalian herbivore)
- the red fox (mammalian carnivore)
- American robin (avian insectivore, avian omnivore, and avian herbivore)
- American kestrel (avian invertebrate and flesh eater, a surrogate for a threatened and endangered [T&E] species).

The rationale for these receptors is presented in “Screening Level Ecological Risk Assessment Methods, Revision 2” (LANL 2004, 87630). The ESLs were derived for each of these receptors where information was available. The ESLs were based on similar species and derived from experimentally determined NOAELs, lowest-observed-adverse-effect levels (LOAELs), or doses lethal to 50% of the population. All relevant information necessary to calculate HQs and HIs, including concentration equations, dose equations, bioconcentration factors, transfer factors, and toxicity reference values, is presented in the ECORISK Database, Version 2.2 (LANL 2005, 90032).

G-6.3 Assessment Endpoints

An assessment endpoint is an “explicit expression of the actual environmental value that is to be protected, operationally defined by an ecological entity and its attributes” (EPA 1998, 62809). Assessments should include ecologically relevant endpoints that help to sustain the natural structure, function, and biodiversity of an ecosystem or its components. In a screening assessment, the assessment endpoints are attributes of ecological receptors that may be adversely affected by exposure to hazardous wastes from past operations (EPA 1997, 59370), wherein receptors are populations and communities (EPA 1999, 70086).

The ecological screening assessment is designed to protect populations and communities of biota rather than individual organisms, except for listed or candidate T&E species or treaty-protected species (EPA 1999, 70086). The protection of individual organisms within these designated protected species could also be achieved at the population level; the populations of these species tend to be small, and the loss of an individual adversely affects the species.

In accordance with this guidance, the Laboratory developed generic assessment endpoints to ensure that values at all levels of the food chain are considered in the ecological screening process (LANL 1999, 64137). These general assessment endpoints can be measured using impacts on reproduction, growth, and survival to represent categories of effects that may adversely impact populations. In addition, specific receptor species were chosen to represent each function group. The receptor species were chosen because of their presence at the site, their sensitivity to the chemicals of potential ecological concern (COPECs), and their potential for exposure to those COPECs. These categories of effects and the chosen receptor species were used to select the types of effects seen in toxicity studies considered in the development of the toxicity reference values (TRVs). Toxicity studies used in the development of TRVs included only those in which the adverse effect evaluated affected reproduction, survival, and/or growth.

The selection of receptors and assessment endpoints is designed to be protective of both the representative species used as screening receptors, the other species within their feeding guilds, and the overall food web for the terrestrial and aquatic ecosystems. Focusing the assessment endpoints on the general characteristics of species that affect populations (rather than the biochemical and behavioral changes that may affect only the studied species) also ensures applicability to the ecosystem of concern.

G-6.4 Screening Evaluation

The purpose of the ecological screening evaluation is to identify COPECs for MDA C. The EPCs are determined from samples collected between 0–5-ft bgs (LANL 2004, 87630). The evaluation involves the calculation of HQs for all COPCs and all screening receptors (LANL 2004, 87630). The HQs are the ratios of the EPCs (95% UCLs or maximum detected concentrations) to the ESLs. The COPCs with HQs greater than 0.3 are identified as COPECs and are evaluated further. The ESLs for terrestrial receptors were obtained from the Laboratory's ECORISK Database, Version 2.2 (LANL 2005, 90032).

Results of the comparison of the EPCs and the final (minimum) soil ESLs for MDA C are shown in Table G-6.4-1. Thorium-232, acenaphthene, and Aroclor-1254 are retained as COPECs because the HQs were greater than 0.3.

The COPECs were evaluated further in Table G-6.4-2. The HQ for each COPEC/receptor combination as well as the HIs for each receptor was calculated. The HI is the sum of HQs for chemicals with common toxicological endpoints for a given receptor. For the purposes of ecological screening, it is assumed that nonradionuclides have common toxicological effects. The HI analysis provides a clearer picture of potential adverse impacts by determining how many receptors may be affected and provides information on T&E species. Only the omnivorous robin and the insectivorous robin have HIs greater than 1.0. The HIs for the other receptors (red fox, kestrel, herbivorous robin, cottontail, shrew, deer mouse, earthworm, and the plant) are less than 1.0, and these receptors are not evaluated further.

Animal burrowing was evident in the vicinity of MDA C. As a result, exposure of burrowing animals to VOCs in the subsurface was assessed. The VOC pore-gas data from the shallowest depth interval (10 ft) were used in the assessment. The inhalation ESLs were obtained from the ECORISK Database, Version 2.2 (LANL 2005, 90032) and are based on Botta's pocket gopher. The eight boreholes that have pore-gas data from the 10-ft depth interval are representative of the pore gas from the remaining boreholes, and the animals are not likely to burrow more than 5 ft. The maximum detected pore-gas concentration from the designated depth interval was assumed to be in equilibrium in an animal burrow and was used as the EPC for those VOCs with inhalation ESLs. The HI for the inhalation VOC assessment was approximately 3.0 for the first round of pore gas samples and 0.7 for the second round of pore-gas samples (Tables G-6.4-3 and G-6.4-4).

G-6.5 Uncertainty Analysis

The uncertainty analysis describes the key sources of uncertainty related to the screening assessment. This analysis may result in either adding or removing chemicals from the list of COPECs for MDA C. This section contains a qualitative uncertainty analysis of the issues relevant to evaluating the potential ecological risk at MDA C.

G-6.5.1 Chemical Form

The assumptions used in the ESL derivations were conservative and not necessarily representative of actual conditions. These assumptions include maximum chemical bioavailability, maximum receptor ingestion rates, minimum bodyweight, and additive effects of multiple COPECs. Most of these factors tend to result in conservative estimates of the ESLs, which may lead to an overestimation of the potential risk. The assumption of additive effects for multiple COPECs may result in an over- or underestimation of the potential risk to receptors.

The chemical form of the individual COPCs was not determined as part of this investigation, largely because of a limitation on analytical quantitation of individual chemical species. Toxicological data are

typically based on the most toxic and bioavailable chemical species, which are not likely found in the environment. The inorganic, radionuclide, and organic COPECs are not generally 100% bioavailable to receptors in the natural environment because of the adsorption of chemical constituents to matrix surfaces (e.g., soils), or rapid oxidation or reduction changes that render harmful chemical forms unavailable to biotic processes. The ESLs were calculated to ensure a conservative indication of potential risk (LANL 2004, 87630), and the values were biased toward overestimating the potential risk to receptors.

G-6.5.2 Exposure Pathway

The concentrations used in the calculations of HQs were the 95% UCLs or the maximum detected concentration to a depth of 5 ft bgs, thereby conservatively estimating the site concentrations of each COPEC. As a result, the exposure of individuals within a population was evaluated using this specific concentration, which was assumed constant throughout the exposure area, resulting in an overestimation of the potential risk because concentrations of COPECs varied across the site and were infrequently detected.

The concentrations used in the calculations of air HQs were the maximum detected concentration to a depth of 10 ft bgs, thereby conservatively estimating the site concentrations of each COPEC. As a result, the exposure of individuals within a population was evaluated using this concentration, which was assumed constant throughout the exposure area, resulting in an overestimation of the potential risk because concentrations of COPECs varied across the site and were infrequently detected.

G-6.5.3 Screening Data

The surface inorganic chemical data were determined to be screening-level quality and therefore were not included in the ecological screening assessment. The surface soil inorganic chemical data is presented in the approved investigation work plan (LANL 2005, 91547) and in Appendix F. The data show that only lead and silver were detected at concentrations above their respective BVs. The maximum detected concentration for lead is 30 mg/kg, only slightly above the maximum background concentration of 28 mg/kg. Silver was detected at a maximum concentration of 6 mg/kg, which results in an HQ of 120 for plants; the HQs for the other receptors are less than 0.3. The vegetative community at MDA C appears healthy and not affected by any COPECs. Therefore, the uncertainty associated with lack of surface analytical inorganic chemical data in the ecological risk screening assessment does not substantially underestimate the potential risk to receptors for MDA C and does not change the results of the assessment.

G-6.5.4 COPECs Contributing to HIs Greater Than 1

Aroclor-1254 is the only COPEC resulting in HQs and HIs greater than 1. The resulting HQs for the omnivorous and insectivorous robin were 1.4 and 2.7, respectively. However, Aroclor-1254 was detected in only 3 of 59 samples from 0–5 ft (concentrations ranged from 0.07 mg/kg to 1 mg/kg) within the 11.8-acre site of MDA C. The HQs for the robin overestimate the potential exposure and risk to Aroclor-1254, given the infrequent detection of this COPEC. In addition, Dourson and Stara (1983, 73474) conducted a study of uncertainty factors incorporated in calculating ESLs for ecological receptors. Based on their study, the LOAEL to NOAEL adjustment indicates that HIs up to 10 may not adversely affect ecological receptors (Dourson and Stara 1983, 73474). To maintain conservatism, Dourson and Stara (1983, 73474) state that HIs less than 3 do not adversely affect ecological receptors. Based on the infrequent detection of Aroclor-1254 (3 detections out of 59 samples) in samples collected from the 0–5 ft depth interval, the generally low concentrations detected (maximum of 1 mg/kg), and the conclusions of

Dourson and Stara (1983, 73474), the HIs for the robin do not indicate a potential unacceptable ecological risk.

G-6.5.5 Pore-Gas COPECs

Two rounds of pore-gas samples were collected: one during the drilling or soon after drilling completion and the second round at least one month after the first round.

For the first round, several of the VOCs (2-butanone, carbon disulfide, cyclohexane, 1,2-dichloro-1,1,2,2-tetrafluoroethane, cis-1,2-dichloroethene, 1,2-dichloropropane, ethylbenzene, 4-ethyltoluene; n-heptane; hexane; 1,1,2-trichloro-1,2,3-trifluoroethane; 1,2,4-trimethylbenzene; 1,3,5-trimethylbenzene; 1,2-xylene; and 1,3-xylene+1,4-xylene) detected in pore gas do not have inhalation ESLs. If benzene is used as a surrogate for ethylbenzene, 1,2,4-trimethylbenzene, and 1,3,5-trimethylbenzene; if 1,1-dichloroethene is used as a surrogate for cis-1,2-dichloroethene; and if total xylene is used as a surrogate for 1,2-xylene and 1,3-xylene+1,4-xylene, the HI increases by only 0.05. For the second round, several VOCs (1,2-dichloro-1,1,2,2-tetrafluoroethane; cis-1,2-dichloroethene; 1,2-dichloropropane; ethylbenzene; and 1,2-xylene) detected in pore gas do not have inhalation ESLs. If benzene, 1,1-dichloroethene, and total xylene are used as surrogates for ethylbenzene, cis-1,2-dichloroethene, and 1,2-xylene and 1,3-xylene+1,4-xylene, respectively, the HI increases by only 0.01. These VOCs are relatively less toxic than those with ESLs based on human health SSLs (EPA 2005, 91002). Therefore, the exclusion of the VOCs without inhalation ESLs from the screening assessment does not substantially underestimate the potential risk to burrowing animals.

G-6.6 Interpretation

Based on the ecological screening assessment for MDA C, several COPECs were identified. Most of the COPECs were eliminated based on HQs/HI less than 1.0 for the receptors. Aroclor-1254 is eliminated as a COPEC based on the infrequency of detection, the relatively low concentrations, and the conclusions of Dourson and Strata (1983, 73474).

G-7.0 CONCLUSIONS

MDA C was evaluated for potential risk to human health using industrial worker SSLs. The risk of 2×10^{-7} , hazard of 0.01, and dose of 10 mrem/yr for an industrial exposure are below the applicable risk, hazard, and dose target levels. In addition to the dose comparison, radionuclide EPCs were used to calculate the potential cancer risk using EPA radionuclide PRGs for outdoor workers (epa-ors.ornl.gov/radionuclides/download.shtml). The total cancer risk from radionuclides under the industrial scenario is approximately 2×10^{-6} . The human health screening assessment indicates no potential unacceptable risk or dose for an industrial worker receptor, and further investigation or corrective action at MDA C is not warranted based on risk/dose.

Based on ecological screening assessment, COPECs were identified and evaluated further. The COPECs were eliminated based on HQs/HIs less than 1.0 and the uncertainty analysis. The results of the ecological risk screening assessment indicate no potential risk to ecological receptors at the site, and further investigation or corrective action is not warranted based on ecological risk.

G-8.0 REFERENCES

The following list includes all documents cited in this appendix. Parenthetical information following each reference provides the author(s), publication date, and ER ID number. This information is also included in text citations. ER ID numbers are assigned by the Environmental Programs Directorate's Records Processing Facility (RPF) and are used to locate the document at the RPF and, where applicable, in the master reference set.

Copies of the master reference set are maintained at the NMED Hazardous Waste Bureau; the U.S. Department of Energy—Los Alamos Site Office; the U.S. Environmental Protection Agency, Region 6; and the Directorate. The set was developed to ensure that the administrative authority has all material needed to review this document, and it is updated with every document submitted to the administrative authority. Documents previously submitted to the administrative authority are not included.

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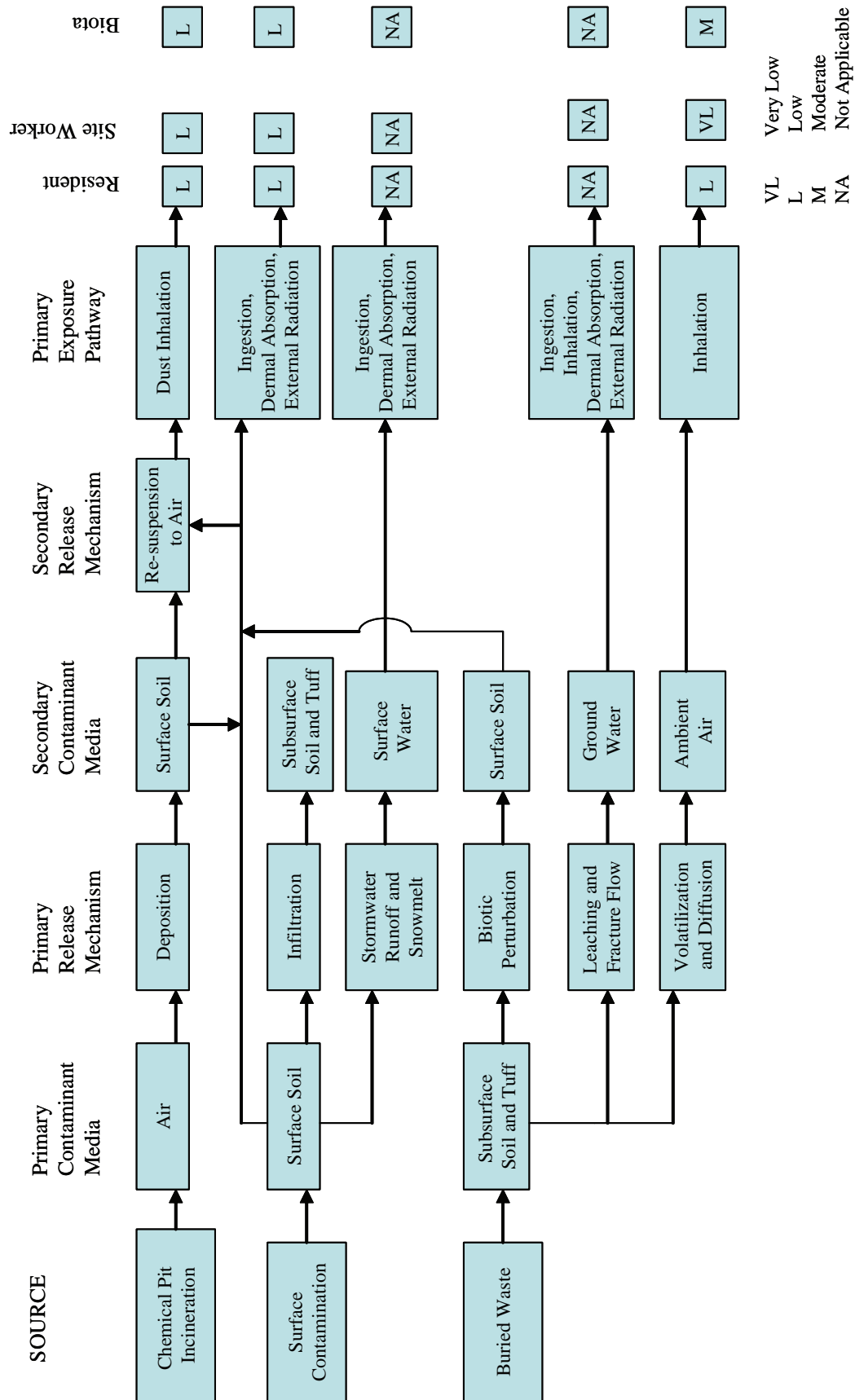


Figure G-3.1-1. Conceptual site model for MDA C

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Table G-2.2-1
Exposure Point Concentrations for the Industrial Scenario and Ecological Assessment
(0–1- and 0–5-ft bgs depths, respectively)

COPCs	Number of Samples	Number of Detects	Detection Limit	Maximum Detected Concentration	Distribution	95% UCL	UCL Method
Organic Chemicals (mg/kg)							
Acenaphthene	59	2	0.17–0.36	0.96	Nonparametric	0.15	Modified- <i>t</i> UCL
Aroclor-1254	59	3	0.03–0.06	1.0	Nonparametric	0.11	95% Chebyshev
Aroclor-1260	59	4	0.03–0.15	0.07	Nonparametric	0.02	Modified- <i>t</i> UCL
Radionuclides (pCi/g)							
Americium-241	74	55	0.001–0.08	1.02	Nonparametric	0.15	95% Chebyshev
Cesium-134	6	3	0.001–0.01	0.08	n/a*	0.08	Maximum value used
Plutonium-238	74	37	0.001–0.02	0.22	Nonparametric	0.04	97.5% Chebyshev
Plutonium-239	74	70	0.001–0.04	10.69	Nonparametric	1.66	95% Chebyshev
Thorium-232	32	15	2.08–3.09	4.80	Nonparametric	3.27	95% Chebyshev
Tritium	59	49	0.027–0.91	0.37	Nonparametric	0.11	97.5% Chebyshev
Uranium-238	73	73	0.019–0.11	2.45	Normal	1.48	Student's- <i>t</i>

*n/a = Not applicable.

Table G-2.2-2
Exposure Point Concentrations for the Residential Scenario
(0–10-ft bgs depth)

COPCs	Number of Samples	Number of Detects	Maximum Detected Concentration	Distribution	95% UCL	UCL Method
Organic Chemicals (mg/kg)						
Acenaphthene	67	2	0.96	Nonparametric	0.15	Modified-t UCL
Aroclor-1254	67	3	1.0	Nonparametric	0.11	95% Chebyshev
Aroclor-1260	67	4	0.07	Nonparametric	0.02	Modified-t UCL
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	7	1	0.000000641	n/a*	0.000000641	Maximum detected concentration
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	7	3	0.0000117	n/a	0.0000117	Maximum detected concentration
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	7	1	0.000000788	n/a	0.000000788	Maximum detected concentration
Radionuclides (pCi/g)						
Americium-241	82	55	1.02	Nonparametric	0.13	95% Chebyshev
Cesium-134	8	3	0.08	n/a	0.08	Maximum detected concentration
Plutonium-238	82	37	0.22	Nonparametric	0.03	95% Chebyshev
Plutonium-239	82	71	10.69	Nonparametric	1.50	95% Chebyshev
Thorium-232	32	15	4.80	Nonparametric	3.28	95% Chebyshev
Tritium	59	49	0.37	Gamma	0.07	Approximate Gamma
Uranium-235	81	4	0.101	Gamma	0.04	Approximate Gamma
Uranium-238	81	81	2.45	Normal	1.43	Student's-t
Inorganic Chemicals (mg/kg)						
Aluminum	8	8	15100	n/a	15100	Maximum detected concentration
Arsenic	8	8	7.11	n/a	7.11	Maximum detected concentration
Barium	8	7	65.2	n/a	65.2	Maximum detected concentration
Calcium	8	7	4850	n/a	4850	Maximum detected concentration
Chromium	8	8	29	n/a	29	Maximum detected concentration
Cobalt	8	8	3.56	n/a	3.56	Maximum detected concentration

Table G-2.2-2 (continued)

COPCs	Number of Samples	Number of Detects	Maximum Detected Concentration	Distribution	95% UCL	UCL Method
Copper	8	8	11.4	n/a	11.4	Maximum detected concentration
Lead	8	8	60.9	n/a	60.9	Maximum detected concentration
Magnesium	8	7	2530	n/a	2530	Maximum detected concentration
Nitrate	8	5	4.9	n/a	4.9	Maximum detected concentration
Perchlorate	8	3	0.00412	n/a	0.004	Maximum detected concentration
Selenium	8	3	15	n/a	15	Maximum detected concentration
Zinc	8	8	101	n/a	101	Maximum detected concentration

*n/a = Not applicable.

Table G-3.1-1
K_d Values for Inorganic COPCs at MDA C

COPCs	K _d ^a (cm ³ /g)
Aluminum	1.50E+03
Antimony	4.50E+01
Arsenic	2.90E+01
Barium	4.10E+01
Beryllium	7.90E+02
Cadmium	7.50E+01
Chromium ^b	1.80E+06
Cobalt	4.50E+01
Copper	3.50E+01
Cyanide, total	9.90E+00
Iron	2.50E+01
Lead	9.00E+02
Manganese	6.50E+01
Mercury	5.20E+01
Nickel	6.50E+01
Nitrate	na ^c
Perchlorate	2.80E-07 ^d
Selenium	5.00E+00
Silver	8.30E+00
Vanadium	1.00E+03
Zinc	6.20E+01

^a K_d values from NMED 2006, 92513, unless otherwise footnoted.

^b K_d value for chromium(III) used because it is the predominant chromium species in soil.

^c na = Not available.

^d K_d value for perchlorate from Superfund Chemical Data Matrix, p. A-271,
<http://www.epa.gov/superfund/sites/npl/hrsres/tools/scdm.htm>.

Table G-3.1-2
K_d Values for Radionuclide COPCs at MDA C

COPCs	K _d (cm ³ /g)
Americium-241	6.80E+02 ^a
Cesium-134	1.00E+03 ^a
Cesium-137	1.00E+03 ^a
Cobalt-60	4.50E+01 ^a
Europium-152	6.50E+02 ^b
Plutonium-238	4.50E+03 ^a
Plutonium-239	4.50E+03 ^a
Strontium-90	3.50E+01 ^a
Ruthenium-106	3.50E+02 ^b
Sodium-22	1.00E+02 ^b
Tritium	9.90E+00 ^a
Uranium-234	4.50E+02 ^b
Uranium-235	4.50E+02 ^b
Uranium-238	4.50E+02 ^b

^a K_d values from SCDM
<http://www.epa.gov/superfund/sites/npl/hrsres/tools/scdm.htm>.

^b K_d values from <http://rais.ornl.gov/>

Table G-3.1-3
Chemical Properties of Organic COPCs at MDA C

COPCs	Solubility (mg/L)	K _{oc} (cm ³ /g)	log K _{ow} (unitless)	Vapor Pressure (mm Hg)
Acenaphthene	4.24E+00	4.90E+03	3.9 ^a	2.5E-03 ^a
Acenaphthylene	1.60E+01 ^a	6.12E+03 ^b	4.1 ^a	9.1E-04 ^a
Acetone	1.00E+06	5.80E-01	-0.24 ^b	231 ^b
Anthracene	4.34E-02	2.95E+04	4.5 ^a	2.70E-06 ^a
Aroclor-1242	2.77E-01	4.48E+04	6.29 ^b	8.63E-05 ^b
Aroclor-1254	2.77E-01	5.30E+05	6.79 ^a	6.53E-06 ^a
Aroclor-1260	2.77E-01	5.30E+05	8.27 ^b	4.05E-05 ^a
Benzo(a)pyrene	1.62E-03	1.02E+06	6.0 ^a	5.50E-09 ^a
Benzo(b)fluoranthene	1.50E-03	1.23E+06	5.78 ^a	5.00E-07 ^a
Benzoic Acid	3.40E+03 ^a	na ^c	1.87 ^a	7.00E-04 ^a
Benzo(k)fluoranthene	8.00E-04	1.23E+06	6.1 ^a	2.09E-09 ^a
Bis(2-ethylhexyl)phthalate	3.40E-01	1.51E+07	5.1 ^a	6.80E-08 ^a
Chloronaphthalene[2-]	1.20E+01	1.60E+03	3.98 ^a	9.03E-03 ^a
Chrysene	1.60E-03	3.98E+05	5.7 ^a	6.20E-09 ^a
Dichlorodifluoromethane	2.80E+02	5.80E+01	2.16 ^b	4850 ^b
Di-n-butylphthalate	1.12E+01	3.39E+04	4.7 ^a	7.30E-05 ^a
Di-n-octylphthalate	2.00E-02 ^a	8.32E+07 ^d	8.1 ^a	2.60E-06 ^a
Fluoranthene	2.06E-01	1.07E+05	5.16 ^a	9.22E-06 ^a
Fluorene	1.90E+00	7.90E+03	4.2	6.3E-04 ^a
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	2.40E-06 ^a	1.70E+00– 2.05E+00 ^e	8.2 ^a	7.50E-10 ^a
Heptachlorodibenzodioxins (Total)	1.90E-03 ^a	7.03E+05 ^b	7.8 ^a	5.60E-10 ^a
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	1.30E-06 ^a	2.07E+00 ^e	7.9 ^a	2.00E-08 ^a
Heptachlorodibenzofurans (Total)	1.40E-06 ^e	na	7.4 ^e	4.70E-11 ^e
Hexachlorodibenzodioxins (Total)	4.40E-06 ^e	na	7.3 ^e	4.40E-11 ^e
Hexachlorodibenzofuran[1,2,3,4,7,8-]	8.25E-06 ^e	2.00E+00 ^e	7.0 ^e	2.40E-10 ^e
Hexachlorodibenzofurans (Total)	1.30E-05 ^e	na	7.0 ^e	2.80E-10 ^e
Indeno(1,2,3-cd)pyrene	2.20E-05 ^a	3.47E+06 ^a	6.6 ^a	1.00E-10 ^a
Methylene Chloride	1.30E+04	1.20E+01	1.25 ^b	435 ^b
Methylnaphthalene[2-] ^f	3.10E+01	2.00E+03	3.3 ^b	8.50E-02 ^b
Methylphenol[2-]	na	na	na	na
Nitrotoluene[2-]	2.10E+03	6.50E+01	2.30 ^a	1.88E-01 ^a
Nitrotoluene[3-]	2.10E+03	6.50E+01	2.45 ^a	2.05E-01 ^a
Nitrotoluene[4-]	2.10E+03	6.50E+01	2.37 ^a	1.64E-01 ^a
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	4.00E-07 ^b	na	9.5 ^b	8.25E-13 ^b
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	1.16E-06 ^b	na	8.6 ^b	3.75E-12 ^b

Table G-3.1-3 (continued)

COPCs	Solubility (mg/L)	K _{OC} (cm ³ /g)	log K _{ow} (unitless)	Vapor Pressure (mm Hg)
Pentachlorodibenzodioxins (Total)	1.18E-04 ^e	na	6.60 ^e	5.60E-10 ^e
Pentachlorodibenzofuran[1,2,3,7,8-]	2.35E-04 ^b	na	6.79 ^b	3.46E-07 ^b
Pentachlorodibenzofurans (Total)	2.40E-04 ^e	na	6.4 ^e	2.70E-09 ^e
Phenanthrene	1.15E+00	1.40E+04	4.46 ^a	1.12E-04 ^a
Pyrene	1.35E-01	6.80E+04	4.88 ^a	4.50E-06 ^a
RDX	5.97E+01	7.00E+01	0.87 ^a	4.10E-09 ^a
Tetrachlorodibenzofuran[2,3,7,8-]	6.90E-04 ^a	8.10E+04 ^b	6.5 ^a	1.50E-06 ^a
Tetrachlorodibenzofurans (Total)	4.20E-04 ^e	na	6.2 ^e	2.50E-08 ^e
Toluene	5.26E+02	1.82E+02	2.73 ^b	28.4 ^b
Trichloroethene (TCE)	1.10E+03	9.40E+01	2.42 ^b	69 ^b

Note: Values from NMED 2006, 92513, unless otherwise footnoted.

^a Value from <http://www.epa.gov/superfund/sites/npl/hrsres/tools/scdm.htm>.

^b Value from <http://rais.ornl.gov/>.

^c na = Not available.

^d Value from <http://www.dep.state.pa.us/physicalproperties/Default.htm>.

^e Value from EPA 2003, 91286.

^f Naphthalene used as a surrogate for 2-methylnaphthalene (NMED 2003, 81172).

Table G-3.3-1
Results of Pore-Gas Screening for MDA C Based on Maximum Detected Concentrations

COPCs	Maximum Detected Concentration (µg/m³)	H'	Screening Level (µg/L)	Screening Value (unitless)
Acetone	390	1.60E-03	5.50E+03 ^a	4.43E-02
Benzene	60	2.28E-01	5.00E+00 ^b	5.26E-02
Butadiene[1,3-]	230	7.30E+00	1.30E+00 ^a	2.40E-02
Butanol[1-]	65	3.47E-04	3.70E+03 ^a	5.06E-02
Butanone[2-]	160	1.10E-03	7.10E+03 ^a	2.05E-02
Carbon disulfide	89	1.2E+00	1.00E+03 ^a	7.42E-05
Carbon tetrachloride	7200	1.25E+00	5.00E+00 ^b	1.15E+00
Chlorodifluoromethane	61	4.1E+00	8.50E+04 ^a	1.75E-07
Chloroform	4600	1.50E-01	1.00E+02 ^a	3.07E-01
Chloromethane	2.3	9.80E-01	2.10E+01 ^a	1.12E-04
Cyclohexane	30	7.24E+00	1.30E+04 ^a	3.19E-07
Dichloro-1,1,2,2-tetrafluoroethane[1,2-]	500	2.80E+00	na ^c	na
Dichlorobenzene[1,2-]	5.7	7.79E-02	4.90E+01 ^a	1.49E-03
Dichlorodifluoromethane	3900	4.10E+00	3.90E+02 ^a	2.44E-03
Dichloroethane[1,1-]	120	2.30E-01	2.50E+01 ^d	2.09E-02
Dichloroethane[1,2-]	430	4.01E-02	5.00E+00 ^a	2.14E+00
Dichloroethene[1,1-]	400	1.1E+00	5.00E+00 ^d	7.27E-02
Dichloroethene[cis-1,2-]	840	1.67E-01	7.00E+01 ^b	7.19E-02
Dichloropropane[1,2-]	860	1.10E-01	5.00E+00 ^b	1.56E+00
Dioxane[1,4-]	2300	3.70E-04	6.10E+01 ^a	1.02E+02
Ethanol	7.2	2.56E-04	na	na
Ethylbenzene	240	3.23E-01	7.00E+02 ^b	1.06E-03
Ethyltoluene[4-]	25	2.02E-01	na	na
Heptane[n-]	220	8.32E+01	na	na
Hexane	170	5.00E+00	4.20E+02 ^a	8.10E-05
Hexanone[2-]	18	9.57E-05	na	na
Methanol	130	1.35E-04	1.80E+04 ^a	5.35E-02
Methyl-2-pentanone[4-]	26	5.70E-03	2.00E+03 ^a	2.28E-03
Methylene chloride	1900	9.00E-02	5.00E+00 ^b	4.22E+00
Propylene	760	na	na	na
Styrene	76	1.10E-01	1.00E+02 ^b	6.91E-03
Tetrachloroethene	24000	7.54E-01	5.00E+00 ^b	6.37E+00
Toluene	750	2.72E-01	7.50E+02 ^d	3.66E-03
Trichloro-1,2,2-trifluoroethane[1,1,2-]	2900	2.14E+01	5.90E+04 ^a	2.30E-06
Trichloroethane[1,1,1-]	530	7.05E-01	6.00E+01 ^d	1.25E-02

Table G-3.3-1 (continued)

COPCs	Maximum Detected Concentration (µg/m ³)	H'	Screening Level (µg/L)	Screening Value (unitless)
Trichloroethane[1,1,2-]	190	3.74E-02	5.00E+00 ^b	1.02E+00
Trichlorofluoromethane	190	4.00E+00	1.30E+03 ^a	3.65E-05
Trichloroethene	77000	4.22E-01	5.00E+00 ^b	3.65E+01
Trimethylbenzene[1,2,4-]	30	2.30E-01	1.20E+01 ^a	1.09E-02
Trimethylbenzene[1,3,5-]	16	3.20E-01	1.20E+01 ^a	4.17E-03
Xylene[1,2-]	39	2.13E-01	1.40E+03 ^a	1.31E-04
Xylene[1,3-]+Xylene[1,4-] ^e	160	3.01E-01	2.10E+02 ^a	2.54E-03
Xylenes[total]	1100	3.00E-01	6.20E+02 ^d	5.91E-03

Note: Bold screening values indicate result is greater than 1.

^a EPA Region 6 screening level for tap water (EPA 2005, 91002).

^b EPA MCL = EPA National Primary Drinking Water Standards.

^c na = Not available.

^d NM WQCC groundwater standard.

^e Properties for xylene[1,3-] used.

Table G-3.3-2
Results of Pore-Gas Screening for MDA C Based on Deepest Detected Concentrations

COPCs	Concentration from Deepest Depth (µg/m³)	Depth (ft)	H'	Screening Level (µg/L)	Screening Value (unitless)
Acetone	120	591	1.60E-03	5.50E+03 ^a	1.36E-02
Benzene	ND ^b	591	2.28E-01	5.00E+00 ^c	n/a ^d
Butadiene[1,3-]	9.8	275	7.30E+00	1.30E+00 ^a	1.00E-03
Butanol[1-]	ND	275	3.47E-04	3.70E+03 ^a	n/a
Butanone[2-]	ND	591	1.10E-03	7.10E+03 ^a	n/a
Carbon disulfide	9.6	591	1.2E+00	1.00E+03 ^a	8.00E-06
Carbon tetrachloride	9.4	591	1.25E+00	5.00E+00 ^c	1.50E-03
Chlorodifluoromethane	ND	591	4.1E+00	8.50E+04 ^a	n/a
Chloroform	10	591	1.50E-01	1.00E+02 ^a	6.67E-04
Chloromethane	ND	591	9.80E-01	2.10E+01 ^a	n/a
Cyclohexane	ND	275	7.24E+00	1.30E+04 ^a	n/a
Dichloro-1,1,2,2-tetrafluoroethane[1,2-]	ND	591	2.80E+00	na ^e	n/a
Dichlorobenzene[1,2-]	ND	591	7.79E-02	4.90E+01 ^a	n/a
Dichlorodifluoromethane	8	591	4.10E+00	3.90E+02 ^a	5.00E-06
Dichloroethane[1,1-]	ND	591	2.30E-01	2.50E+01 ^f	n/a
Dichloroethane[1,2-]	ND	591	4.01E-02	5.00E+00 ^a	n/a
Dichloroethene[1,1-]	ND	591	1.1E+00	5.00E+00 ^f	n/a
Dichloroethene[cis-1,2-]	ND	591	1.67E-01	7.00E+01 ^c	n/a
Dichloropropane[1,2-]	ND	591	1.10E-01	5.00E+00 ^c	n/a
Dioxane[1,4-]	ND	275	3.70E-04	6.10E+01 ^a	n/a
Ethanol	ND	275	2.56E-04	na	n/a
Ethylbenzene	ND	591	3.23E-01	7.00E+02 ^c	n/a
Ethyltoluene[4-]	ND	591	2.02E-01	na	n/a
Heptane[n-]	ND	275	8.32E+01	na	n/a
Hexane	ND	275	5.00E+00	4.20E+02 ^a	n/a
Hexanone[2-]	ND	591	9.57E-05	na	n/a
Methanol	ND	275	1.35E-04	1.80E+04 ^a	n/a
Methyl-2-pentanone[4-]	8.1	591	5.70E-03	2.00E+03 ^a	7.11E-04
Methylene chloride	ND	591	9.00E-02	5.00E+00 ^c	n/a
Propylene	89	275	na	na	2.39E-03
Styrene	ND	591	1.10E-01	1.00E+02 ^c	n/a
Tetrachloroethene	32	591	7.54E-01	5.00E+00 ^c	8.49E-03
Toluene	ND	591	2.72E-01	7.50E+02 ^f	n/a
Trichloro-1,2,2-trifluoroethane[1,1,2-]	ND	591	2.14E+01	5.90E+04 ^a	n/a
Trichloroethane[1,1,1-]	ND	591	7.05E-01	6.00E+01 ^f	n/a

Table G-3.3-2 (continued)

COPCs	Concentration from Deepest Depth ($\mu\text{g}/\text{m}^3$)	Depth (ft)	H'	Screening Level ($\mu\text{g}/\text{L}$)	Screening Value (unitless)
Trichloroethane[1,1,2-]	ND	591	3.74E-02	5.00E+00 ^c	n/a
Trichlorofluoromethane	ND	591	4.00E+00	1.30E+03 ^a	n/a
Trichloroethene	360	591	4.22E-01	5.00E+00 ^c	1.71E-01
Trimethylbenzene[1,2,4-]	ND	591	2.30E-01	1.20E+01 ^a	n/a
Trimethylbenzene[1,3,5-]	ND	591	3.20E-01	1.20E+01 ^a	n/a
Xylene[1,2-]	ND	591	2.13E-01	1.40E+03 ^a	n/a
Xylene[1,3-]+Xylene[1,4-]	28	275	3.01E-01	2.10E+02 ^a	1.51E-04
Xylenes[total]	5.6	548	3.00E-01	6.20E+02 ^f	3.01E-05

^a EPA Region 6 screening level for tap water (EPA 2005, 91002).

^b ND = Not detected at this depth.

^c EPA MCL = EPA National Primary Drinking Water Standards.

^d n/a = Not applicable.

^e na = Not available.

^f NMWQCC groundwater standard.

Table G-4.0-1
Exposure Parameter Values Used to
Calculate Chemical SSLs for the Industrial and Residential Scenarios

Parameters	Industrial Worker Values	Residential Values
Target HQ	1	1
Target cancer risk	10^{-5}	10^{-5}
Averaging time (carcinogen)	70 yr x 365 days	70 yr x 365 days
Averaging time (noncarcinogen)	ED x 365 days	ED x 365 days
Skin absorption factor	SVOC = 0.1	SVOC = 0.1
	Chemical-specific	Chemical-specific
Adherence factor–child	n/a ^a	0.2 mg/cm ²
Body weight–child	n/a	15 kg (0–6 years of age)
Cancer slope factor–oral (chemical-specific)	(mg/kg-day) ⁻¹	(mg/kg-day) ⁻¹
Cancer slope factor–inhalation (chemical-specific)	(mg/kg-day) ⁻¹	(mg/kg-day) ⁻¹
Exposure frequency	225 day/yr	350 day/yr
Exposure duration–child	n/a	6 yr (0–6 years of age)
Age-adjusted ingestion factor	n/a	114 mg-yr/kg-day
Age-adjusted inhalation factor	n/a	11 m ³ -yr/kg-day
Inhalation rate–child	n/a	10 m ³ /day
Soil ingestion rate–child	n/a	200 mg/day
Particulate emission factor	6.61×10^9 m ³ /kg	6.61×10^9 m ³ /kg
Reference dose–oral (chemical-specific)	(mg/kg-day)	(mg/kg-day)
Reference dose–inhalation (chemical-specific)	(mg/kg-day)	(mg/kg-day)
Exposed surface area–child	n/a	2800 cm ² /day (head, hands, forearms, lower legs, feet)
Age-adjusted skin contact factor for carcinogens	n/a	361 mg-yr/kg-day
Volatilization factor for soil (chemical-specific)	(m ³ /kg)	(m ³ /kg)
Body weight–adult	70 kg	70 kg
Exposure duration ^b	25	30 yr
Adherence factor–adult	0.2 mg/cm ²	0.07 mg/cm ²
Soil ingestion rate–adult	100 mg/day	100 mg/day
Exposed surface area–adult	3300 cm ² /day (head, hands, forearms)	5700 cm ² /day (head, hands, forearms, lower legs)
Inhalation rate–adult	20 m ³ /day	20 m ³ /day

Note: Parameter values from NMED 2006, 92513.

^a n/a = Not applicable.

^b Exposure duration for lifetime resident is 30 yr. For carcinogens, the exposures are combined for child (6 yr) and adult (24 yr).

Table G-4.0-2
Parameter Values Used to
Calculate Radionuclide SALs for the Industrial and Residential Scenarios

Parameters	Industrial, Adult	Residential, Child	Residential, Adult
Inhalation rate (m ³ /yr)	19,481 ^a	3652.5 ^b	7305 ^c
Mass loading (g/m ³)	1.5 x 10 ^{-7 d}	1.5 x 10 ^{-7 d}	1.5 x 10 ^{-7 d}
Outdoor time fraction	0.2053 ^e	0.2236 ^f	0.0599 ^g
Indoor time fraction	0	0.7347 ^h	0.8984 ⁱ
Soil ingestion (g/yr)	97.4 ^j	73 ^k	36.5 ^l

^a Calculated as [20 m³/day x 225 day/yr] / [indoor + outdoor time fractions], where 20 m³/day is the daily inhalation rate of an adult and 225 days/yr is the exposure frequency (NMED 2006, 92513).

^b Calculated as [10 m³/day x 350 day/yr] / [indoor + outdoor time fractions], where 10 m³/day is the daily inhalation rate of a child (NMED 2006, 92513).

^c Calculated as [20 m³/day x 350 day/yr] / [indoor + outdoor time fractions], where 20 m³/day is the daily inhalation rate of an adult (NMED 2006, 92513).

^d Calculated as [1/ 6.6 x 10⁺⁹ m³/kg) x 1000 g/kg, where 6.6 x 10⁺⁹ m³/kg is the particulate emission factor (NMED 2006, 92513).

^e Calculated as [8 hr/day x 225 day/yr] / 8766 hr/yr, where 8 hr/day is an estimate of the average length of the work day.

^f Calculated as [5.6 hr/day x 350 day/yr] / 8766 hr/yr, where 5.6 hr/day is an estimate of time spent outdoors for a 3-11 yr old child (EPA 1997, 66598, Section 15.4-1).

^g Calculated as [1.5 hr/day x 350 day/yr] / 8766 hr/yr, where 1.5 hr/day is an estimate of time spent outdoors for an adult 12 yr and older (EPA 1997, 66598, Section 15.4-1).

^h Calculated as [(24-5.6 hr/day x 350 day/yr] / 8766 hr/yr.

ⁱ Calculated as [(24-1.5 hr/day x 350 day/yr] / 8766 hr/yr.

^j Calculated as [0.1 g/day x 225 day/yr] / [indoor + outdoor time fractions], where 0.1 g/day is the adult soil ingestion rate (NMED 2006, 92513).

^k Calculated as [0.2 g/day x 350 day/yr] / [indoor + outdoor time fractions], where 0.2 g/day is the child soil ingestion rate (NMED 2006, 92513).

^l Calculated as [0.1 g/day x 350 day/yr] / [indoor + outdoor time fractions], where 0.1 g/day is the adult soil ingestion rate (NMED 2006, 92513).

Table G-4.0-3
ESLs for Terrestrial Receptors

COPCs	Red fox	Carnivorous Kestral	Omnivorous Kestral	Herbivorous Robin	Omnivorous Robin	Insectivorous Robin	Desert Cottontail	Montane Shrew	Deer Mouse	Earthworm	Plant
Acenaphthene	6.2E+03	na*	na	na	na	na	4.9E+02	1.2E+02	1.6E+02	na	2.5E-01
Aroclor-1254	1.5E-01	2.2E-01	1.7E-01	1.3E+00	8.0E-02	4.0E-02	5.2E+01	4.4E-01	8.8E-01	na	1.6E+02
Aroclor-1260	1.4E-01	4.6E+00	3.7E+00	4.6E+01	1.7E+00	8.8E-01	3.0E+03	1.0E+01	2.0E+01	na	na
Americium-241	2.6E+04	6.2E+04	3.5E+04	1.3E+04	4.0E+03	4.0E+03	3.2E+04	3.1E+04	3.2E+04	4.4E+01	2.1E+04
Cesium-134	3.2E+02	1.3E+03	1.7E+03	1.9E+03	1.7E+03	1.7E+03	1.0E+03	1.1E+03	1.1E+03	7.7E+02	1.1E+04
Plutonium-238	3.0E+04	1.3E+05	3.2E+04	8.3E+03	2.1E+03	2.0E+03	1.2E+05	9.2E+04	1.1E+05	4.4E+01	1.1E+05
Plutonium-239	3.3E+04	1.6E+05	3.4E+04	8.6E+03	2.1E+03	2.1E+03	1.7E+05	1.1E+05	1.5E+05	4.7E+01	1.6E+05
Thorium-232	4.6E+03	2.5E+04	4.6E+03	1.1E+03	2.8E+02	2.8E+02	3.1E+04	2.0E+04	2.9E+04	6.2E+00	3.90E+03
Tritium	1.9E+05	5.8E+05	6.3E+05	3.0E+05	4.4E+05	6.0E+05	2.3E+05	3.4E+05	3.3E+05	4.8E+04	3.6E+04
Uranium-238	2.0E+03	4.2E+03	4.1E+03	3.9E+03	3.4E+03	3.4E+03	2.1E+03	2.0E+03	2.1E+03	5.5E+01	1.8E+03

Note: Values from ECORISK Database, Version 2.2 (LANL 2005, 90032). Units are mg/kg for chemicals and pCi/g for radionuclides.

*na = Not available.

Table G-5.0-1
Risk Screening Comparisons for the Industrial Scenario

COPCs	EPC (mg/kg)	Industrial SSL* (mg/kg)	Carcinogenic Risk
Aroclor-1254	0.11	8.26	1.33E-07
Aroclor-1260	0.02	8.26	2.42E-08
Total Excess Cancer Risk			2E-07

*SSLs from NMED 2006, 92513.

Table G-5.0-2
**Comparison of Noncarcinogenic
COPCs to SSLs for the Industrial Scenario**

COPCs	EPC (mg/kg)	Industrial SSL (mg/kg)	Hazard Quotient
Acenaphthene	0.15	33500 ^a	0.00000448
Aroclor-1254	0.11	12 ^b	0.01
Aroclor-1260	0.02	12 ^b	0.002
HI			0.01

^a SSL from NMED 2006, 92513.

^b SSL from EPA 2005, 91002.

Table G-5.0-3
Comparison of Radionuclide COPCs to SALs for the Industrial Scenario

COPCs	EPC (pCi/g)	Industrial SAL* (pCi/g)	Total Dose (mrem/yr)
Americium-241	0.15	180	0.015
Cesium-134	0.08	9.7	0.15
Plutonium-238	0.04	240	0.003
Plutonium-239	1.66	210	0.15
Thorium-232	3.27	5	9.75
Tritium	0.11	440000	0.00000375
Uranium-238	1.48	430	0.045
Total Dose			10

*SALs from LANL 2005, 88493.

Table G-5.0-4
Toxicity Equivalency for Dioxin and Furan

COPCs	Number of Analyses	Maximum Detected Concentration (mg/kg)	Toxic Equivalency Factor (TEF)*	Exposure Point Concentration (mg/kg)
Dioxin				
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	7	1.17E-05	0.0001	1.17E-09
Furans				
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	7	6.41E-07	0.01	6.41E-09
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	7	7.88E-07	0.0001	7.88E-11
Total				7.66E-09

*TEFs from <http://www.epa.gov/ncea/pdfs/dioxin/nas-review>.

Table G-5.0-5
Risk Screening Comparisons for the Residential Scenario

COPCs	EPC (mg/kg)	Residential SSL (mg/kg)	Carcinogenic Risk
Aroclor-1254	0.11	2.2 ^a	5.00E-07
Aroclor-1260	0.02	2.2 ^a	9.09E-08
Dioxin (2,3,7,8-TCDD)	0.00000000766	0.000039 ^a	1.96E-09
Arsenic	7.11	3.9 ^b	1.82E-05
Chromium	29	2100 ^a	1.38E-07
Total Excess Cancer Risk			2E-05

^a SSL from EPA 2005, 91002.

^b SSL from NMED 2006, 92513.

Table G-5.0-6
Comparison of Noncarcinogenic COPCs to SSLs for the Residential Scenario

COPCs	EPC (mg/kg)	Residential SSL ^a (mg/kg)	Hazard Quotient
Acenaphthene	0.15	3730	4.02E-05
Aluminum	15100	77800	0.2
Aroclor-1254	0.11	1.12	0.1
Aroclor-1260	0.02	1.12	0.02
Arsenic	7.11	22 ^b	0.3
Barium	65.2	15600	0.004
Cobalt	3.56	1520	0.002
Copper	11.4	3130	0.004
Nitrate	4.9	100000	0.00005
Perchlorate	0.00412	55 ^b	7.5E-05
Selenium	15	391	0.04
Zinc	101	23500	0.004
HI			0.9

^a SSL from NMED 2006, 92513 unless otherwise noted.

^b SSL from EPA 2005, 91002.

Table G-5.0-7
Comparison of Radionuclide COPCs to SALs for the Residential Scenario

COPCs	EPC (pCi/g)	Residential SAL * (pCi/g)	Total Dose (mrem/yr)
Americium-241	0.13	30	0.07
Cesium-134	0.08	2.4	0.50
Plutonium-238	0.03	37	0.01
Plutonium-239	1.50	33	0.68
Thorium-232	3.28	4.64	10.60
Tritium	0.07	750	0.001
Uranium-235	0.04	17	0.04
Uranium-238	1.43	86	0.25
Total Dose			12

* SALs from LANL 2005, 88493.

Table G-6.4-1
Final ESL Comparison for MDA C

Analytes	EPC	Final Soil ESL	Receptor	Hazard Quotient	COPEC
Organic Chemicals (mg/kg)					
Acenaphthene	0.15	0.25	Plant	0.6	Yes
Aroclor-1254	0.11	4.10E-02	Robin (insectivore)	2.68	Yes
Aroclor-1260	0.02	1.40E-01	Montane shrew	0.14	No
Radionuclides (pCi/g)					
Americium-241	0.15	44	Earthworm	3.41E-03	No
Cesium-134	0.08*	320	Red Fox	2.50E-04	No
Plutonium-238	0.04	44	Earthworm	9.09E-04	No
Plutonium-239	1.66	47	Earthworm	0.04	No
Thorium-232	3.27	6.2	Earthworm	0.53	Yes
Tritium	0.11	3.60E+04	Plant	3.06E-06	No
Uranium-238	1.48	55	Earthworm	0.03	No

Note: Bold values indicate HQ greater than 0.3

*Maximum detected concentration.

Table G-6.4-2
HI Analysis for MDA C

COPEC	EPC	Red Fox	Carnivorous Kestral	Omnivorous Kestral	Herbivorous Robin	Omnivorous Robin	Insectivorous Robin	Desert Cottontail	Montane Shrew	Deer Mouse	Earthworm	Plant
Acenaphthene	0.15 mg/kg	2.4E-05	na*	na	na	na	na	3.1E-04	1.3E-03	9.4E-04	na	6.0E-01
Aroclor-1254	0.11 mg/kg	7.3E-01	5.0E-01	6.5E-01	7.9E-02	1.4E+00	2.7E+00	2.1E-03	2.5E-01	1.3E-01	na	6.9E-04
Thorium-232	3.27 pCi/g	7.1E-04	1.3E-04	7.1E-04	3.0E-03	1.2E-02	1.2E-02	1.1E-04	1.6E-04	1.1E-04	5.3E-01	8.4E-04
HI		0.7	0.5	0.6	0.1	1.4	2.7	0.002	0.3	0.1	0.5	0.6

Note: Bold values indicate HQ greater than 0.3 or HI greater than 1.0.

*na = Not available.

Table G-6.4-3
HI Analysis for First Round Pore-Gas Samples

COPCs	Maximum Detected Concentration to 10 ft ($\mu\text{g}/\text{m}^3$)	Inhalation ESLs ($\mu\text{g}/\text{m}^3$)	HQ
Acetone	150	5.3E+05	2.83E-04
Benzene	11	2.5E+04	4.40E-04
Carbon tetrachloride	7200	5.7E+03	1.26E+00
Chloroform	2900	2.0E+04	1.45E-01
Chloromethane	1.9	2.1E+04	9.05E-05
Dichlorodifluoromethane	1400	2.6E+06	5.38E-04
Dichloroethane[1,1-]	0	5.6E+07	0.00E+00
Dichloroethane[1,2-]	0	4.1E+04	0.00E+00
Dichloroethene[1,1-]	0	5.7E+03	0.00E+00
Dichloroethene[cis-1,2-] ^a	270	5.7E+03	4.74E-02
Ethylbenzene ^b	7.2	2.5E+04	2.88E-04
Methylene chloride	180	1.3E+06	1.38E-04
Tetrachloroethene	1100	7.3E+04	1.51E-02
Toluene	54	6.0E+04	9.00E-04
Trichloroethane[1,1,1-]	120	2.4E+05	5.00E-04
Trichloroethene	23000	1.9E+04	1.21E+00
Trichlorofluoromethane	18	8.2E+05	2.20E-05
Trimethylbenzene[1,2,4-] ^b	14	2.5E+04	5.60E-04
Trimethylbenzene[1,3,5-] ^b	4.5	2.5E+04	1.80E-04
Xylene (total)	19	8.7E+04	2.18E-04
Xylene[1,2-] ^c	10	8.7E+04	1.15E-04
Xylene[1,3-]+Xylene[1,4-] ^c	24	8.7E+04	2.76E-04
HI			3.0

Note: ESLs obtained from ECORISK Database, Version 2.2 (EPA 2005, 90032).

^a 1,1-Dichloroethene used as a surrogate (NMED 2003, 81172).

^b Benzene used as a surrogate (NMED 2003, 81172).

^c Total xylene used as a surrogate (NMED 2003, 81172).

Table G-6.4-4
HI Analysis for Second Round Pore-Gas Samples

COPCs	Maximum Detected Concentration to 10 ft ($\mu\text{g}/\text{m}^3$)	Inhalation ESLs ($\mu\text{g}/\text{m}^3$)	HQ
Acetone	38	5.3E+05	7.17E-05
Benzene	2.4	2.5E+04	9.60E-05
Carbon tetrachloride	1300	5.7E+03	2.28E-01
Chloroform	1000	2.0E+04	5.00E-02
Chloromethane	1.1	2.1E+04	5.24E-05
Dichlorodifluoromethane	440	2.6E+06	1.69E-04
Dichloroethane[1,1-]	0.86	5.6E+07	1.54E-08
Dichloroethane[1,2-]	1.3	4.1E+04	3.17E-05
Dichloroethene[1,1-]	1.2	5.7E+03	2.11E-04
Dichloroethene[cis-1,2-] ^a	69	5.7E+03	1.21E-02
Ethylbenzene ^b	1.7	2.5E+04	6.80E-05
Methylene chloride	40	1.3E+06	3.08E-05
Tetrachloroethene	3900	7.3E+04	5.34E-02
Toluene	33	6.0E+04	5.50E-04
Trichloroethane[1,1,1-]	270	2.4E+05	1.13E-03
Trichloroethene	6500	1.9E+04	3.42E-01
Trichlorofluoromethane	6.1	8.2E+05	7.44E-06
Xylene (total)	9.8	8.7E+04	1.13E-04
Xylene[1,2-] ^c	3.6	8.7E+04	4.14E-05
HI			0.7

Note: ESLs obtained from ECORISK Database, Version 2.2 (EPA 2005, 90032).

^a 1,1-Dichloroethene used as a surrogate (NMED 2003, 81172).

^b Benzene used as a surrogate (NMED 2003, 81172).

^c Total Xylene used as a surrogate (NMED 2003, 81172).

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Attachment G-1

Ecological Scoping Checklist

PART A—SCOPING MEETING DOCUMENTATION

Site ID	MDA C, SWMU 50-009
Form of site releases (solid, liquid, vapor). Describe all relevant known or suspected <u>mechanisms</u> of release (spills, dumping, material disposal, outfall, explosive testing, etc.) and describe potential <u>areas</u> of release. Reference locations on a map as appropriate.	MDA C was operational from May 1948 to April 1974 but received waste only intermittently from 1968 to 1974, at which point it was decommissioned. MDA C was used for disposal of classified wastes, inorganic chemicals, hazardous chemicals, and radionuclides, and decommissioned in 1974. The MDA consists of 7 inactive pits and 108 inactive shafts, which are collectively identified as SWMU 50-009. Most of the pits and shafts were unlined; a few shafts (in Shaft Group 3) were lined with concrete. After each pit or shaft was filled to capacity with waste, it was back-filled to ground level with crushed tuff. As part of cover maintenance in 1984, most of MDA C was covered with approximately 1.5 ft of crushed tuff, and approximately 0.5 to 3 ft of topsoil was placed over the crushed tuff. Elevated concentrations of a few COPCs exist in surface soil, and these COPCs in surface soil most likely result from erosion of materials originally disposed into pits or shafts.
List of Primary Impacted Media (Indicate all that apply.)	Surface soil – Yes Surface water/sediment – N/A Subsurface – Yes Groundwater – N/A Other, explain – none
FIMAD vegetation class based on Arcview vegetation coverage (Indicate all that apply.)	Water – N/A Bare Ground/Unvegetated – N/A Spruce/fir/aspens/mixed conifer – N/A Ponderosa pine – Yes Piñon juniper/juniper savannah – Yes Grassland/shrubland – Yes Developed – Yes
Is T&E Habitat Present? If applicable, list species known or suspected to use the site for breeding or foraging.	SWMU location information maintained by the FIMAD was intersected with T&E species habitat using GIS databases. MDA C (SWMU 50-009) is in potential Mexican spotted owl core habitat and 6.1 miles from potential bald eagle habitat. The Mexican spotted owl can be conservatively assumed to forage at a high frequency at this site. The bald eagle can be conservatively assumed to forage at a low frequency at MDA C.
Provide list, of Neighboring/ Contiguous/ Upgradient sites, includes a brief summary of COPCs and the form of releases for relevant sites and reference a map as appropriate. (Use this information to evaluate the need to aggregate sites for screening.)	TA-50 borders the site to the north at the head of Ten Site Canyon. Known releases from TA-50 include radionuclide-contaminated liquids from burst pipes [SWMU 50-001(b)] and from drain water from the radioactive liquid waste treatment plant [SWMU 50-001(a)] into the head of the canyon.
Surface Water Erosion Potential Information Summarize information from SOP 2.01, including the run-off subscore (maximum of 46); terminal point of surface water transport; slope; and surface water runoff sources.	The site is relatively flat with a gentle slope to the north. The total score for the surface water assessment erosion matrix for SWMU 50-009 is 54.8. The surface water run-off subscore is 46.0 and the run-on subscore is 0.0.
Other Scoping Meeting Notes	None.

PART B—SITE VISIT DOCUMENTATION

Site ID	MDA C
Dates of Site Visit	29 August and 22 October 2002
Site Visits Conducted by	James Markwiese, Randall Ryti (8-29-02 only), Becky Coel-Roback (10-22-02 only)

Receptor Information:

Estimate cover	Relative vegetative cover (high, medium, low, none) = high Relative wetland cover (high, medium, low, none) = none Relative structures/asphalt, etc. cover (high, medium, low, none) = none
Field notes on the FIMAD vegetation class to assist in ground-truthing the Arcview information	The undeveloped mesa top constituting SWMU 50-009 occurs in the transition zone between pinon-juniper woodland and ponderosa pine (<i>Pinus ponderosa</i>) forest. Grasses and forbs, including blue grama (<i>Bouteloua gracilis</i>), sage (<i>Artemisia</i> spp.) and chamisa (<i>Chrysothamnus</i> sp), represent most ground cover. Overstory vegetation is primarily characterized by small (0.5-1.5 m), scattered ponderosa pines and a few one-seed junipers (<i>Juniperus monosperma</i>).
Field notes on T&E Habitat, if applicable. Consider the need for a site visit by a T&E subject matter expert to support the use of the site by T&E receptors.	A lack of large trees onsite obviates roosting habitat for the Mexican spotted owl. The small mammals and birds that frequent MDA C create a foraging habitat for the Mexican spotted owl.
Are ecological receptors present at the site? (yes/no/uncertain) Describe the general types of receptors present at the site (terrestrial and aquatic), and make notes on the quality of habitat present at the site.	Yes. Scoping activities revealed abundant invertebrates, reptiles, birds and plant life. Numerous examples of mammalian site use (burrow entrances and burrow spoils) were evident as well. No aquatic community exists onsite.

Contaminant Transport Information:

Surface water transport Field notes on the erosion potential, including a discussion of the terminal point of surface water transport (if applicable).	Based on the surface water erosion assessment (SOP 2.01), there is moderate potential for surface water transport and there is evidence of run-off discharging from the site. A man made asphalt diversion channel is present on the northern end of the SWMU.
Are there any off-site transport pathways (surface water, air, or groundwater)? (yes/no/uncertain) Provide explanation	Yes. Air may be a potential transport mechanism for volatile chemicals emanating from the subsurface at SWMU 50-009. Biotic transport (contaminated plant and/or animal material) may also act to move contaminants to offsite areas.
Interim action needed to limit off-site transport? (yes/no/uncertain) Provide explanation/ recommendation to project lead for IA SMDP.	An apparent subsidence hole around the northern perimeter of pit 6 was observed on the 8-29-02 site visit. Interim actions have addressed this problem and no other actions are proposed to limit off-site transport.

Ecological Effects Information:

Physical Disturbance (Provide list of major types of disturbances, including erosion and construction activities, review historical aerial photos where appropriate.)	Signs of disturbance in the northeast corner of the site around the former chemical pit. Bare areas overlay transect of shafts running north-south at approximately the middle of the site. The entire site was mowed several days before the 10-22-02 site visit and grasses and shrubs were reduced to <10 cm in height. A few dozen ponderosa pines and several junipers were still standing at this time.
Are there obvious ecological effects? (yes/no/uncertain) Provide explanation and apparent cause (e.g., contamination, physical disturbance, other).	Yes. While there are no obvious signs of contaminants having overt effects, the site was recently heavily disturbed from site maintenance (mowing) activities.
Interim action needed to limit apparent ecological effects? (yes/no/uncertain) Provide explanation and recommendations to mitigate apparent exposure pathways to project lead for IA SMDP.	No

No Exposure/Transport Pathways:

<p>If there are no complete exposure pathways to ecological receptors onsite and no transport pathways to offsite receptors, the remainder of the checklist should not be completed. Stop here and provide additional explanation/justification for proposing an ecological No Further Action recommendation (if needed). At a minimum, the potential for future transport should include likelihood that future construction activities could make contamination more available for exposure or transport.</p> <p>Not applicable</p>

Adequacy of Site Characterization:

<p>Do existing or proposed data provide information on the nature, rate and extent of contamination? (yes/no/uncertain) Provide explanation (Consider if the maximum value was captured by existing sample data.)</p>	<p>Yes. Some contaminants may have moved from the subsurface to the surface (burrow spoils and ant mounds) or may be entering the biota from the subsurface (root uptake) and possibly entering the food web (e.g., animal ingestion of plant material that is potentially contaminated with radionuclides) although this has not been verified at MDA C. Additional information is also needed on near-surface tritium concentrations in air.</p>
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<p>Do existing or proposed data for the site address potential transport pathways of site contamination? (yes/no/uncertain) Provide explanation (Consider if other sites should be aggregated to characterize potential ecological risk.)</p>	<p>Yes. The existing soil data and proposed sampling and analysis activities for tritium in air and radionuclides in biotic matrices (i.e., plants and burrow spoils/ant mounds) will provide sufficient information to address potential transport pathways.</p>
--	---

Additional Field Notes:

Provide additional field notes on the site setting and potential ecological receptors.

The mesa top of MDA C is fenced off from surrounding areas and covered with bare ground and patches of grass/shrubs with a few small trees scattered about the eastern portion of the site. The trees are small (0.5-1.5 m), ponderosa pines and a few one-seed junipers. Grasses and forbs, including blue grama, sage and chamisa, represent most ground cover.

Abundant signs of fossorial activity exist onsite. In addition, material noted in harvester ant mounds (*Pogonomyrmex* spp) and other ant mounds indicate that subsurface material has been transported to the surface. Numerous lizards were observed and evidence of site use by larger mammals (coyote scat). Soil biological crust observed on patches of bare earth.

At the time of the most recent ecoscoping visit, the predominant site vegetation (grasses and forbs) was impacted site maintenance activities. Grasses and shrubs were cropped close to the surface (<10 cm in height) from mowing although the small trees scattered about the site were left standing. Burrows were disturbed as result of mowing and ant mounds were disturbed at the time of the visit.

PART C—ECOLOGICAL PATHWAYS CONCEPTUAL EXPOSURE MODEL

Provide answers to Questions A to V to develop the Ecological Pathways Conceptual Exposure Model

Question A:

Could soil contaminants reach receptors via vapors?

- **Volatility of the hazardous substance (volatile chemicals generally have Henry's Law constant $>10^{-5}$ atm-m³/mol and molecular weight <200 g/mol).**

Answer (likely/unlikely/uncertain): Likely.

Provide explanation: VOCs were detected in pore gas and flux samples collected at MDA C.

Question B:

Could the soil contaminants reach receptors through fugitive dust carried in air?

- Soil contamination would have to be on the actual surface of the soil to become available for dust.
- In the case of dust exposures to burrowing animals, the contamination would have to occur in the depth interval where these burrows occur.

Answer (likely/unlikely/uncertain): Unlikely.

Provide explanation: Potential for dust entrainment on the mesa top is kept negligible by rooted vegetation and clippings of grass/shrub left in place following recent mowing event. The vegetation clippings form a matted cover over the soil.

Question C:

Can contaminated soil be transported to aquatic ecological communities (use SOP 2.01 run-off score and terminal point of surface water runoff to help answer this question)?

- If the SOP 2.01 run-off score* for each PRS included in the site is equal to zero, this suggests that erosion at the site is not a transport pathway. (* note that the runoff score is not the entire erosion potential score, rather it is a subtotal of this score with a maximum value of 46 points).
- If erosion is a transport pathway, evaluate the terminal point to see if aquatic receptors could be affected by contamination from this site.

Answer (likely/unlikely/uncertain): Unlikely.

Provide explanation: Downgradient transport (e.g., into Ten Site Canyon) is unlikely because residual contamination occurs in the subsurface. In addition, Ten Site Canyon has no perennial water and therefore no aquatic communities. Consequently, there are no aquatic receptors that would be affected by contamination from this site.

Question D:

Is contaminated groundwater potentially available to biological receptors through seeps or springs or shallow groundwater?

Known or suspected presence of contaminants in groundwater.

- The potential for contaminants to migrate via groundwater and discharge into habitats and/or surface waters.
- Contaminants may be taken up by terrestrial and rooted aquatic plants whose roots are in contact with groundwater present within the root zone (~1 m depth).
- Terrestrial wildlife receptors generally will not contact groundwater unless it is discharged to the surface.

Answer (likely/unlikely/uncertain): Unlikely.

Provide explanation: There is no surface water on the mesa top, and no springs or seeps exist in Ten Site Canyon. There is currently no complete pathway to the regional aquifer (ca. 1300 ft) from the disposal shafts and pits.

Question E:

Is infiltration/percolation from contaminated subsurface material a viable transport and exposure pathway?

- Suspected ability of contaminants to migrate to groundwater.
- The potential for contaminants to migrate via groundwater and discharge into habitats and/or surface waters.
- Contaminants may be taken up by terrestrial and rooted aquatic plants whose roots are in contact with groundwater present within the root zone (~1 m depth).
- Terrestrial wildlife receptors generally will not contact groundwater unless it is discharged to the surface.

Answer (likely/unlikely/uncertain): Unlikely.

Provide explanation: Contaminants are unlikely to migrate to the regional aquifer given the depth to groundwater. The lack of any significant hydraulic driver (e.g., no ponded water on the surface) facilitating infiltration also mitigates the potential for contaminants reaching groundwater.

Question F:

Might erosion or mass wasting events be a potential release mechanism for contaminants from subsurface materials or perched aquifers to the surface?

- This question is only applicable to release sites located on or near the mesa edge.
- Consider the erodability of surficial material and the geologic processes of canyon/mesa edges.

Answer (likely/unlikely/uncertain): Unlikely.

Provide explanation: Surface contamination is minimal across the site. Onsite wastes are buried in the subsurface in pits and shafts. These subsurface disposal areas are located away from canyon walls.

Question G:

Could airborne contaminants interact with receptors through respiration of vapors?

- Contaminants must be present as volatiles in the air.
- Consider the importance of inhalation of vapors for burrowing animals.
- Foliar uptake of organic vapors is typically not a significant exposure pathway.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 2

Terrestrial Animals: 3

Provide explanation: Plant roots may be exposed to volatile organic chemicals. Burrowing rodents may encounter vapors in the soil at higher concentrations than most other receptors.

Question H:

Could airborne contaminants interact with plants through deposition of particulates or with animals through inhalation of fugitive dust?

- Contaminants must be present as particulates in the air or as dust for this exposure pathway to be complete.
- Exposure via inhalation of fugitive dust is particularly applicable to ground-dwelling species that would be exposed to dust disturbed by their foraging or burrowing activities or by wind movement.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 1

Terrestrial Animals: 1

Provide explanation: Entrainment of fugitive dust is minimal because of the fairly complete vegetative cover on the site. The dust that may be stirred up should not be a risk driver because preliminary site data indicate that surface soil contamination is minimal.

Question I:

Could contaminants interact with plants through root uptake or rain splash from surficial soils?

- Contaminants in bulk soil may partition into soil solution, making them available to roots.
- Exposure of terrestrial plants to contaminants present in particulates deposited on leaf and stem surfaces by rain striking contaminated soils (i.e., rain splash).

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 3

Provide explanation: Root uptake is a likely pathway for plants. Deeply rooted plants, such as ponderosa pine, may access subsurface contamination and could potentially penetrate waste cells where capping soils are less than 3 m deep.

Question J:

Could contaminants interact with receptors through food web transport from surficial soils?

- The chemicals may bioaccumulate in animals.
- Animals may ingest contaminated food items.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 2

Provide explanation: Some of the contaminants in mesa-top soils, such as PCBs, are considered persistent bioaccumulators. Plants onsite may take up heavy metals and radionuclides. Animals eating plants could receive an exposure dose through this dietary pathway. However, the concentration of bioaccumulative chemicals is fairly low in surface soil and they are not frequently detected.

Question K:

Could contaminants interact with receptors via incidental ingestion of surficial soils?

- Incidental ingestion of contaminated soil could occur while animals grub for food resident in the soil, feed on plant matter covered with contaminated soil or while grooming themselves clean of soil.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 3

Provide explanation: At MDA C, surface soil contamination is minimal. Fossorial animals may come into contact with subsurface contaminants, however, and may ingest soil as a result of digging activities. In addition, these burrow spoils (as well as ant mounds) may result in contaminated subsurface soil being transported to the surface.

Question L:

Could contaminants interact with receptors through dermal contact with surficial soils?

- Significant exposure via dermal contact would generally be limited to organic contaminants that are lipophilic and can cross epidermal barriers.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 1

Provide explanation: Because there are contaminants in the surface soils at MDA C, terrestrial animals may have some dermal contact. However, this is a far less important pathway than dietary uptake, as the pelage of mammals, the scales of reptiles, the exoskeletons/exoderms of invertebrates, and the feathers of birds offer substantial protection from dust and water penetration to the skin.

Question M:

Could contaminants interact with plants or animals through external irradiation?

- External irradiation effects are most relevant for gamma emitting radionuclides.
- Burial of contamination attenuates radiological exposure.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 1

Terrestrial Animals: 1

Provide explanation: The potential for external irradiation from gamma-emitting radionuclides is low because wastes are buried below the surface and contamination of surface soils is minimal.

Question N:

Could contaminants interact with plants through direct uptake from water and sediment or sediment rain splash?

- Contaminants may be taken-up by terrestrial plants whose roots are in contact with surface waters.
- Terrestrial plants may be exposed to particulates deposited on leaf and stem surfaces by rain striking contaminated sediments (i.e., rain splash) in an area that is only periodically inundated with water.
- Contaminants in sediment may partition into soil solution, making them available to roots.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 0

Provide explanation: There are no aquatic environments onsite and there are no pathways to aquatic environments located offsite.

Question O:

Could contaminants interact with receptors through food web transport from water and sediment?

- The chemicals may bioconcentrate in food items.
- Animals may ingest contaminated food items.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 0

Provide explanation: There are no aquatic environments onsite and there are no pathways to aquatic environments located offsite.

Question P:

Could contaminants interact with receptors via ingestion of water and suspended sediments?

- If sediments are present in an area that is only periodically inundated with water, terrestrial receptors may incidentally ingest sediments.
- Terrestrial receptors may ingest water-borne contaminants if contaminated surface waters are used as a drinking water source.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 0

Provide explanation: There are no aquatic environments onsite and there are no pathways to aquatic environments located offsite.

Question Q:

Could contaminants interact with receptors through dermal contact with water and sediment?

- If sediments are present in an area that is only periodically inundated with water, terrestrial species may be dermally exposed during dry periods.
- Terrestrial organisms may be dermally exposed to water-borne contaminants as a result of wading or swimming in contaminated waters.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 0

Provide explanation: There are no aquatic environments onsite and there are no pathways to aquatic environments located offsite.

Question R:

Could contaminants interact with plants or animals through external irradiation?

- External irradiation effects are most relevant for gamma emitting radionuclides.
- Burial of contamination attenuates radiological exposure.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 0

Terrestrial Animals: 0

Provide explanation: There are no aquatic environments onsite and there are no pathways to aquatic environments located offsite.

Question S:

Could contaminants bioconcentrate in free-floating aquatic, attached aquatic plants, or emergent vegetation?

- Aquatic plants are in direct contact with water.
- Contaminants in sediment may partition into pore water, making them available to submerged roots.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Aquatic Plants/Emergent Vegetation: 0

Provide explanation: There are no aquatic environments onsite and there are no pathways to aquatic environments located offsite.

Question T:

Could contaminants bioconcentrate in sedimentary or water column organisms?

- Aquatic receptors may actively or incidentally ingest sediment while foraging.
- Aquatic receptors may be directly exposed to contaminated sediments or may be exposed to contaminants through osmotic exchange, respiration, or ventilation of sediment pore waters.
- Aquatic receptors may be exposed through osmotic exchange, respiration, or ventilation of surface waters.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Aquatic Animals: 0

Provide explanation: There are no aquatic environments onsite and there are no pathways to aquatic environments located offsite.

Question U:

Could contaminants bioaccumulate in sedimentary or water column organisms?

- Lipophilic organic contaminants and some metals may concentrate in an organism's tissues
- Ingestion of contaminated food items may result in contaminant bioaccumulation through the food web.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Aquatic Animals: 0

Provide explanation: There are no aquatic environments onsite and there are no pathways to aquatic environments located offsite.

Question V:

Could contaminants interact with aquatic plants or animals through external irradiation?

- External irradiation effects are most relevant for gamma emitting radionuclides.
- The water column acts to absorb radiation, thus external irradiation is typically more important for sediment dwelling organisms.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

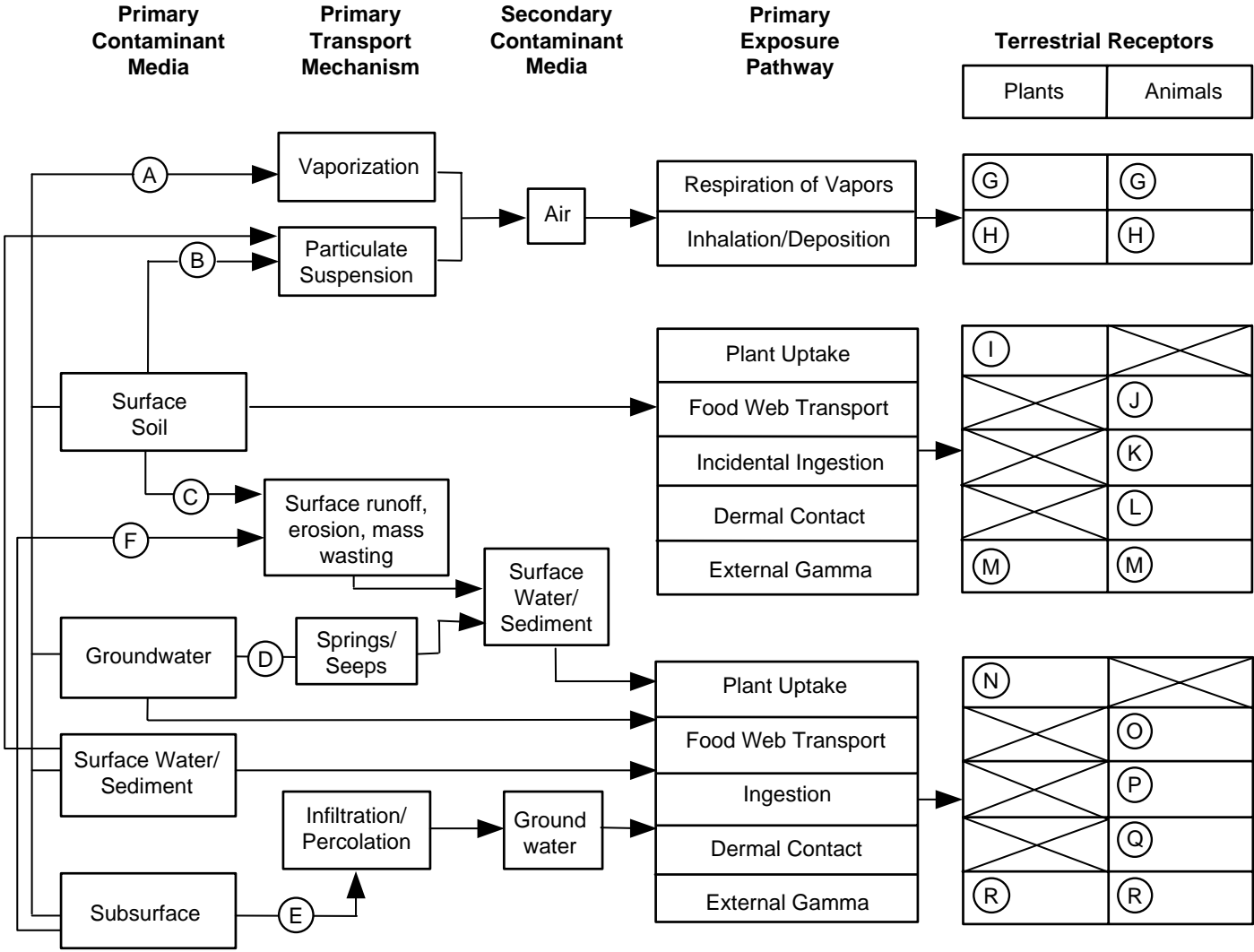
Aquatic Plants: 0

Aquatic Animals: 0

Provide explanation: There are no aquatic environments onsite and there are no pathways to aquatic environments located offsite.

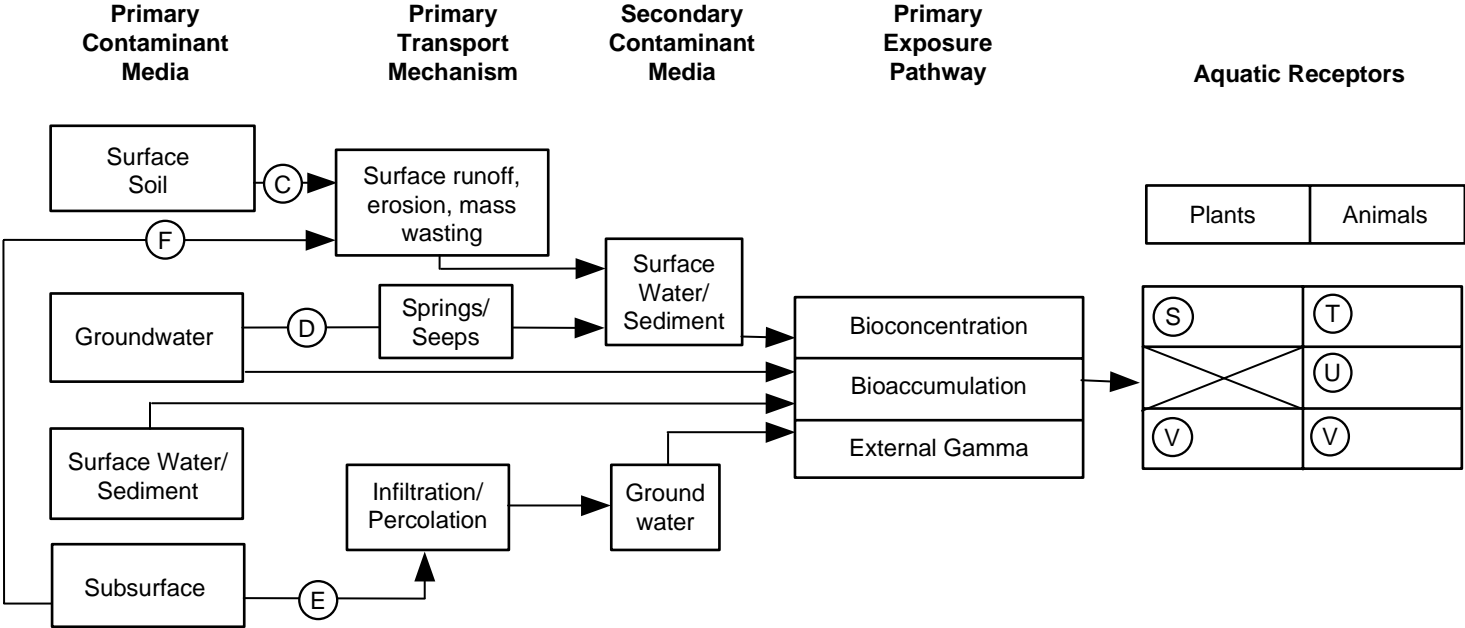
Ecological Scoping Checklist
Terrestrial Receptors
Ecological Pathways Conceptual Exposure Model

NOTE:
Letters in circles
refer to questions
on the Scoping
Checklist



Ecological Scoping Checklist
Aquatic Receptors
Ecological Pathways Conceptual Exposure Model

NOTE:
Letters in circles
refer to questions
on the Scoping
Checklist



Signatures and certifications:

Checklist completed by (provide name, organization and phone number):

Name (printed): James T. Markwiese

Name (signature):

Organization: Neptune and Company, Inc.

Phone number: 505.662.0707, ext 24

Modified on November 19, 2006 by:

Name (printed): Tracy L. McFarland

Name (signature):

Organization: LATA

Phone number: 505.662.1830

Verification by another party (provide name, organization and phone number):

Name (printed): Richard Mirenda

Name (signature):

Organization: ERSS

Phone number: 505.665.6953

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Appendix H

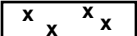
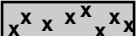
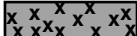
Surface Water Assessment



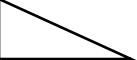
Surface Water Site Assessment**Site Information**

Site ID: 1610	PRS ID: 50-009	Nearest Struct: 50-1
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Setting

Topography On Mesa Top: Yes On Bench in Canyon: No On Canyon Floor, Not Channel: No In Channel in Canyon Floor: No
Topography Explanation: MDA C located on the mesa top on the south side of Ten Site canyon near TA-50.

Ground/Canopy Cover  Sparse (<25%): No  Medium (25-75%): Yes  Thick (>75%): No
Ground/Canopy Cover Explanation: Significant ground cover consisting of various types of brush and grasses. Minimal canopy cover along the north/eastern fence line.

Slope at Area Impacted  Flat (<10%): Yes  Gradual (10-30%): No  Steep (>30%): No
Slope Explanation: Gently slopes towards the north towards Ten Site Canyon.

Run-off

Is There Visible Evidence of Run-off Discharging from Site: Yes

Surface Water Site Assessment

PRS ID: 50-009

Run-off (Continued)

Is Run-off Channelized: Yes	Channel Type: Man-Made
Channelization Explanation: Sheet flow runoff evidence along the eastern fence line towards the east. Along the northern fence line a man-made channel asphalt/volcanic tuff-lined channel and has eroded into existing soils. The channel has moved soils off site and into canyon.	

Where Does Evidence of Runoff Terminate: Drainage/Canyon
Terminus Explanation The headwaters of Ten Site Canyon are located less than 50 meters from the northern fence line of MDA C. Sheetflow runoff and discharges from the erosional feature go directly into the Canyon.

Has Run-off Caused Visible Erosion: Yes	Erosion Type: Gully
Erosion Explanation: Evidence of sheetflow erosion exist around the east/northeast part of site. Gully erosion exists along the northern fence line and crosses under fence and into Ten Site Canyon.	

Run-on

Structural Run On. Are Structures Creating Run-on to the Site: No
Structural Run-on Explanation: No structures within the immediate proximity of MDA C.

Surface Water Site Assessment

PRS ID: 50-009

Run-on (Continued)**Natural Run-on. Is Natural Drainage Creating Run-on to the Site:**

No

Natural Run-on Explanation:

No upslope drainage impacts.

Current Operations Run-on. Are Current Operations Creating Run-on to the Site:

No

Current Operations Run-on Explanation:

No operational impacts.

Assessment Finding**Based on the Above Criteria and the Assessment of this Site, Does Soil Erosion Potential Exist:**

Yes

Sign Off**Site Not Found:**

No

Revision of Earlier Assessment:

Yes

Name of Assessment Author:

Steve Veenis

Assessment Date:

04/18/2001

Surface Water Site Assessment

PRS ID: 50-009

Erosion Matrix

Erosion/Sediment Transport Potential Scoring Criteria	Max Score Poss	Score Modifiers for Transport Potential			Resulting Score
		Low (max * 0.1)	Med (max * 0.5)	High (max * 1.0)	
Setting Group (Max Total 43)					1.0
Topography - On Mesa Top:	1	For these four criteria, use the single highest score from the criteria that received a "Yes" answer.			
Topography - On Bench in Canyon:	4				
Topography - On Canyon Floor, Not in Channel:	13				
Topography - In Channel in Canyon Floor:	17				
Ground/Canopy Cover (Percent):	13	>75%	25-75%	<25%	6.5
Slope at Area Impacted:	13	<10%	10-30%	>30%	1.3
Run-off Group (Max Total 46)					5.0
Visible Evidence of Run-off:	5	"Yes" = 5. "No" = 0 here and for two scores below .			
Where Run-off Terminates:	19	"Other"	"Bench"	"Drainage/Canyon"	19.0
Visible Erosion:	22	"No" = 0. If "Yes", score by Erosion Type.			22.0
Erosion Type:		"Sheet"	"Rill"	"Gully"	
Run-on Group (Max Total 11)					0.0
Structural Run-on:	7	"No" = 0. "Yes" = 7.			
Natural Run-on:	7	"No" = 0. "Yes" = 7.			0.0
Current Operations Run-on:	4	"No" = 0. "Yes" = 4.			0.0
Maximum Possible Total Score:	100	* Actual Total Score:			54.8

Revision of Earlier Assessment: Yes

* No permanent BMPs are in place. Score could be lower with them.

Appendix I

Investigation-Derived Waste Storage and Disposal

This appendix contains the waste management records for waste streams generated during investigation of Material Disposal Area C, also known as Solid Waste Management Unit 50-009, at Technical Area (TA) 50 of Los Alamos National Laboratory. The waste characterization strategy form (WCSF) was prepared to address characterization approaches, on-site management, and final disposition options for wastes. Also included are the waste profile forms (WPFs) and the chemical waste disposal request (CWDR) forms for each waste stream. It should be noted that not all WPFs and CWDRs were available at the time of submittal of this report and will be provided when all waste has been processed. The investigation-derived waste (IDW) streams associated with the investigation of MDA C are identified in Table I-1 and are summarized below.

WCSF Waste #1: IDW includes spent personal protective equipment (PPE) and contaminated sampling supplies, was managed as low level waste (LLW). Less than 3 yd³ of IDW was generated. All IDW were segregated from cuttings and stored on site in a roll-off bin. The IDW will be disposed of at Area G at TA-54 or at a Laboratory-approved off-site disposal facility.

WCSF Waste #2: Municipal solid waste (MSW), including all noncontact trash and debris, was managed as nonradioactive waste, stored in plastic-lined trash cans, and disposed of at the County of Los Alamos landfill.

WCSF Waste #3: Borehole cuttings include soil and tuff cuttings from boreholes. The cuttings were stored in ten 20-yd³ roll-off containers and stored at a waste staging area at MDA C. All roll-off bins were sampled at five locations each and analyzed for radionuclides. The waste was also analyzed using toxicity characteristic leaching procedure (TCLP) to determine if the cuttings were hazardous by characteristic. The borehole cuttings were determined to be nonhazardous LLW and were disposed of at Area G at TA-54.

Addendum 1, Waste #1: Spent high-efficiency particulate air (HEPA) filters were generated during the dust-suppression activities while air coring at location 50-24818. The spent HEPA filters were managed as LLW since data from borehole cuttings showed no hazardous constituents. The filters will be disposed of at Area G at TA-54 or at a Laboratory-approved off-site disposal facility.

Addendum 1, Waste #2: Spent Acetone mixed with soil from high explosives (HE) screening with DTECH test kits (WPF number pending). This waste was characterized using acceptable knowledge of the HE screening process and was managed as Resource Conservation and Recovery Act mixed waste. Acetone, as a spent solvent, is a listed hazardous waste (U.S. Environmental Protection Agency [EPA] Hazardous Waste Number F003) and exhibits the characteristic of ignitability (D001). This waste was packaged and stored with secondary containment in a registered satellite accumulation area (SAA) on-site at MDA C, in accordance with all Laboratory and Environmental Programs Directorate requirements. Disposal of the waste was at a Laboratory-approved off-site treatment, storage, and disposal facility (TSDF).

Addendum 1, Waste #3: Residual sodium azide buffer solution from HE screening with DTECH test kits (WPF number pending) was transferred to a 1 L polyethylene bottle. It is listed as an acutely hazardous waste, EPA Hazardous Waste Number P105, and was segregated and stored in a sealed container within a locked SAA. Less than 1 L of the residual sodium azide buffer solution was generated and it will be disposed of at an off-site TSDF.

Addendum 1, Waste #4: Empty containers from HE test kits were managed as empty product containers and disposed of as nonhazardous, nonradioactive solid waste. As a best management practice, the containers that held acetone were separated from those that held the sodium azide buffer solution. The empty containers will be disposed of at a Laboratory-approved industrial waste facility.

Addendum 2, Waste #3: This waste stream consisted of waste generated from additional volatile organic compound analyses for the waste characterization of Waste #3, borehole cuttings.

Addendum 3, Waste #5: This waste stream consists of HE test kit process waste containing acetone, soil, and spent sodium azide contained in plastic bottles and pipettes (WPF number pending, October 2006). This stream was characterized by a material safety data sheet and process knowledge and is deemed LLW. The waste was stored in a locked SAA and will be disposed of at a Laboratory-authorized off-site TSDF. Less than 30 gal. of waste was generated.

Table I-1
Summary of IDW Generation and Management

Waste Stream	Waste Type	Volume	Characterization Method	On-Site Management	Disposition
Spent PPE and disposable sampling supplies	Low-level radioactive	1.5 yd ³	Acceptable knowledge (analytical results for 2005–2006 samples)	55-gal. drums	Intended path: disposal at TA-54, Area G
Municipal solid	Nonhazardous/Nonradioactive	3 yd ³	Acceptable knowledge	Plastic bags	County of Los Alamos landfill
Drill cuttings	Low-level radioactive	200 yd ³	Direct sampling	20 yd ³ roll-off containers	TA-54, Area G
Spent HEPA filter	LLW	1 yd ³	Acceptable knowledge (analytical results for 2005–2006 samples)	55-gal. drums	Intended path: disposal at TA-54, Area G
Residual sodium azide buffer	Hazardous	<1 L	Acceptable knowledge (MSDS)	1 L plastic container (SAA)	Intended path: off-site TSDF
Empty containers from HE spot test	Industrial	<30 gal.	Acceptable process knowledge	30-gal. drum	Intended path: off-site TSDF
HE test kit process waste	Low-level radioactive	<30 gal.	Acceptable process knowledge	30-gal. drum	Intended path: disposal at TA-54, Area G

Waste Characterization Strategy Form

Project Title	Implementation of IWP at MDA C, SWMU 50-009 at TA-50
Operating Unit #	OU 1147
PRS #	SWMU 50-009
Activity Type	Site Characterization Sampling
Field Team Leader	Joseph T. Sena
Waste Management Coordinator	Joseph T. Sena
Completed by	Joseph T. Sena
Date	July 13, 2005

Description of activities:

MDA C Investigation Activities

The field investigation of MDA C will be comprised of the following activities:

- Thirty two vertical boreholes will be installed at the locations shown in Figure 1. Boreholes will be advanced to the depths and lengths specified in Table 1.
- Continuous core samples will be collected from each borehole. Core will be visually inspected, field screened for alpha and beta/gamma radioactivity, and geologically logged. Borehole logs will be prepared for each borehole.
- Tuff samples will be collected at a minimum of every 50 ft. throughout the entire length of the borehole for laboratory analysis for the parameters shown in Table 1. Collection of samples for laboratory analysis will begin once the borehole is advanced beneath the associated disposal unit.
- Subsurface vapor samples will be collected from all boreholes at the same depths and location as the tuff samples.
- Subsurface vapor samples will be analyzed for VOCs and tritium.
- Groundwater samples will be collected if perched water is encountered.

Acceptable Knowledge

Site history and description:

MDA C is a decommissioned material disposal area at TA-50 which had been established to replace MDA B at TA-21 as a disposal area for Laboratory waste. MDA C operated from May 1948 to April 1974 but received waste only intermittently from 1968 until it was decommissioned in 1974. Wastes disposed of at MDA C included liquids, solids, and gases generated from a broad range of research and development activities conducted at the Los Alamos National Laboratory, including uncontaminated classified materials, metals, hazardous materials, and radionuclides. Historical reports indicate it was common practice for chemicals to be burned in the chemical disposal pit at MDA C.

At MDA C, 7 pits and 108 shafts were excavated into the overlying soil and unit 3 of the Tshirege Member of the Bandelier Tuff. The pits and shafts were unlined with the exception of 10 shafts in Shaft Group 3 that were lined with concrete. After each pit or shaft was filled with waste, it was backfilled to ground level with crushed tuff. Once the disposal shafts were filled, they were sealed with concrete.

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Previous Investigation Activities

Phase I RFI activities included sampling of surface soil, subsurface tuff, and pore gas. Surface sampling activities conducted in 1993 included a radiation survey on a 60- by 60-ft grid and the collection of 203 0–6-in. surface samples of soil or tuff. All surface samples were field-screened for radioactivity. One hundred twenty-two samples were submitted to a mobile analytical laboratory for analysis of polychlorinated biphenyls (PCBs). Sixty-eight surface samples were analyzed at an off-site contract laboratory for target analyte list (TAL) metals, radionuclides, and semivolatile organic compounds (SVOCs). Fifty-nine of these samples were also analyzed for PCBs and nine surface samples were analyzed for VOCs.

A total of 390 subsurface samples were collected in 1995 and 1996 from two vertical and nine angled boreholes drilled to depths ranging from 77 to 316 ft below ground surface (bgs). The subsurface samples were field-screened at approximately 5-ft intervals for radioactivity, high explosives (HE) and VOCs and submitted to a mobile radiological analysis laboratory. Samples were collected at approximately 20-ft intervals and submitted for off-site contract laboratory analysis for TAL metals and cyanide, radionuclides, and SVOCs. With the exception of samples from boreholes 50-09100 and 50-09102, 24 subsurface samples were also analyzed for VOCs and PCBs/pesticides.

In 1996, 15 additional samples were collected from archived borehole cores, in response to a request from EPA. These samples were submitted to an off-site contract laboratory for analysis of inorganic chemicals (excluding cyanide and mercury as the holding times had lapsed) and radionuclides (except tritium). However, based on the core collection dates and the actual dates the samples were analyzed, more than half of the archived core samples missed the 180-day holding time for inorganic chemicals. The inorganic chemical data from these samples is provided only for the purpose of comparison. As the holding times for PCBs, VOCs, SVOCs, and tritium had been exceeded, archived core samples were not analyzed for these analytes. Ten of the 11 boreholes were backfilled and abandoned after the 1995 fieldwork. One vertical borehole (50-09100) was capped after the 1995 fieldwork and subsequently completed in 2000 as a vapor monitoring well with ten sampling ports. A second vertical borehole (50-10131) was drilled as a vapor monitoring well in 2001. Pore-gas samples of VOCs were collected quarterly from selected ports in these boreholes in 2000, 2001, 2002, and 2003. Surface-flux measurements of VOCs were conducted in 2000 at 101 locations. Near-surface tritium soil gas concentrations were measured at 15 locations at MDA C in February 2003.

Terrain conductivity (EM31), high-sensitivity metal detector (EM61), and GPR data were gathered during two geophysical surveys at MDA C conducted in 2001 and 2002 to confirm the general location of the disposal units, confirm that Pits 1 through 5 do not extend east or south past the MDA C fence line and to map the thickness of cover materials across the site. Sufficient anomalies were detected in the area of Pits 1 through 5 to infer general pit boundaries; however, the anomalies extend over the reported width of the pits making it difficult to distinguish the boundaries between the pits. No clear anomalies were observed to indicate the boundaries of Pit 6 or the Chemical Pit. Cover thickness over the site was determined.

Conclusions regarding the nature and extent of contamination at MDA C based on the results of Phase I RFI activities are as follows.

1. Releases of radionuclides to historical surface soils were largely covered with crushed tuff in 1984. Elevated concentrations of americium-241 and isotopic plutonium in surface soils in the northeast area of MDA C are likely related to releases from MDA C prior to placement of crushed tuff on the surface of the site in 1984. The extent of current surface radionuclide contamination is defined sufficient to support corrective action decisions.
2. Lead and silver were the only metals detected at concentrations above their respective BVs in surface soil and fill. Statistical analyses in Appendix D indicate that the range of values is almost identical to background. There are sporadic detects of SVOCs and Aroclor-1254 and Aroclor-1260, but no defined pattern and no evidence for a widespread release of organic chemicals from MDA C were found. The extent of current surface inorganic and organic chemical contamination is defined sufficient to support corrective action decisions.
3. Concentrations of specific metals (including barium, copper, and lead) and radionuclides (strontium-90 and americium-241) in tuff beneath disposal pits indicate that contamination has migrated from disposal pits into underlying rock. The extent of subsurface contamination has not been defined sufficient to

Waste Characterization Strategy Form

support corrective action decisions.

4. Tritium and VOC contamination (primarily trichloroethylene [TCE], tetrachloroethene [PCE], and 1,1,1-trichloroethane [TCA]) exists in subsurface pore gas; however, the vertical and horizontal extent of this contamination has not been defined sufficient to support corrective action decisions.

Surface flux of VOCs and near-surface tritium soil-gas concentrations indicate localized areas where releases to the atmosphere are occurring.

Characterization Strategy:

Three separate waste streams are expected to be generated during characterization activities: investigation-derived waste (IDW), municipal solid waste (MSW), and borehole cuttings. In addition, two other waste streams may potentially be generated: petroleum contaminated soil (PCS)/absorbent material and decontamination liquids.

Waste # 1: Investigation-Derived Waste

Waste type: IDW includes spent PPE, contaminated sampling supplies (including paper towels and sampling jars).

Anticipated Regulatory Status: Low Level Waste (LLW)

Characterization Approach: LLW will be characterized based on the current RFI activities and direct sampling of the borehole cuttings. Contact waste will be segregated from cuttings and will be managed appropriately.

Storage and Disposal Method: All IDW will be stored in 55-gallon drums, staged at a LLR waste staging area at MDA C, and disposed of at Area G at TA-54 or at a LANL-approved offsite disposal facility.

Waste # 2: Municipal Solid Waste

Waste type: MSW will consist of non-contact trash and debris.

Anticipated Regulatory Status: Non-hazardous, non-radioactive municipal solid waste.

Characterization Approach: MSW will be characterized based on acceptable knowledge (i.e., no contact of the wastes with environmental media). MSW will be segregated from all other waste streams.

Storage and Disposal Method: It is anticipated that the waste will be stored in plastic-lined trashcans, and then disposed of at the County of Los Alamos Landfill.

Waste # 3 : Borehole Cuttings

Waste Type: Soil and tuff cuttings from boreholes. Borehole cuttings will be managed as LLW for final disposal at Area G at TA-54 or at a LANL-approved offsite disposal facility.

Anticipated Regulatory Status: Low Level Waste (LLW)

Characterization Approach: LLW will be characterized based upon direct sampling of the borehole cuttings to ensure correct assignment of waste type. The maximum detected concentrations of radionuclides will be compared with background/fallout values. If maximum concentrations are above background/fallout values, the waste cuttings will be designated as low-level radioactive waste. The waste will be sampled and analyzed using the TCLP to determine if it is hazardous by characteristic. If potential listed waste constituents are detected in tuff samples, process knowledge will be evaluated to determine the applicability of EPA listed hazardous waste codes.

Storage and Disposal Method: All borehole cuttings will be stored in 20- cu. yd. roll-off containers, staged at a waste staging area at MDA C, and disposed of at a LANL-approved disposal facility.

Waste # 4: Petroleum-Contaminated Soil (PCS) and Absorbent Material (Potential)

Waste Type: PCS and absorbent material (pads, paper towels, or other material) from the release of commercial products such as hydraulic fluid, motor oil, or diesel fuel which would only be generated in the event of an accidental release, such as the rupture of a hydraulic hose.

Anticipated Regulatory Status: New Mexico Special Waste (NMSW) based on the MSDS for the released product.

Waste Characterization Strategy Form

Characterization Approach: The PCS and absorbent material will be characterized based on the Material Safety Data Sheets (MSDS) for the product and direct waste characterization sampling. LANL RCTs will conduct radiological surveys on all PCS and absorbent material.

Storage and Disposal Method: It is anticipated that the waste will be stored in 55-gallon drums, staged in a designated NMSW storage area, and disposed of offsite at an NMSW-permitted facility.

Waste # 5: Decontamination Liquid (Potential)

Waste Type: To the extent possible, sampling equipment will be decontaminated using the dry techniques described in ER-SOP-01.08, "Field Decontamination of Drilling and Sampling Equipment." If the dry techniques are not applicable or prove to be ineffective, decontamination water/liquids will be utilized to achieve complete decontamination.

Anticipated Regulatory Status: Nonhazardous, nonradioactive.

Characterization Approach: Decontamination liquid characterization will be based on direct sampling of the liquid to ensure correct assignment of the waste type. The maximum detected concentrations of radionuclides will be compared with background/fallout values. If maximum concentrations are above background/fallout values, the waste cuttings will be designated as low-level radioactive waste. The waste will be sampled and analyzed using the TCLP to determine if it is hazardous by characteristic.

Storage and Disposal Method: All decontamination liquids will be stored in 55 gallon drums, staged at a waste staging area at MDA C, and disposed of at a LANL-approved disposal facility.

Waste Characterization Strategy Form

CHARACTERIZATION TABLE

WASTE DESCRIPTION	Waste #1 – IDW	Waste #2 – MSW	Waste #3 - Borehole Cuttings	Waste #4 - PCS/Absorbant Material	Waste #5 – Decon. Liquid
Volume (estimate)	2 cubic yard (cy)	2 cy	100 cy	0.25 cy	< 55 gal.
Packaging	55-gal drums	Plastic-lined trash cans	20 cu. yard roll-off containers	55-gal drum	55-gal drum
Regulatory classification					
Solid	X	X	X		X
RCRA					
TSCA					
New Mexico Special				X	
CHARACTERIZATION METHOD					
AK: Existing Data/Documentation				X (MSDS)	
AK: from Site Characterization	X	X			
Direct Sampling of Containerized Waste	X		X	X	X
ANALYTICAL TESTING					
Volatile Organic Constituents EPA 8260-B				X	
Semivolatiles EPA 8270-C					
Organic Pesticides EPA 8081-A			X		X
Organic Herbicides EPA 8151-A					
PCBs EPA 8082			X	X	X
Total Metals EPA 6010-B					
Total Cyanide EPA 9012-A					
High Explosives Constituents EPA 8330					
Asbestos					
TPH EPA 8015				X	
TCLP Metals (EPA 1311/6010-B)			X	X	X
TCLP Organics (EPA 1311/8260 & 1311/8270)			X		X
TCLP Pest. & Herb. (EPA 1311/8081/1311/8151-A)			X		X
Gross Alpha (alpha counting)			X		X
Gross Beta (beta counting)			X		X
Gross Gamma (gamma counting)			X		X
Tritium (liquid scintillation)			X		X
Gamma spectroscopy			X		X
Isotopic plutonium (chem. Separation/alpha spec.)			X		X

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Isotopic uranium (chem. Separation/alpha spec.)			X		X
Total uranium (6020 ICPMS)			X		X
Strontium-90 (beta proportional counting)			X		X
Americium-241 (chem. separation/alpha spec.)			X		X
Waste Profile Form #	TBD	TBD	TBD	TBD	TBD

Waste Characterization Strategy Form


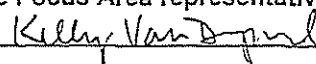

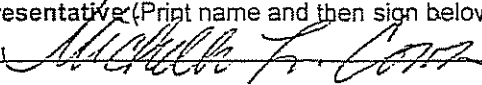
SIGNATURES		DATE
Team Leader (Print name and then sign below.) Kent Rich 		7/19/05
Regulatory Compliance Focus Area representative (Print name and then sign below.) Kelly VanDerpoel 		7/19/05
ER Waste Management Coordinator (Print name and then sign below.) Leonard Trujillo 		7/14/05
Waste Services representative (Print name and then sign below.) Michelle Coriz 		7/20/05
ER-SOP-01.10, R1		Los Alamos Environmental Restoration Project

Figure1 - Proposed Borehole Locations MDA C

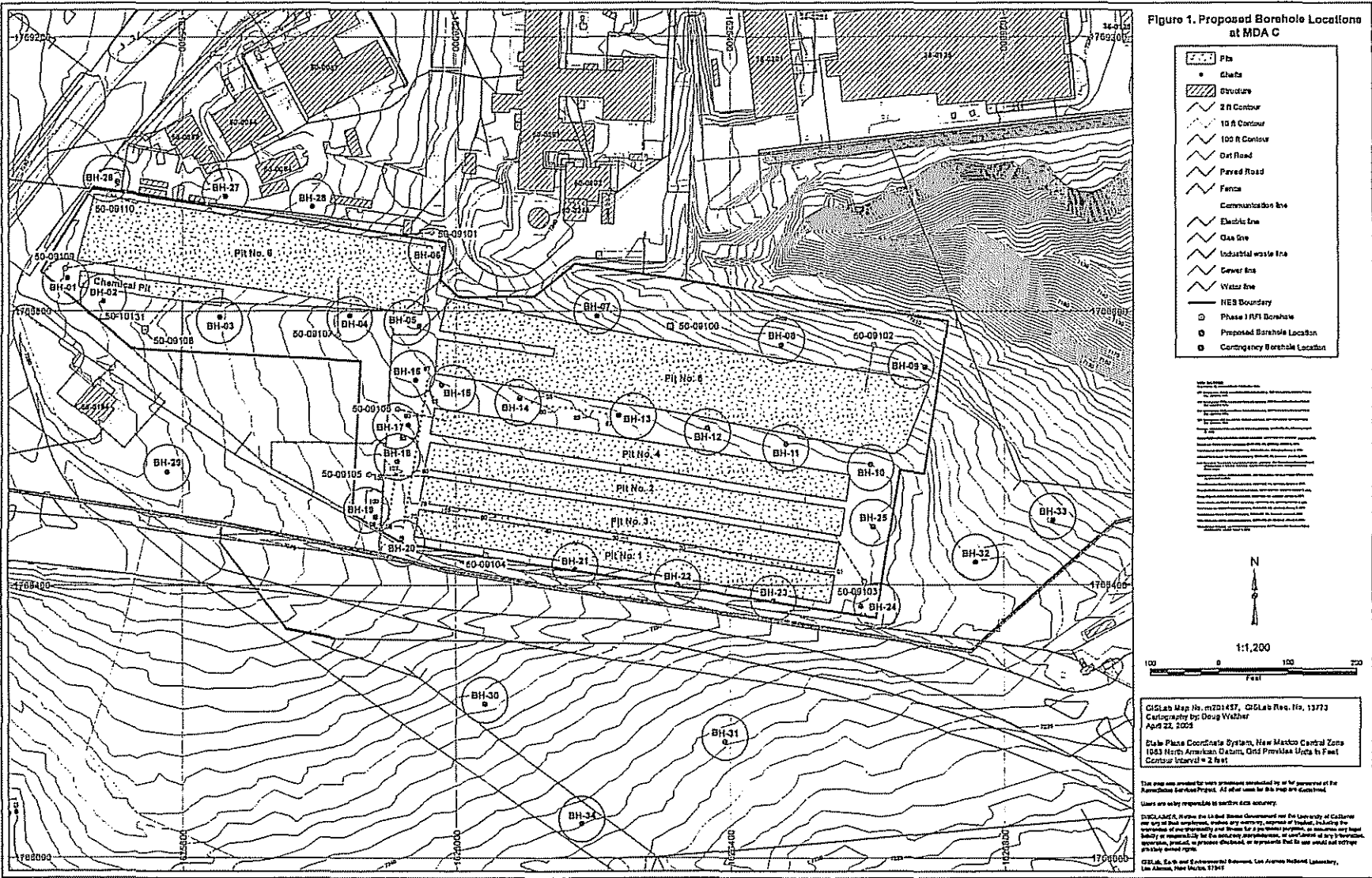


Table 1- Borehole Depth and Analysis to be Collected

Table 1
Summary of Borehole Drilling, Sampling, and Analyses Proposed for MDA C

Site / Issue Addressed	Borehole ID	Location Description	Borehole Deviation from Horizontal (degrees)	Borehole Total Depth (ft)	Geologic Units Encountered	Geophysical Logging	Minimum Number of Samples Estimated for Fixed-Laboratory Analysis	Fixed-Laboratory Analysis														
								SVOCs (SW-846 8270C)	Dioxins/Furans (SW-846 8290)	pH (SW-846 9045C)	PCBs (EPA Method 8082)	TAL Metals (SW-846 6010B or SW-846 6020)	Cyanide (SW-846 9012A)	Nitrates (EPA Method 300.0)	Perchlorate (EPA Method 314 or SW-846 831A)	Gamma Spectroscopy (EPA Method 901.1)	Cross Alpha Beta and Cross Gamma Rad	Americium-241 (HASL-300)	Isotopic Plutonium (HASL-300)	Isotopic Uranium (HASL-300)	Strontium-90 (EPA Method 905)	VOCs (EPA Method TO-15)
Disposal Pit 6 & Chemical Pit; vertical extent, horizontal extent, cover thickness	BH-01	Southwest corner of Pit 6 and west of Chemical Pit	90	-150	Qbt 3, Qbt 2	X	5	X	X	X	X	X	X	X	X	X	X	X	X	X	6	6
Disposal Pit 6 & Chemical Pit; vertical extent, horizontal extent, cover thickness	BH-02	South of Pit 6 and Chemical Pit	90	-150	Qbt 3, Qbt 2	—	5	X	X	X	X	X	X	X	X	X	X	X	X	X	6	6
Disposal Pit 6 & Chemical Pit; vertical extent, horizontal extent, cover thickness	BH-03	South of Pit 6, Southeast corner of Chemical Pit	90	-150	Qbt 3, Qbt 2	X	5	X	X	X	X	X	X	X	X	X	X	X	X	X	6	6
Disposal Pit 6; vertical extent, horizontal extent, cover thickness	BH-04	South of Pit 6	90	-150	Qbt 3, Qbt 2	—	5	X	X	X	X	X	X	X	X	X	X	X	X	X	6	6
Disposal Pit 6; vertical extent, horizontal extent, cover thickness	BH-05	Southwest corner of Pit 6	90	-150	Qbt 3, Qbt 2	X	5	X	X	X	X	X	X	X	X	X	X	X	X	X	6	6
Disposal Pit 6; vertical extent, horizontal extent, cover thickness	BH-06	Northwest corner of Pit 6	90	-150	Qbt 3, Qbt 2	X	5	X	X	X	X	X	X	X	X	X	X	X	X	X	6	6
Pit 5; vertical extent, horizontal extent, cover thickness, perched groundwater, geotechnical parameters	BH-07	North of Pit 5	90	-800	Qbt 3, Qbt2, Qbt1, Qet, Qbo	X	16	X	X	X	X	X	X	X	X	X	X	X	X	X	32	32
Disposal Pit 5; vertical extent, horizontal extent, cover thickness	BH-08	North of Pit 5	90	-150	Qbt 3, Qbt 2	X	5	X	X	X	X	X	X	X	X	X	X	X	X	X	6	6
Disposal Pit 5; vertical extent, horizontal extent, cover thickness	BH-09	Northeast corner of Pit 5	90	-150	Qbt 3, Qbt 2	X	5	X	X	X	X	X	X	X	X	X	X	X	X	X	6	6
Disposal Pit 4 & Pit 5; vertical extent, horizontal extent, cover thickness	BH-10	Northeast corner of Pit 4 between Pits 4 & 5	90	-150	Qbt 3, Qbt 2	X	5	X	X	X	X	X	X	X	X	X	X	X	X	X	6	6
Disposal Pit 4 & Pit 5; vertical extent, horizontal extent, cover thickness	BH-11	Between Pits 4 & 5	90	-150	Qbt 3, Qbt 2	—	5	X	X	X	X	X	X	X	X	X	X	X	X	X	6	6
Disposal Pit 4 & Pit 5; vertical extent, horizontal extent, cover thickness	BH-12	Between Pits 4 & 5	90	-150	Qbt 3, Qbt 2	—	5	X	X	X	X	X	X	X	X	X	X	X	X	X	6	6
Shaft Group 1, Disposal Pit 4 & Pit 5; vertical extent, horizontal extent, cover thickness	BH-13	Between Pits 4 & 5, east end of Shaft Group 1	90	-150	Qbt 3, Qbt 2	X	5	X	X	X	X	X	X	X	X	X	X	X	X	X	6	6

Table 1- Borehole Depth and Analysis to be Collected

Table 1 (continued)

Site / Issue Addressed	Borehole ID	Location Description	Borehole Deviation From Horizontal (degrees)	Borehole Total Depth (ft)	Geologic Units Encountered	Geophysical Logging	Minimum Number of Samples Estimated for Fixed -Laboratory Analysis	Fixed-Laboratory Analysis															
								SVOCs (SW-846 8270C)	Dioxin/Furans (SW-846 8290)	pH (SW-846 9045C)	PCBs (EPA Method 8082)	TAL Metals (SW-846 6010B or SW-846 6020)	Cyanide (SW-846 9012A)	Nitrates (EPA Method 300.0)	Perchlorate (EPA Method 314 or SW-846 8311A)	Gamma Spectroscopy (EPA Method 901.1)	Gross Alpha Beta and Gross Gamma Rad	Americium-241 (HASL-300)	Isotopic Plutonium (HASL-300)	Isotopic Uranium (HASL-300)	Strontium-90 (EPA Method 905)	VOCs (EPA Method TO-15)	Tritium (EPA Method 906)
Shaft Group 1, Disposal Pit 4 & Pit 5; vertical extent, horizontal extent, cover thickness	BH-14	Between Pits 4 & 5, west end of Shaft Group 1	90	~150	Qbt 3, Qbt 2	—	5	X	X	X	X	X	X	X	X	X	X	X	X	X	X	6	6
Shaft Group 3, Disposal Pit 4 & Pit 5; vertical extent, horizontal extent, cover thickness	BH-15	Southwest of Pit 5 between Pits 4 & 5	90	~150	Qbt 3, Qbt 2	—	5	X	X	X	X	X	X	X	X	X	X	X	X	X	X	6	6
Shaft Group 3, Disposal Pit 5; vertical extent, horizontal extent, cover thickness	BH-16	Southwest corner of Pit 5 and northeast of Shaft Group 3	90	~150	Qbt 3, Qbt 2	—	5	X	X	X	X	X	X	X	X	X	X	X	X	X	X	6	6
Shaft Group 3; vertical extent, horizontal extent, cover thickness	BH-17	West of Shaft Group 3, near shaft 88	90	~150	Qbt 3, Qbt 2	—	5	X	X	X	X	X	X	X	X	X	X	X	X	X	X	6	6
Shaft Group 3; vertical extent, horizontal extent, cover thickness	BH-18	North of Shaft Group 3, near shaft 107	90	~150	Qbt 3, Qbt 2	X	5	X	X	X	X	X	X	X	X	X	X	X	X	X	X	6	6
Shaft Group 3; vertical extent, horizontal extent, cover thickness	BH-19	Southwest of Shaft Group 3, near shaft 98	90	~150	Qbt 3, Qbt 2	—	5	X	X	X	X	X	X	X	X	X	X	X	X	X	X	6	6
Disposal Pit 1, Shaft Group 3; vertical extent, horizontal extent, cover thickness	BH-20	Southwest corner of Pit 1, south of Shaft Group 3	90	~150	Qbt 3, Qbt 2	X	5	X	X	X	X	X	X	X	X	X	X	X	X	X	X	6	6
Disposal Pit 1; vertical extent, horizontal extent, cover thickness	BH-21	South of Pit 1	90	~150	Qbt 3, Qbt 2	—	5	X	X	X	X	X	X	X	X	X	X	X	X	X	X	6	6
Disposal Pit 1; vertical extent, horizontal extent, cover thickness	BH-22	South of Pit 1	90	~150	Qbt 3, Qbt 2	X	5	X	X	X	X	X	X	X	X	X	X	X	X	X	X	6	6
Disposal Pit 1; vertical extent, horizontal extent, cover thickness	BH-23	South of Pit 1	90	~150	Qbt 3, Qbt 2	—	5	X	X	X	X	X	X	X	X	X	X	X	X	X	X	6	6
Disposal Pit 1; vertical extent, horizontal extent, cover thickness	BH-24	East of Pit 1	90	~150	Qbt 3, Qbt 2	X	5	X	X	X	X	X	X	X	X	X	X	X	X	X	X	6	6
Disposal Pit 2; vertical extent, horizontal extent, cover thickness	BH-25	East of Pit 2	90	~150	Qbt 3, Qbt 2	—	5	X	X	X	X	X	X	X	X	X	X	X	X	X	X	6	6
Disposal Pit 6; vertical extent, horizontal extent, cover thickness	BH-26	Northeast corner of Pit 6	90	~150	Qbt 3, Qbt 2	X	5	X	X	X	X	X	X	X	X	X	X	X	X	X	X	6	6
Disposal Pit 6; vertical extent, horizontal extent, cover thickness	BH-27	North of Pit 6	90	~250	Qbt 3, Qbt 2, Qbt 1	—	8	X	X	X	X	X	X	X	X	X	X	X	X	X	X	14	14

Table 1 (continued)

Table 1- Borehole Depth and Analysis to be Collected

Site / Issue Addressed	Borehole ID	Location Description	Borehole Deviation from Horizontal (degrees)	Borehole Total Depth (ft)	Geologic Units Encountered	Geophysical Logging	Minimum Number of Samples Estimated for Fixed-Laboratory Analysis	Fixed-Laboratory Analysis														
								SVOCs (SW-846 8270C)	Dioxins/Furans (SW-846 8290)	pH (SW-846 9045C)	PCBs (EPA Method 8082)	TAL Metals (SW-846 6010B or SW-846 6020)	Cyanide (SW-846 9012A)	Nitrates (EPA Method 300.0)	Perchlorate (EPA Method 314 or SW-846 8321A)	Gamma Spectroscopy (EPA Method 901.1)	Gross Alpha Beta and Gross Gamma Rad	Americium-241 (HASL-300)	Isotopic Plutonium (HASL-300)	Isotopic Uranium (HASL-300)	Strontium-90 (EPA Method 905)	VOCs (EPA Method TO-15)
Disposal Pit 6; vertical extent, horizontal extent, cover thickness	BH-28	North of Pit 6	90	~150	Qbt 3, Qbt 2	X	5	X	X	X	X	X	X	X	X	X	X	X	X	X	6	6
Vertical and horizontal extent outside MDA C	BH-29	~250 ft south of Chemical Pit	90	~250	Qbt 3, Qbt 2, Qbt 1	X	8	X	X	X	X	X	X	X	X	X	X	X	X	X	6	6
Vertical and horizontal extent outside MDA C	BH-30	~250 ft south of Pit 1 across Pajarito Road	90	~250	Qbt 3, Qbt 2, Qbt 1	X	8	X	X	X	X	X	X	X	X	X	X	X	X	X	6	6
Vertical and horizontal extent outside MDA C	BH-31	~250 ft south of Pit 1 across Pajarito Road	90	~250	Qbt 3, Qbt 2, Qbt 1	—	8	X	X	X	X	X	X	X	X	X	X	X	X	X	6	6
Vertical and horizontal extent outside MDA C	BH-32	~200 ft east of eastern end of Pits 1 – 4	90	~250	Qbt 3, Qbt 2, Qbt 1	X	8	X	X	X	X	X	X	X	X	X	X	X	X	X	6	6
Vertical and horizontal extent outside MDA C	BH-33	~300 ft east of eastern end of Pits 1 – 4, northeast of BH-32	90	~250	Qbt 3, Qbt 2, Qbt 1	—	8	X	X	X	X	X	X	X	X	X	X	X	X	X	6	6
Vertical and horizontal extent outside MDA C	BH-34	~375 ft south of Pit 1 across Pajarito Road between BH-30 and BH-32	90	~250	Qbt 3, Qbt 2, Qbt 1	—	8	X	X	X	X	X	X	X	X	X	X	X	X	X	6	6

- Notes:
1. All boreholes will be continuously cored for collection of curation materials to a depth of 40 ft; material for curation will be collected every 10 ft thereafter.
 2. From all boreholes, four samples will be collected for fixed-laboratory analysis including (a) base depths of the nearest waste units (pits, vertical shafts, General's Tanks), (b) maximum reading of field screen detection, (c) maximum depth of positive field screening detection, and (d) total depth.
 3. From all boreholes less than 100 ft TD, two additional samples may be collected from preferential flow pathways (fractures, fracture fill, moist zones, surge beds/higher permeability zones).
 4. From all boreholes greater than 100 ft TD, four additional samples may be collected from preferential flow pathways (fractures, fracture fill, moist zones, surge beds/higher permeability zones).
 5. If there are no field-screening detections or zones of potential migration encountered, then samples will be collected from midpoint between the ground surface and base of waste unit and the midpoint between the base of the waste unit and TD.
 6. Groundwater samples will also be analyzed for general chemistry, if required (e.g., anions, alkalinity, total organic carbon, total inorganic carbon, and total dissolved solids) and explosive compounds.
 7. Geophysical logging will include using a neutron probe in specified boreholes, and a borehole video camera in borehole BH-7, if required. A caliper logging tool will be available, if required.
 8. Borehole depth is listed as approximate depths. The final depth is dependant on field-screening result. Boreholes will be advanced a minimum of 25 ft beyond the last field-screening detection.

n/a = Not applicable.
 TBD = To be determined.
 Qbt 1 = Bandelier Tuff, Tshirege Member, Unit 1.
 Qbt 2 = Bandelier Tuff, Tshirege Member, Unit 2.
 Qbt 3 = Bandelier Tuff, Tshirege Member, Unit 3.
 Qct = Cerro Toledo Interval.
 Qbu = Bandelier Tuff, Otowi Member.
 X = Analysis to be performed.
 — = No analysis to be performed.

**Amendment to the
Waste Characterization Strategy Form (WCSF)
Implementation of the IWP at MDA C, SWMU 50-009 at TA-50
August 24, 2005**

INTRODUCTION

This amendment to the WCSF for the Implementation of the investigation work plan (IWP) at MDA C, SWMU 50-009 at TA-50 will address four additional waste streams. The waste streams will consist of 1) spent HEPA filters that will be used during dust suppression activities, 2) spent acetone with soil from high explosive test kits, 3) residual sodium azide buffer solution, and 4) empty containers from high explosive test kits.

BACKGROUND

The scope of the project consists of the implementation of the IWP at MDA C, SWMU 50-009 at TA-50. The implementation consists of nature and extent sampling using hollow stem augers, air coring, pore gas field screening and field testing of soil for high explosives. A more comprehensive description of the activities can be found within the original WCSF, Implementation of the IWP at MDA C, SWMU 50-009 at TA-50, ER2005-0324, July 13, 2005.

WASTE DESCRIPTION

Waste #1: Spent HEPA Filters

Spent HEPA filters generated during dust suppression activities while air coring at borehole (BH)-7. The estimated volume of all spent HEPA filters will be approximately 55 gallons or less.

Waste #2: Spent acetone with soil from high explosive test kits.

This waste stream comprises spent solvent mixed with soil. High explosive soil screening with DTECH test kits uses acetone as a solvent to extract the HE compounds from soil. Approximately 20 ml of waste is generated per test.

Waste #3: Residual Sodium Azide Buffer Solution

Approximately one milliliter of residual sodium azide buffer solution may be left over per sample analysis and will be transferred into a 1 liter polyethylene bottle. The residual buffer solution is a residue to be managed in accordance with 40CFR Part 261.33(c), whereby the residue in the container carries the hazardous waste listing unless the container is deemed "RCRA empty" per 40 CFR 261.(7).

Waste #4: Empty Containers from High Explosive Test Kits

Plastic containers, glass tubes, or eye droppers last containing sodium azide buffer solution or acetone solutions from HE test kits. The DTECH test kits use acetone as a solvent and a separate buffer solution containing sodium azide; any remaining spent acetone or residual sodium azide buffer solution will be managed as described above (Wastes #2 and #3). All test kit component containers will be fully emptied of their contents as part of the process and will meet the definition of RCRA-empty, per 40 CFR 261.7, prior to being declared as waste. Less than 4 liters of waste will be generated for the entire investigation.

CHARACTERIZATION, MANAGEMENT, AND DISPOSAL

Waste #1: Spent HEPA Filters

The spent HEPA filter characteristics will be determined using the data collected during the characterization of the borehole cuttings. The borehole cuttings waste stream analytical suites are detailed within the original WCSF for the project. The spent HEPA filters will be managed as LLW until the data from the borehole cuttings are obtained. The spent HEPA filters will be stored on-site within a 55-gallon drum until final characterization. The filters will be disposed of at a LANL-approved disposal facility.

Waste #2: Spent acetone with soil from high explosive test kits.

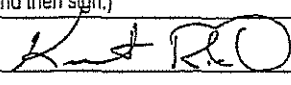
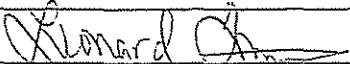
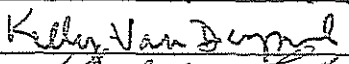
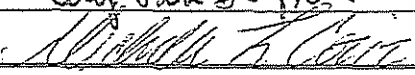
This waste will be characterized using acceptable knowledge of the process generating the waste and the material used in this process. This waste will be managed as RCRA mixed waste. Acetone, as a spent solvent, is a listed hazardous waste (EPA Hazardous Waste Number F003) and exhibits the characteristic of ignitability (D001), and the soil to be tested from boreholes at MDA C is expected to be LLW. This waste will be packaged in a sealed inner container, and stored inside a hazardous waste drum within a registered Satellite Accumulation Area (SAA), in accordance with all LANL and ENV-ECR requirements. The SAA will be located within the fence at MDA C. Disposal of the waste will be at a LANL-approved offsite TSDF.

Waste #3: Residual Sodium Azide Buffer Solution

The residual sodium azide buffer solution is listed as acutely hazardous waste, EPA Hazardous Waste Number P105, and will be segregated and stored in a sealed container within a registered SAA in a secure area within the fence at MDA C, pending transportation to and disposal at a LANL-approved offsite TSDF.

Waste #4: Empty Containers from High Explosive Test Kits

The empty containers will be managed as empty product containers and disposed of as nonhazardous, nonradioactive solid waste. As a best management practice, the containers that held acetone will be kept separate from those that held sodium azide buffer solution, and disposed of at a LANL-approved industrial waste facility.

SIGNATURES (Print name and then sign.)		DATE
Project Leader: Kent Rich		9/19/05
ERS-ECR Waste Management Coordinator: Leonard Trujillo		9/19/05
SWRC Representative: Kelly VanDerpoel		9/21/05
NWIS-SWO Representative: Andy Elicio		10/3/05

**Amendment to the
Waste Characterization Strategy Form (WCSF)
Implementation of the IWP at MDA C, SWMU 50-009 at TA-50
October 3, 2005**

INTRODUCTION

This amendment to the WCSF for the implementation of the investigation work plan (IWP) at MDA C, SWMU 50-009 at TA-50 will modify (addition of analyses for total VOCs using EPA Method 8260B) the waste characterization of waste #3 from the original WCSF.

BACKGROUND

The scope of the project consists of the implementation of the IWP at MDA C, SWMU 50-009 at TA-50. The implementation consists of nature and extent sampling using hollow stem augers, air coring, pore gas field screening and field testing of soil for high explosives. A more comprehensive description of the activities can be found within the original WCSF, Implementation of the IWP at MDA C, SWMU 50-009 at TA-50, ER2005-0324, July 13, 2005.

WASTE DESCRIPTION

Waste #3 (original waste # from WCSF): Borehole Cuttings

Waste Type: Soil and tuff cuttings from boreholes. Borehole cuttings will be managed as LLW for final disposal at Area G at TA-54 or at a LANL-approved offsite disposal facility.

Anticipated Regulatory Status: Low Level Waste (LLW)

CHARACTERIZATION, MANAGEMENT, AND DISPOSAL

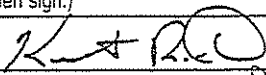
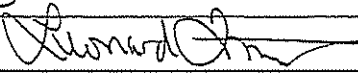
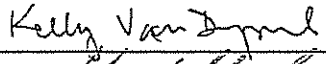
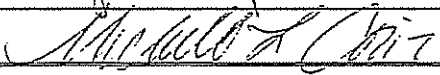
Waste #3:

Characterization Approach: As provided in the original WCSF, the borehole cuttings will be characterized based upon direct sampling of the containerized waste to ensure correct assignment of waste type. The change to the characterization strategy for this waste is as follows: In addition to the analyses indicated in the original WCSF Characterization Table, the containerized waste will be sampled and analyzed for total VOCs using EPA Method 8260B to determine the potential for listed waste constituents. This replaces the strategy in the original WCSF, which indicates that data from tuff samples will be used to evaluate the potential for listed waste constituents. All other aspects of the characterization strategy for this waste remain the same as in the original WCSF.

WASTE DESCRIPTION	Waste #3 - Borehole Cuttings
Volume (estimate)	100 cy
Packaging	20 cu. yard roll- off containers
Regulatory classification	
Solid	X
RCRA	
TSCA	
New Mexico Special	
CHARACTERIZATION METHOD	
AK: Existing Data/Documentation	
AK: from Site Characterization	
Direct Sampling of Containerized Waste	X
ANALYTICAL TESTING	
Volatile Organic Constituents EPA 8260-B	X
Semivolatiles EPA 8270-C	
Organic Pesticides EPA 8081-A	X
Organic Herbicides EPA 8151-A	
PCBs EPA 8082	X
Total Metals EPA 6010-B	
Total Cyanide EPA 9012-A	
High Explosives Constituents EPA 8330	
Asbestos	
TPH EPA 8015	

TCLP Metals (EPA 1311/6010-B)	X
TCLP Organics (EPA 1311/8260 & 1311/8270)	X
TCLP Pest. & Herb. (EPA 1311/8081/1311/8151-A)	X
Gross Alpha (alpha counting)	X
Gross Beta (beta counting)	X
Gross Gamma (gamma counting)	X
Tritium (liquid scintillation)	X
Gamma spectroscopy	X
Isotopic plutonium (chem. Separation/alpha spec.)	X
Isotopic uranium (chem. Separation/alpha spec.)	X
Total uranium (6020 ICPMS)	X
Strontium-90 (beta proportional counting)	X
Americium-241 (chem. separation/alpha spec.)	X
Waste Profile Form #	TBD

Storage and Disposal Method: All borehole cuttings will be stored in 20- cu. yd. roll-off containers, staged at a waste staging area at MDA C, and disposed of at a LANL-approved disposal facility.

SIGNATURES (Print name and then sign.)	DATE
Project Leader: Kent Rich 	10/11/05
ERS-ECR Waste Management Coordinator: Leonard Trujillo 	10/11/05
SWRC Representative: Kelly VanDerpoel 	10/11/05
NWIS-SWO Representative: Michelle Coriz 	10/13/05

**Amendment 3 to the
Waste Characterization Strategy Form (WCSF) for
Implementation of the IWP at MDA C, SWMU 50-009 at TA-50**

Date: September 20, 2006

Page 1 of 1

INTRODUCTION

This third amendment to the WCSF for the Implementation of the investigation work plan (IWP) at MDA C, SWMU 50-009 at TA-50 will change two waste streams from Amendment 1 to the WCSF for Implementation of the IWP at MDA C, SWMU 50-009 at TA50.

Amendment 1, Waste #2 Will be changed to HE test kit process waste

BACKGROUND

The scope of the project consists of the implementation of the IWP at MDA C, SWMU 50-009 at TA-50. The implementation consists of nature and extent sampling using hollow stem augers, air coring, pore gas field screening and field testing of soil for high explosives. A more comprehensive description of the activities can be found in the original WCSF, Implementation of the IWP at MDA C, SWMU 50-009 at TA-50, ER2005-0324, July 13, 2005.

WASTE DESCRIPTION

Waste Stream #2: HE test kit process waste consisting of acetone, soil and spent sodium azide and is contained in plastic bottles and pipettes. Less than 30 gallons of waste, including liquid, soil, plastic bottles and pipettes will be generated.

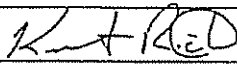
CHARACTERIZATION, MANAGEMENT, AND DISPOSAL

Waste Stream #2: This waste stream will be characterized by an MSDS and process knowledge. It is anticipated to be low level waste. The HE test kit process waste will be contained in plastic bottles and glass pipettes and placed in a larger drum. The waste will be stored in a locked satellite accumulation area, and disposed of at an authorized offsite TSDF.

SIGNATURES (Print name and then sign.)

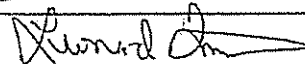
DATE

Project Leader: Kent Rich



9/21/06

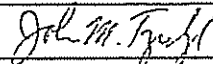
ERS-ECR Waste Management Coordinator: Leonard Trujillo



9/27/06

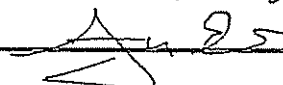
SWRC Representative: Kelly VanDerpeel

John M. Tymkanyel



9/26/06

NWIS-SWO Representative: Andy Elicio



9/21/06

WASTE PROFILE FORM

Contact (if other than given below)		For rapid processing, complete all sections in black, or blue ink and mail to SOLID WASTE OPERATIONS GROUP at MS JS95. For assistance with completing this form, call SOLID WASTE OPERATIONS GROUP at 5-4000				Reference Number (For SOLID WASTE OPERATIONS GROUP use only.)	
Generator's Z Number 177319	Waste Generator's Name (print) Kent Rich		WMC's Z Number 100587	WMC's Name (print) Leonard Trujillo			
Generator's Telephone 665-4272	Generator's Mail Stop M992	Waste Generating Group ENV-CAP	Waste Stream Technical Area 50	Building NA	Room NA	WMC Telephone 667-5162	
Waste Accumulation (Check only one.)	<input type="checkbox"/> Satellite Accumulation Area <input type="checkbox"/> Less-than-90-days Storage Area <input type="checkbox"/> TSD <input type="checkbox"/> Universal Waste Storage Area <input type="checkbox"/> Used Oil for Recycle		Site no: _____ Site no: _____ Site no: _____ Site no: _____	<input type="checkbox"/> PCBs Storage Area <input type="checkbox"/> NM Special Waste <input type="checkbox"/> Rad Staging Area <input type="checkbox"/> Rad Storage Area <input checked="" type="checkbox"/> None of the Above		Site no: _____ Site no: _____ Site no: _____ Site no: _____	
ER Use Only <input checked="" type="checkbox"/> ER Site		SWMU/AOC #: 50-009					
Method of Characterization (Check as many as apply.)		<input type="checkbox"/> Chemical/Physical Analysis <input type="checkbox"/> Radiological Analysis <input type="checkbox"/> PCB Analysis <input checked="" type="checkbox"/> Acceptable Knowledge Documentation <input type="checkbox"/> MSDS		<input type="checkbox"/> Attached <input type="checkbox"/> Attached <input type="checkbox"/> Attached <input checked="" type="checkbox"/> Attached <input type="checkbox"/> Attached		Sample #: _____ Sample #: _____ Sample #: _____ Documentation #: _____	

Section 1 - Waste Prevention/Minimization (answer all questions)			
Can hazard segregation, elimination, or material substitution be used?	<input type="checkbox"/> Yes (Provide comments)	<input checked="" type="checkbox"/> No	
Can any of the materials in the waste stream be recycled or reused?	<input type="checkbox"/> Yes (Provide comments)	<input checked="" type="checkbox"/> No	
Has waste minimization been incorporated into procedures or other process controls?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No (Provide comments)	
Can this waste be generated outside a RCA?	<input type="checkbox"/> Yes (Provide comments)	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A
Comments:			

Section 2 - Chemical and Physical Information			
Waste Type (Check only one) <input type="checkbox"/> Unused/Unspent Chemical (Complete all sections as appropriate) <input checked="" type="checkbox"/> Process Waste/Spent Chemical/ Other (Complete all sections) Radiological Information Was Waste Generated in a RCA? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Non-radioactive <input checked="" type="checkbox"/> Radioactive - Low Level <input type="checkbox"/> Radioactive - Transuranic	Waste Category (Check all that apply) <input checked="" type="checkbox"/> Inorganic <input checked="" type="checkbox"/> Organic <input type="checkbox"/> Solvent * <input type="checkbox"/> Degreaser * <input type="checkbox"/> Dioxin <input type="checkbox"/> Electroplating <input type="checkbox"/> Treated Hazardous waste or residue <input type="checkbox"/> No-Longer Contained-In <input type="checkbox"/> Explosive process <input type="checkbox"/> Infectious/Medical <input type="checkbox"/> Biological <input type="checkbox"/> Beryllium <input type="checkbox"/> Empty Container (See instructions) <input type="checkbox"/> Battery (See instructions) Asbestos <input type="checkbox"/> friable <input type="checkbox"/> non-friable PCB Source Concentration <input type="checkbox"/> PCB < 50 ppm <input type="checkbox"/> PCB ≥ 50 - < 500 ppm <input type="checkbox"/> PCB ≥ 500 ppm <input type="checkbox"/> Hazardous Waste Contaminated Soil <input type="checkbox"/> Untreated Hazardous Debris <input type="checkbox"/> Commercial Solid Waste <input checked="" type="checkbox"/> Other (Describe below) * See instructions	Waste Source (Check only one) Waste Source A <input type="checkbox"/> Decon <input type="checkbox"/> Materials Processing/Production <input type="checkbox"/> Research/Development/Testing <input type="checkbox"/> Scheduled Maintenance <input type="checkbox"/> Housekeeping - Routine <input type="checkbox"/> Spill Cleanup - Routine <input type="checkbox"/> Sampling - Routine Monitoring <input type="checkbox"/> Other (Describe below) Waste Source B <input type="checkbox"/> Abatement <input type="checkbox"/> Construction/Upgrades <input type="checkbox"/> Demolition <input type="checkbox"/> Decon/Decom <input checked="" type="checkbox"/> Investigative Derived <input type="checkbox"/> Orphan/Legacy <input type="checkbox"/> Remediation/Restoration <input type="checkbox"/> Repackaging (Secondary) <input type="checkbox"/> Unscheduled Maintenance <input type="checkbox"/> Housekeeping (Non-routine) <input type="checkbox"/> Spill Cleanup (Non-routine) <input type="checkbox"/> UST - Non-petroleum <input type="checkbox"/> UST - Petroleum <input type="checkbox"/> Other (Describe below)	Waste Matrix (Check only one) Gas <input type="checkbox"/> ≤ 1.5 Atmospheres pressure <input type="checkbox"/> > 1.5 Atmospheres pressure <input type="checkbox"/> Liquefied compressed gas Liquid <input type="checkbox"/> Aqueous <input type="checkbox"/> Non-aqueous <input type="checkbox"/> Suspended Solids/ Aqueous <input type="checkbox"/> Suspended Solids/ Non-aqueous Solid <input type="checkbox"/> Powder/Ash/Dust <input checked="" type="checkbox"/> Solid <input type="checkbox"/> Sludge <input type="checkbox"/> Absorbed/Solidified liquid <input type="checkbox"/> Debris Matrix Type (Check only one) <input type="checkbox"/> Homogeneous <input checked="" type="checkbox"/> Heterogeneous (Describe below) Estimated Annual Volume (m³) <div style="text-align: center; font-size: large;">155 m³</div>

Section 3 – Process and Waste Descriptions

Process Description:

The objective of this investigation is to finalize surface and subsurface chemical/radionuclide and geotechnical characterization of MDA C in accordance with the New Mexico Environment Department-approved MDA C investigation work plan. This investigation included drilling boreholes and characterizing soil samples.

Waste Description:

Drill cuttings from the boreholes drilled at MDA C.

Section 4 – Characteristics

Ignitability (Check only one.) (°F) (°C)	Corrosivity (Check only one.) (pH)	Reactivity (Check as many as apply.)	Boiling Point (Check only one.) (°F) (°C)
<input type="checkbox"/> < 73 <input type="checkbox"/> 73 - 99 <input type="checkbox"/> 100 - 179 <input type="checkbox"/> 180 - 200 <input type="checkbox"/> > 200 <input type="checkbox"/> EPA Ignitable - Non-liquid <input type="checkbox"/> DOT Flammable Gas <input type="checkbox"/> DOT Oxidizer <input checked="" type="checkbox"/> Not ignitable	<input type="checkbox"/> ≤ 2.0 <input type="checkbox"/> 2.1 - 4.0 <input type="checkbox"/> 4.1 - 6.0 <input type="checkbox"/> 6.1 - 9.0 <input type="checkbox"/> 9.1 - 12.4 <input type="checkbox"/> ≥ 12.5 <input type="checkbox"/> Liquid corrosive to steel <input checked="" type="checkbox"/> Non-aqueous	<input type="checkbox"/> RCRA Unstable <input type="checkbox"/> Water Reactive <input type="checkbox"/> Cyanide Bearing <input type="checkbox"/> Sulfide Bearing <input type="checkbox"/> Pyrophoric <input type="checkbox"/> Shock Sensitive <input type="checkbox"/> Explosive - DOT Div _____ <input checked="" type="checkbox"/> Non-reactive	<input type="checkbox"/> ≤ 95 <input type="checkbox"/> > 95 <input checked="" type="checkbox"/> Not applicable

Identify for all contaminants listed.	Characterization Method			None or Non-detect	Concentration of Contaminants Contaminant present at		Regulatory Limit
	AK	TCLP	Total		Minimum	Maximum	
Toxicity Characteristic Metals							
Arsenic	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	(10,000 ppm = 1%)		5.0 ppm
Barium	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0	10	100.0 ppm
Cadmium	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	0	10	1.0 ppm
Chromium (Total)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	0	10	5.0 ppm
Lead	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0	10	5.0 ppm
Mercury	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0	10	0.2 ppm
Selenium	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	0	10	1.0 ppm
Silver	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	0	10	5.0 ppm
Toxicity Characteristic Organics							
Benzene	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	0	10	0.5 ppm
Carbon tetrachloride	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	0	10	0.5 ppm
Chlorobenzene	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	0	10	100.0 ppm
Chloroform	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	0	10	6.0 ppm
n - cresol	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	0	10	200.0 ppm
m - cresol	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	0	10	200.0 ppm
p - cresol	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	0	10	200.0 ppm
Cresol - mixed	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	0	10	200.0 ppm
1,4-Dichlorobenzene	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	0	10	7.5 ppm
1,2-Dichloroethane	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	0	10	0.5 ppm
1,1-Dichloroethylene	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	0	10	0.7 ppm
2,4-Dinitrotoluene	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	0	10	0.13 ppm
Hexachlorobenzene	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	0	10	0.13 ppm
Hexachlorobutadiene	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	0	10	0.5 ppm
Hexachloroethane	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	0	10	3.0 ppm
Methyl ethyl ketone	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	0	10	200.0 ppm
Nitrobenzene	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	0	10	2.0 ppm
Pentachlorophenol	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	0	10	100.0 ppm
Pyridine	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	0	10	5.0 ppm
Tetrachloroethylene	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	0	10	0.7 ppm
Trichloroethylene	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	0	10	0.5 ppm
2,4,5-Trichlorophenol	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	0	10	400.0 ppm
2,4,6-Trichlorophenol	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	0	10	2.0 ppm
Vinyl chloride	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	0	10	0.2 ppm
Herbicides and Pesticides							
Chlordane	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	0	10	0.05 ppm
2,4-D	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	0	10	10.0 ppm
Endrin	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	0	10	0.02 ppm
Heptachlor (& its epoxide)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	0	10	0.008 ppm
Lindane	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	0	10	0.4 ppm
Methoxychlor	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	0	10	10.0 ppm
Toxaphene	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	0	10	0.5 ppm
2,4,5-TP (Silvex)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	0	10	0.5 ppm

Section 5 - Additional Constituents and Information			
<p>Additional Constituents and Contaminants. Please account for 100% of waste. Ranges should be given within guidelines of individual constituents. List all other constituents (including inert) not identified above and attach any applicable analysis. No chemical formulas allowed in this field. Continue in Section 5 Additional Information as necessary. CAS Numbers are needed for all chemical constituents. For material without a CAS Number enter "No CAS Number." Contact Waste Services at 5-4600 for assistance.</p>			
CAS No.	Name of constituent	Minimum	Maximum
	Cutlines	98	99 %
	Plastic fiberite wraps and drum liners	1	2 %
Total of max. ranges of this section and page 2		101	in %
Additional Information (Use additional sheet if necessary.) If additional information is available on the chemical, physical, or radiological character of the waste not covered on this form, provide it below:			
Plutonium-239 0.0508 PCI/G Tritium 0.7042735 PCI/G Uranium 1.31 MG/KG Uranium-234 1.73 PCI/G Uranium-235 0.143 PCI/G Uranium-238 1.75 PCI/G Waste Characterization Strategy Form: ER2005-0324 Title - Implementation of the IWP at MDA C SWRIU 50-009 at TA-50 Waste Stream # 3			
Section 6 - Work Control Documentation (answer all questions)			
Do the procedures for this process cover how to manage this waste?		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No (Provide comments)	
Do the procedures for this process address controls to prevent changes to waste constituents and concentrations or addition or removal of waste to/from containers?		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No (Provide comments)	
Comments			
Section 7 - Packaging and Storage Control			
Describe how the waste will be packaged in according to the applicable WAC			
Identify the storage management controls that will be used for this waste stream: (check all that apply)			
<input type="checkbox"/> Tamper indication devices		<input type="checkbox"/> Locked cabinet or building	
<input type="checkbox"/> Limited use locks with log-in for waste		<input checked="" type="checkbox"/> Other (describe): roll-off bins	
Section 8 - Waste Certification Statements (check only one)			
<input checked="" type="checkbox"/> Waste appears to meet WAC chapter for Low Level Radioactive Waste			
<input type="checkbox"/> Waste stream needs exception/exemption for treatment, storage, or disposal at			
<input type="checkbox"/> Waste does not meet the criteria for any known TSDF (DOE approval is required. Contact the Waste Management Program Office for assistance.)			
WASTE GENERATOR CERTIFICATION: Based on my knowledge of the waste and/or chemical/physical analysis, I certify that the waste characterization information on this form is correct and that it meets the requirements of the applicable waste acceptance criteria. I understand that this information will be made available to regulatory agencies and that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.			
Signature		Date 8/4/06	
WASTE CERTIFYING OFFICIAL: I have reviewed this form and any associated attachments and the characterization information provided appears to be complete and accurate. I certify, to the best of my knowledge, that the waste characterization information provided by the waste generator meets the requirements of the applicable WAC.			
Signature		Date 8-4-06	

ANALYTE_NAME	STD_SAMPLE_VALUE	FU4_QUAL	STD_REPORTING_UNITS	ANALYTICAL_SUITE
Aroclor-1242	0.0102		MG/KG	PCB
Aroclor-1254	0.0113		MG/KG	PCB
Aroclor-1260	0.0028	J	MG/KG	PCB
Barium	290		ppb	METAL_TCLP
Lead	5.8	J	ppb	METAL_TCLP
Mercury	0.89	J	ppb	METAL_TCLP
Plutonium-239	0.0508		PCI/G	ISO_PU
Tritium	0.7042735		PCI/G	H3
Uranium	1.31		MG/KG	METALS
Uranium-234	1.73		PCI/G	ISO_U
Uranium-235	0.143		PCI/G	ISO_U
Uranium-238	1.75		PCI/G	ISO_U

National Laboratory

Chemical Waste Disposal Request

ORIGINAL

Waste Services Use Only

3020357


This form is used to request disposal of chemical and low-level radioactive wastes. Fill out electronically, then print and sign. Mail completed form to Waste Services at MS J595.

Account Information 6A000A MR2A 0111 BBW0		Z Number 100587	Name (Print) Leonard J. Trujillo		Telephone 667-5162	Date 9/18/06
Waste Pick-up Location and Storage Type:			TA 50	Building N/A	Room N/A	<input type="checkbox"/> Security Area <input type="checkbox"/> Direct Off-Site Shipment
<input type="checkbox"/> < 90 Day Accumulation Area <input type="checkbox"/> Universal Waste Area <input type="checkbox"/> TSDF (Start Date:)		<input type="checkbox"/> Satellite Accumulation Area (Approx. vol:) <input type="checkbox"/> PCB Waste (Start Date:) <input type="checkbox"/> NM Special Waste (<90 days) (Start Date:)		<input type="checkbox"/> Rad Staging Area (<90 days) <input type="checkbox"/> Rad Storage Area (<1 year) (Start Date:)		<input type="checkbox"/> Rad Dumpster (No:) X Other (describe in description)

[illegible]

Container Types					Units for Volume		Units for Weight	
01-Bulk (Unpackaged)	04-Plastic Bottle or Container	07-Fiber or Plastic Box	10-Portable Tank	13-Other (specify in description)	G-Gallon	M-Cubic Meters	P-Pound	O-Ounce
02-Metal Drum	05-Glass Bottle or Container	08-Wooden Box	11-Cylinder	14-Compactor Box	L-Liters	Q-Fluid Ounce	K-Kilograms	T-Tons
03-Fiber or Plastic Drum	06-Plastic Bag	09-Metal Box	12-Shield Cask	15-Aerosol Can	F-Cubic Feet	P-Pint	G-Grams	
					Q-Quart			

CERTIFICATION STATEMENT: To the best of my knowledge, I certify that the information on this form is correct. I understand that this information will be made available to regulatory agencies and that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Printed Name	Signature	Z Number	Date
Leonard J. Trujillo		100587	9/18/06

*For new and unused chemicals

FMU64-F286, R.1 (3/02)

Low- level Radiological Information

[illegible]¹ S = Surface, V = Volume, B = Both Surface and Volume²C = Compactible, NC = Non-compactible

Units for Activity

C — curies

M — grams

L - curies/liter

National Laboratory

Chemical Waste Disposal Request

ORIGINAL

Waste Services Use Only

REC'D SEP 18 2006

This form is used to request disposal of chemical and low-level radioactive wastes. Fill out electronically, then print and sign. Mail completed form to Waste Services at MS J595.


3020362

Account Information 6A000A MR2A 0111 BBW0		Z Number 100587	Name (Print) Leonard J. Trujillo			Telephone 667-5162	Date 9/18/06
Waste Pick-up Location and Storage Type:			TA 50	Building N/A	Room N/A	<input type="checkbox"/> Security Area	<input type="checkbox"/> Direct Off-Site Shipment
<input type="checkbox"/> < 90 Day Accumulation Area <input type="checkbox"/> Universal Waste Area <input type="checkbox"/> TSDF (Start Date:)		<input type="checkbox"/> Satellite Accumulation Area (Approx. vol:) <input type="checkbox"/> PCB Waste (Start Date:) <input type="checkbox"/> NM Special Waste (<90 days) (Start Date:)		<input type="checkbox"/> Rad Staging Area (<90 days) <input type="checkbox"/> Rad Storage Area (<1 year) (Start Date:)		<input type="checkbox"/> Rad Dumpster (No:) X Other (describe in description)	

[illegible]

Container Types					Units for Volume		Units for Weight	
01-Bulk (Unpackaged)	04-Plastic Bottle or Container	07-Fiber or Plastic Box	10-Portable Tank	13-Other (specify in description)	G-Gallon	M-Cubic Meters	P-Pound	O-Ounce
02-Metal Drum	05-Glass Bottle or Container	08-Wooden Box	11-Cylinder	14-Compactor Box	L-Liters	O-Fluid Ounce	K-Kilograms	T-Tons
03-Fiber or Plastic Drum	06-Plastic Bag	09-Metal Box	12-Shield Cask	15-Aerosol Can	F-Cubic Feet	P-Pint	G-Grams	
					Q-Quart			

CERTIFICATION STATEMENT: To the best of my knowledge, I certify that the information on this form is correct. I understand that this information will be made available to regulatory agencies and that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Printed Name	Signature	Z Number	Date
Leonard J. Trujillo		100587	9/18/06

*For new and unused chemicals

MN
9-18-04

Low- level Radiological Information

[illegible]¹ S = Surface, V = Volume, B = Both Surface and Volume²C = Compactible, NC = Non-compactible

Units for Activity

C — curies

M – grams

L - curies/liter

Los Alamos
National Laboratory

Chemical Waste Disposal Request

REC'D SEP 18 2006

ORIGINAL

Waste Services Use Only

3020361


This form is used to request disposal of chemical and low-level radioactive wastes. Fill out electronically, then print and sign. Mail completed form to Waste Services at MS J595.

Account Information 6A000A MR2A 0111 BBW0		Z Number 100587	Name (Print) Leonard J. Trujillo		Telephone 667-5162	Date 9/18/06
Waste Pick-up Location and Storage Type:			TA 50	Building N/A	Room N/A	<input type="checkbox"/> Security Area <input type="checkbox"/> Direct Off-Site Shipment
<input type="checkbox"/> < 90 Day Accumulation Area <input type="checkbox"/> Universal Waste Area <input type="checkbox"/> TSDF (Start Date:)		<input type="checkbox"/> Satellite Accumulation Area (Approx. vol:) <input type="checkbox"/> PCB Waste (Start Date:) <input type="checkbox"/> NM Special Waste (<90 days) (Start Date:)		<input type="checkbox"/> Rad Staging Area (<90 days) <input type="checkbox"/> Rad Storage Area (<1 year) (Start Date:)		<input type="checkbox"/> Rad Dumpster (No:) <input checked="" type="checkbox"/> Other (describe in description)

Item Id	Waste Profile Number	Shipping Container Information					Waste Information					Description
		Type	Volume	Unit	Tare Weight	Unit	Volume	Unit	Weight	Unit	*S=Solid L=Liquid G=Gas P=Powder	
10056251	39529	13	15.2	M	6000	P	9.12	M	13063	P	S	Drill Cuttings, etc in a metal roll-off container.

Container Types					Units for Volume		Units for Weight	
01-Bulk (Unpackaged)	04-Plastic Bottle or Container	07-Fiber or Plastic Box	10-Portable Tank	13-Other (specify in description)	G-Gallon	M-Cubic Meters	P-Pound	O-Ounce
02-Metal Drum	05-Glass Bottle or Container	08-Wooden Box	11-Cylinder	14-Compactor Box	L-Liters	O-Fluid Ounce	K-Kilograms	T-Tons
03-Fiber or Plastic Drum	06-Plastic Bag	09-Metal Box	12-Shield Cask	15-Aerosol Can	F-Cubic Feet	P-Pint	G-Grams	
					Q-Quart			

CERTIFICATION STATEMENT: To the best of my knowledge, I certify that the information on this form is correct. I understand that this information will be made available to regulatory agencies and that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Printed Name Leonard J. Trujillo	Signature 	Z Number 100587	Date 9/18/06
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*For new and unused chemicals

MW
9-18-06

Low- level Radiological Information

[illegible]

¹ S = Surface, V = Volume, B = Both Surface and Volume

²C = Compactible, NC = Non-compactible

Units for Activity

C – curies

M — grams

L - curies/liter

Low- level Radiological Information

[illegible]

¹S = Surface, V = Volume, B = Both Surface and Volume

²C = Compactible, NC = Non-compactible

Units for Activity

C — curies

M – grams

L - curies/liter

National Laboratory

Chemical Waste Disposal Request

REC'D SEP 18 2006

Waste Services Use Only

This form is used to request disposal of chemical and low-level radioactive wastes. Fill out electronically, then print and sign. Mail completed form to Waste Services at MS J595.

ORIGINAL
World Services, Inc. MS: 1595

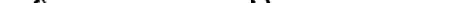
3020359

Account Information 6A000A MR2A 0111 BBW0		Z Number 100587	Name (Print) Leonard J. Trujillo			Telephone 667-5162	Date 9/18/06
Waste Pick-up Location and Storage Type:			TA 50	Building N/A	Room N/A	<input type="checkbox"/> Security Area	<input type="checkbox"/> Direct Off-Site Shipment
<input type="checkbox"/> < 90 Day Accumulation Area <input type="checkbox"/> Universal Waste Area <input type="checkbox"/> TSDF (Start Date:)		<input type="checkbox"/> Satellite Accumulation Area (Approx. vol:) <input type="checkbox"/> PCB Waste (Start Date:) <input type="checkbox"/> NM Special Waste (<90 days) (Start Date:)		<input type="checkbox"/> Rad Staging Area (<90 days) <input type="checkbox"/> Rad Storage Area (<1 year) (Start Date:)		<input type="checkbox"/> Rad Dumpster (No:) X Other (describe in description)	

[illegible]

Container Types					Units for Volume		Units for Weight	
01-Bulk (Unpackaged)	04-Plastic Bottle or Container	07-Fiber or Plastic Box	10-Portable Tank	13-Other (specify in description)	G-Gallon	M-Cubic Meters	P-Pound	O-Ounce
02-Metal Drum	05-Glass Bottle or Container	08-Wooden Box	11-Cylinder	14-Compactor Box	L-Liters	O-Fluid Ounce	K-Kilograms	T-Tons
03-Fiber or Plastic Drum	06-Plastic Bag	09-Metal Box	12-Shield Cask	15-Aerosol Can	F-Cubic Feet	P-Pint	G-Grams	
					Q-Quart			

CERTIFICATION STATEMENT: To the best of my knowledge, I certify that the information on this form is correct. I understand that this information will be made available to regulatory agencies and that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Printed Name	Signature	Z Number	Date
Leonard J. Trujillo		100587	9/18/06

*For new and unused chemicals

mm
9-18-04

Low- level Radiological Information

[illegible]¹ S = Surface, V = Volume, B = Both Surface and Volume²C = Compactible, NC = Non-compactible

Units for Activity

C - curies

M -- grams

L - curies/liter

National Laboratory

Chemical Waste Disposal Request

RFC'D SEP 18 2006

ORIGINAL

Waste Services Use Only

3020360


This form is used to request disposal of chemical and low-level radioactive wastes. Fill out electronically, then print and sign. Mail completed form to Waste Services at MS J595.

Account Information 6A000A MR2A 0111 BBW0		Z Number 100587	Name (Print) Leonard J. Trujillo		Telephone 667-5162	Date 9/18/06
Waste Pick-up Location and Storage Type:			TA 50	Building N/A	Room N/A	<input type="checkbox"/> Security Area <input type="checkbox"/> Direct Off-Site Shipment
<input type="checkbox"/> < 90 Day Accumulation Area <input type="checkbox"/> Universal Waste Area <input type="checkbox"/> TSDF (Start Date:)		<input type="checkbox"/> Satellite Accumulation Area (Approx. vol:) <input type="checkbox"/> PCB Waste (Start Date:) <input type="checkbox"/> NM Special Waste (<90 days) (Start Date:)		<input type="checkbox"/> Rad Staging Area (<90 days) <input type="checkbox"/> Rad Storage Area (<1 year) (Start Date:)		<input type="checkbox"/> Rad Dumpster (No:) X Other (describe in description)

[illegible]

Container Types					Units for Volume		Units for Weight	
01-Bulk (Unpackaged)	04-Plastic Bottle or Container	07-Fiber or Plastic Box	10-Portable Tank	13-Other (specify in description)	G-Gallon	M-Cubic Meters	P-Pound	O-Ounce
02-Metal Drum	05-Glass Bottle or Container	08-Wooden Box	11-Cylinder	14-Compactor Box	L-Liters	O-Fluid Ounce	K-Kilograms	T-Tons
03-Fiber or Plastic Drum	06-Plastic Bag	09-Metal Box	12-Shield Cask	15-Aerosol Can	F-Cubic Feet	P-Pint	G-Grams	
					Q-Quart			

CERTIFICATION STATEMENT: To the best of my knowledge, I certify that the information on this form is correct. I understand that this information will be made available to regulatory agencies and that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Printed Name	Signature	Z Number	Date
Leonard J. Trujillo		100587	9/18/06

*For new and unused chemicals

WMD
9-18-06

National Laboratory

Chemical Waste Disposal Request

ORIGINAL

Waste Services Use Only

3020.358


This form is used to request disposal of chemical and low-level radioactive wastes. Fill out electronically, then print and sign. Mail completed form to Waste Services at MS J595.

Account Information 6A000A MR2A 0111 BBW0		Z Number 100587	Name (Print) Leonard J. Trujillo		Telephone 667-5162	Date 9/18/06
Waste Pick-up Location and Storage Type:			TA 50	Building N/A	Room N/A	<input type="checkbox"/> Security Area <input type="checkbox"/> Direct Off-Site Shipment
<input type="checkbox"/> < 90 Day Accumulation Area <input type="checkbox"/> Universal Waste Area <input type="checkbox"/> TSDF (Start Date:)		<input type="checkbox"/> Satellite Accumulation Area (Approx. vol:) <input type="checkbox"/> PCB Waste (Start Date:) <input type="checkbox"/> NM Special Waste (<90 days) (Start Date:)		<input type="checkbox"/> Rad Staging Area (<90 days) <input type="checkbox"/> Rad Storage Area (<1 year) (Start Date:)		<input type="checkbox"/> Rad Dumpster (No:) X Other (describe in description)

[illegible]

Container Types					Units for Volume		Units for Weight	
01-Bulk (Unpackaged)	04-Plastic Bottle or Container	07-Fiber or Plastic Box	10-Portable Tank	13-Other (specify in description)	G-Gallon	M-Cubic Meters	P-Pound	O-Ounce
02-Metal Drum	05-Glass Bottle or Container	08-Wooden Box	11-Cylinder	14-Compactor Box	L-Liters	O-Fluid Ounce	K-Kilograms	T-Tons
03-Fiber or Plastic Drum	06-Plastic Bag	09-Metal Box	12-Shield Cask	15-Aerosol Can	F-Cubic Feet	P-Pint	G-Grams	
					Q-Quart			

CERTIFICATION STATEMENT: To the best of my knowledge, I certify that the information on this form is correct. I understand that this information will be made available to regulatory agencies and that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Printed Name	Signature	Z Number	Date
Leonard J. Trujillo		100587	9/18/06

*For new and unused chemicals

mw
9-18-06

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J. Valz
9/20/06

²C = Compactible, NC = Non-compactible

L - curies/liter

Los Alamos
National Laboratory

Chemical Waste Disposal Request

REC'D SEP 18 2006

ORIGINAL

Waste Services Use Only

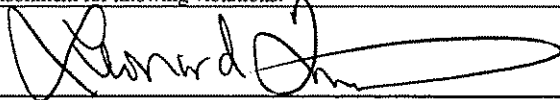
3020356

This form is used to request disposal of chemical and low-level radioactive wastes. Fill out electronically, then print and sign. Mail completed form to Waste Services at MS J595.

Account Information 6A000A MR2A 0111 BBW0		Z Number 100587	Name (Print) Leonard J. Trujillo		Telephone 667-5162	Date 9/18/06
Waste Pick-up Location and Storage Type:			TA 50	Building N/A	Room N/A	<input type="checkbox"/> Security Area <input type="checkbox"/> Direct Off-Site Shipment
<input type="checkbox"/> < 90 Day Accumulation Area <input type="checkbox"/> Universal Waste Area <input type="checkbox"/> TSDf (Start Date:)		<input type="checkbox"/> Satellite Accumulation Area (Approx. vol:) <input type="checkbox"/> PCB Waste (Start Date:) <input type="checkbox"/> NM Special Waste (<90 days) (Start Date:)		<input type="checkbox"/> Rad Staging Area (<90 days) <input type="checkbox"/> Rad Storage Area (<1 year) (Start Date:)		<input type="checkbox"/> Rad Dumpster (No:) X Other (describe in description)

Item Id	Waste Profile Number	Shipping Container Information					Waste Information				*S=Solid L=Liquid G=Gas P=Powder	Description
		Type	Volume	Unit	Tare Weight	Unit	Volume	Unit	Weight	Unit		
10056255	39529	13	15.2	M	6000	P	13.68	M	19595	P	S	Drill Cuttings, etc in a metal roll-off container.

Container Types 01-Bulk (Unpackaged) 04-Plastic Bottle or Container 07-Fiber or Plastic Box 10-Portable Tank 13-Other (specify in description) 02-Metal Drum 05-Glass Bottle or Container 08-Wooden Box 11-Cylinder 14-Compactor Box 03-Fiber or Plastic Drum 06-Plastic Bag 09-Metal Box 12-Shield Cask 15-Aerosol Can					Units for Volume G-Gallon M-Cubic Meters L-Liters O-Fluid Ounce F-Cubic Feet P-Pint Q-Quart	Units for Weight P-Pound O-Ounce K-Kilograms T-Tons G-Grams
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CERTIFICATION STATEMENT: To the best of my knowledge, I certify that the information on this form is correct. I understand that this information will be made available to regulatory agencies and that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.					
Printed Name Leonard J. Trujillo		Signature 		Z Number 100587	Date 9/18/06

*For new and unused chemicals

MN
9-18-06

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²C = Compactible, NC = Non-compactible

C – curies

L - curies/liter

Los Alamos
National Laboratory

Chemical Waste Disposal Request

REC'D SEP 18 2006

ORIGINAL

Waste Services Use Only


3020355

This form is used to request disposal of chemical and low-level radioactive wastes. Fill out electronically, then print and sign. Mail completed form to Waste Services at MS J595.

Account Information 6A000A MR2A 0111 BBW0		Z Number 100587	Name (Print) Leonard J. Trujillo		Telephone 667-5162	Date 9/18/06
Waste Pick-up Location and Storage Type:			TA 50	Building N/A	Room N/A	<input type="checkbox"/> Security Area <input type="checkbox"/> Direct Off-Site Shipment
<input type="checkbox"/> < 90 Day Accumulation Area <input type="checkbox"/> Universal Waste Area <input type="checkbox"/> TSD (Start Date:)		<input type="checkbox"/> Satellite Accumulation Area (Approx. vol:) <input type="checkbox"/> PCB Waste (Start Date:) <input type="checkbox"/> NM Special Waste (<90 days) (Start Date:)		<input type="checkbox"/> Rad Staging Area (<90 days) <input type="checkbox"/> Rad Storage Area (<1 year) (Start Date:)		<input type="checkbox"/> Rad Dumpster (No:) <input checked="" type="checkbox"/> Other (describe in description)

Item Id	Waste Profile Number	Shipping Container Information					Waste Information				*S=Solid L=Liquid G=Gas P=Powder	Description
		Type	Volume	Unit	Tare Weight	Unit	Volume	Unit	Weight	Unit		
10056256	39529	13	15.2	M	6000	P	11.4	M	16329	P	S	Drill Cuttings, etc in a metal roll-off container.

Container Types					Units for Volume	Units for Weight
01-Bulk (Unpackaged)	04-Plastic Bottle or Container	07-Fiber or Plastic Box	10-Portable Tank	13-Other (specify in description)	G-Gallon	M-Cubic Meters
02-Metal Drum	05-Glass Bottle or Container	08-Wooden Box	11-Cylinder	14-Compactor Box	L-Liters	O-Fluid Ounce
03-Fiber or Plastic Drum	06-Plastic Bag	09-Metal Box	12-Shield Cask	15-Aerosol Can	F-Cubic Feet	P-Pint
					Q-Quart	G-Grams

CERTIFICATION STATEMENT: To the best of my knowledge, I certify that the information on this form is correct. I understand that this information will be made available to regulatory agencies and that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.			
Printed Name Leonard J. Trujillo	Signature 	Z Number 100587	Date 9/18/06

*For new and unused chemicals

MN
9-18-06

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D. Vally	
	9/20/06

L = curies/liter

Los Alamos
National Laboratory

Chemical Waste Disposal Request

REC'D SEP 18 2006

Waste Services Use Only


3020354

This form is used to request disposal of chemical and low-level radioactive wastes. Fill out electronically, then print and sign. Mail completed form to Waste Services at MS J595.

Account Information 6A000A MR2A 0111 BBW0		Z Number 100587	Name (Print) Leonard J. Trujillo		Telephone 667-5162	Date 9/18/06
Waste Pick-up Location and Storage Type:			TA 50	Building N/A	Room N/A	<input type="checkbox"/> Security Area <input type="checkbox"/> Direct Off-Site Shipment
<input type="checkbox"/> < 90 Day Accumulation Area <input type="checkbox"/> Universal Waste Area <input type="checkbox"/> TSDF (Start Date:)		<input type="checkbox"/> Satellite Accumulation Area (Approx. vol:) <input type="checkbox"/> PCB Waste (Start Date:) <input type="checkbox"/> NM Special Waste (<90 days) (Start Date:)		<input type="checkbox"/> Rad Staging Area (<90 days) <input type="checkbox"/> Rad Storage Area (<1 year) (Start Date:)		<input type="checkbox"/> Rad Dumpster (No:) <input checked="" type="checkbox"/> Other (describe in description)

Item Id	Waste Profile Number	Shipping Container Information					Waste Information				*S=Solid L=Liquid G=Gas P=Powder	Description
		Type	Volume	Unit	Tare Weight	Unit	Volume	Unit	Weight	Unit		
10056257	39529	13	15.2	M	6000	P	13.68	M	19595	P	S	Drill Cuttings, etc in a metal roll-off container.

Container Types					Units for Volume		Units for Weight	
01-Bulk (Unpackaged)	04-Plastic Bottle or Container	07-Fiber or Plastic Box	10-Portable Tank	13-Other (specify in description)	G-Gallon	M-Cubic Meters	P-Pound	O-Ounce
02-Metal Drum	05-Glass Bottle or Container	08-Wooden Box	11-Cylinder	14-Compactor Box	L-Liters	O-Fluid Ounce	K-Kilograms	T-Tons
03-Fiber or Plastic Drum	06-Plastic Bag	09-Metal Box	12-Shield Cask	15-Aerosol Can	F-Cubic Feet	P-Pint	G-Grams	
					Q-Quart			

CERTIFICATION STATEMENT: To the best of my knowledge, I certify that the information on this form is correct. I understand that this information will be made available to regulatory agencies and that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.			
Printed Name Leonard J. Trujillo	Signature 	Z Number 100587	Date 9/18/06

*For new and unused chemicals

MN
9-18-06

— 22 —

NC
per
wmc
L. Vally
9/20/06

L - curies/liter

**Los Alamos
National Laboratory**

Chemical Waste Disposal Request

Waste Services Use Only

REC'D SEP 18 2006

ORIGINAL

3020353

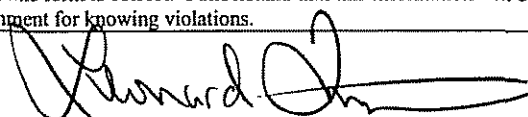
This form is used to request disposal of chemical and low-level radioactive wastes. Fill out electronically, then print and sign. Mail completed form to Waste Services at MS J595.

Account Information 6A000A MR2A 0111 BBW0		Z Number 100587	Name (Print) Leonard J. Trujillo		Telephone 667-5162	Date 9/18/06
Waste Pick-up Location and Storage Type:			TA 50	Building N/A	Room N/A	<input type="checkbox"/> Security Area <input type="checkbox"/> Direct Off-Site Shipment
<input type="checkbox"/> < 90 Day Accumulation Area <input type="checkbox"/> Universal Waste Area <input type="checkbox"/> TSDF (Start Date:)		<input type="checkbox"/> Satellite Accumulation Area (Approx. vol:) <input type="checkbox"/> PCB Waste (Start Date:) <input type="checkbox"/> NM Special Waste (<90 days) (Start Date:)		<input type="checkbox"/> Rad Staging Area (<90 days) <input type="checkbox"/> Rad Storage Area (<1 year) (Start Date:)		<input type="checkbox"/> Rad Dumpster (No:) <input checked="" type="checkbox"/> Other (describe in description)

Item Id	Waste Profile Number	Shipping Container Information					Waste Information				*S=Solid L=Liquid G=Gas P=Powder	Description
		Type	Volume	Unit	Tare Weight	Unit	Volume	Unit	Weight	Unit		
10056258	39529	13	15.2	M	6000	P	12.16	M	17418	P	S	Drill Cuttings, etc in a metal roll-off container.

Container Types					Units for Volume		Units for Weight	
01-Bulk (Unpackaged)	04-Plastic Bottle or Container	07-Fiber or Plastic Box	10-Portable Tank	13-Other (specify in description)	G-Gallon	M-Cubic Meters	P-Pound	O-Ounce
02-Metal Drum	05-Glass Bottle or Container	08-Wooden Box	11-Cylinder	14-Compactor Box	L-Liters	Q-Fluid Ounce	K-Kilograms	T-Tons
03-Fiber or Plastic Drum	06-Plastic Bag	09-Metal Box	12-Shield Cask	15-Aerosol Can	F-Cubic Feet	P-Pint	G-Grams	
					Q-Quart			

CERTIFICATION STATEMENT: To the best of my knowledge, I certify that the information on this form is correct. I understand that this information will be made available to regulatory agencies and that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Printed Name Leonard J. Trujillo	Signature 	Z Number 100587	Date 9/18/06
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*For new and unused chemicals

MN
9-18-06

1. 2. 3.

NC
per
WMC
J. V. [unclear]
9/20/06

²C = Compactible, NC = Non-compactible

C – curies

L - curies/liter

Appendix J

Radionuclide Inventory Report

EXECUTIVE SUMMARY

Material Disposal Area (MDA) C was used for the disposal of uncontaminated classified materials, hazardous chemicals, and radionuclides from May 1948 through April 1974. MDA C consists of seven disposal pits, 107 disposal shafts arranged in three shaft groups, and an unnumbered shaft used for a single strontium-90 disposal. Establishing the inventory of specific radionuclides within the disposal pits and shafts at MDA C is a necessary precursor to assessing future human or ecological impacts associated with their potential release. Existing published information on the characteristics of the disposed wastes at MDA C is largely limited to descriptive statements and radioactivity estimates of uncertain accuracy. Disposal logbooks and other historical documents related to MDA C disposals were systematically reviewed to develop the inventory estimate in this appendix. Radionuclide information for pit disposals at MDA G was also evaluated to support estimates of radioactivity for MDA C pit disposals.

Radionuclide inventory estimates for the MDA C shafts are based on the MDA C disposal logbooks and supplemental information obtained from a draft inventory report. Shaft inventories are presented separately for each of the three shaft groups at MDA C. These shaft groups are spatially distinct and may be subject to different remedial decisions. Information was inadequate to estimate individual inventories for each disposal pit, so a single inventory across all pits was generated. Radionuclide inventories for pits and shafts are provided in the form of “as-disposed” and “present-day” (decayed) activities.

The as-disposed activity in Shaft Group 1 was estimated to be approximately 270 Ci, of which approximately 55% consists of fission products and 40% of strontium-90 from the radioactive barium-lanthanum solution used in explosive testing. The as-disposed activity in Shaft Group 2 was estimated to be approximately 16,000 Ci, of which about 80% consists of irradiated tantalum. Another 17% of the as-disposed activity estimated for Shaft Group 2 consists of fission products, tritium, and strontium-90 from the radioactive barium-lanthanum solution. The as-disposed activity in Shaft Group 3 was estimated to be approximately 62,000 Ci, of which 97% consists of tritium and the remainder includes fission products and irradiated steel. The total as-disposed radioactive inventory in the MDA C shafts was estimated to be approximately 79,000 Ci.

Present-day radionuclide activities (decayed to January 2005) in the shafts are considerably lower than the as-disposed activities since most of the radionuclides associated with the waste are relatively short-lived. Present-day estimated activities for Shaft Groups 1 through 3 are 57 Ci, 620 Ci, and 7100 Ci, respectively. In Shaft Group 1, 67% of present-day activity consists of strontium-90 and 28% of cesium-137. Sixty-three percent of present-day activity in Shaft Group 2 consists of cesium-137 and strontium-90, with aluminum-26 and tritium contributing another 28%. In Shaft Group 3, tritium (which has a radioactive half-life of 12 years) accounts for 94% of present-day activity.

Because information in the disposal logbooks is minimal for pit disposals, estimates of radionuclide activities in the MDA C pits was developed based upon other sources of information. Later routine disposals of low-level waste and transuranic waste at MDA G, associated with similar producers and activities as the earlier MDA C pit disposals, were used to extrapolate an MDA C pit inventory. Also, MDA C shaft disposals related to the Omega West Reactor and Los Alamos Molten Plutonium Reactor Experiment were used to extrapolate a pit inventory for earlier reactor programs active during the time when the MDA C pits were receiving wastes.

The radioactive waste inventory for MDA G pits is described in terms of surface-contaminated waste, soils, and concrete and sludge. As-disposed activities for these categories of waste at MDA C were estimated to be 15,000 Ci, 0.84 Ci, and 440 Ci, respectively. Of the 15,000 Ci of surface-contaminated wastes, about 1000 Ci represent reactor-program wastes while the remaining 14,000 Ci were estimated on the basis of routine disposals at MDA G. The 440 Ci of concrete and sludge was also related primarily

to the extrapolation of routine disposals at MDA G, with only about 30 Ci of radioactive sludge being related to nonroutine disposals.

Present-day radionuclide inventories in the MDA C pits were estimated to be 5600 Ci, 0.75 Ci, and 320 Ci for surface-contaminated waste, soils, and concrete and sludge, respectively. The majority of the activity in surface-contaminated waste, and concrete and sludge, is attributable to plutonium isotopes. The majority of the activity for soils is attributable to uranium isotopes. For surface-contaminated waste, which contains the bulk of the estimated radioactivity for the MDA C pits, plutonium isotopes are responsible for approximately 90% of the disposed activity.

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J-1.0 INTRODUCTION

Material Disposal Area (MDA) C is located in the east-central portion of Los Alamos National Laboratory (the Laboratory, formerly the Los Alamos Scientific Laboratory) on Mesita del Buey between Pajarito Canyon to the south and Cañada del Buey to the north (Figure J-1.0-1). There are 7 disposal pits, with constructed depths ranging from 12 to 25 ft, and 108 disposal shafts, with constructed depths ranging from 10 to 25 ft. The topography of MDA C is relatively flat, although the slope steepens to the north, and the northeast corner of MDA C abuts the steep southern slopes of the head of Ten Site Canyon. Figure J-1.0-1 shows the locations of the pits and shafts as well as other surface features at MDA C. The approximate dimensions of the disposal units are provided in Table J-1.0-1.

MDA C is an 11.8-acre fenced, radiologically controlled area that was used for the disposal of uncontaminated classified materials and wastes containing hazardous chemicals and/or radionuclides. It operated from May 1948 to April 1974 and was decommissioned in 1974. Additional cover material consisting of crushed tuff and soil was applied over the site in 1984. Public access to the site is restricted by fencing, locked gates, and Pajarito Road security access restrictions. Additional information on the operational history and environmental setting of MDA C is provided in the MDA C investigation work plan LANL 2005, 91493) and the Operable Unit (OU) 1147 Resource Conservation and Recovery (RCRA) facility investigation (RFI) work plan (LANL 1992, 07672)

The information provided in this appendix is organized into three parts. Section J-2.0 provides a summary of historical information used to develop the MDA C inventory. Section J-3.0 describes the technical approach and assumptions used to estimate the radionuclide inventory in the MDA C shafts. Section J-4.0 describes the technical approach used to estimate the inventory for the MDA C pits. A comparison of the results of the inventory estimation for the MDA C shafts and pits with historical estimates from Rogers (1977, 05707) is presented in section J-5.0.

J-2.0 HISTORICAL ESTIMATES OF RADIONUCLIDE INVENTORY AT MDA C

Records of the waste materials disposed of at MDA C are contained in a series of disposal logbooks (LANL 2003, 76035). Information in the logbooks varies, with earlier logbooks having less complete information than later ones. The information generally recorded includes the disposal date, the number of the receiving pit or shaft, waste origin, and a description of the waste. Beta/gamma radiation flux and/or activity were also recorded for some disposals.

Much of the historical information regarding disposals in the MDAs at the Laboratory is described in Rogers (1977, 05707). This document compiles information on disposal practices and disposed wastes from many sources, both documented and anecdotal, but does not attempt to interpret the information or assess its accuracy. Estimates of the disposed inventory at MDA C are provided in Rogers (1977, 05707) for pits and shafts but not at the more detailed level of an individual pit or shaft group. The “preliminary values” of inventory are provided in Part B (Type of Waste) of the MDA C section of Rogers (1977, 05707). These estimates were reported as decay-corrected to January 1, 1973, and are provided in Table J-2.0-1.

Rogers (1977, 05707) also provides estimates of the mass of certain radioactive materials. These estimates include approximately 15,700 kg of depleted uranium, 2.1 kg of plutonium-239, 1.5 kg of uranium-233, and 0.01 kg of tritium (tritium for Areas C and G combined). These latter estimates were not included in the “preliminary values” described above.

A second source of information for disposed wastes at MDA C is the OU 1147 RFI work plan (LANL 1992, 07672). This work plan reproduces the pit and shaft radionuclide inventory cited in Rogers (1977, 05707), with the individual radionuclides decayed to January 1989 (LANL 1992, 07672, p. 2-56). The RFI work plan also provides a textual and tabular description of the types of wastes buried in each individual pit and shaft field, based upon a review of the Laboratory's disposal logbooks for these disposal units. The descriptions of disposed wastes include only occasional mention of a specific quantity of radioactive material. A summary of the types of wastes disposed in the pits and shafts is recorded in section 2.3.1.1 and section 2.3.1.2 of the OU 1147 RFI work plan (LANL 1992, 07672, pp. 2-52 to 2-56).

J-2.1 Unpublished MDA C Shaft Inventory Estimates

Rogers (1977, 05707) contains a placeholder for Appendix H, a radionuclide inventory for the MDA C shafts, which states "to be added at a later date." During records retrieval activities at the Information Practices and Records Management (IM-5) Record Center and after a shaft inventory was drafted for this investigation report, a draft of this Appendix H with some supporting notes was discovered. The shaft inventory data in the Appendix H draft is identical to that used here: logbooks 9593, 11363, and 12442. The Rogers (1977, 05707) draft inventory is organized by shaft number and contains three types of information for each logbook entry. This information includes the following:

1. the disposal date
2. waste identification (based on the logbook fields "Waste Description" and "Activity")
3. an estimate of activity, mass, and/or volume organized in seven categories: "mixed fission products," "mixed activation products," "activation products," "transuranic," "tritium," "uranium," and "other"

The Rogers draft shaft inventory (1977, 05707) is essentially a supplemented transcription of information included in the disposal logbooks. The inventory is provided according to the descriptions of disposed wastes in the disposal logbooks, with activity, mass, and/or volume assigned according to one or more of the seven categories listed above. For example, waste described as irradiated tantalum may have associated with it an activity attributed to "activation products," but the specific radionuclides in the waste were not defined. Similarly, activities or masses related to fuel elements, specific uranium isotopes, and depleted uranium would all be described as "uranium."

Three disposal records described in the Rogers (1977, 05707) draft shaft inventory could not be confirmed in the disposal logbooks: a disposal of fission-contaminated sand and water on September 25, 1962, in Shaft 53; a disposal of uranium-235 and fission products on September 24, 1964, in Shaft 88; and a disposal of irradiated sodium on September 20, 1965, in Shaft 97. However, approximately 50 disposals described in the logbooks do not appear in the Rogers (1977, 05707) draft shaft inventory. In addition, the Rogers (1977, 05707) draft shaft inventory does not include disposal Shafts 91, 92, and 94.

J-3.0 MDA C DISPOSAL SHAFTS RADIONUCLIDE INVENTORY

The disposal shafts were primarily used for the disposal of beta- and gamma-contaminated waste derived from the "CMJ-DO-GS" group at Technical Area (TA) 35 (Rogers 1977, 05707, p. C-3). However, logbook disposal records indicate that many other Laboratory facilities used these shafts for the disposing of wastes. Three groups of shafts were used sequentially over time. Twelve shafts were dug from February 29, 1958, to October 29, 1959, and were originally numbered 1–12 but were renumbered to 56–67 in 1962. An additional 55 shafts were dug in the third quarter of 1959 and were numbered 1–55. Forty additional shafts were completed in the first quarter of 1964 and were numbered 68–107 (Rogers 1977,

05707, p. C-3). All of the shafts were unlined, with the exception of Shafts 98–107, which were lined with 12-in.-thick concrete.

J-3.1 Technical Approach for Estimating Shaft Inventory

Logbook entries for the disposal shafts are generally comprehensive in their descriptions of the types and kinds of activities carried out with disposed radioactive materials. Therefore, these logbook records were used as the primary source of information for estimating the radionuclide content of the shafts.

J-3.1.1 Preparation of Disposal Logbook Records

The information listed in the individual MDA C disposal logbooks were transcribed into individual worksheets that were compiled in a single worksheet to capture all of the MDA C disposal records for both pits and shafts. A series of new information fields was created in the worksheet to facilitate the sorting of records and information retrieval. These fields are described as follows:

- *Logbook Reference*: Identifies the specific logbook from which the entry was taken
- *Pit or Shaft*: Identifies whether the disposal occurred in a pit or shaft
- *Pit or Shaft Number*: Identifies the individual pit or shaft in which the disposal occurred
- *Shaft Group*: Identifies the shaft group (1, 2, or 3) associated with the disposal
- *Category*: Associates a disposal entry with one of three categories of contaminant information content
- *Analyte*: Identifies the chemical or radionuclide suspected of being associated with the disposal entry, if known. This information may have appeared in various fields in the logbooks.
- *Analyte Comments*: Comments related to the interpretation of logbook information presented in the “Analyte” field
- *Reported Activity*: Provides numerical information related to activity, mass, volume, or other quantity pertaining to the material in the “Analyte” field. This information may have appeared in various fields in the logbooks.
- *Reported Activity Units*: Provides the units associated with the information in “reported activity”

After the individual logbook records were compiled, the records were sorted according to whether they belonged to a disposal pit or shaft. During the processing of records described in section J-3.2, several additional fields were added to further enhance the utility of the spreadsheet for sorting of records and information retrieval. A new information field called “Identifier” was added to the “Original Shaft Records” and “Analyte Inventory” worksheets. The “Identifier” field contains a unique number corresponding to a single shaft-disposal record in the disposal logbooks. The identifier number allows a single record to be subdivided into multiple rows in the spreadsheet if it refers to multiple individual radionuclides. The goal of this process is to be able to sum up isotope-specific inventories across all or a portion of the shaft-disposal records and still be able to track the component radionuclides based on the attributes of the original disposal records. By using the identifier number, each isotope-specific entry can be traced back to the original electronic disposal record and therefore back to a disposal logbook entry.

The new information fields created are described as follows:

- *Identifier*: Individual disposal records were copied across multiple rows if they contained multiple analytes. Each row entry was provided with a different “Assigned Analyte” described in the disposal record.
- *Reactor Waste*: This field identified if disposals of reactor-program wastes were related to the Omega West Reactor (OWR) at TA-02 or Los Alamos Molten Plutonium Reactor Experiment (LAMPRE) at TA-35.
- *Composite Material*: This Y/N field refers to whether an “Assigned Analyte” is a composite material consisting of multiple radioisotopes (such as “fission,” “uranium,” etc.) or a single isotope.
- *Assigned Analyte*: This field standardizes the analyte names originally recorded in the “Analyte” field to permit sorting.
- *Assigned Inventory*: This numerical estimate of inventory is associated with the “assigned analyte.”
- *Inventory Units*: This field was standardized according to “curies”, “kg”, or “mR/h”, depending on the available information.
- *Distance for Gamma Reading (m)*: This field contains a value only if ‘inventory units’ is “mR/h.” It refers to the distance from the waste material at which the radiation field measurement was made. A distance of 1 m was assumed if no such information was recorded in the disposal logbook.
- *Inventory G-Ray Calc*: This is a Y/N field that refers to whether the “curies” estimate is based on a calculation using mR/h data and isotope-specific gamma ray constants.
- *Notes*: This field documents assumptions or comments pertaining to one or more of the fields described above.

These fields may contain different information for the same unique identifier number. One additional information field, called “reactor waste,” was also added to identify those records selected to support the extrapolation of the reactor waste inventory in the MDA C pits. This extrapolation is described in section J-4.0 of this appendix.

J-3.1.2 Process for Estimating Shaft Radionuclide Inventory

The critical information fields used to quantify the radionuclide inventory associated with each disposal record are “Assigned Analyte” and “Assigned Inventory.” Some of the shaft-disposal records described in the MDA C disposal logbooks contained incomplete information regarding the nature of the radioactive waste and/or the quantity of radioactive material. In such cases, one or both of these fields could not be completed. For records where “Assigned Inventory” had units of mR/h, additional efforts were employed to estimate the activity of the inventory. To develop the most comprehensive inventory estimates possible, three strategies were employed to evaluate records for which critical information was missing. These strategies included

1. using similar disposal records in which activities were documented as surrogate records,
2. developing logical assumptions to estimate inventory and/or identify specific radionuclides, and
3. using mR/h readings for a disposal to calculate radionuclide activities.

The technical approach for estimating the radionuclide inventory for the MDA C shafts is shown in the sequence of activities presented in Figure J-3.1-1. The three strategies described above correspond to boxes 4, 5, and 6 in Figure J-3.1-1. The processes of standardizing analyte names and units (Box 3), identifying analogous records for use as inventory surrogates (Box 4), and developing assumptions to facilitate estimating inventory for records with incomplete information (Box 5) were iterative in nature. For example, it was impossible to determine the most efficient set of assigned analyte names and identify appropriate surrogate records until a fairly large number of records were evaluated. Similarly, the development of logical assumptions to estimate inventories and/or identify specific radionuclides was an iterative process: the assumptions were revised several times as the review of the disposal records progressed.

The types of critical information most commonly absent from the shaft-disposal records were the identities of the radionuclides associated with the disposal events and the numerical estimates of radionuclide mass or activity. Few records exist for which the type of radioactive material was undefined or could not be readily inferred from information provided in the various logbook data fields. Therefore, once the logbook entries had been prepared, as described in section J-3.1.1, they were sorted according to the "Assigned Analyte" field. Each individual disposal record was then reviewed.

If the eight new information fields described in section J-3.1.1 (except "Inventory G-Ray Calc," which is populated later in the process) were complete for an entry, the entry was examined to verify that no conflicting information existed and that the user-created fields were populated correctly. Any discrepancies or uncertainties potentially affecting the usability of the entry for estimating inventory were captured in the "Notes" field. Missing data in the fields "Composite Material," "Inventory Units," and "Distance for Gamma Reading (m)" could usually be added at this time from information in the original logbook fields.

As noted above, if the "Assigned Inventory" and/or (more rarely) the "Assigned Analyte" fields were incomplete, various assumptions might be made during the review of the entry to complete this information. These assumptions were recorded in the "Notes" field. The nature of these assumptions is described in section J-3.2. If the "Assigned Inventory" field was incomplete and one or more similar¹ disposals existed where such information was provided, the inventory of this surrogate record might be used to complete this field. The surrogate record used would be recorded in the "Notes" field. On some occasions, the development of assumptions and the use of surrogate records to estimate missing inventories were viable approaches for estimating missing information; in such cases, professional judgment was used to select the alternative most likely to provide the accurate inventory estimate. If the "Assigned Inventory" field was based on a radiation meter reading ("Inventory Units" of mR/h), assumptions were made and surrogate records were used to estimate an actual inventory.

After all disposal records were reviewed and processed, remaining entries having inventory units of mR/h were sorted and evaluated in greater detail. If no feasible assumptions or surrogate records could be uncovered, a curie inventory was calculated from the mR/h value using isotope-specific gamma-ray constants. This methodology has considerable uncertainties in this application and results in an inventory estimate with a high degree of uncertainty.

At this point, the disposed inventory (based on either radioactivity or mass) can be estimated for each "Assigned Analyte" entry. However, to estimate the inventory of specific radioisotopes and decay radioisotope activity to present-day levels, it is necessary to break down composite radioactive materials

¹ A similar record generally was taken to mean the same waste originator and waste description in the logbook entries.

into individual radioisotopes. This calculation is also needed to convert mass estimates (kg) of composite materials into radioactivity estimates (Ci) using specific activity values unique to each radioisotope. The present-day individual isotope activity was calculated with S-Plus programming software, which allowed the calculations to be automated, minimizing the possibility of human error once the programming was completed. An additional benefit of S-Plus is that the assumptions used in these calculations can be easily changed, and revised estimates of shaft radioisotope inventory can be compiled with relatively little effort.

Use of Information in Rogers Draft Shaft Inventory

The draft MDA C shaft inventory appendix to Rogers (1977, 05707) was developed almost 30 yr ago, when the author had access to key individuals with recent memories of disposal activities and perhaps written records that were not found during the current inventory characterization effort. Although it is reasonable to expect that greater access to individuals and records may lead to more accurate inventory estimates, the shaft inventory is clearly a work in progress, with numerous handwritten corrections, additions, and deletions. It is not known how close the draft appendix was to becoming a “final” document, although the editorial nature of most edits suggests the appendix was nearly finished.

The MDA C shaft inventory developed using the methods described in section J-3.1.2 was completed before the recovery of the Rogers draft shaft inventory appendix. Given that the Rogers draft inventory appeared to be nearly complete, it was used to update, where appropriate, the assumptions and methods used to identify radionuclides and assign contaminant activities and masses. However, the disposal logbooks themselves, which were the basis for the Rogers draft shaft inventory, are still considered to be the primary reference for this inventory. Where numerical values differed between the logbooks and the Rogers draft shaft inventory, the logbook entries were used.

The information in the Rogers draft shaft inventory was integrated with the information in the first draft of the electronic database developed to support this appendix by reviewing each electronic logbook disposal record and adjusting assumptions to match those of Rogers. The principal assumptions adopted through this integration process relate to disposals of uranium- and plutonium-contaminated wastes that have information for both activity and mass. For such disposals where fission products may have been present, Rogers assigned the listed activity to the fission products and the mass to uranium or plutonium. For some records, Rogers provided information on activity or mass that was not available in the logbooks. Integrating information from the Rogers draft shaft inventory with the electronic logbooks allowed information such as logbook reference, waste origin, etc., not captured in the Rogers draft appendix to be retained in this inventory. More importantly, the electronic database standardized waste information and supported calculations to convert the logbook entries into radionuclide-specific inventories that can be decayed to present-day activities.

Three main differences exist between the inventory of disposed wastes presented in the Rogers draft shaft inventory and the shaft inventory presented in this appendix. First, the inventory in this appendix includes much of the information contained in the original logbooks, but Rogers provides only the disposal date, waste description, and activity/volume/mass summarized by seven waste categories. Second, this inventory uses a series of assumptions and extrapolations from analogous disposal records to estimate the activity or mass for individual disposals where this information is lacking. Third, this inventory estimate uses additional information and assumptions to estimate the isotope-specific inventory associated with composite materials such as fuel elements and fission products. Development of an isotope-specific inventory allows the inventory to be expressed as both an as-disposed activity and a decayed activity to estimate present-day activities.

J-3.2 Assumptions and Calculations for Shafts Inventory

Sections J-3.2.1 and J-3.2.2 describe assumptions used to estimate radionuclide inventory when information for a disposal record was incomplete. Section J-3.2.1 describes general assumptions that pertain to a wide range of disposal records. Section J-3.2.2 describes the assumptions used to assign an isotope-specific inventory to disposal records for composite radioactive materials. The calculation of radionuclide activity for records containing only beta/gamma radiation flux data is described in section 3.2.3. Section J-3.2.4 documents the data and equations used to calculate present-day (decayed) activities.

J-3.2.1 General Assumptions Used in Processing Shaft-disposal Logbook Records

Inventory described as "<X": Many shaft-disposal records have activity recorded as less than a specific value, such as "<1 Ci." In these cases, the value may in fact be a reporting limit of some kind. If this were the case, one might expect on average that many disposals in fact had a significantly lower quantity than the value listed. It was assumed that the inventory was one-half the number following the "<" sign. Similarly, in the few instances where disposal records have activity recorded as greater than a specific value, such as ">1 Ci," it was assumed that the inventory was twice the number following the ">" sign.

Multiple analytes associated with a single inventory value: Many disposal records list two or more radioactive isotopes or materials but provide a single estimate of radiation flux, mass, or activity. Following the precedent in the Rogers (1977, 05707) draft shaft inventory appendix, if both mass and activity were provided for a disposal of plutonium- or uranium-contaminated waste that included fission products, the mass was assigned to uranium or plutonium, and the activity was assigned to fission products. In all other cases, the inventory value was apportioned equally among all assigned analytes.

Barium-140 and Lanthanum-140 solution: The radioactive barium-lanthanum solution used at the Laboratory came from Oak Ridge National Laboratory (ORNL) and later from the Idaho National Engineering Laboratory (INEL). This solution contained small quantities of strontium-89 (half-life of 50 d) and strontium-90 (half-life of 28.8 yr) as contaminants. Barium-140 and lanthanum-140, the principal isotopes in the radioactive barium-lanthanum solution, have half-lives of 13 d and 1.7 d, respectively. For this reason, the relative activity of the strontium isotopes quickly increases as the solution ages. Determining the percentage of strontium-90 activity (the radioisotope of present-day concern) related to the total activity in a disposal of barium-140/lanthanum-140 waste is effectively impossible for this reason.

An alternative approach to estimating strontium-90 activity in the disposal shafts was therefore used. Barium-140/lanthanum-140 disposals to the MDA C shafts occurred between 1958 and 1963. A 1973 memorandum (Schulte 1973, 27273) describes an estimated quantity of 740 Ci of strontium-90 contamination in the radioactive barium-lanthanum solution received by the Laboratory between 1956 and 1963. According to the memorandum, this estimate was based on "a careful study of Group records concerned with the receipt and processing of ¹⁴⁰Ba shipments" (Schulte 1973, 27273). Some fraction of the 740 Ci of strontium-90 contamination was likely discharged into Ten Site Canyon from the holding tanks at Ten Site where the material was processed; however, this amount is not known. Therefore, it was conservatively assumed that all of the 740 Ci of strontium-90 contamination received by the Laboratory in these shipments from 1956 to 1963 was interred in the disposal shafts. This activity was distributed evenly among 65 disposal records associated with barium-140/lanthanum-140 waste. Each disposal record was therefore assigned a strontium-90 inventory of 11.4 Ci.

Depleted uranium disposal inventory: A large number of disposal records for depleted uranium and uranium-238 have no associated inventory estimate of mass or activity. When the "Waste Description" field described a hemisphere, a mass of 30 kg was assumed because this value is approximately a

minimum quantity for a fissionable mass of uranium. In many cases, the “Packaging” field for the disposal records describes a container of a certain volume. Volume estimates of such disposals were converted to a uranium mass according to the following example: 1 gal. \times 19 g U/cm³ \times 3,785 cm³/gal \times 0.5 void space = 36 kg. When the “Packaging” field described a cardboard box, the weight of uranium was assumed to be 50 kg per box.

Plasma thermocouples: Plasma thermocouples were assumed to refer to a type of fission reactor. This assumption is strengthened by the existence of various Los Alamos Scientific Laboratory (LASL) technical reports, such as one titled “Design Considerations for a Plasma Thermocouple Reactor” (Watts 1960, 94154). Also, one record refers to uranium and zirconium carbide for a thermocouple; zirconium carbide is a cladding material used for uranium reactor fuel. Therefore, it was assumed that thermocouples contain enriched uranium and potentially fission products. Consistent with general assumption 2 above, if both mass and activity values were recorded, the mass was assigned to uranium-235 and the activity to fission products. Otherwise, these entries are generally captured under the assigned analyte “uranium/fission.” An exception to this rule are those records describing irradiated steel rods or wire associated with thermocouples; inventory for such records was generally captured under the assigned analyte “stainless, irradiated.”

Polonium-beryllium sources: Specific isotopes of polonium and beryllium were not specified in any shaft-disposal records. Polonium-210 is known to have been used for polonium-beryllium sources; therefore, this isotope was defined as the “Assigned Analyte” for disposal records referring to polonium-beryllium sources. It was also assumed that the beryllium associated with these sources was not a radioactive isotope.

Sodium coils: In shafts numbered 89 and higher are several records referring to sodium coils. These records may refer to heat-transfer coils in a liquid sodium-cooled reactor, such as that associated with LAMPRE. The “Type” field referring to the waste is invariably transuranic (TRU) radionuclides, and the origin of the waste is Ten Site, where LAMPRE was located. The assigned analyte “plutonium” was identified for these disposal records.

Tritium reservoirs: Numerous records refer to tritium reservoirs, but only a few contain estimates of tritium activity. For example, in one record eight tritium reservoirs held just 0.4 Ci, and in another record a tritium reservoir held 7.5 Ci. Although the records vary significantly, an approximate average value was used to assign an inventory to other records describing these reservoirs. Each reservoir was assumed to hold 1 Ci, if not specified. This is a specific example of the identification of analogous records (Box 4 in Figure J-3.1-1) where the quality of such information was relatively poor.

Irradiated tantalum: Presumably, the irradiated tantalum refers to its use in tantalum “thimbles” developed to hold the plutonium-iron fuel in the LAMPRE. Tantalum may also have been used in other reactor-related projects or as a target in a linear accelerator. The primary radioisotope of tantalum is tantalum-182, with a half-life of 114.4 d. Tantalum-182 was defined as the “Assigned Analyte” for a waste description referring to irradiated tantalum.

Radioactive copper: Stable isotopes of copper include copper-63 and copper-65. The longest-lived radioisotope of copper is copper-64, with a half-life of 12.7 h. Copper-64 was defined as the “Assigned Analyte” for a waste description referring to radioactive copper.

Irradiated sodium: The longest-lived radioisotope of sodium is sodium-22, with a half-life of 2.6 yr. For waste records referring to irradiated sodium or other potentially radioactive sodium, the isotope sodium-22 was defined as the “Assigned Analyte.”

J-3.2.2 Assumptions about Composite Radioactive Materials

The following composite materials were identified in the shaft inventory: fission; or alloy; plutonium; plutonium/fission; plutonium, fuel; stainless, irradiated; tub alloy; uranium-38; uranium, depleted; uranium, natural; uranium, enriched; uranium, fuel; and uranium/fission. The basis for determining the isotopic composition of these materials is described in the following paragraphs.

Fission Products: Approximately 250 disposal records are associated with fission products alone. Fission products, the isotopes generated during nuclear fission, potentially encompass a wide variety of radioisotopes. Inventory characterization waste projections were developed for MDA G (LANL 2005, 94156). The estimates of the fractional abundance of radioisotopes generated by fission were based on the MDA G inventory report. The isotopic composition and activity fraction information provided in the inventory report (LANL 2005, 94156) are presented in Table J-3.2-1.

Plutonium: Approximately 90 disposal records are associated with plutonium. Plutonium may be comprised of various isotopes depending on the origin and use of the material. In the corrective measures study (CMS) report for MDA H (LANL 2003, 79559), plutonium was assumed to exist in the waste primarily as a material type referred to as PU52. Examination of the 1971 to 1977 MDA G pit data used to estimate MDA C pit inventories indicates that about 70 percent of the total activity of all plutonium material types consisted of PU52. Lacking more specific information, all plutonium disposals in the MDA C shafts were assumed to consist of PU52. The isotopic composition and activity fraction of the material PU52 are plutonium-238 (0.0061), plutonium-239 (0.21), plutonium-240 (0.049), plutonium-241 (0.74) and plutonium-242 (2.8E-06) (LANL 2005, 94156). These values were used to assign specific isotopes to the composite material "plutonium."

Although PU52 was the most common plutonium material type disposed of during the 1970s at MDA G, using PU52 to represent all plutonium may underestimate the quantity of plutonium-238 at MDA C. Other types of plutonium fuel may have contained greater amounts of plutonium-238 as well as different proportions of other plutonium isotopes.

Plutonium Fuel: Two disposal records are associated with plutonium fuel. In both records, the "Type" field from the disposal logbooks indicated TRU waste. For these records, the relative quantities of fissile plutonium and fission products associated with the waste must be estimated because information in the disposal records is not sufficient to directly allocate the listed activities to the two waste types. These relative quantities depend on the degree to which the fissile material was kept in a neutron flux and the length of time between fission and the time of disposal. Although this information is not available in the disposal records, it can be assumed that the fission products are responsible for most of the radioactivity because the half-lives of key fission products are relatively short (see Table J-3.2-1), and a short half-life indicates high specific activity. Therefore, 99% of activity was assigned to fission products and only 1% of the assigned inventory was allocated to plutonium. Assigning the bulk of the activity to fission products is also consistent with assumptions in the Rogers (1977, 05707) draft shaft inventory appendix, as discussed in section J-3.1.2.1.

Plutonium and Fission Products: About 20 disposal records indicated both plutonium and fission products without sufficient information to differentiate inventory for these two waste types. For these records, the relative quantities of fissile plutonium and fission products must be estimated, as described for the composite material plutonium fuel. In the case of disposals of plutonium and fission products, it is possible that some records refer to disposals where the relative amount of the two materials may be unrelated to plutonium as a reactor fuel. For example, plutonium and fission waste products from unrelated operations may have been disposed of together. However, the logic of assigning virtually all

activity to fission products holds equally well for disposals of plutonium and fission products. Therefore, 99% of the assigned inventory was allocated to fission products and 1% to plutonium.

Irradiated Steel: Over 80 disposal records are associated with irradiated stainless steel or irradiated objects that are likely to be constructed of this material. The "Type" field from the disposal logbooks generally indicated mixed activation products (MAP). The chemical composition of stainless steel varies according to grade and has also varied over time. Grade 304 stainless steel, the 18/8 stainless steel in many present-day consumer products, is about 18% carbon, 8% nickel, and <2% manganese. Grade 310 stainless steel is used in high-temperature applications for reactors and similar applications. Grade 310 composition includes approximately 25% chromium, 20% nickel, <2% manganese, and <0.25% carbon.

Mixed activation products associated with activated steel were also described in the MDA G inventory report (LANL 2005, 94156). The isotopic composition and activity fraction of activated steel included cobalt-57 (0.25), cobalt-60 (0.13), manganese-54 (0.35), and zinc-65 (0.27). Uncertainty of the composition of steels disposed at MDA C renders the use problematic of steel-specific compositions such as those described above. Therefore, the values were used to assign specific isotopes to the composite material denoted as "stainless, irradiated."

Thorium: Five disposal records contain references to thorium, although a specific isotope is not identified. Thorium was assumed to refer to the isotope thorium-232, which can be converted to fissionable uranium-233 in a reactor.

Tuballoy: Five disposal records are associated with tuballoy, which is synonymous with depleted uranium. In the CMS report for MDA H (LANL 2003, 79559), the isotopic composition and activity fractions of depleted uranium were assumed to be uranium-234 (0.42), uranium-235 (0.01), uranium-236 (0.02) and uranium-238 (0.55). These values were used to assign specific isotopes to the composite material called "tuballoy."

Depleted Uranium: Approximately 110 disposal records are associated with depleted uranium, which refers to uranium that has been processed to recover the fissile isotope uranium-235 and thus is depleted in uranium-235 as well as uranium-234. The isotopic composition and activity fraction of the material depleted uranium include uranium-234 (0.42), uranium-235 (0.01), uranium-236 (0.02), and uranium-238 (0.55) (LANL 2005, 94156). These values were used to assign specific isotopes to the composite material called "uranium, depleted."

Uranium-38: A single disposal record was associated with U38, which refers to a specific uranium material used at the Laboratory. The isotopic composition and activity fraction of the material uranium-38 include uranium-234 (0.97), uranium-235 (0.03), uranium-236 (0.0041), and uranium-238 (0.00028) (LANL 2005, 94156). These values were used to assign specific isotopes to the composite material called "U38."

Natural Uranium: Twelve disposal records are associated with natural uranium. In the CMS report for MDA H (LANL 2003, 79559), the isotopic composition and activity fractions of natural uranium were assumed to be uranium-234 (0.50047), uranium-235 (0.02227), and uranium-238 (0.47726). These values were used to assign specific isotopes to the composite material called "uranium, natural."

Enriched Uranium: Only five disposal records were assigned to the waste type enriched uranium. More commonly, disposal records associated with fissile uranium indicated the presence of fission products and contained information on a specific amount of uranium-235. In the CMS report for MDA H (LANL 2003, 79559), the isotopic composition and activity fractions of enriched uranium were assumed to be

uranium-234 (0.8945), uranium-235 (0.0359), uranium-236 (0.0111), and uranium-238 (0.0585). These values were used to assign specific isotopes to the composite material called “uranium, enriched.”

The composite material “uranium, enriched,” was assigned to disposal records where the waste description, notes, or material type fields from the logbooks indicated that it was not likely that the uranium contained fission products. Many such records contain references to the “KIWI” reactor program, which were test reactors for a nuclear-powered rocket propulsion system. The first reactors used uranium oxide fuel (UO_2). A KIWI reactor with uranium carbide (UC_2) fuel operated around 1964. The next class of reactors (Phoebus, 1965–1968) used niobium-carbide coatings on the fuel elements.

Oralloy: Eleven disposal records are associated with oralloy, a form of enriched uranium produced at ORNL. In the CMS report for MDA H (LANL 2003, 79559), the isotopic composition and activity fractions of highly enriched uranium were assumed to be uranium-234 (0.96925), uranium-235 (0.02867), uranium-236 (0.00183), and uranium-238 (0.00025). These values were used to assign specific isotopes to the composite material called “oralloy.”

Uranium Fuel: About fifteen disposal records are associated with uranium fuel. For these records, the relative quantities of fissile uranium and fission products that may be associated with fuel must be estimated because the information to directly allocate the listed activities to the two waste types is not sufficient. As with plutonium fuel, the relative quantity of fission products and uranium depends on the degree to which the fissile material was kept in a neutron flux and the length of time between fission and disposal of the waste. Using the same logic applied to the plutonium fuel, 99% of the listed activity was assigned to fission products, but 1% of the activity of each disposal was assumed to be enriched uranium. Some records for uranium fuel have inventory in mass units. In these cases, because the bulk of the mass will be related to the relatively low-activity uranium material, 99% of the mass was assigned to enriched uranium and 1% to fission products.

The composite material “uranium, fuel” was assigned to disposal records where the waste description, notes, or other fields from the logbooks indicated a physical form likely to be associated with use in a reactor. The most common reference in such a record was a fuel element or fuel rod.

Uranium and Fission Products: Numerous disposal records indicated both uranium and fission products, although the information was sufficient to specify the relative quantities of each according to strategy 2 in section J-3.2.1. About 50 disposal records indicated both uranium and fission products were present but lacked the information needed to assign inventories to the two waste types. For these records, the relative quantities of enriched uranium and fission products must be estimated. This relative quantity of uranium and fission products was discussed for the composite material uranium fuel. In the case of disposals of uranium and fission products, some records may refer to disposals where the relative amount of the two materials may be unrelated to uranium as a reactor fuel. For example, uranium and fission waste products from unrelated operations may have been disposed together. However, the logic of assigning virtually all radioactivity to fission products holds equally well for disposal of uranium and fission products. Therefore, 99% of the assigned inventory was allocated to fission products and 1% to uranium when activity was reported and the reverse when mass was reported.

J-3.2.3 Calculation of Inventory from Radiation Flux (mR/h) Data

Many disposal records provide values for a beta/gamma radiation flux reading (units of mR/h) but contain no other information regarding the activity associated with the disposal. One approach to estimating activity (units of Ci) for disposal records having only flux data is to identify analogous disposal records (similar waste origin and description) for which the activity is recorded and use this activity as a surrogate value. In these cases, an estimate of the average activity among the analogous records is generally used

as a surrogate. A second approach is using gamma ray constants (units of R/h per Ci) for specific nuclides to estimate the activity associated with such records. However, a number of confounding factors need to be considered when calculating activity based on a flux reading (e.g., waste composition and packaging, waste geometry, meter efficiency, and flux measurement distance); supporting information in the disposal records to assess these factors is generally limited. The activity based on the flux data was performed for certain materials, but this approach is considered to be less accurate than estimating activity based on analogous records for which activity data exist. Therefore, the use of analogous records was used preferentially. However, analogous disposal records were not always available.

Among the radionuclides and radioactive materials for which only beta/gamma radiation flux readings are available, only a few have gamma-ray emissions that would likely be measurable by a hand-held radiation meter. Radionuclides for which gamma emissions occur very infrequently, and/or those with very weak gamma emissions, were not evaluated through gamma ray constants because they are poorly measured by a radiation meter. Therefore, materials such as plutonium and uranium are not addressed here. Radionuclides and radioactive materials for which activities are estimated based on radiation flux values include americium-241, cesium-137, fission products, radium-226, and irradiated steel. Activity for fissile material combined with fission products was also estimated based on the gamma-ray constants for fission products. Records pertaining to disposals for which all radionuclides have half-lives of less than 5 yr are excluded from this evaluation because eight or more half-lives will be accounted for between disposal and the present-day, rendering current activity levels negligible.

Americium-241 (1 record): This record specifies americium and curium waste products from DP East, but provides no detail on the package and cites beta/gamma flux only as <20 mR/h. No similar DP East disposals exist from which the activity might be estimated. If an estimated total flux of 10 mR/h is used and 50% assigned to each analyte, an approximate inventory may be estimated using a gamma-ray constant for americium-241 of 0.314 R/h per Ci at 1 m. This estimate yields an activity of 0.02 Ci.

Cesium-137 (3 records): Activity was estimated for the three Cesium-137 records by converting the flux readings to activity using a specific gamma-ray constant for a point source. This approach holds considerable uncertainty because the flux readings may be of uncertain units (record 434) or meter distance (record 161), as well as uncertainty regarding source geometry and shielding. However, this approach allows at least some estimation of activity for these disposal records. A gamma ray of 0.382 R/h per Ci at 1 m was used for this conversion. For record 161, where the meter distance was assumed to be 5 m, activity was estimated according to Equation 1,

$$A = \frac{r^2 \times \text{flux}}{\Gamma} \quad \text{Equation 1}$$

where A = activity (Ci)

r = distance of meter from source (m)

flux = gamma flux (R/h)

Γ = nuclide-specific gamma ray constant (R/h at 1 m per Ci)

Fission (49 records): The greatest number of disposal records for which only flux data are available are related to the analyte "fission." Of these 49 records, 36 are related to the disposal of animal tissue from the Health Research Laboratory (HRL). Only one analogous disposal record having Ci data (record 923) exists from which to extrapolate activity. In this disposal, 20 plastic bags of tissue contained 0.5 Ci of fission products. This record and logical inference suggest that quantities of fission products in these HRL

disposals are probably quite small relative to disposals associated with fission products from reactor experiments.

Because a single record forms a very weak basis for inferring activity across 35 disposals, the activity associated with these HRL disposals and the other 13 records listed above is estimated based on conversion using gamma-ray constants. Five gamma-emitting nuclides account for over 98% of the activity of fission products that are 2 yr old before disposal. A gamma-ray constant for fission products was calculated by taking the sum of the constants for these nuclides weighted by their relative contribution to the activity of all fission products. This weighted sum was then multiplied by 0.63 to better account for the total activity across all fission products, because 37% of the residual activity is related to the beta emitters ruthenium-106 and strontium-90, whose emissions may have been largely attenuated by packaging. The nuclides, activity fractions, and gamma-ray constants are provided in the Table J-3.2-2.

The gamma-ray constant for fission products calculated as the weighted sum of the three nuclides for which gamma-ray constants exist is 0.107 R/h at 1 m per Ci. Adjusting this value by a factor of 0.63 yields a final gamma-ray constant of 0.065 R/h at 1 m per Ci. For record 350, where the meter distance was assumed to be 0.1 m, activity was estimated according to the formula described above for cesium-137.

Radium-226 (1 record): Record 331 refers to strontium and radium waste from Ten Site. The reported flux was divided evenly between these two waste types; activity for radium-226 was estimated using a gamma-ray factor of 0.0121138 R/h at 1 m per Ci. Record 179 also has only flux data and refers to two radium sources from TA-03. Such sources are normally contained in a shielded vessel, and in fact the note for this record states that the sources are “leaking,” which implies such shielding. Lacking information about the type of shielding used for this source, no attempt was made to estimate an activity from the mR/h data for this record.

Stainless, Irradiated (3 records): Activities for these three disposals were estimated using gamma-ray factors. A weighted sum of the four isotopic constituents of “stainless, irradiated” was calculated in a manner analogous to that used for fission products, plutonium, and oralloy, as shown in Table J-3.2-3. These included cobalt-57 (activity fraction of 25%), cobalt-60 (activity fraction of 12%), manganese-54 (activity fraction of 36%), and zinc-65 (activity fraction of 27%). The gamma-ray constant calculated as the weighted sum of these four nuclides is 0.475 R/h at 1 m per Ci.

Uranium, Fuel (3 records): Records 221, 346, and 852 are for disposals from TA-46 of “rods,” activated uranium carbide, and “fuel elements and modules,” respectively. Relatively few disposals of uranium materials occurred from TA-46, and none had similar waste descriptions. Therefore, activities for these disposals were estimated using a gamma-ray factor. “Uranium, fuel” is a waste type that may contain both enriched uranium and some quantity of fission products if the fuel was partially consumed. Across all “uranium, fuel” disposals, an assumption is made that 99% of the activity consists of fission products (see section J-3.2.2). A gamma-ray constant of 0.065 R/h at 1 m per Ci was derived for fission products and is applied to uranium fuel.

Uranium, fission (3 records): Activities for these records were estimated using gamma-ray constants for enriched uranium and fission products. Across all “uranium, fission” disposals, an assumption is made that 99% of the activity results from fission products (see section J-3.2.2). Therefore, the fission products gamma-ray constant of 0.065 R/h at 1 m per Ci is applied to mixtures of uranium fuel and fission products.

J-3.2.4 Radionuclide Decay Calculations

For the calculation of inventory decayed to present-day levels, and for the conversion of inventory estimates in mass units to units of activity, certain radiological data are necessary. These data are provided in Table J-3.2-4. Conversion of inventory from mass to activity was accomplished by multiplication of the mass by the specific activity of each nuclide. Specific activities shown in Table J-3.2-4 were calculated based on half-life and atomic mass as follows:

$$\frac{357800}{\text{half life} \times \text{atomic mass}} \quad \text{Equation 2}$$

The decay of radionuclides from disposed activities to present-day levels was calculated according to the following equation:

$$A = A_o \times e^{-\lambda t}, \quad \text{Equation 3}$$

where A = decayed activity (Ci),

A_o = initial activity (Ci),

λ = decay coefficient calculated as $\ln(2)/\text{half-life}$ (yr^{-1}), and

t = decay time period (yr).

Ingrowth of radioactive progeny (a.k.a. daughters) over the approximately 50-yr period since MDA C was in use is important for some radionuclides in the MDA C inventory. These radionuclides include plutonium-241 (ingrowing americium-241), thorium-232 (ingrowing radium-228 and thorium-228), and radium-226 (ingrowing lead-210). Ingrowth of these progeny was calculated according to the following equations:

For the first daughter (americium-241, radium-228, and lead-210);

$$A_d = A_p \times \lambda_d \times \left[\frac{e^{-\lambda_p t}}{(\lambda_d - \lambda_p)} + \frac{e^{-\lambda_d t}}{(\lambda_p - \lambda_d)} \right] \quad \text{Equation 4}$$

where A_d = daughter activity,

A_p = parent activity,

λ_d = decay coefficient of daughter, calculated as $\ln(2)/\text{half-life}$ (yr^{-1}),

λ_p = decay coefficient of parent, calculated as $\ln(2)/\text{half-life}$ (yr^{-1}), and

t = decay time period (yr).

In the case of thorium-228 (a second daughter);

$$A_{d_2} = A_p \times \lambda_{d_1} \times \lambda_{d_2} \times \left[\left(\frac{e^{-\lambda_p t}}{(\lambda_{d_2} - \lambda_p)(\lambda_{d_1} - \lambda_p)} \right) + \left(\frac{e^{-\lambda_{d_1} t}}{(\lambda_p - \lambda_{d_1})(\lambda_{d_2} - \lambda_{d_1})} \right) + \left(\frac{e^{-\lambda_{d_2} t}}{(\lambda_p - \lambda_{d_2})(\lambda_{d_1} - \lambda_{d_2})} \right) \right] \quad \text{Equation 5}$$

where A_{d_2} = second daughter activity,

A_p = parent activity,

λ_{d_1} = decay coefficient of first daughter, calculated as $\ln(2)/\text{half-life}$ (yr^{-1}),

λ_{d_2} = decay coefficient of second daughter, calculated as $\ln(2)/\text{half-life (yr}^{-1}\text{)}$,

λ_p = decay coefficient of parent, calculated as $\ln(2)/\text{half-life (yr}^{-1}\text{)}$, and

t = decay time period (yr).

J-3.3 MDA C Disposal Shaft Inventory Estimates

Estimates of as-disposed and present-day radionuclide activities are presented in this section.

Table J-3.3-1 provides a summary of the as-disposed activities for each of the analytes identified in the disposal logbooks. Shaft inventory was summarized for the disposal records according to activity, mass, or radiation flux depending upon the information associated with a particular record. Accordingly, the as-disposed materials inventory in Table J-3.3-1 includes activity estimates associated with each of these categories. Because a single disposal record may be associated with more than one analyte, the total number of records described in Table J-3.3-1 exceeds the number of individual records in the logbooks.

The as-disposed inventory of individual radionuclides is shown in Table J-3.3-2. The inventory of composite radioactive materials such as fission products, uranium fuel, etc., was converted to individual radionuclides according to the assumptions and methods described in section J-3.2.2. Analytes for which only radiation flux measurements exist in Table J-3.3-1 (e.g., cerium-141 in Shaft Group 1) appear in Table J-3.3-2 with an inventory estimate of zero. Present-day activities of the radionuclides in each shaft group are shown in Table J-3.3-3. If present-day activity is less than 1 pCi, the value is reported as "<1 pCi" in Table J-3.3-3.

J-3.3.1 Uncertainty Analysis for MDA C Shafts Inventory

All disposal data used to develop the MDA C shafts and pits inventories are subject to uncertainty introduced by the ability to accurately measure or otherwise estimate radionuclide activities in the waste. The accuracy of the radiation flux measurements made at the time of waste disposal, and of the quantities of disposed activity will be influenced by the radionuclides under consideration and the time at which disposal occurred. The radionuclides under consideration may affect characterization efforts in two ways. First, the radiation types and energies emitted by the isotopes may make measurement more or less difficult. Second, accountability requirements for some radionuclides are such that greater effort has been invested in measuring or estimating activities associated with the disposed waste packages. The time at which the waste was disposed of and, therefore, characterized is also an important factor affecting the error associated with activity estimates. In general, detection equipment has improved over the years, as have efforts to more accurately characterize the material placed in the disposal facility.

Many of the individual MDA C shaft disposals included wastes containing mixed fission products (MFP). Fission products are associated with the majority of estimated present-day radioactivity in Shaft Group 2, which contains more than half of all the estimated disposal activity at MDA C. These activities were allocated to specific radionuclides as described in section J-3.2. Several sources of uncertainty are associated with the allocation of activities to specific radionuclides, including the nature of the fission reactions responsible for the fission products, the age of the MFP waste, and the impacts of daughter ingrowth.

It is reasonable to expect that plutonium-239 and uranium-235 are the fissile materials that led to the generation of the MFP. However, it is not always clear what proportion of the waste was generated by plutonium-239 fission as opposed to reactions involving uranium-235 and what proportion of the waste was the result of interactions with thermal and fast neutrons. Fission yields and therefore the radionuclides assigned to the MFP waste will vary depending upon the fissile material and the neutron

energy. For example, the activity fractions used to estimate radionuclide-specific activities may differ by a factor of 2 or more, and often by more than an order of magnitude, depending upon the fissile material and neutron energy involved.

The short-lived nature of the majority of the fission products requires that an accurate assessment be made of the age of the waste at the time of disposal. The composition of the waste changes rapidly as radionuclides with very short half-lives decay. The error introduced into the inventory projections by uncertainties in the age of the MFP waste is likely to be significant. For example, the activity allocation fractions for cesium-137, averaged over the thermal and fast neutron yields for plutonium-239 and uranium-235, increase from about 0.14 to 0.73 as the age of the MFP waste increases from 1 to 10 yr. Here, then, changing the waste age by an order of magnitude results in a fivefold change in the projected inventory of cesium-137.

Most radionuclides associated with the MFP waste are very short-lived and decay to negligible levels within a matter of days or weeks. In some instances, the daughter products generated by the decay process may be longer-lived than their parents and as a result, contribute to estimated MFP waste activities beyond the time of generation. However, because of the very large number of short-lived daughter products, the contributions of long-lived daughter products were not taken into account. This simplification will underestimate the activities of any long-lived daughters that were overlooked and will overestimate the activities of the radionuclides that were carried forward in the analysis.

Tritium is associated with most of the estimated present-day activity in Shaft Group 3 and 40% of all estimated present-day activity in the MDA C shafts. Relative to fission products little uncertainty in the tritium inventory exists because most of the tritium activity is based on records where the disposed activity was specified and where no assumptions are required with respect to material composition.

J-4.0 MDA C DISPOSAL PIT RADIONUCLIDE INVENTORY

The waste disposed of in the MDA C pits consists of routine and nonroutine material. As the name implies, routine waste refers to material generated regularly by Laboratory operations. Examples of routine waste disposed at MDA C include material generated at the chemistry labs and barrels of sludge generated from the liquid waste treatment plants at DP West and TA-45. Nonroutine waste was generated infrequently and includes debris from the demolition of the Bayo Site and TA-01, classified materials, and uranium chips from the shops (Rogers 1977, 05707, p. C-3).

The pits at MDA C were used for the disposal of routine waste from 1948 through 1958; nonroutine waste was disposed of in Pits 5 and 6 through 1964. Routine waste requiring disposal in 1959 and beyond was placed in pits at MDA G; nonroutine waste was placed in pits at MDA G as early as 1957. MDA G has been the primary waste disposal site since the start of routine disposal operations in 1959.

J-4.1 Technical Approach for Estimating Disposal Pit Inventory

The waste disposed of in the pits at MDA C cannot be adequately characterized using the information provided in the handwritten logbooks. Although the logbooks provide general descriptions of the waste and the origin of the material, the volumes, activities, and radiological characteristics associated with the waste packages are provided infrequently. A search of the IM-5 Record Center was conducted to locate any additional information that may exist about the types and quantities of waste disposed of in the pits at MDA C. Although some general information was located, the detailed data needed to prepare inventory estimates were not found. Lacking this information, alternatives for estimating the pit inventory were developed and are described below. Section J-4.1.1 addresses the routine waste that was disposed of at

MDA C, and section J-4.1.2 discusses the methods used to characterize the nonroutine waste disposals at MDA C.

J-4.1.1 Routine MDA C Disposal Pit Waste Inventory

To the extent that Laboratory programs generating routine wastes were consistent over time, the routine waste disposed of in the MDA C pits from 1948 through 1958 is expected to resemble the routine waste placed in the MDA G pits in the late 1950s and early 1960s. Therefore, an evaluation of waste generators was conducted to see if the disposal data for the waste placed in the pits at MDA G could be used to estimate the MDA C pit inventory. This extrapolation process was considered feasible because the MDA G disposal pits were used immediately after the MDA C pits stopped receiving routine waste.

Pit inventories were developed for MDA G (LANL 2005, 94156) in support of the MDA G performance assessment and composite analysis. The work conducted to estimate the MDA G inventory for the waste disposed of before 1971 is most relevant to the MDA C pit inventory estimate. As with the MDA C pits, the development of the inventory for this period was hampered because detailed disposal records were not available. Because the required information was lacking, disposal data for material placed at MDA G from 1971 to 1977 were used to characterize the routine waste placed in the pits before 1971.

The extrapolation-based approach that was used to estimate a portion of the pre-1971 MDA G pit inventory (1948 to 1958) is based on the implicit assumption that the characteristics of the waste generated before 1971 were similar to the properties of the waste generated from 1971 to 1977. Using MDA G waste data to characterize the material placed in the pits at MDA C requires making a similar assumption.

The similarity between the waste disposed of at MDA G from 1971 to 1977 and that disposed of in the pits at MDA C was evaluated in a qualitative manner by comparing the generators of the MDA G waste with the generators present during the 1950s. On this basis, using the extrapolation approach to characterize the waste disposed of in the MDA C pits appears to be valid. The primary generators of the waste placed in the pits at MDA G from 1971 to 1977 are TA-03, -21, and -50; queries conducted using the low-level waste (LLW) disposal and TRU waste databases indicate that these facilities accounted for more than 99% of the waste activity sent to MDA G during this period. TA-03 and TA-21 were active during the time the pits at MDA C received routine waste. The Chemistry and Metallurgy Research (CMR) Building was one of the first buildings constructed at TA-03 and was completed in 1951. Uranium and plutonium operations were conducted at TA-21 from the mid-1940s to 1978, when operations were moved to TA-55. The treatment of liquid radioactive waste was also conducted at TA-21 throughout the period that the MDA C pits were in use.

TA-50 began to operate in 1963 and has been used to treat liquid radioactive waste since that time. Although the facility did not operate during the time the pits at MDA C were used for the disposal of routine waste, the waste generated at this facility from 1971 to 1977 is expected to generally resemble the waste generated by liquid waste treatment activities that were conducted in the 1940s and 1950s. Most of these treatment activities were conducted at TA-45, the predecessor to TA-50; as stated earlier, some liquid waste was also treated at TA-21.

On the basis of the comparison described above, 1971 to 1977 MDA G pit waste data were used to estimate the routine waste component of the MDA C pit inventory. The average annual volumes and activities of waste shipped by TA-03, -21, and -50 during this time were calculated. Information from the LLW disposal database and the TRU waste database were used to develop these averages, consistent with the fact that TRU waste was routinely disposed of at the Laboratory before 1971. The average volumes and activities developed using the MDA G data were multiplied by 11 yr to account for the

routine waste disposed of at MDA C from 1948 to 1958. The contributions of other TAs to the estimated inventory were ignored because of the small amount of waste generated by these facilities from 1971 to 1977.

The physical and chemical forms of the waste disposed of in the pits will influence the manner in which radionuclides are released to the environment. For example, surface contamination on glass may be quickly rinsed from the waste as water percolates through the disposal units; however, radionuclides sorbed to soils or concrete may be released gradually over time. Given potential differences such as these, the waste streams disposed of at MDA G were categorized or grouped into three predominant waste forms: (1) surface-contaminated waste, (2) soils, and (3) concrete and sludge. Each waste stream was conservatively assumed to be surface-contaminated waste unless specific knowledge about the waste and its release characteristics allowed it to be assigned to one of the other three waste forms. Waste streams encompassing a variety of waste matrices were assumed to fall into several different waste forms. For example, waste streams consisting of debris were assumed to include surface-contaminated waste, soils, and concrete components. Separate inventory projections were developed for each waste form; the waste forms to which the waste streams were assigned are provided in LANL 2005, 94156. This same approach was adopted for the MDA C pit inventory.

Some of the waste addressed by the 1971-1977 MDA G waste data is identified as MAP or MFP; in other instances, uranium and plutonium waste is identified using several uranium and plutonium material types. The activities listed for these wastes were allocated to specific radionuclides as part of the MDA G inventory report (LANL 2005, 94156); the allocation factors used in that work, listed in Table J-4.1-1, were also applied to the data used to estimate the MDA C pit inventory. The Los Alamos Meson Physics Facility, now referred to as the Los Alamos Neutron Science Center, was a major generator of the MAP waste; waste characterization information collected from facility personnel was used to develop the allocation factors listed in Table J-4.1-1 for this material. Radionuclide allocation factors for the MFP waste were estimated on the basis of fission yield curves for plutonium-239 and uranium-235; a complete description of this approach is provided in the inventory report (LANL 2005, 94156). The allocation factors for the uranium and plutonium material types were extracted from the Laboratory's LLW disposal database.

J-4.1.2 Nonroutine MDA C Disposal Pit Waste Inventory

Using the 1971 to 1977 MDA G data to estimate the MDA C pit inventory does not account for nonroutine waste that was unique to that facility. To the extent allowed by the available data, these unique disposals were identified and characterized in terms of total and radionuclide-specific volumes and activities. The results were added to the extrapolation-based inventory projections to arrive at the total inventory projections for the MDA C pits.

Warren (1980, 00573) identified several disposal events relevant to the MDA C inventory characterization effort and not captured by the extrapolation process. Reactor waste is another source of nonroutine waste not addressed through extrapolation. This material was typically placed in the MDA C shafts when disposal in those units began in the late 1950s. Before that time, however, it was assumed that all reactor waste was placed in the pits. The characteristics of the reactor waste placed in the pits were estimated using data for waste from similar reactor programs that was placed in the shafts.

J-4.2 MDA C Disposal Pit Inventory Estimates

The routine waste projections for the MDA C pits are summarized in Tables J-4.2-1 and J-4.2-2. Table J-4.1-1 lists the total volumes and activities of waste for surface-contaminated waste, soils, and

concrete and sludge. The volumes and activities of waste estimated on the basis of the LLW disposal data and the TRU waste data are provided separately. Table J-4.2-2 lists the projected radionuclide-specific inventories in the routine MDA C pit waste. The volumes provided in this table are the quantities of waste contaminated with each radionuclide. Because several radionuclides may occur in a single waste package, the sum of these volumes is greater than the total volume of waste disposed of in the pits. The listed activities represent as-disposed activities and include the radionuclides to which the MAP, MFP, and material type activities were allocated.

As discussed earlier, the extrapolation process overlooks waste that was unique to the period during which MDA C was active. Warren (1980, 00573) identified four nonroutine waste streams that were disposed of during the time MDA C was active; the nature of these wastes is summarized in Table J-4.2-3. Only one of the nonroutine waste streams included in Table J-4.2-3 was added to the extrapolation-based MDA C pit inventory estimate. The sludge generated from 1952 to 1967 was assumed to be placed in the pits at MDA C and G in equal amounts, given that both facilities received routine waste during this period. The plutonium mass listed for this waste was assumed to be plutonium-239; the 585 g of plutonium-equivalents was assumed to be 94 and 6 wt% plutonium-239 and plutonium-240, respectively, based on information contained in Warren (1980, 00573) and Rogers (1977, 05707). All of the cement paste generated from 1959 to 1968 was assumed to have been sent to MDA G for disposal. Consequently, none of this waste was included in the MDA C pit inventory.

The lack of quantitative information about the radionuclide contents in the sludge shipped for disposal from 1951 to 1963, and from 1963 to 1971 prevented adding some or all of this waste to the MDA C extrapolation-based inventory. However, a number of historical reports documented the liquid waste treatment operations (quantities and/or activity) from the 1940s through the 1980s that might provide information useful to the MDA C pit inventory.

An additional type of nonroutine waste added to the routine-waste inventory estimated by extrapolation from MDA G is waste associated with reactor programs. Reactor-program waste disposed of in the MDA C pits was estimated based on extrapolation from analogous wastes disposed of later in the MDA C shafts. Estimated activities are shown in Table J-4.2-4. For the purpose of summing total activities in Tables J-4.2-5 and J-4.2-6, these reactor-program wastes were assigned to the "surface-contaminated" waste form category.

The MDA C pits operated from approximately 1948 to 1959, but the shafts operated from approximately 1959 through 1967. The MDA C shafts received disposals of reactor-program wastes related to the OWR at TA-02 (from 1956, uranium fuel); the Los Alamos Power Reactor Experiments at TA-35 (from 1955 to 1960, uranium fuel); and LAMPRE at TA-35 (1961 to 1963; plutonium fuel). Before the MDA C shafts were constructed and used, reactor-program wastes were associated with the water-boiler reactor at TA-02 (from 1944, uranium fuel) and the Clementine reactor at TA-02 (1946 to 1953, plutonium fuel).

Disposals in the MDA C shafts associated with the OWR were used to extrapolate to potential pit disposals related to the water-boiler reactor. Similarly, shaft disposals related to the LAMPRE reactor project were used to extrapolate to potential pit disposals related to the Clementine reactor. Only disposal records for which disposed activity or mass was estimated were used in the extrapolation. The shaft inventories for the OWR disposals were multiplied by a factor of 1.3 to account for the longer operating period of the pits (12 yr/9 yr) during which reactor wastes from the water boiler reactor could have been disposed. The pit inventory from the Clementine reactor was estimated by multiplying the shaft inventory for the LAMPRE wastes by a factor of 2.7 to accommodate the relative longevities of the Clementine (8 yr) and LAMPRE (3 yr) projects during which wastes may have been generated and subsequently disposed of at MDA C. LAMPRE-related records pertaining to activated sodium, the LAMPRE coolant, were not used for extrapolation.

The total MDA C pit inventory is the sum of the extrapolation-based inventory of routine wastes summarized in Tables J-4.2-1 and J-4.2-2, the waste included to account for nonroutine disposals in Warren (1980, 00573) (Table J-4.2-3), and the waste related to reactor programs (Table J-4.2-4). The total as-disposed volumes and activities associated with this waste are summarized in Table J-4.2-5, the corresponding radionuclide-specific inventories are listed in Table J-4.2-6. Tables J-4.2-7 and J-4.2-8 list the total and radionuclide-specific inventories, respectively, accounting for radioactive decay and ingrowth through January 2005. The volumes provided in Tables J-4.2-6 and J-4.2-7 are the quantities of waste contaminated with each radionuclide, but the sum of these volumes is greater than the volumes listed in Tables J-4.2-5 and J-4.2-7 because several radionuclides may occur in a single waste package.

J-4.2.1 Uncertainty Analysis for MDA C Disposal Pit Inventory

The MDA C pit radionuclide inventory estimates provided above are subject to uncertainty introduced by the assumptions made in developing the inventories and the data upon which the estimates are based. Potentially important sources of uncertainty are discussed below.

The extrapolation process used to estimate the routine waste inventory for the pits is based on several assumptions, all of which may introduce uncertainty into the inventory estimates. As discussed earlier, the basis for using the extrapolation method was that the routine waste placed in the pits at MDA G before 1971 resembles the routine waste that was placed in the pits at MDA C. The routine waste disposed of at MDA G in 1959 and the early 1960s would generally resemble the routine waste placed in the MDA C pits in the late 1950s. However, it is also reasonable to expect that differences between the characteristics of the MDA C and MDA G pit waste would arise at later times as the mission of the Laboratory evolved and as the processes responsible for the generation of the waste changed.

A second major assumption associated with the extrapolation process is that the 1971 to 1977 data set used in the analysis adequately characterizes the pre-1971 MDA G pit inventory and, in turn, the routine waste inventory for the pits at MDA C. Reviews of the MDA G disposal records found that the extrapolation process may overestimate the actual activities placed in the pits before 1971 (LANL 2005, 94156). It is also not clear if the disposal records adequately characterize the nonsludge waste placed in the facility. If the extrapolation approach overestimates the MDA G inventory, the inventory in the pits at MDA C may also be overestimated.

The accuracy of the extrapolation-based MDA C pit inventory ultimately depends upon the degree to which operations at TA-03, TA-21, and the liquid-waste treatment facilities during the 1950s resembled the operations at these facilities in the 1970s. Although many of the same types of processes were conducted during the two periods, there were some differences. For example, portions of TA-03 began to operate at different times. Although the CMR Building was completed in the early 1950s, the construction of Wing 9 of the facility was not completed until 1961. Other generators of waste at TA-03, such as the Sigma complex (TA-03-35/66) and the main shops (TA-03-102), can also be expected to have varied contributions over time. While plutonium and uranium recovery activities were underway at TA-21 during the 1950s and the 1970s, processes changed over time in an attempt to maximize recovery efficiencies. In cases such as these, differences can be expected in the types and quantities of waste generated during the 1950s and the 1970s.

Several facilities besides TA-03, TA-21, and the liquid-waste treatment facilities were in operation during the 1950s; examples include TA-02, -11, -15, -16, -33, -35, -41, -46, and -48. The routine waste generated by these facilities during the 1950s was not accounted for in the extrapolation process either because these facilities were no longer active during the 1970s or because insignificant amounts of waste were sent from these facilities from 1971 to 1977 to MDA G. If the quantities of routine wastes generated

by these facilities were significantly greater during the 1950s, then the extrapolation approach may underestimate the actual quantities of routine waste placed in the MDA C pits. Alternatively, if these facilities generated relatively little waste compared to what was generated by TA-03, TA-21, and the liquid-waste treatment facilities, then the error introduced by excluding them from the extrapolation will be negligible.

The nonroutine portion of the MDA C pit inventory addresses the disposal of sludge based on information contained in Warren (1980, 00573) and estimates the types and quantities of reactor-program waste that may have been placed in the pits. It is clear, however, that other unique disposal events were not captured by the inventory projections. Examples of such disposals include the waste generated by the cleanup of facilities such as the Bayo Site and TA-01, property numbered items such as vacuum pumps, tanks, laundry, and gloveboxes, as well as classified wastes. Without the data needed to characterize the waste generated by these activities, it was not possible to incorporate these events in the MDA C pits inventory.

Uncertainty in the pit inventory estimates of reactor wastes is primarily related to potential differences in program wastes over time. The extrapolation of radionuclide inventories from the OWR and LAMPRE to the water boiler reactor and Clementine, respectively, assumes that comparable wastes were generated and disposed of across these programs. The fact that the designs of the earlier and later reactors differed and different experiments were conducted at different times indicates that this extrapolation may be inaccurate. A second aspect of uncertainty in the estimated pit reactor wastes relates to the identification of LAMPRE-related disposals in the shaft logbooks. Numerous disposals from Ten Site during the operational period of LAMPRE described plutonium and/or fission products but were not specifically described as being related to operations at LAMPRE. Because these disposals may be from other activities at Ten Site, they were not used for the extrapolation to Clementine wastes. If they were reactor wastes, the inventories of this waste developed for the pits may be underestimated. Similar errors may be introduced if waste from other facilities at the Laboratory were related to reactor-program activities but were not identified as such in the shaft-disposal records.

Uncertainties are associated with the factors used to allocate the MAP waste to specific radionuclides as well. However, the activity associated with this waste in the MDA C pits is very small, much less than 1 Ci. Consequently, the errors introduced by these uncertainties will be negligible. The uncertainties related to the allocation of MFP waste to specific radionuclides have been discussed in section J-3.3.1.

A number of material types have been used to refer to specific radionuclide compositions; in terms of the MDA C pit inventory, these material types refer to isotopic mixtures of plutonium isotopes. The data used to estimate the MDA C pit inventory include approximately 10,000 Ci of activity reported using these material types. Therefore, uncertainties in the factors used to allocate the material type activities to specific radionuclides may have significant impacts on the projected MDA C pit inventory.

Work conducted in support of the MDA G inventory estimate (LANL 2005, 94156) examined the potential variability associated with the radionuclide contents in selected material types. On the basis of that analysis, it appears that the radionuclide contents in a given material type generally fall within a factor of two of the allocation factors used in the development of the MDA C pit inventory.

J-5.0 COMPARISON OF INVENTORY ESTIMATES TO HISTORICAL VALUES

Rogers (1977, 05707) compiled the MDA C shaft and pit inventories for selected radionuclides and composite materials. The activities listed in Rogers (1977, 05707) for individual radionuclides were decay-corrected to the year 1977, but as-disposed activities were provided for composite materials such as

activation and fission products (see Table J-2.0-1). The inventories listed in Rogers (1977, 05707) have been decay-corrected to January 2005 and are summarized in Table J-5.0-1. Standardizing all activities in this manner allows direct comparison of Rogers inventory estimates with those developed in this appendix.

Comparison of Pit Inventories: The present-day pit inventories of americium-241, plutonium-239, and uranium exceed the quantities shown estimated by Rogers by factors of 1.8, 60, and 2.2, respectively. The plutonium-239 in the present-day pit inventory is almost wholly related to the extrapolations of routine disposals from the MDA G pits. Approximately 85% of the americium-241 inventory projected by this effort results from the decay of plutonium-241, the inventory of which is likewise largely related to extrapolations of routine disposals from the MDA G pits. By contrast, most of the uranium inventory for the MDA C pits was estimated on the basis of the reactor-program wastes that were assumed to be disposed of in the pits.

Comparison of Shaft Inventories: A comparison of the projected shaft inventories with the inventories reported by Rogers is shown in Table J-5.0-2. Summing up the activities shown for these radionuclides in Table J-3.3-3 yields a total of 0.8 Ci, an activity that compares favorably with the 0.7 Ci listed by Rogers (1977, 05707) for activation products. Fission products, whose composition is described in section J-3.2.2, can be similarly compared with data from Rogers.

The much greater activity of fission products is related to differences in approach in Rogers, as interpreted from the draft MDA C shaft inventory appendix. No evidence indicates that Rogers converted mass estimates of fission products or mixed-waste types to equivalent curies. The draft MDA C shaft inventory appendix contains entries in units of mass and activities. By contrast, these inventory estimates incorporate a conversion of mass to activity. Additionally, this estimate of inventory uses analogous records to assign inventory to records for which such data are lacking and also employs isotope-specific gamma-ray constants to estimate activity associated with disposals for which only radiation flux data are provided in the disposal logbooks. The differences in the activities of uranium isotopes other than uranium-233 are, like that of fission products, affected by the conversion of mass to equivalent activity for these inventory estimates. In the case of uranium, many disposal records for which no inventory was recorded in the logbooks were processed as an associated mass of uranium for containers such as "boxes" and "cartons."

The current estimate of the strontium-90 inventory in the MDA C shafts is based entirely on a memorandum recovered in the IM-5, the Record Center. As described in section J-3.2.1, this 1973 memorandum records an estimated quantity of 740 Ci of strontium-90 contamination associated with shipments of a radioactive barium-lanthanum solution used at the Laboratory (Schulte 1973, 27273).

J-6.0 REFERENCES

The following list includes all documents cited in this appendix. Parenthetical information following each reference provides the author(s), publication date, and ER ID number. This information is also included in text citations. ER ID numbers are assigned by the Environmental Programs Directorate's Records Processing Facility (RPF) and are used to locate the document at the RPF and, where applicable, in the master reference set.

Copies of the master reference set are maintained at the NMED Hazardous Waste Bureau; the U.S. Department of Energy—Los Alamos Site Office; the U.S. Environmental Protection Agency, Region 6; and the Directorate. The set was developed to ensure that the administrative authority has all material

needed to review this document, and it is updated with every document submitted to the administrative authority. Documents previously submitted to the administrative authority are not included.

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LANL (Los Alamos National Laboratory), May 2003. "Corrective Measures Study Report for Material Disposal Area H, Solid Waste Management Unit 54-004, at Technical Area 54," Los Alamos National Laboratory document LA-UR-03-3354, Los Alamos, New Mexico. (LANL 2003, 79559)

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Schulte, J.W., November 15, 1973. "Summary of Disposition of Impurities in ¹⁴⁰La Shipment," Los Alamos Scientific Laboratory memorandum (CMB-14) to C.W. Christenson (H-7) and L.G. Chellus (H-1) from J.W. Schulte, Los Alamos, New Mexico. (Schulte 1973, 27273)

Warren, J.L., January 2, 1980. "Program Status Report: Review of Past Waste Disposal Records," Los Alamos Scientific Laboratory memorandum (H7-80-1) to W. Hansen (H-6) from J.L. Warren, Los Alamos, New Mexico. (Warren 1980, 00573)

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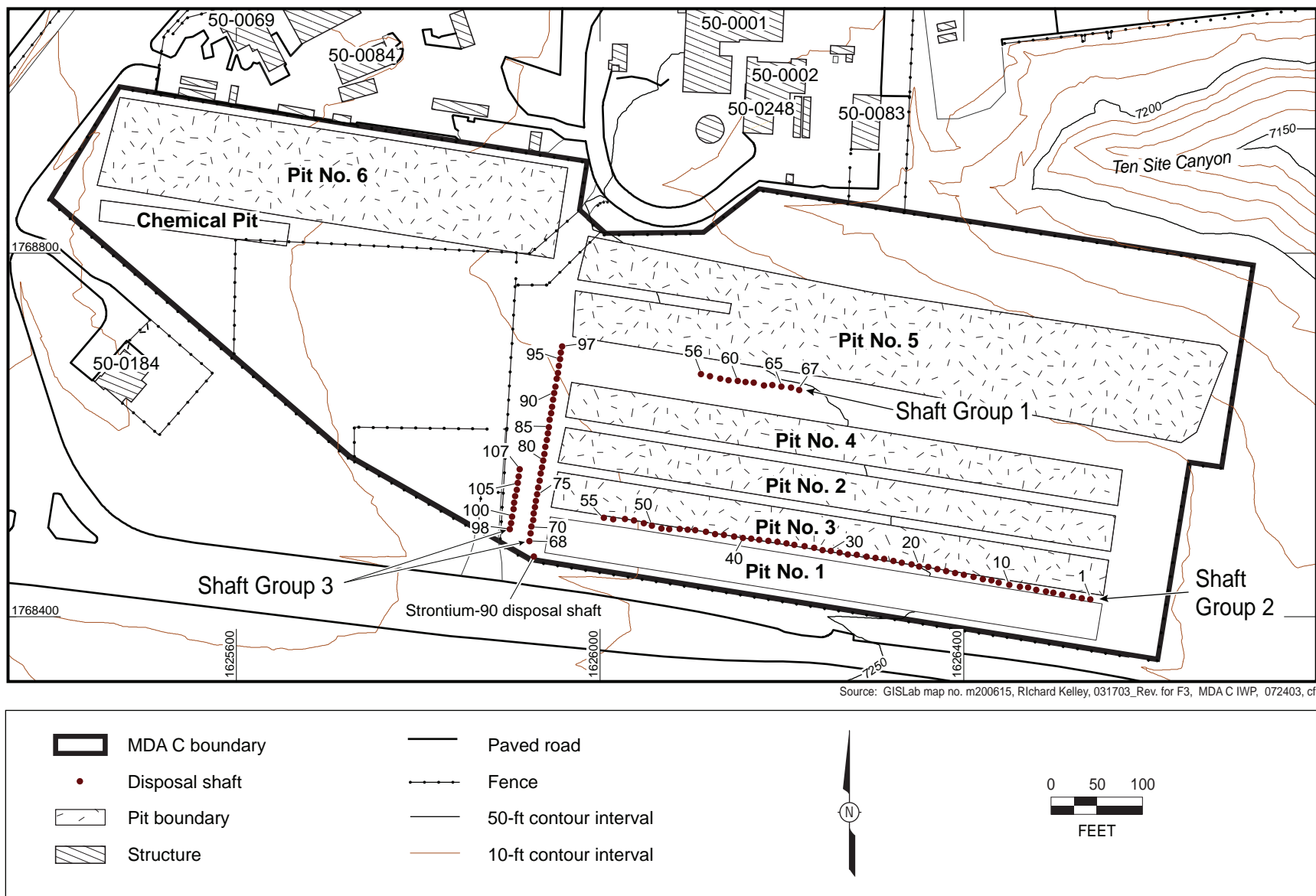


Figure J-1.0-1. Locations of pits and shafts at MDA C

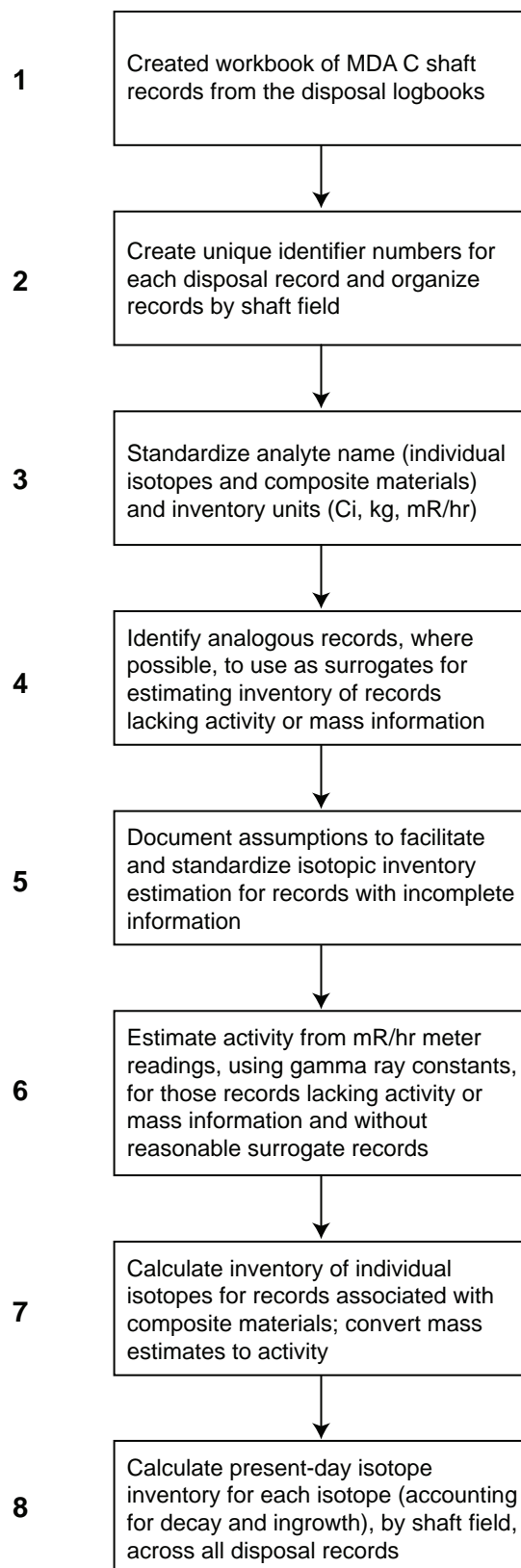
**Figure J-3.1-1. Shaft inventory development flowchart**

Table J-1.0-1
Dimensions of the Disposal Units at MDA C

Disposal Unit	Dimensions ^a (ft)	Period of Operations
Pit 1	610 x 40 x 25	1948–1951
Pit 2	610 x 40 x 25	1950–1951
Pit 3	610 x 40 x 25	1951–1953
Pit 4	610 x 40 x 25	1951–1955
Pit 5	705 x 110 x 18	1953–1959
Pit 6	505 x 100 x 25	1956–1959
Chemical Pit	180 x 25 x 12	1960–1964
Shaft Group 1 (12 [Shafts 56–67])	2 x 10	1959
Shaft Group 2 (55 [Shafts 1–55])	2 x 15	1959–1967
Shaft Group 3 (40 [Shafts 68–107])	1–2 x 20–25 ^b	1962–1966
Shaft 108 (Strontium-90 Disposal Shaft)	Unknown	1950s or 1960s

^a As stated in Table 2-11 of the OU 1147 work plan, pit dimensions are length by width by depth; shaft dimensions are diameter by depth (LANL 1992, 07672). Dimensions are approximate.

^b Shafts 98–107 are 1 ft in diameter and lined with 12-in.-thick concrete. Shafts 68–97 are 2 ft in diameter and unlined.

Table J-2.0-1
MDA C Inventory Estimates from Rogers

Pit Inventory (Ci)*		Shaft Inventory (Ci)*	
Americium-241	149	Activation products	200
Plutonium-239	26	Cobalt-60	20
Uranium (all isotopes)	25	Fission products	50
		Sodium-22	40
		Radium-226	1
		Strontium/yttrium-90	31
		Tritium	49,136
		Uranium-233	5
		Uranium (all other isotopes)	<0.1
Total Curies	196		49,483

*Activity decayed to January 1973 (Rogers 1977, 05707).

Table J-3.2-1
Isotopic Composition and Activity Fraction of Fission Products

Isotope	Half-Life (yr)	Fraction of Activity*	Isotope	Half-Life (yr)	Fraction of Activity*
Ce-144	0.78	3.05E-01	Sm-151	90	1.68E-06
Cs-137	30.1	2.61E-01	Sn-119m	0.802	5.51E-06
Eu-154	8.59	1.26E-05	Sn-121m	44	1.06E-04
Eu-155	4.75	1.74E-04	Sn-123	0.354	8.03E-03
Kr-85	10.8	4.43E-02	Sn-126	2.3E+05	1.21E-05
Pm-147	2.62	2.79E-07	Sr-89	0.138	1.16E-04
Ru-106	1.02	3.00E-01	Sr-90	28.8	7.39E-02
Sb-124	0.165	4.73E-06	Y-91	0.16	1.85E-05
Sb-125	2.76	8.53E-04	Zr-95	0.175	6.11E-03

*Activity fraction assumes a 2-yr lag time between fission and disposal.

Table J-3.2-2
Fission Products Gamma Ray Constant—Input Data

Radionuclide	Activity Fraction at 2 yr	Gamma-ray Constant (R/h at 1 m per Ci)
Cerium-144	0.305	0.0233
Cesium-137	0.261	0.382
Krypton-85	0.0443	0.00157
Ruthenium-106	0.30	na*
Strontium-90	0.0739	na

*na = Not available.

Table J-3.2-3
“Stainless, Irradiated” Gamma Ray Constant—Input Data

Radionuclide	Activity Fraction	Gamma-ray Constant (R/h at 1 m per Ci)
Cobalt-57	0.25	0.15122
Cobalt-60	0.12	1.37
Manganese-54	0.36	0.51134
Zinc-65	0.27	0.33019

**Table J-3.2-4
Radionuclide Data**

Radionuclide	Half-Life (yr)	Specific Activity (Ci/g)	Radionuclide	Half-Life (yr)	Specific Activity (Ci/g)
Ac-227	2.18E+01	7.23E+01	Na-22	2.60E+00	6.26E+03
Ag-105	1.10E-01	3.10E+04	Np-237	2.14E+06	7.05E-04
Al-26	7.10E+05	1.94E-02	Pb-210	2.23E+01	7.64E+01
Am-241	4.33E+02	3.43E+00	Pm-147	2.20E+00	1.11E+03
Am-242m	1.50E+02	9.86E+00	Po-210	3.78E-01	4.51E+03
Ba-132	1.00E+21	2.71E-18	Pu-238	8.77E+01	1.71E+01
Ba-133	1.05E+01	2.55E+02	Pu-239	2.41E+04	6.21E-02
Ba-140	3.49E-02	7.32E+04	Pu-240	6.56E+03	2.27E-01
Be-7	1.46E-01	3.50E+05	Pu-241	1.44E+01	1.03E+02
Cd-113m	1.41E+01	2.25E+02	Pu-242	3.75E+05	3.94E-03
Ce-134	8.65E-03	3.09E+05	Ra-226	1.60E+03	9.90E-01
Ce-137	1.00E-03	2.61E+06	Ra-228	5.76E+00	2.72E+02
Ce-141	8.90E-02	2.85E+04	Ru-106	1.02E+00	3.31E+03
Ce-144	7.80E-01	3.19E+03	Sb-124	1.65E-01	1.75E+04
Cf-249	3.51E+02	4.09E+00	Sb-125	2.76E+00	1.04E+03
Cf-251	9.00E+02	1.58E+00	Sm-151	9.00E+01	2.63E+01
Cf-252	2.65E+00	5.37E+02	Sn-119m	8.02E-01	3.75E+03
Cl-36	3.01E+05	3.30E-02	Sn-121m	4.40E+01	6.72E+01
Cm-244	1.81E+01	8.10E+01	Sn-123	3.54E-01	8.22E+03
Co-54m	1.22E-01	5.43E+04	Sn-126	2.30E+05	1.23E-02
Co-57	7.40E-01	8.48E+03	Sr-85	1.80E-01	2.34E+04
Co-60	5.27E+00	1.13E+03	Sr-89	1.38E-01	2.91E+04
Cs-134	2.07E+00	1.29E+03	Sr-90	2.88E+01	1.38E+02
Cs-137	3.01E+01	8.69E+01	Ta-182	3.10E-01	6.34E+03
Cs-144	3.20E-08	7.76E+10	Tc-99	2.13E+05	1.70E-02
Cu-64	1.45E-03	3.86E+06	Th-228	1.91E+00	8.21E+02
Eu-150	3.60E+01	6.63E+01	Th-230	7.54E+04	2.06E-02
Eu-152	1.35E+01	1.74E+02	Th-232	1.40E+10	1.10E-07
Eu-154	8.59E+00	2.70E+02	Tl-204	3.78E+00	4.64E+02
Eu-155	4.75E+00	4.86E+02	U-233	1.59E+05	9.65E-03
Fe-59	1.22E-01	4.97E+04	U-234	2.46E+05	6.22E-03
H-3	1.23E+01	9.68E+03	U-235	7.04E+08	2.16E-06
Ho-166m	1.20E+03	1.80E+00	U-236	2.34E+07	6.47E-05
I-129	1.57E+07	1.77E-04	U-238	4.47E+09	3.36E-07
I-131	9.00E-04	3.03E+06	Xe-133	6.00E-04	4.48E+06
In-114	2.28E-06	1.38E+09	Y-88	2.90E-01	1.40E+04
Ir-192	2.00E-01	9.32E+03	Y-90	7.30E-03	5.45E+05
Kr-85	1.08E+01	3.91E+02	Y-91	1.60E-01	2.46E+04
La-137	6.00E+04	4.35E-02	Zn-65	6.67E-01	8.25E+03
La-140	4.59E-03	5.57E+05	Zr-93	1.50E+06	2.56E-03
Mn-54	8.50E-01	7.80E+03			

Table J-3.3-1
As-Disposed Materials Inventory for MDA C Shafts

Analyte	Total Number of Records	Number of Curie Records	Activity (Ci)	Number of Mass Records	Mass (kg)	Number of Flux-Only Records	Radiation Flux (mR/h)	Number of Records w/o Inventory
Shaft Group 1								
Ce-141	2	0	0	0	0	2	8.0E+00	0
Co-60	3	2	5.0E+00	0	0	1	1.0E+01	0
Cs-137	2	2	5.0E+00	0	0	0	0	0
Fission	2	2	4.0E+00	0	0	0	0	0
Po-210	2	2	8.0E+00	0	0	0	0	0
Ra-226	1	1	2.0E-01	0	0	0	0	0
Sr-90	12	9	1.0E+02	0	0	3	1.6E+01	0
Ta-182	3	0	0	0	0	3	1.0E+06	0
U-233	1	1	5.0E-01	0	0	0	0	0
Uranium, depleted	1	0	0	0	0	1	5.0E-01	0
Uranium, fuel	1	1	1.5E+02	0	0	0	0	0
Total Activity			270	Total Mass	0			
Shaft Group 2								
Ac-227	1	1	1.0E+00	0	0	0	0	0
Al-26	3	2	1.0E+02	0	0	1	3.0E+00	0
Am-241	1	1	2.0E-02	0	0	0	0	0
Ba-132	1	1	7.1E-05	0	0	0	0	0
Ce-134	1	1	7.1E-05	0	0	0	0	0
Ce-137	2	2	2.5E-01	0	0	0	0	0
Ce-141	2	2	2.8E+01	0	0	0	0	0
Cl-36	1	1	5.0E-02	0	0	0	0	0
Cm-244	1	0	0	0	0	1	1.0E+01	0
Co-57	2	1	1.5E-01	1	3.0E-08	0	0	0
Co-60	18	16	6.7E+01	0	0	2	5.0E+01	0

Table J-3.3-1 (continued)

Analyte	Total Number of Records	Number of Curie Records	Activity (Ci)	Number of Mass Records	Mass (kg)	Number of Flux-Only Records	Radiation Flux (mR/h)	Number of Records w/o Inventory
Cs-134	1	1	6.2E-01	0	0	0	0	0
Cs-137	4	4	3.8E+00	0	0	0	0	0
Cs-144	1	1	7.1E-05	0	0	0	0	0
Cu-64	1	1	5.0E-02	0	0	0	0	0
Fe-59	1	1	1.5E-01	0	0	0	0	0
Fission	77	73	1.2E+03	2	2.8E-01	0	0	2
H-3	15	11	7.8E+02	0	0	2	3.8E+00	2
I-131	2	1	1.5E-01	0	0	1	5.0E-01	0
Na-22	2	2	1.4E-04	0	0	0	0	0
Np-237	1	0	0	0	0	0	0	1
Oralloy	8	4	2.8E-01	4	5.6E-01	0	0	0
Plutonium	20	9	6.8E+00	5	5.0E-03	4	1.4E+01	2
Plutonium, fuel	1	1	1.0E+00	0	0	0	0	0
Plutonium/fission	12	12	3.5E+01	0	0	0	0	0
Po-210	3	3	8.0E+00	0	0	0	0	0
Pu-239	2	0	0	2	2.0E-02	0	0	0
Pu-240	1	1	7.0E-02	0	0	0	0	0
Ra-226	3	1	5.0E-01	1	5.0E-08	1	1	0
Sr-85	1	1	7.1E-05	0	0	0	0	0
Sr-90	44	44	4.7E+02	0	0	0	0	0
Stainless, irradiated	20	20	2.4E+01	0	0	0	0	0
Ta-182	8	6	1.3E+04	0	0	2	2.3E+02	0
Tc-99	1	1	7.1E-05	0	0	0	0	0
Th-230	1	1	7.1E-05	0	0	0	0	0
Th-232	2	2	7.5E-01	0	0	0	0	0
Tl-204	1	1	7.1E-05	0	0	0	0	0

Table J-3.3-1 (continued)

Analyte	Total Number of Records	Number of Curie Records	Activity (Ci)	Number of Mass Records	Mass (kg)	Number of Flux-Only Records	Radiation Flux (mR/h)	Number of Records w/o Inventory
Tuballoy	2	1	1.0E-01	1	7.0E+01	0	0	0
U-233	2	1	2.5E-01	0	0	1	1.0E+01	0
U-235	54	18	3.6E+01	33	2.4E+00	3	4.0E+00	0
U-238	1	0	0	1	2.0E+00	0	0	0
Uranium, depleted	31	9	1.9E+00	22	2.1E+03	0	0	0
Uranium, enriched	3	2	2.2E+00	1	1.0E-01	0	0	0
Uranium, fuel	6	5	1.6E+02	1	1.8E-02	0	0	0
Uranium, natural	5	0	0	2	1.3E+02	0	0	3
uranium/fission	32	31	9.5E+01	1	3.0E+00	0	0	0
Y-88	1	1	7.1E-05	0	0	0	0	0
Total Activity			16,000	Total Mass	2,300			
Shaft Group 3								
Ag-105	1	0	0	0	0	1	1.5E+02	0
Al-26	7	5	1.7E+01	0	0	2	4.5E+02	0
Am-242m	1	0	0	0	0	1	2.0E+02	0
Ce-137	1	1	2.3E+00	0	0	0	0	0
Ce-141	1	1	1.2E+00	0	0	0	0	0
Co-54m	1	1	1.5E-01	0	0	0	0	0
Co-57	6	2	6.0E-03	0	0	4	9.8E+02	0
Co-60	12	9	3.4E+01	0	0	2	5.3E+02	1
Cs-137	7	7	1.9E+01	0	0	0	0	0
Cu-64	1	1	2.0E+00	0	0	0	0	0
Fe-59	1	1	1.5E-01	0	0	0	0	0
Fission	179	179	7.3E+02	0	0	0	0	0
H-3	40	20	6.0E+04	0	0	10	2.7E+03	10
Ho-166m	1	1	4.0E-02	0	0	0	0	0

Table J-3.3-1 (continued)

Analyte	Total Number of Records	Number of Curie Records	Activity (Ci)	Number of Mass Records	Mass (kg)	Number of Flux-Only Records	Radiation Flux (mR/h)	Number of Records w/o Inventory
I-131	1	1	1.5E-01	0	0	0	0	0
In-114	1	0	0	0	0	0	0	1
Ir-192	1	0	0	0	0	1	3.5E+02	0
Na-22	4	4	6.1E+00	0	0	0	0	0
Oralloy	3	0	0	3	8.7E-01	0	0	0
Plutonium	66	32	3.7E+01	26	1.4E+00	6	4.1E+02	2
Plutonium, fuel	1	1	1.0E+00	0	0	0	0	0
Plutonium/fission	9	9	6.2E+01	0	0	0	0	0
Po-210	6	6	2.4E+01	0	0	0	0	0
Pu-239	11	4	1.6E+00	4	5.1E-02	3	6.0E+02	0
SJ-125	1	1	5.0E-01	0	0	0	0	0
Sr-90	21	19	1.8E+02	0	0	1	2.5E+02	1
Stainless, irradiated	64	63	4.6E+02	0	0	0	0	1
Ta-182	10	8	2.6E+02	0	0	2	1.0E+02	0
Th-232	3	0	0	3	1.0E+01	0	0	0
Tuballoy	3	0	0	1	1.0E-02	0	0	2
U-233	4	3	6.2E+00	1	2.0E-03	0	0	0
U-235	97	8	5.9E+00	79	3.5E+00	7	7.9E+02	3
U-238	13	1	1.5E-01	12	5.4E+02	0	0	0
Uranium, depleted	78	1	2.5E-01	76	1.4E+04	0	0	1
Uranium, enriched	2	2	2.2E+00	0	0	0	0	0
Uranium, fuel	10	10	2.9E+02	0	0	0	0	0
Uranium, natural	7	0	0	6	2.2E+03	0	0	1
Uranium/fission	19	15	1.9E+02	4	1.5E+00	0	0	0
Xe-133	2	0	0	0	0	2	2.0E+02	0
Y-91	1	0	0	0	0	0	0	1

Table J-3.3-1 (continued)

Analyte	Total Number of Records	Number of Curie Records	Activity (Ci)	Number of Mass Records	Mass (kg)	Number of Flux-Only Records	Radiation Flux (mR/h)	Number of Records w/o Inventory
Zn-65	1	0	0	0	0	1	1.5E+02	0
Zr-93	1	1	1.3E-01	0	0	0	0	0
Total Activity			62,000	Total Mass	17,000			
Total Activity for All Shafts			79,000	Total Mass	19,000			

Note: An additional 12 records had inadequate information to identify the analyte or inventory.

Table J-3.3-2
As-Disposed Isotopic Inventory for MDA C Shafts

Shaft Group 1		Shaft Group 2		Shaft Group 3	
Analyte	Activity (Ci)	Analyte	Activity (Ci)	Analyte	Activity (Ci)
Ce-141	0	Ac-227	1.0E+00	Ag-105	0
Co-60	5.0E+00	Al-26	1.0E+02	Al-26	1.7E+01
Cs-137	4.6E+01	Am-241	2.0E-02	Am-242m	0
Ce-144	4.8E+01	Ba-132	7.1E-05	Ce-137	2.3E+00
Eu-154	2.0E-03	Ce-134	7.1E-05	Ce-141	1.2E+00
Eu-155	2.7E-02	Ce-137	2.5E-01	Ce-144	3.9E+02
Kr-85	6.9E+00	Ce-141	2.8E+01	Co-54m	1.5E-01
Pm-147	4.4E-05	Ce-144	4.7E+02	Co-57	1.1E+02
Ru-106	4.7E+01	Cl-36	5.0E-02	Co-60	9.4E+01
Sb-124	7.4E-04	Cm-244	0	Cs-137	4.9E+02
Sb-125	1.3E-01	Co-57	6.1E+00	Cu-64	2.0E+00
Sm-151	2.6E-04	Co-60	7.0E+01	Eu-154	1.6E-02
Sn-119m	8.6E-04	Cs-134	6.2E-01	Eu-155	2.2E-01
Sn-121m	1.6E-02	Cs-137	4.8E+02	Fe-59	1.5E-01
Sn-123	1.3E+00	Cs-144	7.1E-05	H-3	6.0E+04
Sn-126	1.9E-03	Cu-64	5.0E-02	Ho-166m	4.0E-02
Sr-89	1.8E-02	Eu-154	1.9E-02	I-131	1.5E-01
Sr-90	1.1E+02	Eu-155	2.7E-01	In-114	0
Y-91	2.8E-03	Fe-59	1.5E-01	Ir-192	0
Zr-95	9.6E-01	H-3	7.8E+02	Kr-85	5.6E+01
Po-210	8.0E+00	I-131	1.5E-01	Mn-54	1.6E+02
Ra-226	2.0E-01	Kr-85	6.8E+01	Na-22	6.1E+00
Ta-182	0	Mn-54	8.3E+00	Pm-147	3.5E-04
U-233	5.0E-01	Na-22	1.4E-04	Po-210	2.4E+01
U-235	5.5E-02	Np-237	0	Pu-238	2.3E-01
U-234	1.4E+00	Pm-147	4.3E-04	Pu-239	9.5E+00
U-236	1.7E-02	Po-210	8.0E+00	Pu-240	1.8E+00
U-238	9.0E-02	Pu-238	4.4E-02	Pu-241	2.8E+01
		Pu-239	1.5E+00	Pu-242	1.1E-04
		Pu-240	4.2E-01	Ru-106	3.8E+02
		Pu-241	5.3E+00	Sb-124	6.0E-03
		Pu-242	2.0E-05	Sb-125	1.6E+00
		Ra-226	5.0E-01	Sm-151	2.1E-03
		Ru-106	4.6E+02	Sn-119m	7.0E-03
		Sb-124	7.2E-03	Sn-121m	1.3E-01
		Sb-125	1.3E+00	Sn-123	1.0E+01
		Sm-151	2.6E-03	Sn-126	1.5E-02

Table J-3.3-2 (continued)

Shaft Group 1		Shaft Group 2		Shaft Group 3	
Analyte	Activity (Ci)	Analyte	Activity (Ci)	Analyte	Activity (Ci)
		Sn-119m	8.4E-03	Sr-89	1.5E-01
		Sn-121m	1.6E-01	Sr-90	2.8E+02
		Sn-123	1.2E+01	Ta-182	2.6E+02
		Sn-126	1.9E-02	Th-232	1.1E-09
		Sr-85	7.1E-05	U-233	6.2E+00
		Sr-89	1.8E-01	U-234	6.4E+00
		Sr-90	5.8E+02	U-235	6.2E+00
		Ta-182	1.3E+04	U-236	8.3E-02
		Tc-99	7.1E-05	U-238	7.0E-01
		Th-230	7.1E-05	Xe-133	0
		Th-232	7.5E-01	Y-91	2.4E-02
		Tl-204	7.1E-05	Zn-65	1.2E+02
		U-233	2.5E-01	Zr-93	1.3E-01
		U-234	5.4E+00	Zr-95	7.8E+00
		U-235	3.6E+01		
		U-236	9.3E-02		
		U-238	1.4E+00		
		Y-88	7.1E-05		
		Y-91	2.8E-02		
		Zn-65	6.4E+00		
		Zr-95	9.4E+00		
Total Activity	280	Total Activity	16,000	Total Activity	62,000
Total Activity for All Shafts of 79,000 Ci					

Note: Analytes for which only radiation flux measurements are available in Table J-3.3-1 appear with an inventory estimate of zero.

Table J-3.3-3
Present-Day Isotopic Inventory for MDA C Shafts

Shaft Group 1		Shaft Group 2		Shaft Group 3	
Analyte	Activity (Ci)	Analyte	Activity (Ci)	Analyte	Activity (Ci)
Ce-141	<1 pCi	Ac-227	2.6E-01	Ag-105	<1 pCi
Ce-144	<1 pCi	Al-26	1.0E+02	Al-26	1.7E+01
Co-60	1.2E-02	Am-241	1.7E-01	Am-241	7.5E-01
Cs-137	1.6E+01	Ba-132	7.1E-05	Am-242m	<1 pCi
Eu-154	4.8E-05	Ce-134	0	Ce-137	<1 pCi
Eu-155	3.3E-05	Ce-137	0	Ce-141	<1 pCi
Kr-85	3.6E-01	Ce-141	<1 pCi	Ce-144	<1 pCi
Pb-210	1.5E-01	Ce-144	<1 pCi	Co-54m	<1 pCi
Pm-147	2.2E-11	Cl-36	5.0E-02	Co-57	<1 pCi
Po-210	<1 pCi	Cm-244	<1 pCi	Co-60	5.5E-01
Ra-226	2.0E-01	Co-57	<1 pCi	Cs-137	2.0E+02
Ru-106	1.3E-12	Co-60	2.8E-01	Cu-64	<1 pCi
Sb-124	<1 pCi	Cs-134	4.7E-07	Eu-154	6.9E-04
Sb-125	1.3E-06	Cs-137	1.8E+02	Eu-155	7.5E-04
Sm-151	1.8E-04	Cs-144	<1 pCi	Fe-59	<1 pCi
Sn-119m	<1 pCi	Cu-64	<1 pCi	H-3	6.7E+03
Sn-121m	8.0E-03	Eu-154	6.5E-04	Ho-166m	3.9E-02
Sn-123	<1 pCi	Eu-155	5.8E-04	I-131	<1 pCi
Sn-126	1.9E-03	Fe-59	<1 pCi	In-114	<1 pCi
Sr-89	<1 pCi	H-3	7.4E+01	Ir-192	<1 pCi
Sr-90	3.8E+01	I-131	<1 pCi	Kr-85	4.6E+00
Ta-182	<1 pCi	Kr-85	4.5E+00	Mn-54	<1 pCi
U-233	5.0E-01	Mn-54	<1 pCi	Na-22	1.9E-04
U-234	1.4E+00	Na-22	1.2E-09	Pm-147	1.6E-09
U-235	5.5E-02	Np-237	<1 pCi	Po-210	<1 pCi
U-236	1.7E-02	Pb-210	3.6E-01	Pu-238	1.7E-01
U-238	9.0E-02	Pm-147	7.7E-10	Pu-239	9.4E+00
Y-91	<1 pCi	Po-210	<1 pCi	Pu-240	1.8E+00
Zr-95	<1 pCi	Pu-238	3.1E-02	Pu-241	4.3E+00
		Pu-239	1.5E+00	Pu-242	1.1E-04
		Pu-240	4.2E-01	Ra-228	1.1E-09
		Pu-241	7.0E-01	Ru-106	1.2E-09
		Pu-242	2.0E-05	Sb-124	<1 pCi
		Ra-226	4.9E-01	Sb-125	8.8E-05
		Ra-228	7.5E-01	Sm-151	1.6E-03
		Ru-106	1.9E-10	Sn-119m	<1 pCi

Table J-3.3-3 (continued)

Shaft Group 1		Shaft Group 2		Shaft Group 3	
Analyte	Activity (Ci)	Analyte	Activity (Ci)	Analyte	Activity (Ci)
		Sb-124	<1 pCi	Sn-121m	7.3E-02
		Sb-125	3.4E-05	Sn-123	<1 pCi
		Sm-151	1.9E-03	Sn-126	1.5E-02
		Sn-119m	<1 pCi	Sr-89	<1 pCi
		Sn-121m	8.4E-02	Sr-90	1.1E+02
		Sn-123	<1 pCi	Ta-182	<1 pCi
		Sn-126	1.9E-02	Th-228	1.1E-09
		Sr-85	<1 pCi	Th-232	1.1E-09
		Sr-89	<1 pCi	U-233	6.2E+00
		Sr-90	2.1E+02	U-234	6.4E+00
		Ta-182	<1 pCi	U-235	6.2E+00
		Tc-99	7.1E-05	U-236	8.3E-02
		Th-228	7.4E-01	U-238	7.0E-01
		Th-230	7.1E-05	Xe-133	<1 pCi
		Th-232	7.5E-01	Y-91	<1 pCi
		Tl-204	3.2E-08	Zn-65	<1 pCi
		U-233	2.5E-01	Zr-93	1.3E-01
		U-234	5.4E+00	Zr-95	<1 pCi
		U-235	3.6E+01		
		U-236	9.3E-02		
		U-238	1.4E+00		
		Y-88	<1 pCi		
		Y-91	<1 pCi		
		Zn-65	<1 pCi		
		Zr-95	<1 pCi		
Total Activity	57	Total Activity	620	Total Activity	7100
Decrease from As-Disposed	80%	Decrease from As-disposed	96%	Decrease from As-disposed	89%

Note: Shaft Group 1 waste was decayed for 46 yr; Shaft Group 2 waste was decayed for 42 yr; Shaft Group 3 waste was decayed for 39 yr.

Table J-4.1-1
Radionuclide Allocation Factors for Pit Wastes

Material Type	Isotopes	Fractional Abundance (Activity Basis)
MAP	Be-7	7.0E-01
	Na-22	4.1E-02
	Mn-54	9.2E-02
	Co-57	6.7E-02
	Co-60	3.3E-02
	Zn-65	7.1E-02
MFP	See Table J-3.2-1	
PU51	Pu-238	7.0E-03
	Pu-239	4.1E-01
	Pu-240	4.9E-02
	Pu-241	5.4E-01
	Pu-242	4.8E-06
PU52	Pu-238	6.1E-03
	Pu-239	2.1E-01
	Pu-240	4.9E-02
	Pu-241	7.4E-01
	Pu-242	2.8E-06
PU53	Pu-238	1.1E-02
	Pu-239	1.2E-01
	Pu-240	4.2E-02
	Pu-241	8.2E-01
	Pu-242	6.1E-06
PU54	Pu-238	8.5E-03
	Pu-239	5.9E-02
	Pu-240	2.8E-02
	Pu-241	9.0E-01
	Pu-242	9.4E-06
PU55	Pu-238	8.9E-03
	Pu-239	4.5E-02
	Pu-240	2.9E-02
	Pu-241	9.2E-01
	Pu-242	1.0E-05
PU56	Pu-238	8.0E-03
	Pu-239	3.9E-02
	Pu-240	2.9E-02
	Pu-241	9.3E-01
	Pu-242	1.1E-05

Table J-4.1-1 (continued)

Material Type	Isotopes	Fractional Abundance (Activity Basis)
PU57	Pu-238	2.7E-02
	Pu-239	1.7E-02
	Pu-240	1.7E-02
	Pu-241	9.4E-01
	Pu-242	2.4E-05
PU83	Pu-238	9.9E-01
	Pu-239	5.0E-04
	Pu-240	1.9E-04
	Pu-241	1.2E-02
	Pu-242	1.4E-07
TH88	Th-232	1.0E+00
U10	U-238	1.0E+00
U12	U-234	2.7E-01
	U-235	1.0E-02
	U-238	7.2E-01

Table J-4.2-1**Extrapolation-Based As-Disposed Radionuclide Inventories for Routine MDA C Pit Waste**

Disposal Unit/Waste Form	LLW		TRU Waste		All Waste	
	Volume (m ³)	Activity (Ci)	Volume (m ³)	Activity (Ci)	Volume (m ³)	Activity (Ci)
Surface-Contaminated Waste	2.5E+04	4.4E+02	1.4E+03	1.4E+04	2.6E+04	1.4E+04
Soils	3.8E+03	8.4E-01	6.2E+00	—*	3.8E+03	8.4E-01
Concrete and Sludge	3.4E+03	2.6E+02	1.7E+02	1.5E+02	3.6E+03	4.1E+02

*— = All disposal activities in the data used to project the pit inventory were zero.

Table J-4.2-2
As-Disposed Radionuclide-Specific Inventories for Routine MDA C Pit Waste

Waste Form/Radionuclide	LLW		TRU Waste		All Waste	
	Volume ^a (m ³)	Activity (Ci)	Volume ^a (m ³)	Activity (Ci)	Volume ^a (m ³)	Activity (Ci)
Surface-Contaminated Waste						
Ac-227	6.5E-01	1.1E-01	1.8E-01	6.8E-01	8.3E-01	7.9E-01
Am-241	— ^b	—	1.3E+00	1.0E+01	1.3E+00	1.0E+01
Be-7	2.5E+00	2.6E-04	—	—	2.5E+00	2.6E-04
Ce-144	4.3E+01	5.8E-02	1.7E+01	2.9E+02	6.0E+01	2.9E+02
Cf-249	8.9E-01	6.4E-04	—	—	8.9E-01	6.4E-04
Cf-251	—	—	1.3E-01	2.5E-03	1.3E-01	2.5E-03
Cf-252	4.5E-01	1.3E-02	—	—	4.5E-01	1.3E-02
Co-57	2.5E+00	2.5E-05	—	—	2.5E+00	2.5E-05
Co-60	2.5E+00	1.2E-05	—	—	2.5E+00	1.2E-05
Cs-137	4.3E+01	4.9E-02	1.7E+01	2.5E+02	6.0E+01	2.5E+02
Eu-154	4.3E+01	2.4E-06	1.7E+01	1.2E-02	6.0E+01	1.2E-02
Eu-155	4.3E+01	3.3E-05	1.7E+01	1.6E-01	6.0E+01	1.6E-01
H-3	2.5E+01	2.4E+00	—	—	2.5E+01	2.4E+00
Kr-85	4.3E+01	8.4E-03	1.7E+01	4.2E+01	6.0E+01	4.2E+01
Mn-54	2.5E+00	3.4E-05	—	—	2.5E+00	3.4E-05
Na-22	2.5E+00	1.5E-05	—	—	2.5E+00	1.5E-05
Np-237	—	—	1.8E-01	2.9E-04	1.8E-01	2.9E-04
Pm-147	4.3E+01	5.3E-08	1.7E+01	2.6E-04	6.0E+01	2.6E-04
Pu-238	1.1E+03	4.1E+02	5.6E+02	3.2E+03	1.6E+03	3.6E+03
Pu-239	7.0E+02	1.0E+00	5.2E+02	1.6E+03	1.2E+03	1.6E+03
Pu-240	6.9E+02	2.2E-03	4.9E+02	4.2E+02	1.2E+03	4.2E+02
Pu-241	6.9E+02	3.4E-02	4.9E+02	7.5E+03	1.2E+03	7.5E+03
Pu-242	6.9E+02	1.3E-07	4.9E+02	4.5E-02	1.2E+03	4.5E-02
Ru-106	4.3E+01	5.7E-02	1.7E+01	2.8E+02	6.0E+01	2.8E+02
Sb-124	4.3E+01	8.9E-07	1.7E+01	4.5E-03	6.0E+01	4.5E-03
Sb-125	4.3E+01	1.6E-04	1.7E+01	8.0E-01	6.0E+01	8.0E-01
Sm-151	4.3E+01	3.2E-07	1.7E+01	1.6E-03	6.0E+01	1.6E-03
Sn-119m	4.3E+01	1.0E-06	1.7E+01	5.2E-03	6.0E+01	5.2E-03
Sn-121m	4.3E+01	2.0E-05	1.7E+01	1.0E-01	6.0E+01	1.0E-01
Sn-123	4.3E+01	1.5E-03	1.7E+01	7.6E+00	6.0E+01	7.6E+00
Sn-126	4.3E+01	2.3E-06	1.7E+01	1.1E-02	6.0E+01	1.1E-02
Sr-89	4.3E+01	2.2E-05	1.7E+01	1.1E-01	6.0E+01	1.1E-01
Sr-90	4.3E+01	1.4E-02	1.7E+01	7.0E+01	6.0E+01	7.0E+01
Th-230	1.8E-02	1.5E+01	—	—	1.8E-02	1.5E+01

Table J-4.2-2 (continued)

Waste Form/Radionuclide	LLW		TRU Waste		All Waste	
	Volume ^a (m ³)	Activity (Ci)	Volume ^a (m ³)	Activity (Ci)	Volume ^a (m ³)	Activity (Ci)
Th-232	4.9E+00	1.6E-03	—	—	4.9E+00	1.6E-03
U-234	4.6E+01	1.6E+00	—	—	4.6E+01	1.6E+00
U-235	2.8E+02	3.9E-01	1.8E+01	2.0E-04	3.0E+02	3.9E-01
U-236	9.4E+00	8.8E-05	—	—	9.4E+00	8.8E-05
U-238	1.1E+02	8.8E+00	—	—	1.1E+02	8.8E+00
Y-91	4.3E+01	3.5E-06	1.7E+01	1.7E-02	6.0E+01	1.7E-02
Zn-65	2.5E+00	2.6E-05	—	—	2.5E+00	2.6E-05
Zr-95	4.3E+01	1.2E-03	1.7E+01	5.8E+00	6.0E+01	5.8E+00
Soils						
Pu-238	9.4E+02	2.8E-01	—	—	9.4E+02	2.8E-01
Pu-239	9.4E+02	3.1E-02	—	—	9.4E+02	3.1E-02
Th-232	4.4E-03	1.7E-04	—	—	4.4E-03	1.7E-04
U-234	1.8E-02	1.3E-01	—	—	1.8E-02	1.3E-01
U-235	1.6E+00	4.9E-03	—	—	1.6E+00	4.9E-03
U-238	4.6E-01	3.9E-01	—	—	4.6E-01	3.9E-01
Concrete and Sludge						
Am-241	4.2E+02	6.6E-01	7.3E+01	3.5E+01	4.9E+02	3.5E+01
Pu-238	1.5E+03	2.5E+02	1.3E+02	1.0E+02	1.7E+03	3.6E+02
Pu-239	1.5E+03	3.9E+00	1.5E+02	1.5E+01	1.7E+03	1.8E+01
U-235	7.5E+01	3.1E-03	2.9E+00	8.9E-05	7.8E+01	3.2E-03

^a The sum of these volumes is greater than the total volume of waste disposed of in the pits listed in Table J-2.0-1 because several radionuclides may occur in a single waste package.

^b — = No record.

Table J-4.2-3
Summary of MDA C Disposal Data Provided in Warren (1980)

Disposal Date	Disposal Areas	Disposal Units	Mass (g)				Notes
			Pu	Am-241	U-233	Other	
1951–1963	MDAs C, G	Pits	na ^a	na	na	— ^b	Sludges in 0.21-m ³ drums; generated by the TA-45 treatment plant
1952–1967	MDAs C, G	Pits	3.4E+02	—	—	5.8E+02 (equivalent Pu) ^c	Over 3000 0.21-m ³ drums of weapons-grade Pu disposed of as sludge; generated by the TA-21 treatment plant
1959–1968	MDAs C, G	Pits	7.4E+02	6.6E+02	6.5E+02	—	Approximately 11,800 0.21-m ³ drums of weapons-grade material disposed of as cement paste
1963–1971	MDAs C, G	Pits	na	na	na	na	Sludge in 0.21-m ³ drums

^a na = Not available; no radionuclide content data were provided in Warren (1980, 00573).

^b — = No information provided in Warren (1980, 00573).

^c This waste has a specific activity of 0.073 Ci/g (Warren 1980, 00573).

Table J-4.2-4
Extrapolation-Based, As-Disposed Radionuclide
Pit Inventories for Nonroutine Reactor-Program Wastes

Analyte	Identifier	Date	Inventory	Units	Waste Description
Omega West Reactor Shaft Disposals					
Al-26	365	12/12/62	14	curies	Aluminum sample holders
Al-26	401	06/03/63	2.6	curies	ARR. Aluminum tube
Al-26	459	03/12/64	3.3	curies	Al furnace
Co-60	80	02/08/62	0.22	curies	Fiss. Prod. Residues, Co ⁶⁰ in soln, Sr ⁹⁰ Soln
Co-60	84	02/12/62	0.65	curies	Co ⁶⁰ Ni Sheets
Co-60	380	02/15/63	5.2	curies	Cesium ¹³⁷ & Cobalt ⁶⁰
Co-60	558	07/12/65	3.9	curies	Co ⁶⁰ & "unknown sources"
Cs-137	378	02/13/63	5.2	curies	Cesium ¹³⁷
Cs-137	380	02/15/63	5.2	curies	Cesium ¹³⁷ & Cobalt ⁶⁰
Cs-137	434	10/23/63	0.13	curies	Cs ¹³⁷
Cs-137	553	06/30/65	0.13	curies	Cg ¹³⁷ residue
Cs-137	559	07/12/65	5.2	curies	Cs ¹³⁷ sources
Cs-137	560	07/14/65	5.2	curies	2.Cs ¹³⁷ sources 4 contact rods
Cu-64	55	04/25/61	0.065	curies	copper sphere
Fission	1	11/10/59	6.5	curies	1 st container Ba ¹⁴⁰ , La ¹⁴⁰ , waste also some fission products from Omega Reactor
Fission	6	01/05/60	7.8	curies	graphite slugs
Fission	80	02/08/62	0.22	curies	Fiss. Prod. Residues, Co ⁶⁰ in soln, Sr ⁹⁰ Soln
Fission	366	12/12/62	14	curies	Boron Stainless Control Rod
Fission	479	06/22/64	0.23	curies	Co ¹³⁷ Fission Prod.
Fission	484	09/22/64	7.8	curies	Graphite stringer
Fission	832	01/25/65	2.6	curies	Fission chamber
Fission	838	02/01/65	20	curies	Fission chamber
Fission	882	10/25/65	3.3	curies	fission chamber
H-3	41	09/14/60	1.3	curies	Tritium reservoir
H-3	52	03/21/61	2.6	curies	Res. (tritium)
H-3	358	10/25/62	6.5	curies	Reservoirs & valves irradiated with T2
Ho-166m	634	03/31/66	0.052	curies	HO ¹⁶⁶
Na-22	495	09/20/65	6.5	curies	Irradiated sodium
Po-210	35	08/03/60	5.2	curies	Po-Be sources
Po-210	54	04/25/61	5.2	curies	"Rabbit" tube w/ Be inside
SJ-125	381	02/15/63	0.65	curies	Antimony
Sr-90	80	02/08/62	0.22	curies	Fiss. Prod. Residues, Co ⁶⁰ in soln, Sr ⁹⁰ Soln
Stainless, irradiated	226	11/17/60	0.65	curies	End boxes to fuel elements.
Stainless, irradiated	51	03/02/61	0.065	curies	End, F elements
Stainless, irradiated	224	03/24/61	0.65	curies	Fuel elements end caps
Stainless, irradiated	250	09/11/61	0.65	curies	Fuel element end boxes

Table J-4.2-4 (continued)

Analyte	Identifier	Date	Inventory	Units	Waste Description
Stainless, irradiated	251	09/15/61	2.0	curies	Fuel element end caps
Stainless, irradiated	261	10/27/61	0.65	curies	Fuel Elements, caps
Stainless, irradiated	262	11/30/61	0.65	curies	Fuel Element Caps
Stainless, irradiated	263	12/01/61	0.65	curies	End Boxes
Stainless, irradiated	253	02/26/62	0.65	curies	Fuel element end caps
Stainless, irradiated	282	05/28/62	0.65	curies	Fuel element end caps
Stainless, irradiated	299	08/29/62	0.26	curies	Fuel elements caps
Stainless, irradiated	679	11/19/62	0.052	curies	End Boxes
Stainless, irradiated	708	02/15/63	0.26	curies	Ion Chambers
Stainless, irradiated	709	02/15/63	5.2	curies	Thermopiles
Stainless, irradiated	385	03/06/63	0.65	curies	Boron stainless
Stainless, irradiated	720	03/06/63	0.13	curies	Thermocouple wire
Stainless, irradiated	722	04/03/63	0.65	curies	Fuel element and caps
Stainless, irradiated	729	04/15/63	0.65	curies	Fuel element, end caps
Stainless, irradiated	765	07/29/63	0.65	curies	Fuel element , end caps
Stainless, irradiated	775	10/08/63	1.3	curies	Fuel element, end caps
Stainless, irradiated	788	12/27/63	13	curies	Matrix Lid
Stainless, irradiated	789	01/14/64	6.5	curies	Fuel element end caps
Stainless, irradiated	795	06/04/64	1.3	curies	8 fuel element boxes and 2 matrix pins and washers
Stainless, irradiated	796	06/05/64	1.3	curies	8 Fuel element boxes
Stainless, irradiated	798	07/15/64	26	curies	Control rods 2-pc 6' long
Stainless, irradiated	488	10/21/64	0.65	curies	8-Eud & Boxes 1 pc lead
Stainless, irradiated	826	12/17/64	2.6	curies	16 end boxes fuel elements
Stainless, irradiated	835	02/03/65	1.3	curies	Fuel element end boxes
Stainless, irradiated	860	06/16/65	2.6	curies	Fuel elements end boxes
Stainless, irradiated	863	07/14/65	2.6	curies	Fuel elements end boxes
Stainless, irradiated	876	08/17/65	3.9	curies	OWR end boxes, 1 fission chamber
Stainless, irradiated	817	09/20/65	1.3	curies	Irradiated control tube
Stainless, irradiated	883	11/05/65	2.6	curies	Fuel elements, end boxes
Stainless, irradiated	899	01/26/66	2.6	curies	Fuel elements end boxes
Stainless, irradiated	907	03/16/66	1.3	curies	Irradiated box ends
Stainless, irradiated	887	06/02/66	1.3	curies	Thermo couples activated SS
Tuballoy	792	02/03/64	0.013	kg	Tuballoy Powder
Uranium, depleted	719	03/06/63	65	kg	1A-192.284.3301,HAPC1 Classified Units
Uranium, fuel	225	10/18/60	195	curies	Fuel elements (rods)
Uranium, fuel	346	09/17/59	200	curies	U ²³⁵ in carbide form - activated in OWR
Uranium, fuel	793	05/15/64	312	curies	8' control rods
LAMPRE Shaft Disposals					
Fission	354	10/08/62	2.7	curies	Irradiated plutonium (<1gm of Pu) plus Fiss. Products

Table J-4.2-4 (continued)

Analyte	Identifier	Date	Inventory	Units	Waste Description
Fission	776	10/15/63	1.4	curies	Fission Products
Fission	456	02/11/64	16	curies	Pu Waste (Dick Wilhelm)
Fission	602	12/10/65	81	curies	Pu waste (Lampre)
Plutonium	354	10/08/62	0.0014	kg	Irradiated plutonium (<1gm of Pu) plus Fiss. Products
Plutonium	456	02/11/64	0.1269	kg	Pu Waste (Dick Wilhelm)
Plutonium	472	04/08/64	2.7	curies	LAMPRE Pu waste
Plutonium	474	05/12/64	0.35	curies	Lab waste, Zr ⁹³ , Na ²² , & Pu
Plutonium	496	08/19/64	0.016	kg	Sodium Coil
Plutonium	500	08/19/64	0.016	kg	Sodium Coil
Plutonium	503	08/19/64	0.016	kg	Sodium Coil
Plutonium	530	08/19/64	0.016	kg	Sodium Coil
Plutonium	547	08/19/64	0.016	kg	Sodium Coil
Plutonium	639	11/18/64	0.35	curies	Sodium and NAK waste, Pu containers
Plutonium	529	05/13/65	0.016	kg	Sodium and Alpha
Plutonium	548	05/19/65	0.016	kg	Sodium coils
Plutonium	570	05/19/65	0.004	kg	Sodium coils
Plutonium	579	05/19/65	0.016	kg	Sodium coil
Plutonium	612	05/19/65	0.016	kg	Sodium coil
Plutonium	602	12/10/65	0.14	kg	Pu waste (LAMPRE)
Plutonium, fuel	921	04/06/64	2.7	curies	LAMPRE Rod Assembly
Plutonium, fuel	218	07/26/66	2.7	curies	Fission Rod
Plutonium/fission	91	06/26/61	27	curies	"Waste" contaminated with Irradiated Pu.
Plutonium/fission	93	07/07/61	14	curies	Irradiated Pu plus Fission Products
Plutonium/fission	95	07/17/61	2.7	curies	Pu and fission Prod. Waste
Plutonium/fission	359	11/01/62	22	curies	Solid clean up, Pu waste
Plutonium/fission	364	12/12/62	2.7	curies	Solid Fission Products, Pu Polishing wheel
Plutonium/fission	439	09/11/63	14	curies	Irradiated Pu
Plutonium/fission	483	09/14/64	14	curies	Pu irr.

Note: Shaft inventory multiplied by 1.3 to account for longer pit disposal period of water boiler reactor. Shaft inventory multiplied by 2.7 to account for longer pit disposal period of Clementine. Descriptions were copies "as written" from the disposal logbooks.

Table J-4.2-5
Total "As-Disposed" Volume and
Activity Projections for the MDA C Pits

Waste Form	Volume (m ³)	Activity (Ci)
Surface-Contaminated Waste	2.6E+04 ^a	1.5E+04 ^b
Soil	3.8E+03	8.4E-01
Concrete and Sludge	3.9E+03	4.4E+02

^a Volume does not incorporate reactor wastes described in Table J-4.2-4.

^b Activity incorporates approximately 1000 Ci from reactor-waste extrapolation.

Table J-4.2-6
Total As-Disposed Radionuclide-Specific Inventory Projections for MDA C Pits

Radionuclide	Waste Form					
	Surface-Contaminated Waste		Soils		Concrete and Sludge	
	Volume ^a (m ³)	Activity (Ci)	Volume (m ³)	Activity (Ci)	Volume (m ³)	Activity (Ci)
Ac-227	8.3E-01	7.9E-01	— ^b	—	—	—
Al-26	^c	2.0E+01	—	—	—	—
Am-241	1.3E+00	1.0E+01	—	—	4.9E+02	3.5E+01
Be-7	2.5E+00	2.6E-04	—	—	—	—
Ce-144	6.0E+01	5.2E+02	—	—	—	—
Cf-249	8.9E-01	6.4E-04	—	—	—	—
Cf-251	1.3E-01	2.5E-03	—	—	—	—
Cf-252	4.5E-01	1.3E-02	—	—	—	—
Co-57	2.5E+00	2.2E+01	—	—	—	—
Co-60	2.5E+00	2.1E+01	—	—	—	—
Cs-137	6.0E+01	4.7E+02	—	—	—	—
Cu-64	^c	6.5E-02	—	—	—	—
Eu-154	6.0E+01	2.2E-02	—	—	—	—
Eu-155	6.0E+01	2.9E-01	—	—	—	—
H-3	2.5E+01	1.3E+01	—	—	—	—
Ho-166m	^c	5.2E-02	—	—	—	—
Kr-85	6.0E+01	7.6E+01	—	—	—	—
Mn-54	2.5E+00	3.1E+01	—	—	—	—
Na-22	2.5E+00	6.5E+00	—	—	—	—
Np-237	1.8E-01	2.9E-04	—	—	—	—
Pm-147	6.0E+01	4.7E-04	—	—	—	—
Po-210	^c	1.0E+01	—	—	—	—
Pu-238	1.6E+03	3.6E+03	9.4E+02	2.8E-01	1.7E+03	3.6E+02
Pu-239	1.2E+03	1.6E+03	9.4E+02	3.1E-02	2.0E+03	4.6E+01
Pu-240	1.2E+03	4.2E+02	—	—	3.1E+02	4.0E+00
Pu-241	1.2E+03	7.5E+03	—	—	—	—
Pu-242	1.2E+03	4.5E-02	—	—	—	—
Ru-106	6.0E+01	5.1E+02	—	—	—	—
Sb-124	6.0E+01	8.1E-03	—	—	—	—
Sb-125	6.0E+01	2.1E+00	—	—	—	—
Sm-151	6.0E+01	2.9E-03	—	—	—	—
Sn-119m	6.0E+01	9.4E-03	—	—	—	—
Sn-121m	6.0E+01	1.8E-01	—	—	—	—
Sn-123	6.0E+01	1.4E+01	—	—	—	—
Sn-126	6.0E+01	2.0E-02	—	—	—	—

Table J-4.2-6 (continued)

Radionuclide	Waste Form					
	Surface-Contaminated Waste		Soils		Concrete and Sludge	
	Volume ^a (m ³)	Activity (Ci)	Volume (m ³)	Activity (Ci)	Volume (m ³)	Activity (Ci)
Sr-89	6.0E+01	2.0E-01	—	—	—	—
Sr-90	6.0E+01	1.3E+02	—	—	—	—
Th-230	1.8E-02	1.5E+01	—	—	—	—
Th-232	4.9E+00	1.6E-03	4.4E-03	1.7E-04	—	—
U-234	4.6E+01	6.1E+00	1.8E-02	1.3E-01	—	—
U-235	3.0E+02	3.9E+01	1.6E+00	4.9E-03	7.8E+01	3.2E-03
U-236	9.4E+00	5.6E-02	—	—	—	—
U-238	1.1E+02	9.1E+00	4.6E-01	3.9E-01	—	—
Y-91	6.0E+01	3.1E-02	—	—	—	—
Zn-65	2.5E+00	2.4E+01	—	—	—	—
Zr-95	6.0E+01	1.0E+01	—	—	—	—
Total Activity (Ci)		15,000	—	0.84	—	440

^a Volume does not incorporate reactor wastes described in Table J-4.2-4.

^b — = Not available or not applicable.

^c This isotope is associated solely with reactor wastes for which volume estimates are not available.

Table J-4.2-7
Total Present-Day Radionuclide-Specific Inventory Projections for MDA C Pits

Radionuclide	Waste Form		
	Surface-Contaminated Waste	Soils	Concrete and Sludge
Ac-227	1.6E-01	—*	—
Al-26	2.0E+01	—	—
Am-241	2.2E+02	—	3.2E+01
Be-7	<1 pCi/g	—	—
Ce-144	<1 pCi/g	—	—
Cf-249	5.8E-04	—	—
Cf-251	2.4E-03	—	—
Cf-252	2.7E-08	—	—
Co-57	<1 pCi/g	—	—
Co-60	2.9E-02	—	—
Cs-137	1.5E+02	—	—
Cu-64	<1 pCi/g	—	—
Eu-154	3.9E-04	—	—
Eu-155	2.0E-04	—	—
H-3	7.8E-01	—	—
Ho-166m	5.1E-02	—	—
Kr-85	3.0E+00	—	—
Mn-54	<1 pCi/g	—	—
Na-22	1.1E-05	—	—
Np-237	2.9E-04	—	—
Pm-147	6.8E-11	—	—
Po-210	<1 pCi/g	—	—
Pu-238	2.4E+03	1.9E-01	2.4E+02
Pu-239	1.6E+03	3.1E-02	4.6E+01
Pu-240	4.2E+02	—	4.0E+00
Pu-241	6.8E+02	—	—
Pu-242	4.5E-02	—	—
Ra-228	1.6E-03	—	—
Ru-106	<1 pCi/g	—	—
Sb-124	<1 pCi/g	—	—
Sb-125	7.4E-06	—	—
Sm-151	2.0E-03	—	—
Sn-119m	<1 pCi/g	—	—
Sn-121m	8.2E-02	—	—
Sn-123	<1 pCi/g	—	—
Sn-126	2.0E-02	—	—

Table J-4.2-7 (continued)

Radionuclide	Waste Form		
	Surface-Contaminated Waste	Soils	Concrete and Sludge
Sr-89	<1 pCi/g	—	—
Sr-90	3.9E+01	—	—
Th-228	1.6E-03	—	—
Th-230	1.5E+01	—	—
Th-232	1.6E-03	1.7E-04	—
U-234	6.1E+00	1.3E-01	—
U-235	3.9E+01	4.9E-03	3.2E-03
U-236	5.6E-02	—	—
U-238	9.1E+00	3.9E-01	—
Y-91	<1 pCi/g	—	—
Zn-65	<1 pCi/g	—	—
Zr-95	<1 pCi/g	—	—
Total Activity	5,600	0.75	320
Decrease from As-Disposed	63%	11%	27%

Note: Decay period for pit wastes was set at 50 yr, corresponding to an average waste generation year of 1955.

* — = Not available.

Table J-5.0-1
Rogers (1977) MDA C Inventory Estimates, Decayed to January 2005

Pits Inventory (Ci)		Shafts Inventory (Ci)	
Americium-241	142	Activation Products ^a	0.4
Plutonium-239	26	Cobalt-60	0.3
Uranium (all isotopes)	25	Fission Products ^b	2.2
		Sodium-22	0.008
		Radium-226	1
		Strontium/Yttrium-90	14
		Tritium	8120
		Uranium-233	5
		Uranium (all other isotopes)	<0.1

^a Isotopic composition based on activated steel (LANL 2005, 94156). Original activity described in Rogers (1977, 05707) was 200 Ci.

^b Isotopic composition based on assumptions in the MDA G inventory report (LANL 2005, 94156). The original activity described in Rogers (1977, 05707) was 50 Ci.

Table J-5.0-2
Comparison of Estimated Present-Day Shaft
Activities with Decayed Values from Rogers (1977)

Analyte	Current Estimate	Rogers (Table 5.1)
Activation products	0.8	0.7
Fission products	490 ^a	2.2
Sodium-22	0.00019	0.008
Radium-226	0.69	1
Strontium/yttrium-90	280 ^b	14
Tritium	6800	8120
Uranium-233	7.0	5
Uranium (all other isotopes)	58	<0.1

^a Of the 360 Ci of strontium-90 shown in Table J-3.3-7, approximately 80 Ci is from fission products.

^b Only strontium activity related to the radioactive barium-lanthanum solution is included here.

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Appendix K

Summary of Biota Sampling Results

MDA C Biota Sampling Memo

To: John Hopkins
From: Neptune and Company, Inc.
CC: Ralph Perona, Kristen Lockhart, Jim Markwiese
Date: 9/26/2005
Re: Field Summary, Sample Selection Rationale and Field and Laboratory Screening Results

Introduction

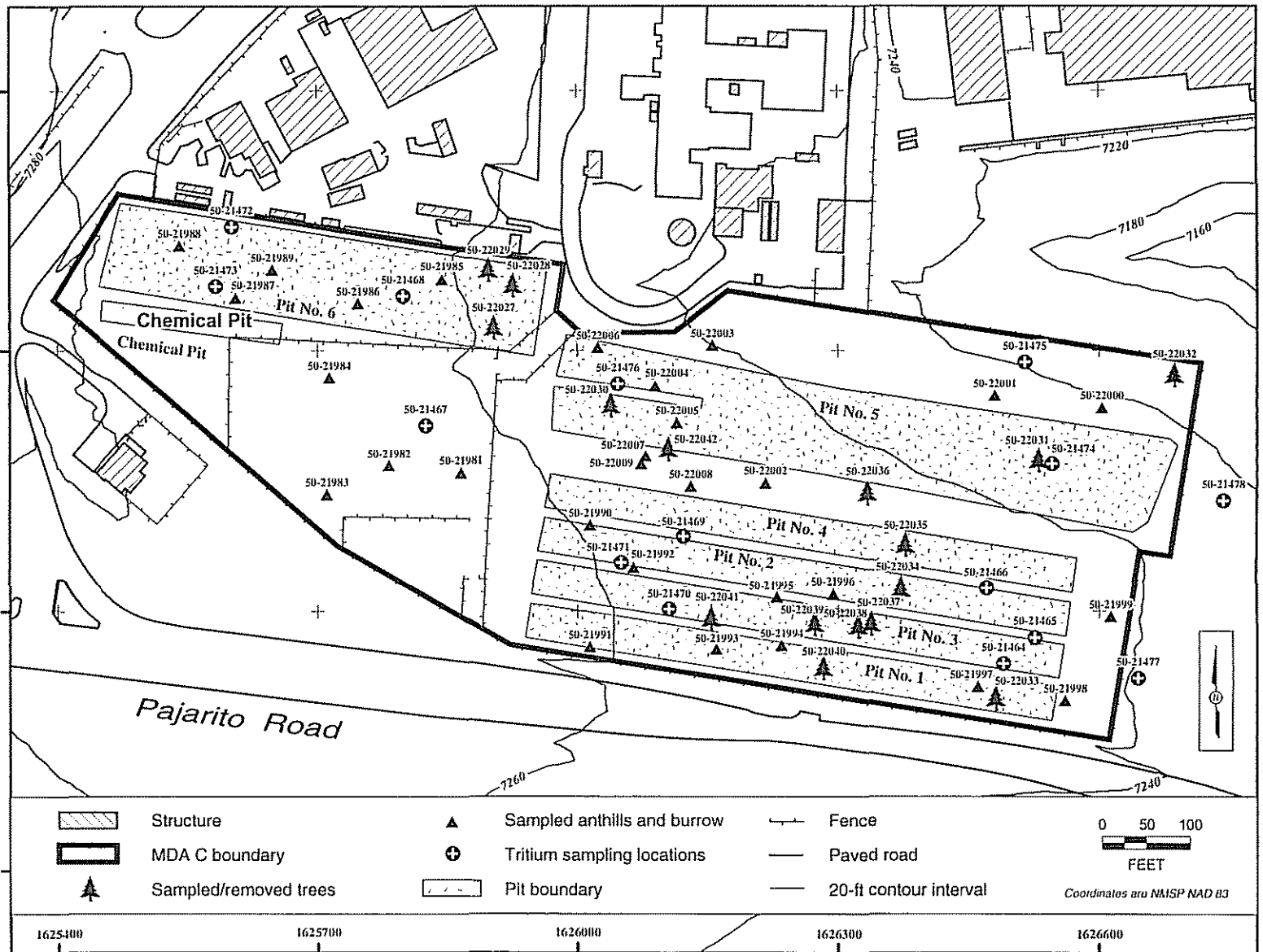
Modeling of buried waste mobility has identified biotic processes as the most likely driver behind long-term subsurface waste translocation (Hollis et al. 1997). Biotic transport processes include excavation of subsurface materials by burrowing animals and uptake of waste constituents by plants via roots. This memorandum details the rationale for sampling and the results available for assessing potential biotic (root, mammal, ant) intrusion and radionuclide waste transport at Material Disposal Area C (MDA C) at TA-50. The objective of this investigation was to determine if biotic transport is currently active onsite. The choice of gross radioactivity as the indicator of biotically-driven radionuclide transport was based on considerations of cost efficiency and the ability to readily employ field screening instruments for selection of soil material to submit to an analytical laboratory for more accurate screening of gross radioactivity.

Field Activities Summary

The addendum to the sampling and analysis plan (SAP; LANL 2003a) in the approved Resource Conservation and Recovery Act (RCRA) facility investigation (RFI) work plan for Operable Unit 1147 (LANL 1992) describes the rationale and implementation of additional sampling at Solid Waste Management Unit (SWMU) 50-009, also referred to as MDA C, at Technical Area (TA) 50 for completion of the RFI. Biota sampling was conducted by WGII/PMC/SEA team (2003), contracted to the Los Alamos National Laboratory (LANL or the Laboratory) Risk Reduction Environmental Stewardship Remediation Program (RRES-R).

On February 12, 2003 the WGII/PMC/SEA team performed field screening on ant mounds and animal burrows across the site for gross alpha, beta and gamma activity in the field according to ER-SOP-10.14, "Performing and Documenting Gross Gamma Radiation Scoping Surveys" (LANL 2001a). Alpha radiation screening was performed with a Ludlum 139 radiation meter. A Ludlum ESP 1 radiation meter with an HP 260 pancake probe, and a Ludlum Model 2221 Scaler/Ratemeter with a Ludlum Model 44-10 2x2 Gamma Scintillator, were used for screening beta/gamma radiation. The screening followed protocols outlined in ER-SOP-10.14 including ensuring that the meter was source checked prior to use and taking background readings periodically during the meter's use. Background for beta/gamma activity was determined to be 300-400 dpm. On March 20, 2003, the WGII/PMC/SEA team collected soil samples according to SOP-6.09 "Spade and Scoop Method for the Collection of Soil Samples" (LANL 2001b). Collected material was placed in containers provided by the LANL SMO. Sample identification followed ER-SOP-01.04-R5, "Sample Control and Field Documentation" (LANL 2003). Each location was surveyed by GPS in accordance with ER-SOP-3.11, "Coordination and Evaluating Geodetic Surveys" (LANL 2001c) (Figure 1). Approximately 500 g of soil material was collected from each of the ant mounds and burrow spoils.

Samples of pine needles from tree branches were collected on the following day. Needles were placed in containers provided by the LANL SMO. Sample identification followed ER-SOP-01.04, "Sample Control and Field Documentation" (LANL 2003b). Each location was surveyed by GPS in accordance with ER-SOP-3.11, "Coordination and Evaluating Geodetic Surveys" (LANL 2001c) (Figure 1).



Source: SEA map ID 4512.070(1) Rev.1, MW-H, 032503_Rev. for MDA C IWP, 073003, cf

Approximately 500 g of needles were collected from each ponderosa pine tree. The trees were cut down and a wafer of the tree trunk was collected and turned over to Neptune and Company, Inc. for tree-ring dating.

Sample Selection Rationale

The soil comprising ant mounds and burrow spoils is assumed to be representative of deeper soils that have been brought to the surface. Locations selected for field screening of soil were based on the actual locations of ant mounds and burrow spoils. Seventy-seven locations across MDA C were flagged and labeled. The approximate locations of these flagged locations were recorded on a surface map of MDA C. It was originally anticipated that ant mounds and burrow spoils would be evenly represented among the sample locations. However, only 14 ant mounds were found and the decision was made to perform field screening for all ant mounds.

Burrow spoil material was field-screened at 63 locations. The criteria used to select burrow spoils for field screening were:

1. magnitude of field screening values;
2. achieving broad spatial coverage of the MDA C area, and;
3. selecting some locations in areas characterized by shallow fill material overlaying disposal pits.

Field screening values were used to bias selection of locations for analytical laboratory screening by choosing the highest field screening values across the site. Achieving broad spatial coverage of the MDA C area, including above and around the chemical pit, pits 1-6 and the southwest corner of the area where no pits or shafts are identified, will ensure that analytical laboratory screening can be used to establish the pattern of gross radioactivity across the site. Analytical laboratory screening from this southwest area will be used as control data representing background levels of gross radioactivity. To the extent practicable, some of the locations sampled for the analytical laboratory screening were biased towards areas characterized by shallow (e.g., <3 ft) fill material that overlaid disposal pits. These areas are considered to have the highest probability of potential radionuclide contamination on the soil surface based on easier access for burrowing animals and plant roots. Field screening ant mound material resulted in a gross beta/gamma range of 414 to 612 disintegrations per minute (dpm). Gross alpha activity measured in the field was reported as 0 counts per minute (cpm).

Soil material was collected from a subset of the field-screened locations as described previously. After evaluating the locations of the ant mounds and burrow spoils and the field screening data associated with each, a subset of locations was chosen for analytical laboratory screening. Of the 14 ant mounds field-screened, 9 samples of ant-mound material were collected for analytical laboratory screening at ARS in Los Alamos, NM. Twenty of the 63 burrow spoils were also sampled for analytical laboratory screening. Selection of samples for analytical laboratory screening was based on the same criteria described for selection of burrow locations for field screening. In a deviation from the SAP, the field designations (e.g., 1R = 1st marked ant mound; 1B = 1st marked burrow spoil) of the flagged field screening locations were not recorded on the sample collection logs for the material sent off for laboratory analysis. Consequently, the field screening results are not amenable to correlation with laboratory analytical results because of the uncertainty associated with the actual sampling location. In other words, the locations of the material sent for laboratory screening is known with certainty (GPS coordinates) but it is unclear exactly which field screening data are associated with this point.

The 29 samples selected for laboratory analyses are slightly more than the number initially targeted in the SAP (LANL 2003a) but these additional samples provide information in terms of spatial coverage and biased sampling. Field screening mammal burrow spoil material resulted in a gross beta/gamma range of 418 to 769 dpm. Gross alpha activity measured in the field was reported as 0 counts per minute (cpm).

Ponderosa pine trees were selected to evaluate potential constituent migration because these trees are some of the deepest-rooting flora onsite. Pine needles were collected from branches of all sixteen ponderosa pine trees onsite (Figure 1). Field screening was not performed to bias selection of samples because so few trees existed onsite; needles were collected from all trees. In a deviation from the SAP (LANL 2003a), exact information on tree height was not provided in the WGII/PMC/SEA (2003) Field Summary Report. However, as recorded in a recent (22 October 2002) ecological scoping evaluation of MDA C, all trees were between 4.5 and 5.5 ft high.

Laboratory Results

Ponderosa Pine Needles

For tree-ring ageing, the disk used to count rings was collected at the base of the trunk. The approximate age of the trees is presented in Table 1. Sixteen needle samples were sent to American Radiation Services (ARS; Los Alamos, NM) for gross alpha, beta and gamma screening. The results of the pine needle analyses are presented in Table 1. Note that the results are in different units for the laboratory results (picocuries per gram) relative to the field screening results (disintegrations per minute).

Table 1
Results of tree-ring counting and laboratory screening
for gross alpha, beta, and gamma activity in pine needles at MDA C

Tree Location (ID)	Tree Sample ID	Gross alpha (pCi/g)	Gross beta (pCi/g)	Gross gamma (pCi/g)	Tree Age (years)
50-22027	MD50-03-51115	-	14.1	6.34	8
50-22028	MD50-03-51116	-	6.54	7.18	17
50-22029	MD50-03-51117	-	7.96	2.77	10
50-22030	MD50-03-51118	-	235.9	-	18
50-22031	MD50-03-51119	17.89	54.4	5.47	15
50-22032	MD50-03-51120	-	265.7	4.24	17
50-22033	MD50-03-51121	-	8.44	2.94	10
50-22034	MD50-03-51122	91.4	11.57	-	11
50-22035	MD50-03-51123	77.18	10.97	8.99	12
50-22036	MD50-03-51124	-	6.92	-	9
50-22037	MD50-03-51125	-	10.24	-	11
50-22038	MD50-03-51126	-	13.26	4.94	9
50-22039	MD50-03-51127	-	8.55	7.45	9
50-22040	MD50-03-51128	-	10.54	9.15	18
50-22041	MD50-03-51129	-	10.54	-	no sample*
50-22042	MD50-03-51130	-	12.91	9.54	14

pCi = picoCuries

See (Figure 1) for onsite tree locations.

The reported minimum detectable activities for gross alpha activity in pine needles ranged from 2.74 to 3.59 pCi/g. As shown in Table 1, gross alpha was largely undetected in the pine needles at MDA C. However, two trees (locations 50-22034 and 50-22035) were in an area of fill cover between 3 and 5 feet (AGS 2001) and had gross alpha activity of 91 and 77 pCi/g. This gross alpha activity is approximately 5 times higher than that in the bioturbated soil material (Table 2). A comparison of gross alpha between tree and soil samples is presented spatially in Figure 2. The relatively elevated gross alpha activity in pine needles suggests that onsite trees are able to mobilize contamination when it exists in the root zone.

The gross beta was detected in every sample (Table 1). In particular, two of the oldest trees (50-22030 and 50-22032; Table 1) showed elevated gross beta activity (Figure 3). One of these trees was growing near the edge of northeast site boundary where site soil data indicated surface contamination associated with earlier releases. The fill material is quite shallow or nonexistent along the fence line in this area (AGS 2001), indicating that uptake from historically contaminated soil may be more likely here. The other elevated gross beta measurement occurred in an area of thick (~ 5 ft) fill, indicating that the current surface of MDA C may not be an impediment to constituent mobilization by deeply rooting trees.

The gross gamma activities (Table 1, Figure 4) show that gamma activity is evenly distributed between the control area (southwest corner) and the potentially impacted area, indicating that plants are not mobilizing gamma-emitting radionuclides at the site.

Animal Burrow Spoils and Ant Mounds

Table 2
Results of laboratory screening for gross alpha, beta, and gamma activity
in burrow spoils or ant mound sample material at MDA C

Soil Location ID		Gross alpha (pCi/g)	Gross beta (pCi/g)	Gross gamma (pCi/g)	Type
50-21981	MD50-03-50891	11.07	54.05	11.67	Ant mound
50-21982	MD50-03-50892	17.44	50.97	16.18	Ant mound
50-21984	MD50-03-50894	11.18	53.11	-	Ant mound
50-21991	MD50-03-50901	16.77	56.05	13.09	Ant mound
50-21993	MD50-03-50903	9.43	35.12	12.19	Ant mound
50-21997	MD50-03-50907	23.29	64.98	11.05	Ant mound
50-21998	MD50-03-50908	7.31	47.15	15.41	Ant mound
50-22006	MD50-03-50916	13.93	43.45	12.84	Ant mound
50-22009	MD50-03-50919	16.47	48.07	11.72	Ant mound
50-21983	MD50-03-50893	18.48	52.85	17.64	Burrow spoil
50-21985	MD50-03-50895	16.01	56.94	20.05	Burrow spoil
50-21986	MD50-03-50896	13.88	48.38	15.19	Burrow spoil
50-21987	MD50-03-50897	10.93	53.91	14.55	Burrow spoil
50-21988	MD50-03-50898	10.11	36.53	14.07	Burrow spoil
50-21989	MD50-03-50899	11.35	5	13.07	Burrow spoil
50-21990	MD50-03-50900	17.36	58.09	20.66	Burrow spoil
50-21992	MD50-03-50902	7.15	39.41	15.2	Burrow spoil
50-21994	MD50-03-50904	11.38	62	19.64	Burrow spoil
50-21995	MD50-03-50905	16.17	59.39	17.54	Burrow spoil
50-21996	MD50-03-50906	13.29	49.15	17.11	Burrow spoil
50-21999	MD50-03-50909	16.28	57.38	11.72	Burrow spoil
50-22000	MD50-03-50910	19.73	59.25	20.44	Burrow spoil
50-22001	MD50-03-50911	21.35	61.44	18.73	Burrow spoil
50-22002	MD50-03-50912	14.63	44.2	20.32	Burrow spoil
50-22003	MD50-03-50913	19.19	60.08	19.42	Burrow spoil
50-22004	MD50-03-50914	21.13	64.97	20	Burrow spoil
50-22005	MD50-03-50915	15.66	54.06	18.29	Burrow spoil
50-22007	MD50-03-50917	16.22	54.84	16.16	Burrow spoil
50-22008	MD50-03-50918	19.77	58.25	19.4	Burrow spoil

pCi = picoCuries

ant mound = material collected from ant mounds

burrow spoil = material collected from mammal burrow spoils

Table 2 shows the results of sampling of soil material associated with mammalian burrow spoils and ant mounds. Gross alpha, beta, and gamma activity was detected in every sample, the magnitude of which is similar across the site. Relative to the trees (Table 2 and Figures 2 and 3), there are no obvious outliers for gross alpha, beta, or gamma activity associated with soil material (Figures 2 through 4). It therefore does not appear that ants or mammals are accessing buried waste or other subsurface contamination and bringing associated radionuclides to the ground surface.

Conclusions and Recommendations

Considering the relatively uniform distribution of gross alpha, beta, and gamma activity in burrow spoils material (Figures 2-4), it does not appear that mammals and ants are transporting radionuclides from the subsurface to the ground surface at MDA C. Consequently, further investigation into this mechanism for transport of contaminants in buried waste does not appear critical for future site management strategies. However, changing site conditions including the degradation of waste and/or waste containers may alter future site conditions. In contrast, several trees showed elevated radioactivity for gross alpha and beta measurements (Figures 2 and 3). It would therefore appear that trees are capable of accessing waste and sequestering radionuclides in the pine needles. The current management policy of maintaining MDA C through mowing activities will minimize this transport pathway and active tree suppression should be continued. Evaluation of the potential for other plant species to uptake contamination via their roots, and investigation of the specific constituents and transport rates involved in root uptake, should also be considered.

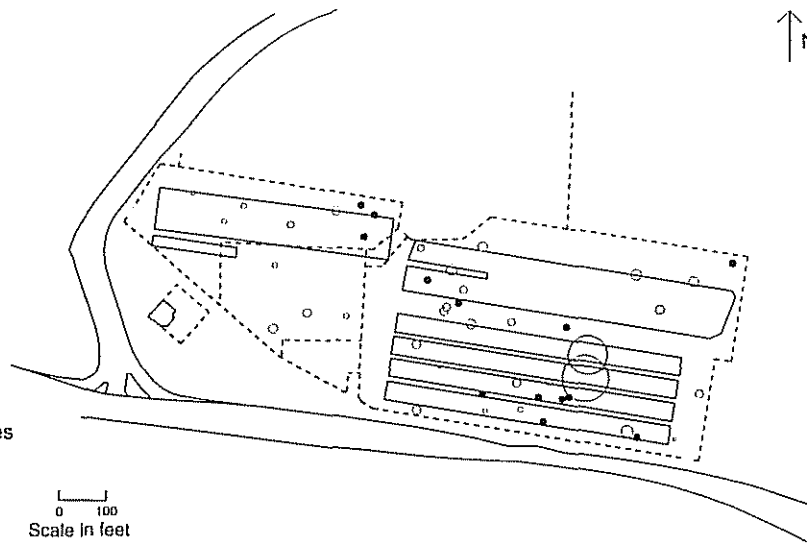
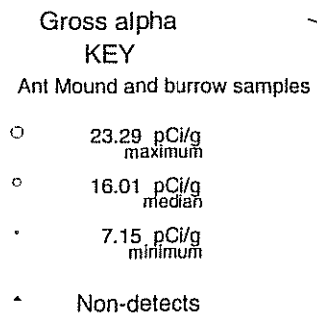
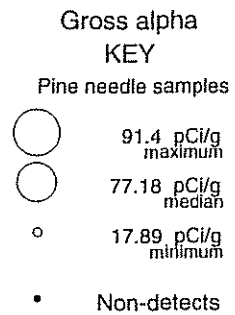


Figure 2. Bubble plot of gross alpha activity in pine needles and ant mound and burrow samples at MDA C.

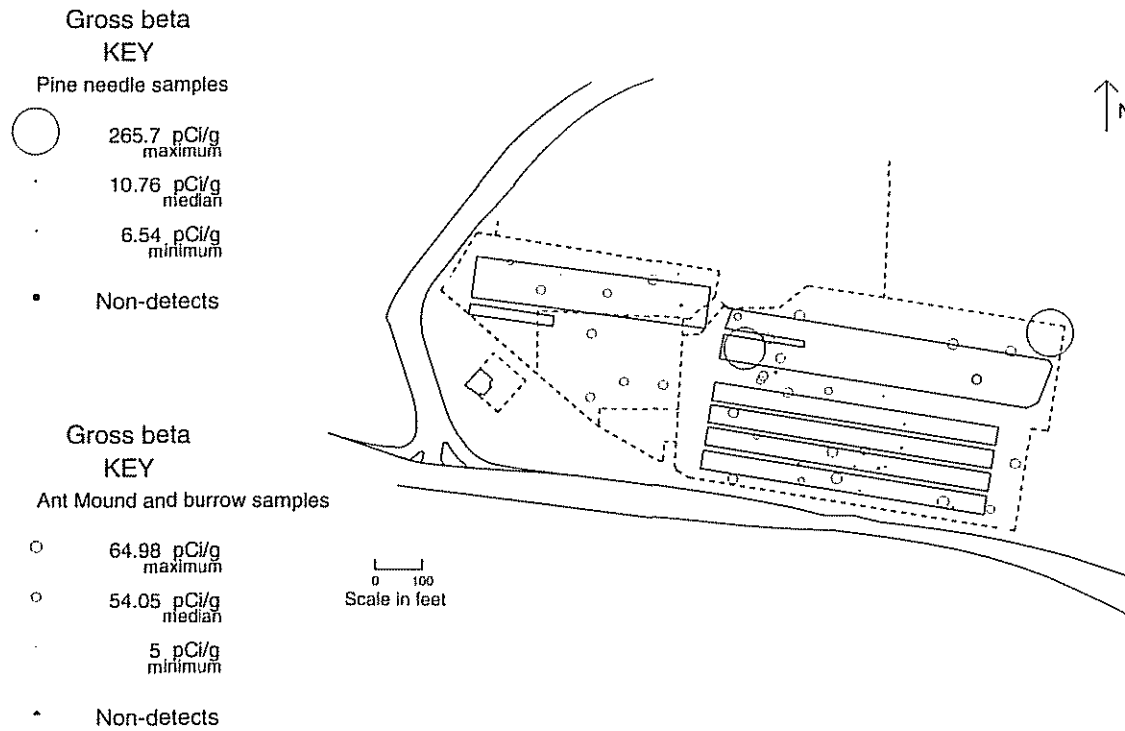


Figure 3. Bubble plot of gross beta activity in pine needles and ant mound and burrow samples at MDA C.

Gross gamma
KEY

Pine needle samples

- 9.54 pCi/g
maximum
- 6.34 pCi/g
median
- 2.77 pCi/g
minimum
- Non-detects

Gross gamma
KEY

Ant Mound and burrow samples

- 20.66 pCi/g
maximum
- 16.17 pCi/g
median
- 11.05 pCi/g
minimum
- Non-detects

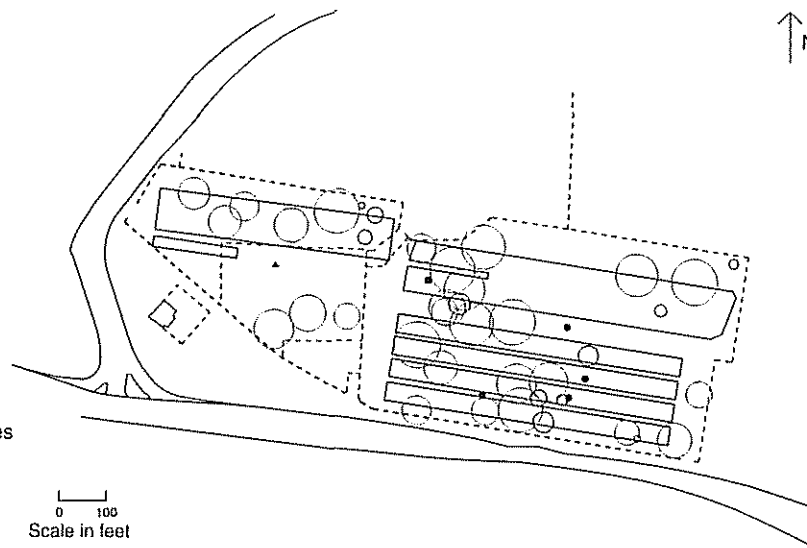


Figure 4. Bubble plot of gross gamma activity in pine needles and ant mound and burrow samples at MDA C.

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Appendix L

Summary of Anion Data

Report on Anion and Water-Content Profiles for Los Alamos National Laboratory, Material Disposal Area C Boreholes

**B.D. Newman, M.O. Gard, D. Counce, E. Kluk, J. Salazar, and T. Schofield
LA-UR-06-8311**

Los Alamos Environmental Restoration Project, and Earth and Environmental Sciences Division

November 2006

Introduction

As part of the 2006 field investigations of the Material Disposal Area (MDA) C subsurface, core samples from 20 boreholes were analyzed to develop pore-water anion profiles to help constrain the extent of some possible contaminants and to estimate downward fluxes and vadose zone residence times in the mesa using the chloride mass balance approach. The boundaries of MDA C and the borehole locations are shown in Figure 1. Chlorate, perchlorate, and nitrate were the primary contaminants investigated in this study because their concentrations can be constrained using the deionized water leaching procedure (see the Methods Section) and because these contaminants are present in the nearby Ten Site and Mortandad drainages (perchlorate and nitrate in particular). In addition, volumetric water-content profiles were measured using a neutron thermalization (neutron probe).

Methods

Water-Content Profiles

Volumetric water-content profiles were collected in 19 boreholes across MDA C using neutron thermalization (neutron probe). The profiles provide a higher resolution sampling than the laboratory-based gravimetric water-content analysis. Measurements were made in April and May 2006 with a Mount Sopris logging system using a CPN neutron source. These one-time measurements were taken at 0.5-ft increments over the entire depth of each borehole. Typically, neutron probe readings are gross counts of thermalized neutrons for a given count time that can then be converted to a volumetric water content through a comparison to standards of soil with known water-content values. This comparison is valid only if the counting geometry is constant. The calibrations used previously for similar studies were based on measurements in 2-in.-diameter access holes. Since the boreholes at MDA C are all 10 in. in diameter, previous calibrations could not be used. A new calibration was established based on the soil water content in the cores taken from four of the boreholes. The neutron count is divided by the daily standard count to compensate for any drift in the system. This ratio is then plotted versus the known volumetric water content (in this case, based on the laboratory-measured gravimetric samples and the appropriate bulk density), and a linear regression is determined to define a calibration equation. A total of 35 data pairs were used for the regression shown in Figure 2.

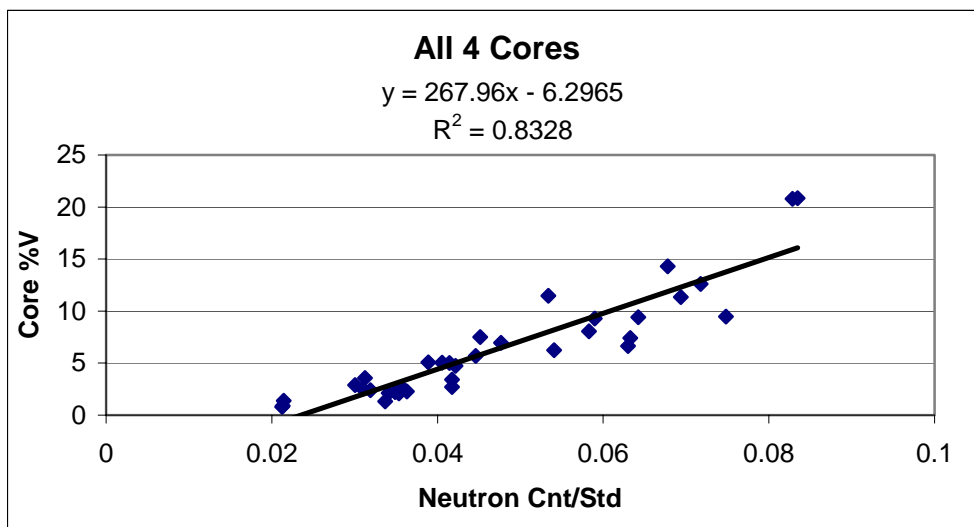


Figure 2. Regression plot of data used for the neutron probe calibration.

All field neutron-probe measurements were converted to volumetric water content using the regression equation shown on the plot. Plots of volumetric water content (% V) from cores versus calculated neutron-probe values are shown for all four boreholes used in the calibrations as a quality check of the calibration (Figures 3a–3d).

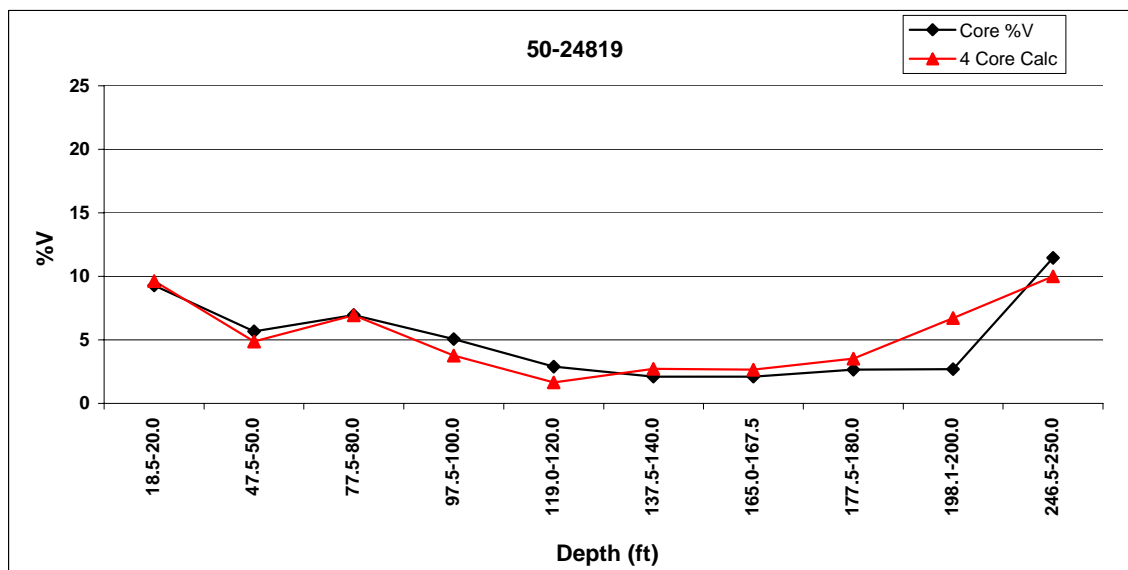


Figure 3a. Comparison of laboratory based and neutron probe volumetric water contents for calibration borehole 50-24819.

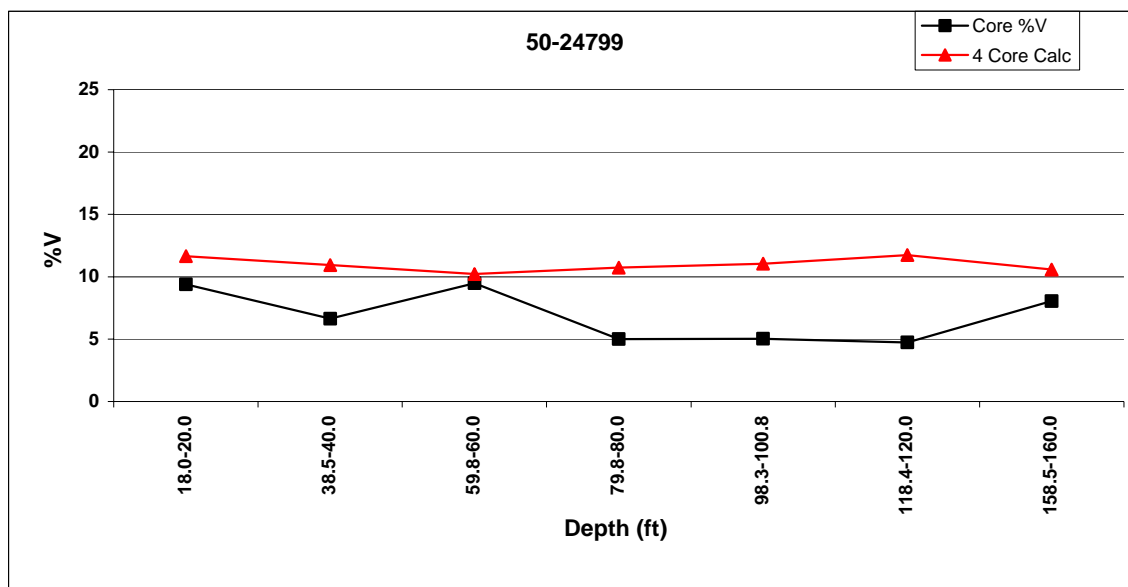


Figure 3b. Comparison of laboratory based and neutron probe volumetric water contents for calibration borehole 50-24799.

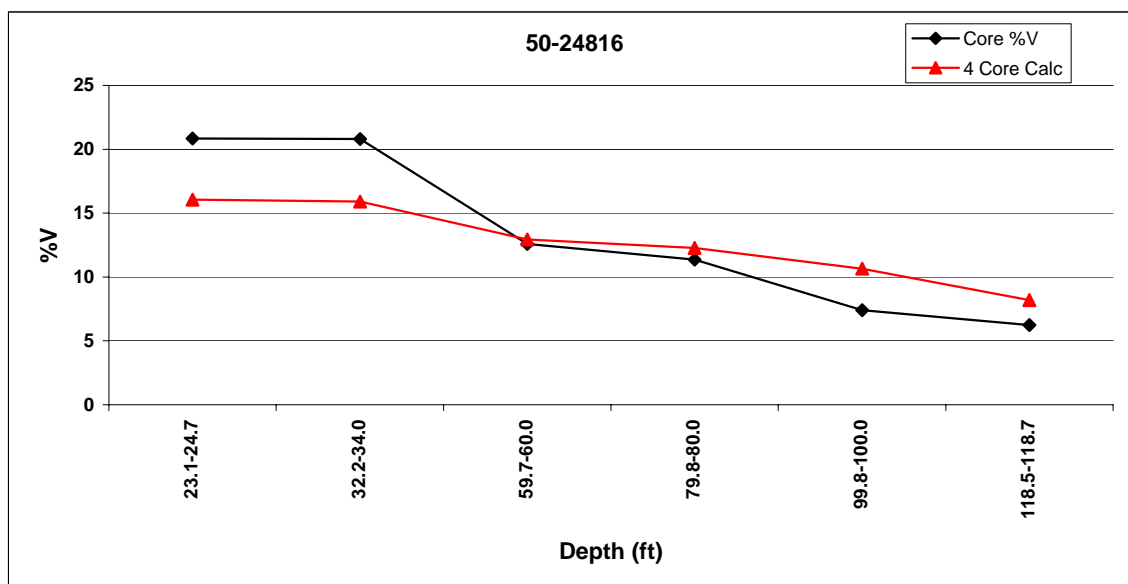


Figure 3c. Comparison of laboratory based and neutron probe volumetric water contents for calibration borehole 50-24816.

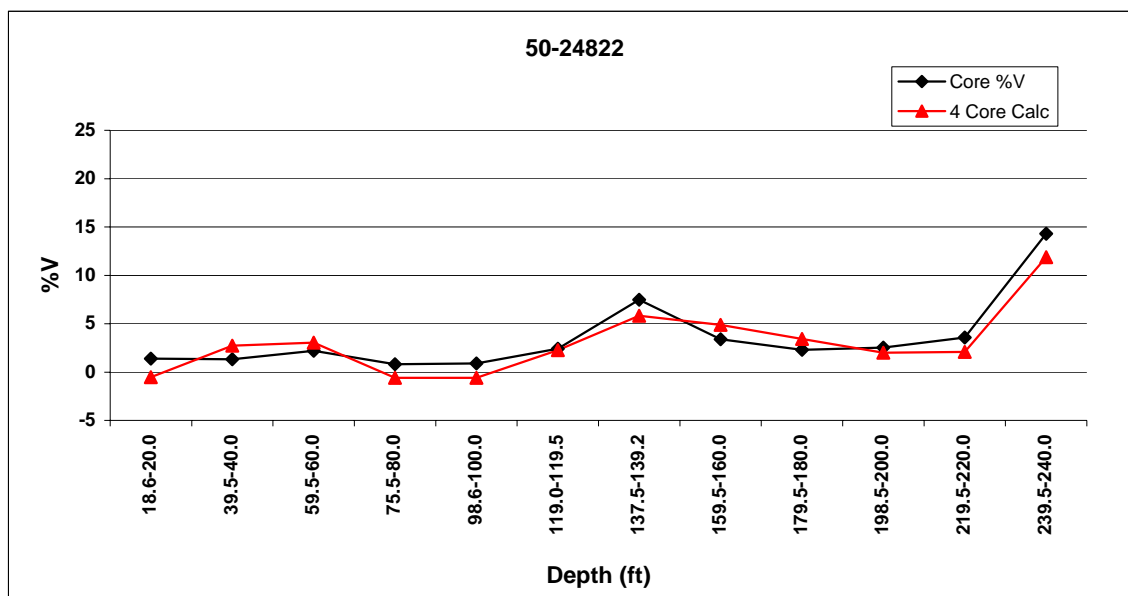


Figure 3d. Comparison of laboratory based and neutron probe volumetric water contents for calibration borehole 50-24822.

Because logging was done in open boreholes where borehole diameters varied as a result from drilling effects, the volumetric water-content data will not have the same accuracy as measurements from a uniform diameter borehole. Despite this limitation, the agreement between the laboratory-based values and the field-based values are generally good. Thus, even though the reported values may have additional error associated with them compared to other neutron-probe based data sets, they still appear to be representative of the in situ conditions within the mesa.

Anion Profiles

Pore-water chemistry values from 20 MDA C boreholes (50-24766, 50-24767, 50-24768, 50-24769, 50-24773, 50-24784, 50-24796, 50-24799, 50-24803, 50-24810, 50-24812, 50-24814, 50-24816, 50-24817, 50-24818, 50-24819, 50-24820, 50-24821, 50-24822, 50-245621) were determined to provide additional information regarding subsurface conditions at MDA C.

Core samples were collected on approximately 10-ft intervals, and all of the boreholes were sampled down to or near the maximum coring depth. Samples were collected and stored in pretared amber glass jars with Teflon lined lids. Samples were oven dried in the laboratory to determine gravimetric water content according to American Society for Testing and Materials (ASTM) method D2216-90, Standard Test Method for Laboratory Determination of Water (Moisture) Content of Soil and Rock.

Anion concentrations were determined following the procedure described in Broxton et al. (2001) and Newman et al. (1997a). Samples were leached using 50 g of dried alluvium or tuff with 75 g deionized water and agitated for 24 h on a rotary shaker. Once the shaker was turned off and the solid material settled, the supernatant was then filtered and analyzed using a dionex ion chromatograph at the Earth and Environmental Science Division Geochemistry Laboratory. Analytical precision of the ion chromatograph (IC) is better than 5%.

Pore-water anion concentrations were calculated using leachate concentrations (IC data), gravimetric water contents, and bulk densities. Bulk densities for each stratigraphic unit were taken from Rogers and Gallaher (1995). The pore water anion concentrations were then used to evaluate nature and extent of selected contaminants, and the chloride data were used in the chloride mass-balance approach to estimate downward water fluxes and residence times in the mesa vadose zone.

Chloride Mass-Balance Approach

The chloride mass-balance approach is particularly useful for estimating vadose zone fluxes and residence times in semiarid and arid environments (Allison et al., 1985; Newman et al., 1997a; Phillips, 1994; Scanlon, 2000). The approach involves measuring chloride concentrations in vadose zone pore water with depth. These concentrations serve as indicators of downward flux and residence time. The downward flux is inversely proportional to the amount of chloride accumulation: high chloride concentrations indicate a low flux that represents many years of meteoric chloride accumulation coupled with evapotranspirative removal of water. Relatively low chloride contents indicate a high downward flux because water is able to move through the vadose zone at a fast enough rate to flush chloride from the vadose zone. The residence time is proportional to the amount of chloride accumulation; for example, a long residence time and a low flux will occur when a lot of chloride is in the system.

The chloride mass-balance method is based on the following assumptions: (1) flow occurs largely as downward piston flow; (2) dispersive mixing of water and chloride is small; (3) atmospheric chloride deposition has been relatively constant and is the sole source of chloride to the system; and (4) chloride uptake by plants is negligible. A key assumption for application at MDA C is that disposal of liquid waste in the pits has not significantly affected the water and chloride contents in the zones where the boreholes were drilled. The validity of this assumption will be discussed later in the discussion section.

If vadose zone chloride concentrations are constant, then the long-term, average annual downward flux can be estimated using:

$$R = P \cdot Cl_p / Cl_{sw}, \quad (1)$$

where R is the flux (m/yr); P is the average annual precipitation rate (m/yr); Cl_p is the average concentration of chloride in bulk precipitation (g/m^3); and Cl_{sw} is the chloride concentration in vadose-zone water (g/m^3). However, chloride concentrations in profiles are sometimes not constant with depth (e.g., fluxes can change over time as a result of climate or land use changes, or other factors). In this case, plots of cumulative chloride as a function of cumulative water in the profile can be used to determine changes in fluxes. Approximately linear segments on the cumulative-cumulative plots indicate zones of constant flux. The flux for a segment is given by:

$$R = (Cl_p \cdot P) / Cl_{seg}, \quad (2)$$

where Cl_{seg} is the average chloride content of the samples represented by the segment (g/m^3).

Similarly, the vadose zone residence time can be determined using the cumulative amount of pore water chloride from the surface down to a particular depth using the following equation:

$$T = Cl_{cum} / (Cl_p \times P) \quad (3)$$

Where T is the vadose zone residence time (yr), Cl_{cum} is the cumulative chloride content from the land surface to a particular depth of interest (g/m^2). A value of 0.44 m/yr was used for the average annual precipitation (P) at MDA C, based on data in Bowen (1990), and a value of 0.29 g/m^3 was used for the average concentration of chloride in bulk precipitation (Cl_p) based on data in Anderholm (1994).

Results

Water-Content Profiles

Volumetric water-content plots from neutron probe measurements for each borehole are shown in Appendix 1. Data were aggregated by geologic unit, and values of maximum, minimum, and average water-content percentages were computed for each unit (Table 1). In general, water contents were low with average water contents for each borehole/unit below about 13%, and the majority of values were less than 10%. Maximum water contents were also low (with the exception of a few values in the 18—20% range), and the average maximum values for the various units were less than 18%. A brief summary of observations from Table 1 for each unit follows.

- Alluvium/ Fill — The range of average water-content values is typical for the near surface zone for the April/May timeframe. There is some variation in the range of maximum values which is mainly driven by the relatively higher water contents in boreholes 50-24816 and 50-24819. The range of minimum values is fairly small.
- Qbt 3 — The average water-content range is similar to the alluvium layer (<13%). However, there is more variation in that the average maximum water content is higher and the average minimum water content is lower than the alluvium/fill.
- Qbt 2 — The range of average water-content values is similar to the shallower units. The range of maximum values is similar to Qbt 3, but the minimum values are distinctly lower than either of the previous layers. Some of the water contents is low and may represent residual water-content conditions (the residual water content is the point where the rock is so dry that the water content cannot be reduced any further under the ambient environmental conditions).
- Qbt 1v — Only five of the boreholes sampled this unit. The range of average water-content values was slightly lower than the shallower units. The range of maximum values was slightly higher than Qbt 2 and the range of minimum values was equivalent to Qbt 2 values.
- Qbt 1g — Only three boreholes sampled this unit. The range of average water-content values was the highest of any unit, but this value is likely a function of the fact that data were collected from only three boreholes. This is supported by the observation that the range of maximum values is similar to the shallower units.

One other notable feature is that a distinct spike occurs in water content at the interface between the Qbt 1v and Qbt 1g in boreholes 50-24784, 50-24819, 50-24821, and 50-24822. This feature has been observed elsewhere in mesa environments at Los Alamos, for example at MDA G (Newman, 1996). It is probably related to a hydraulic contrast between the vapor-phase-altered Qbt 1v unit and the nonvapor-phase-altered Qbt 1g unit.

Table 1. Summary of Volumetric Water-Content Data by Geologic Unit

Borehole	Alluvium/Fill			Qbt 3			Qbt 2			Qbt 1v			Qbt 1g		
	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min
50-24766	6	8	5	10	17	3	10	16	6	—*	—	—	—	—	—
50-24767	5	5	5	7	12	2	9	13	0	—	—	—	—	—	—
50-24768	4	5	3	5	8	1	6	10	0	—	—	—	—	—	—
50-24769	9	18	4	7	15	3	5	10	0	—	—	—	—	—	—
50-24771	6	9	4	7	13	5	10	16	0	—	—	—	—	—	—
50-24782	6	7	4	5	10	0	4	7	0	—	—	—	—	—	—
50-24784	9	10	7	10	19	2	5	9	2	6	18	2	10	17	0
50-24797	5	8	3	5	13	1	5	8	0	—	—	—	—	—	—
50-24799	6	8	5	9	15	3	7	11	0	—	—	—	—	—	—
50-24801	7	9	5	5	13	0	4	7	0	—	—	—	—	—	—
50-24803	7	9	5	10	18	7	9	13	0	—	—	—	—	—	—
50-24810	6	7	5	11	21	7	11	19	0	—	—	—	—	—	—
50-24812	6	9	4	9	13	5	11	16	0	—	—	—	—	—	—
50-24814	5	6	5	6	9	1	9	14	0	—	—	—	—	—	—
50-24815	6	8	4	10	18	6	11	18	0	—	—	—	—	—	—
50-24816	13	18	7	13	21	8	9	14	5	6	11	0	—	—	—
50-24819	11	21	7	6	12	1	3	5	0	4	19	1	—	—	—
50-24821	7	9	5	8	12	1	13	19	7	7	14	1	14	16	12
50-24822	8	9	7	3	12	0	4	8	0	5	19	1	10	19	6
Unit averages, all holes	7	10	5	8	14	3	8	12	1	6	16	1	11	17	6

*— = No data available.

Anion Profiles

Pore-water anion concentration data for each borehole are shown in Appendix 2 for bromide, chloride, chlorate, perchlorate, fluoride, nitrite, nitrate, oxalate, phosphate, and sulfate. Profile plots for each borehole down to 275 ft are shown in Appendix 3. Concentrations of anions vary with depth and between boreholes (see example for borehole 27484 in Figure 4). Unit Qbt 2 often contains a zone where fluoride and phosphate and sometimes chloride and sulfate accumulate. This accumulation is not observed in every borehole, but it is present in quite a few. In terms of contaminants, perchlorate detections were relatively rare, and chlorate was not detected at all. Nitrate was detected in every borehole, but only some boreholes appear to have concentrations above what can occur naturally in mesas on the Pajarito Plateau. The significance of these data is discussed further in the Discussion Section.

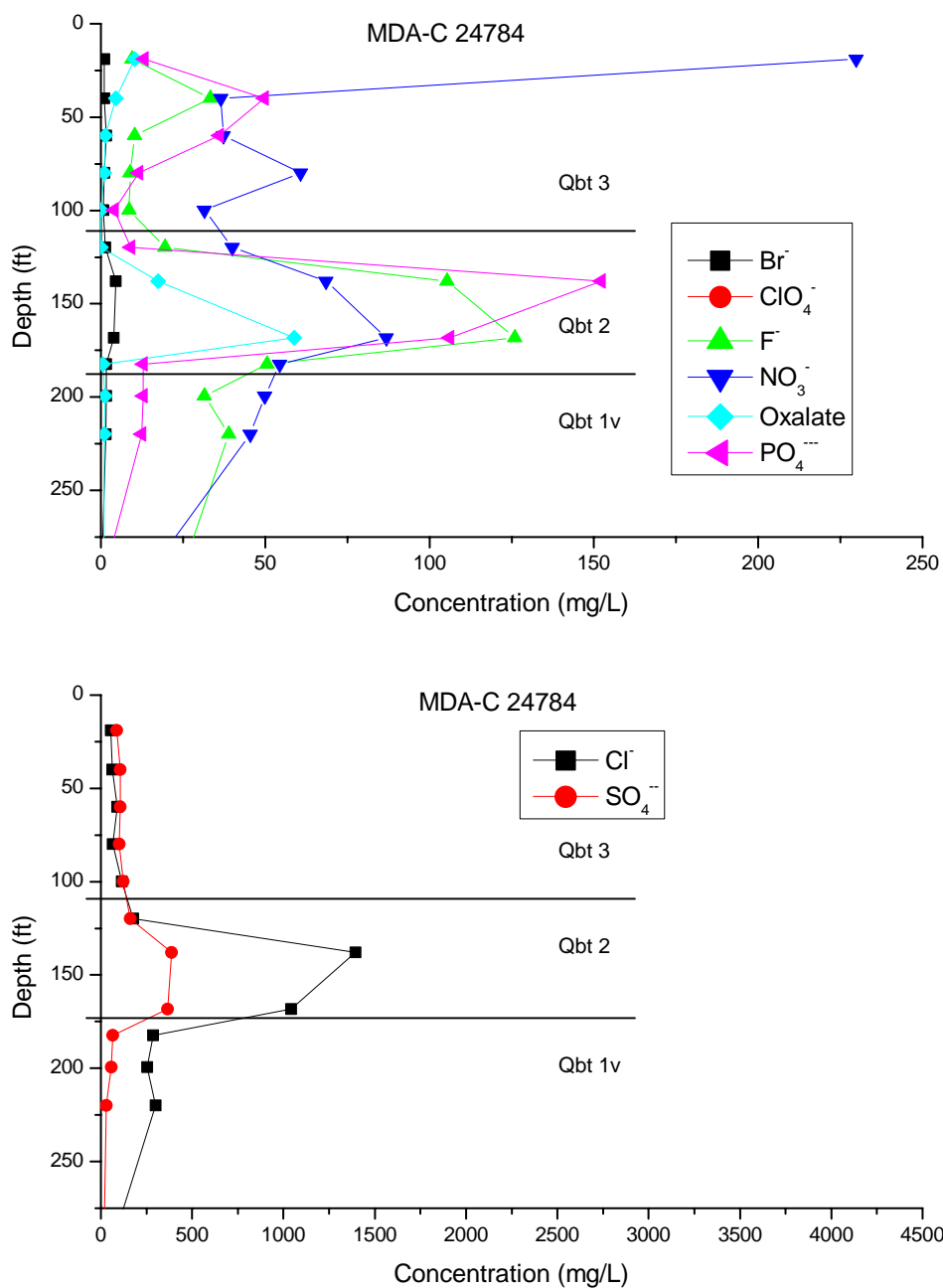


Figure 4. Example anion profiles for borehole 50-24784. Note how concentrations are affected by changes in stratigraphy.

Chloride-Based Flux Estimates

Downward flux estimates within the mesa at MDA C are shown in Table 2. Fluxes are low at <0.3 cm/yr, and some boreholes have flux estimates of <0.1 cm/yr. About half the boreholes can be characterized by a single long-term average flux throughout the entire depth sampled by the

borehole (i.e., those holes where “Flux All” and “Flux 1” are equal in Table 2). Other boreholes have apparent shifts in flux with depth (i.e., those holes that have values in the “Flux 2” or “Flux 3” columns in Table 2).

**Table 2. MDA C Downward Flux Estimates (cm/yr)
Using Chloride Mass Balance**

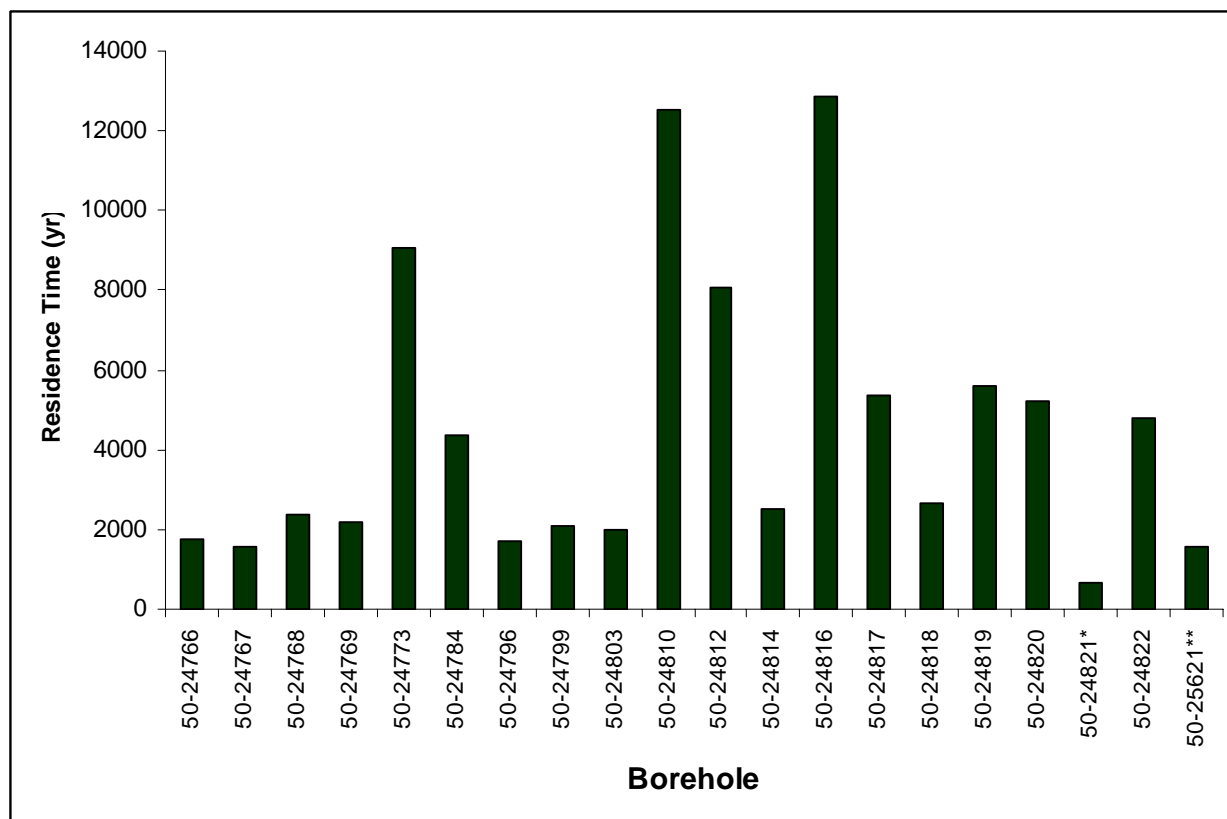
Borehole Number	Flux All	Flux 1	Flux 2	Flux 3
50-24766	0.26	0.26	—*	—
50-24767	0.20	0.20	—	—
50-24768	0.08	0.08	—	—
50-24769	0.11	0.17	0.07	—
50-24773	0.02	0.04	0.01	0.02
50-24784	0.04	0.14	0.02	0.07
50-24796	0.12	0.12	—	—
50-24799	0.18	0.18	—	—
50-24803	0.16	0.23	0.09	—
50-24810	0.04	0.04	—	—
50-24812	0.04	0.03	0.07	—
50-24814	0.11	0.11	—	—
50-24816	0.06	0.04	0.16	—
50-24817	0.07	0.04	0.08	—
50-24818	0.23	0.23	—	—
50-24819	0.07	0.06	0.29	—
50-24820	0.03	0.01	0.05	—
50-24821	0.32	0.32	—	—
50-24822	0.02	0.01	0.09	—
50-25621	0.16	0.16	—	—

Note: Flux all is the estimate using all the data assuming a constant long-term flux with depth. Boreholes with Flux 2 and Flux 3 estimates indicate changes in apparent flux with depth (note Flux 2 represents a deeper depth interval than Flux 1, and Flux 3 represents a deeper depth interval than Flux 2).

* — No further changes in flux with depth occur beyond those listed in the table for a particular borehole.

Vadose Zone Residence Times

In addition to facilitating the estimation of downward fluxes in the mesa, the pore-water chloride data can also be used to estimate the average residence time of water in the mesa vadose zone. These residence times indicate the average amount of time that a “packet” of water (e.g., a drop or something larger) will take to move from the mesa surface down to some depth. To address the problem that the boreholes were drilled to different depths, residence times were calculated down to 150 ft. The 150-ft depth is sufficient to provide a good indication of how long it takes to move through the upper part of the vadose zone at MDA C. Residence times are plotted in Figure 5 as a histogram so that the variation of residence times across MDA C can be seen.



*Residence time for 100 ft borehole.

**Residence time for 90 ft borehole.

Figure 5. Distribution of vadose zone residence times from MDA C boreholes at the 150 ft depth.

Discussion

Hydrological Characterization

Hydrological characterization using the borehole data presents a relatively consistent picture of the MDA C mesa subsurface. There is certainly variability across the site; however, the water-content and chloride results all suggest relatively dry, low downward flux, long residence-time conditions in the vadose zone. Based on data in Rogers and Gallaher (1995), the porosity of the tuffs at MDA C is very likely around 40%. The volumetric water-content data can be divided by the porosity to get an idea of the percent saturation in the mesa. Using the highest water content from Table 1 (21%) gives a percent saturation of about 50%. Thus, the pore space in the tuffs that have water contents around 20% are only about half full of liquid water. Most of the water-content values suggest percent saturations below 25%, and a good number of those suggest water contents substantially below that. Thus, none of the boreholes appeared to contact any zones of saturation, and much of the mesa subsurface is very dry.

In terms of downward fluxes and residence times, all the boreholes have substantial inventories of chloride, which qualitatively suggests that fluxes are low and residence times are long. When the quantitative chloride based flux results are calculated (Table 2), fluxes are indeed quite low.

The boreholes all have fluxes below 0.32 cm/yr and half of the holes have fluxes that are below 0.1 cm/yr. Half the boreholes can be characterized by a single downward flux, the others have apparent changes in flux with depth. In some of the boreholes changes are clearly related to contacts between stratigraphic units (where changes in hydraulic properties might occur). For example, changes in apparent flux occur at the Qbt 3/Qbt 2 contact in boreholes 50-24769, 50-24784, and 50-24803. Other boreholes show changes at the Qbt 2/Qbt 1v contact such as 50-24819. There are other boreholes such as 50-24773, 50-24812, 50-24816, and 50-24817 that do not have a clear correlation between changes in flux and changes in stratigraphy. These boreholes have shifts 10 to 20 ft above the Qbt 3/Qbt 2 contact. However, the changes in flux are not very large. Another observation is that if changes in flux with depth are observed, they tend to decrease with depth, except at 50-24816 and 50-24819. The residence-time calculations provide a similar result (Figure 5). Residence times for all the boreholes except 50-24821 are greater than 1000 yr, and two of the borehole results are greater than 10,000 yr. Borehole 50-24821 was drilled only to 100 ft, and thus the residence time may increase significantly if additional chloride is present below 100 ft in the mesa. (More cumulative chloride implies a longer residence time, as shown in Equation 3).

There is spatial variability in the water content, downward flux, and residence time results. This variability is likely the result of differences in surface infiltration, evapotranspiration, and the hydraulic properties across the site and with depth. What is notable about the water-content data is that even though there is variability, all the measurements indicate dry to very dry conditions. Likewise, the flux data vary, but many of the holes have fluxes that have less than an order of magnitude difference, and all of the fluxes suggest slow downward movement of water. The residence-time data vary by about an order of magnitude; however, all the data suggest that the long-term, average time scale of flow through the vadose zone is on the order of millennia. Some of the variability in the hydrological results may be attributable to effects from disposal practices. However, based on the data reported here, these effects appear to be relatively minor. This conclusion is also important because it suggests that the chloride-based fluxes and residence times are reasonably representative of actual site conditions. Contaminants such as perchlorate and nitrate (discussed below) were detected in some of the boreholes, but spatially extensive zones of these contaminants were not observed (with the exception of nitrate in 50-24766). One of the more important factors suggesting that effects of disposal practices are minor is the low water content. For example, every borehole encountered zones where volumetric water contents were less than 10%. Additionally, the MDA C results are similar to other mesa studies at Los Alamos (e.g., at MDA G and TA-49; Newman, 1996 and Newman et al., 1997b). Specifically, the range of water contents is typical of other mesa locations, as are the chloride based fluxes and residence times.

Contaminant Characterization

One of the more interesting MDA C results is that perchlorate was only detected in a few boreholes, and its concentrations were generally low (Table 3). In addition, in the boreholes where perchlorate was detected, it was observed only at one or two depths. This finding contrasts strongly to perchlorate profiles in lower Ten Site and Mortandad Canyons where perchlorate detections were common, and several boreholes had continuous zones of perchlorate contamination, sometimes down to around the 300 ft depth (Mortandad Canyon Investigation

Report, 2006, In Preparation). Chlorate was suspected to possibly be present in the vadose zone at MDA C because it was the replacement site for waste disposal at TA-21. Chlorate is often a cocontaminant with perchlorate at TA-21, and chlorate concentrations in the vadose zone at TA-21 are sometimes significantly higher than perchlorate (Newman et al., 2005). However, no chlorate was detected in any of the boreholes at MDA C, which is consistent with boreholes in the bottoms of Mortandad and Ten Site Canyons (which do not typically contain chlorate).

**Table 3. Summary of Pore-Water Perchlorate
Detections in MDA C Boreholes
(Concentrations in $\mu\text{g/L}$)**

Borehole Number	Max ClO_4^-	Min ClO_4^-	# of ClO_4^- Detections
50-24773	38	38	1
50-24799	26	26	1
50-24810	9	13	2
50-24812	13	13	1
50-24817	14	14	1
50-24822	214	43	2

Nitrate was detected in all boreholes. The presence of nitrate is not necessarily an indication of contamination because natural nitrate levels in vadose zones of the southwestern U.S., including the Los Alamos area, can be quite high (Walvoord et al., 2003). However, the potential presence of anthropogenic nitrate as contamination at MDA C can be evaluated by comparing the ratio of the pore-water nitrate concentration to the chloride concentration. In precipitation, the chloride concentration is consistently higher than nitrate. Thus, an uncontaminated sample of precipitation or percolating water (below the soil zone) will typically have a ratio less than one. Samples that have nitrate/chloride ratios larger than one are probably impacted by nitrate contamination. This approach may not identify every instance of nitrate contamination, but it does identify samples where substantial nitrate contamination is likely. Using the pore-water concentration data in Appendix 2, we find that 10 of the 20 boreholes have nitrate/chloride ratios less than one (for all samples), indicating minimal or no nitrate contamination. In addition, eight of the other ten boreholes only have one or two samples that have ratios above 1 (these are generally in the shallowest samples between 20 and 40 ft). Thus, only two boreholes have more than two samples with nitrate/chloride ratios over one. Borehole 50-24769 has three samples (from 20 to 60 ft) and Borehole 50-24766 has five samples (from 20 to 100 ft). These results indicate that in boreholes where nitrate contamination is evident, it tends to occur in the upper 40 ft of the profile (except in 50-24766 and 50-24769 where it occurs deeper). This depth range of nitrate contamination suggests that contaminant extent is limited largely to around 20—30 ft below the bottoms of the pits and shafts (which were excavated to 25 ft). However, in a few cases the vertical extent is around 75 ft below the pits and shafts.

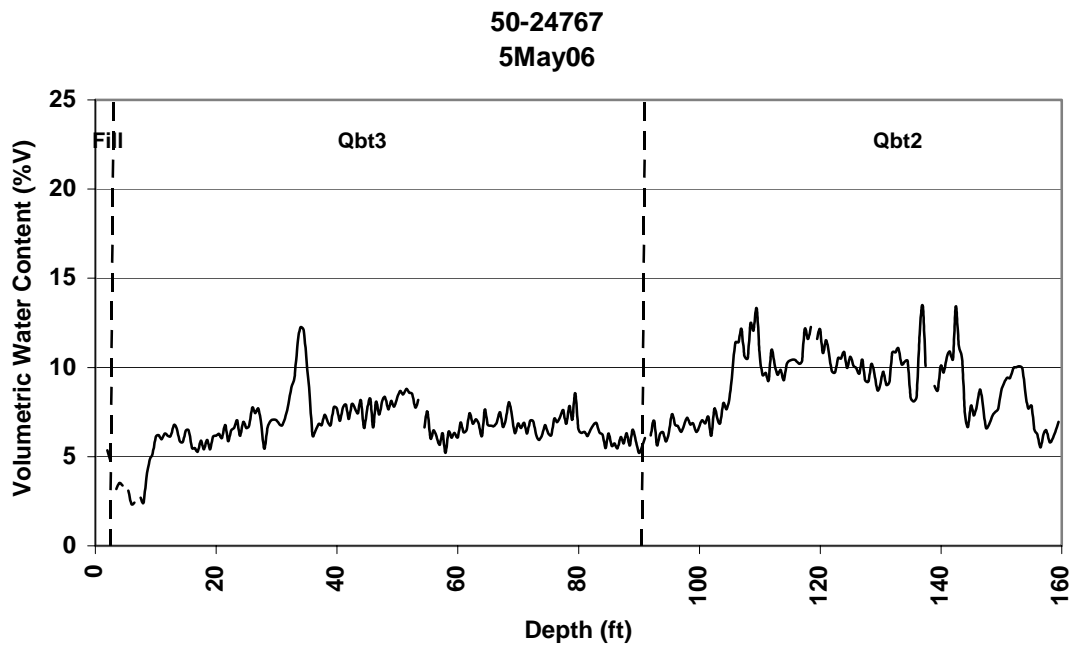
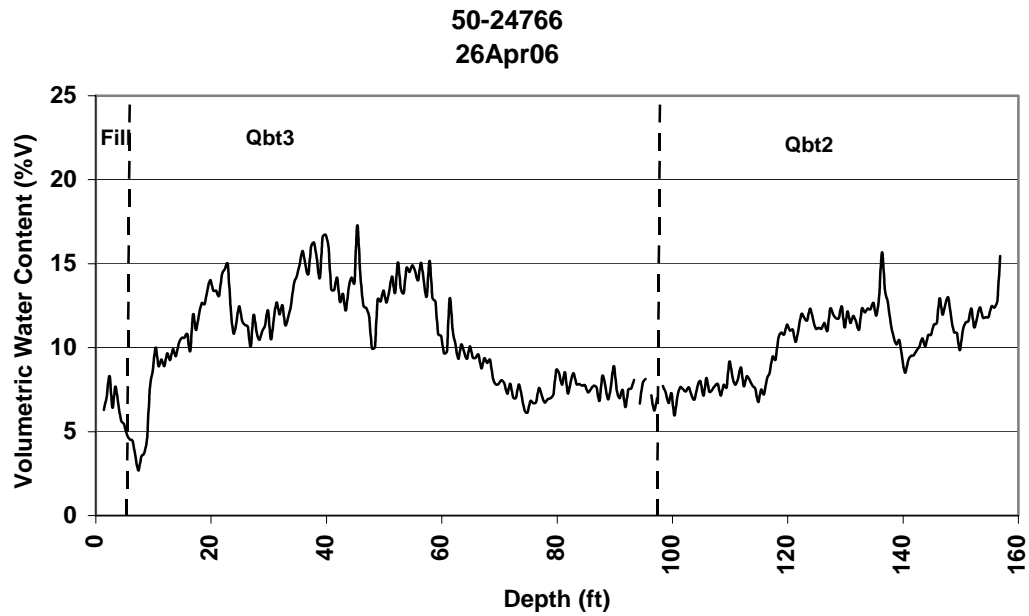
Acknowledgements

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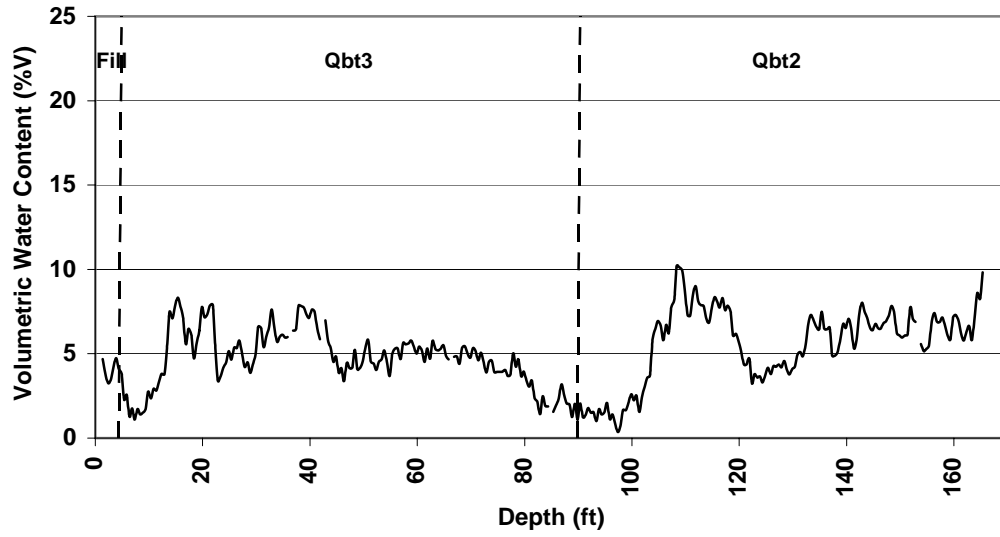
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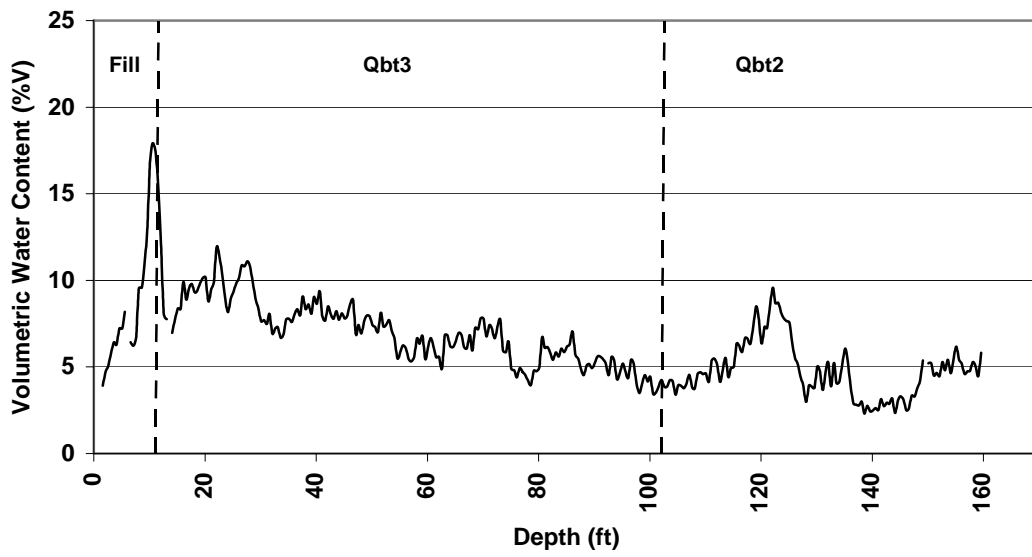
Appendix 1. Volumetric water content profiles with depth



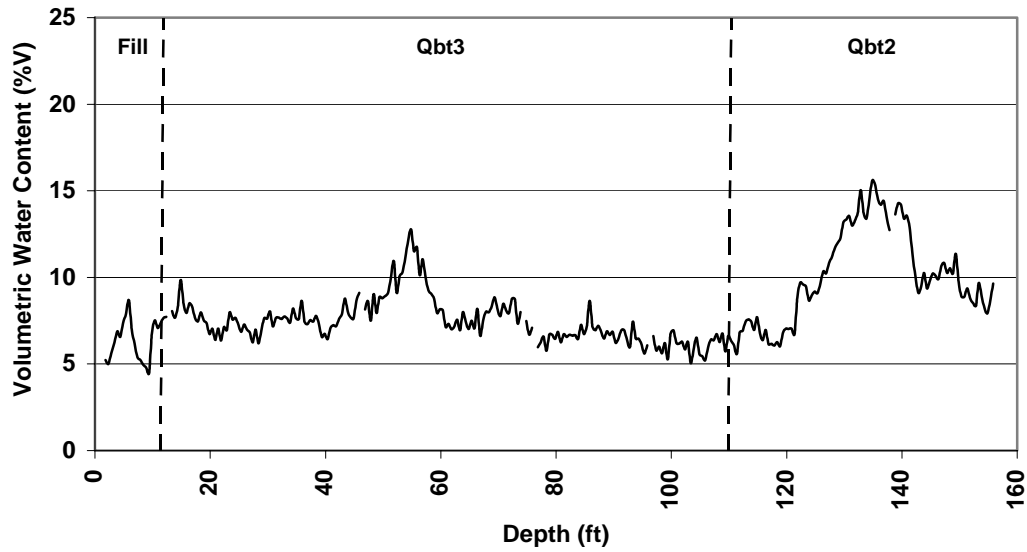
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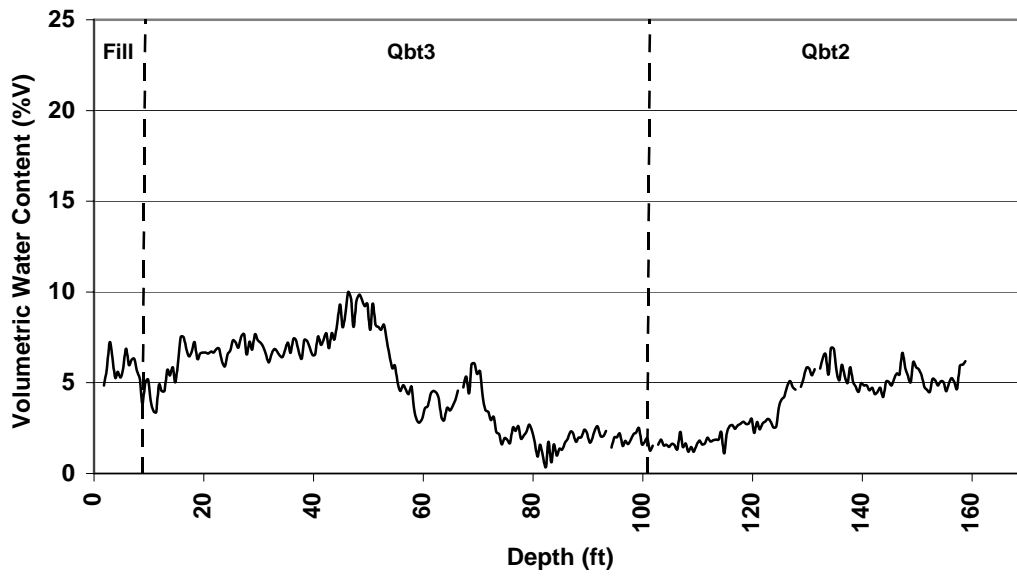
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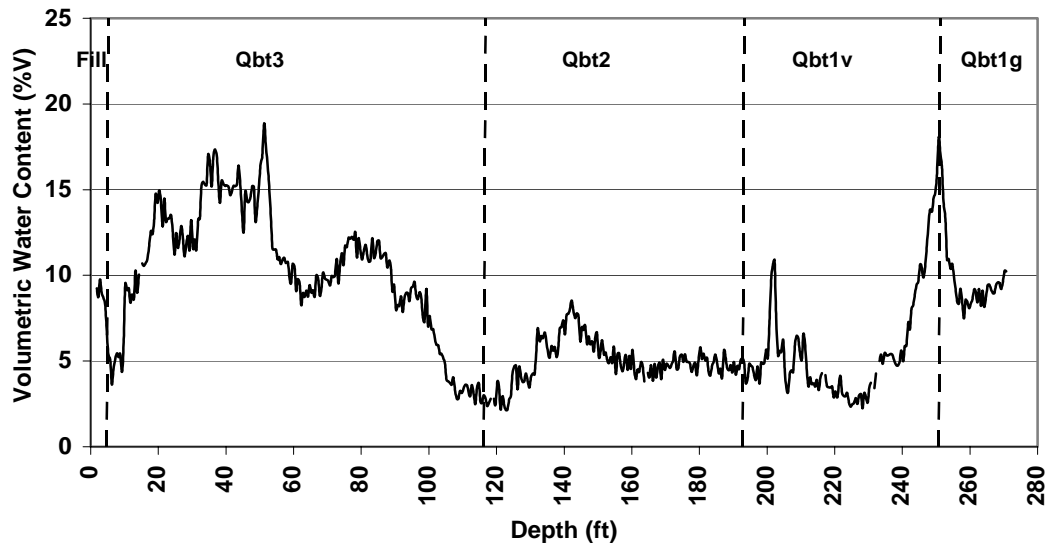
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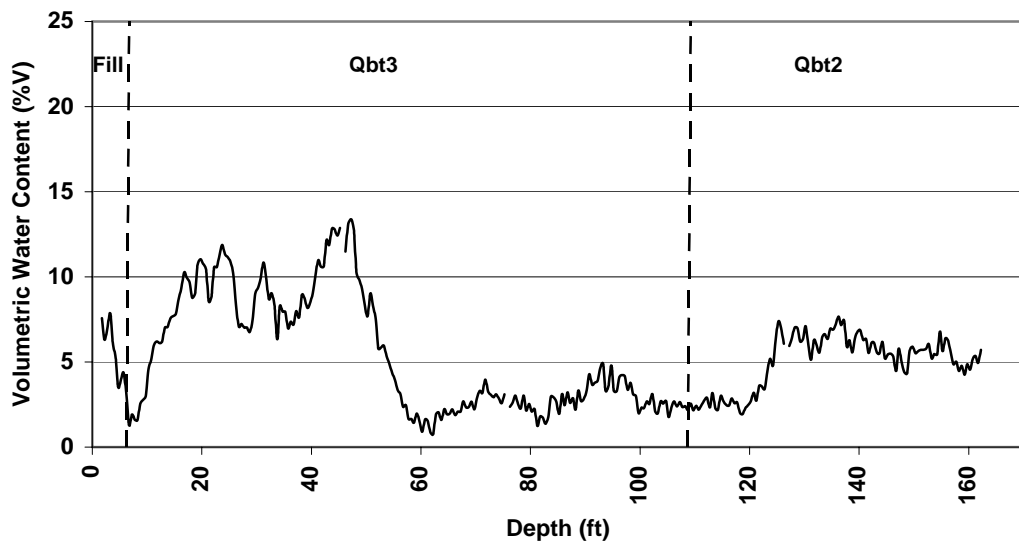
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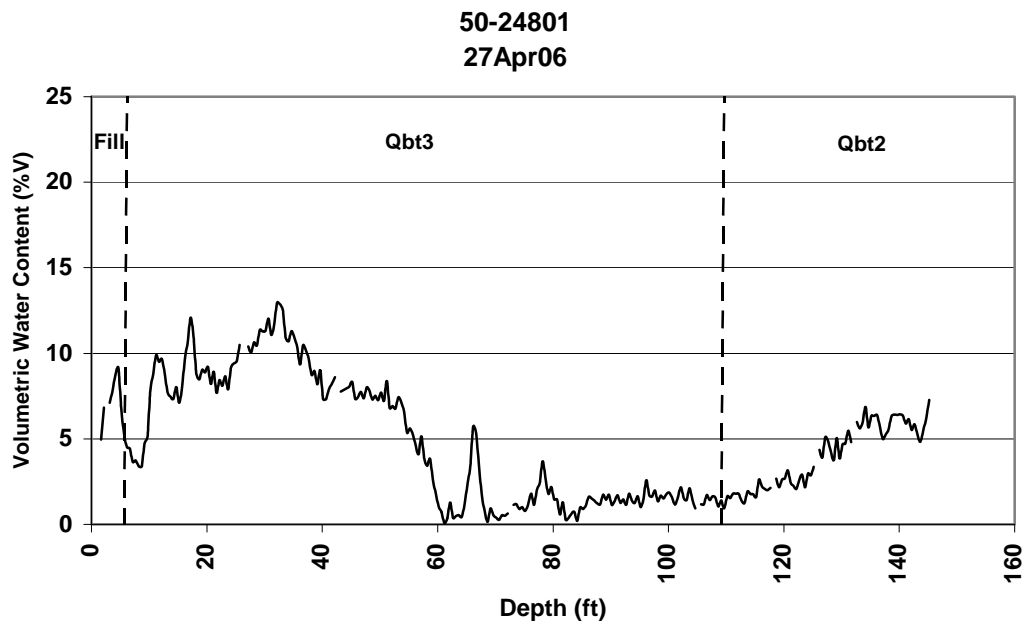
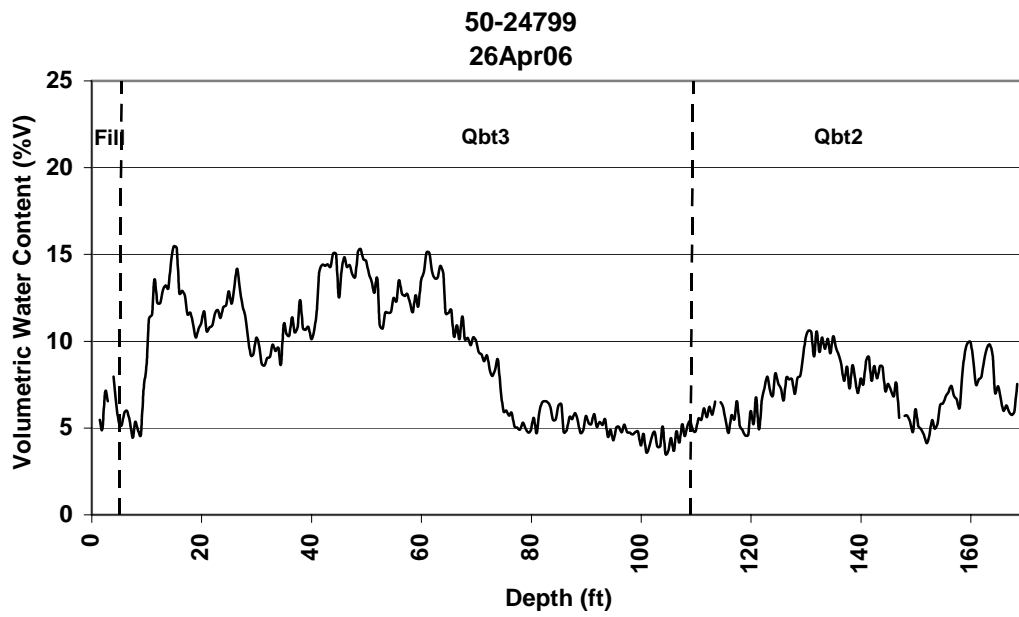


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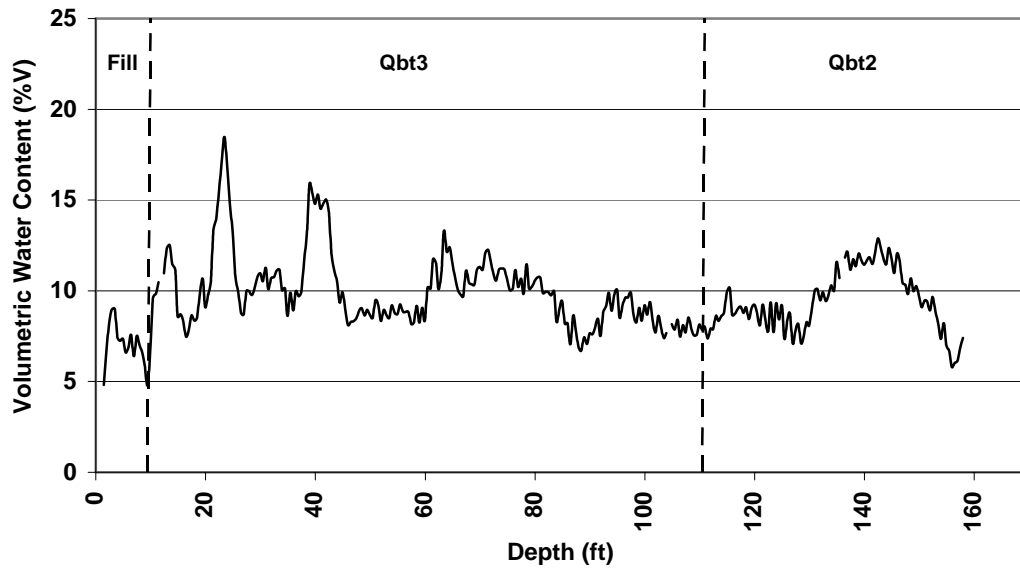


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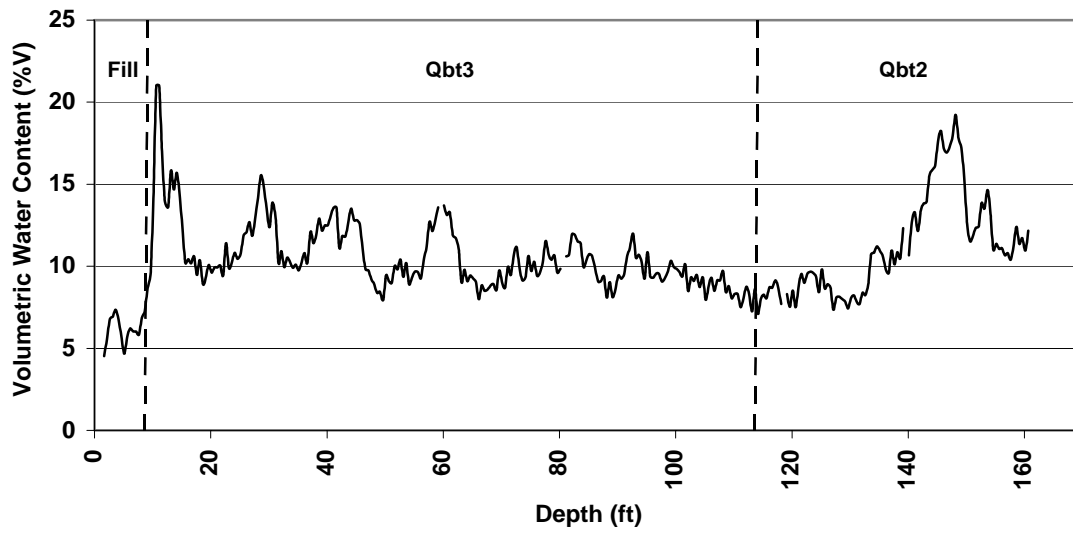




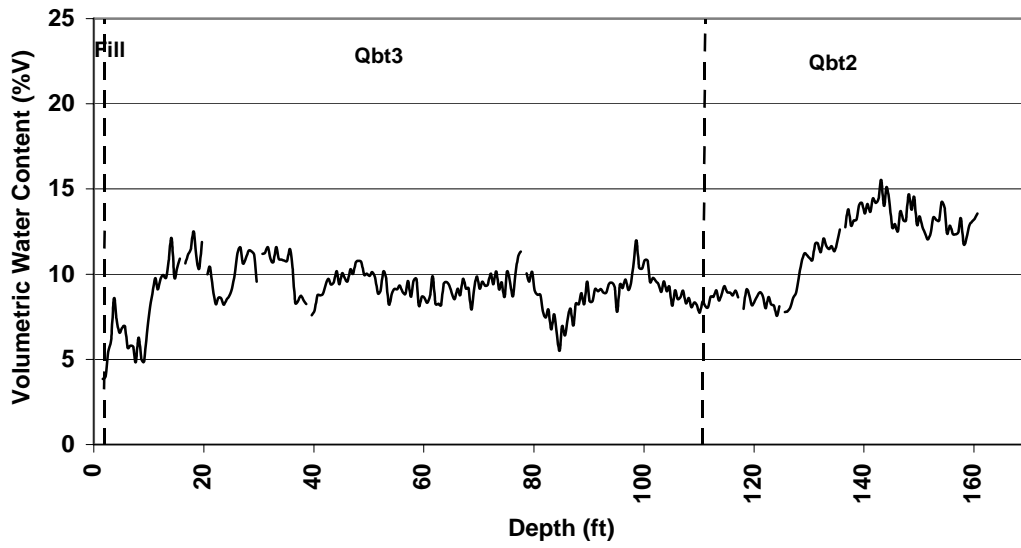
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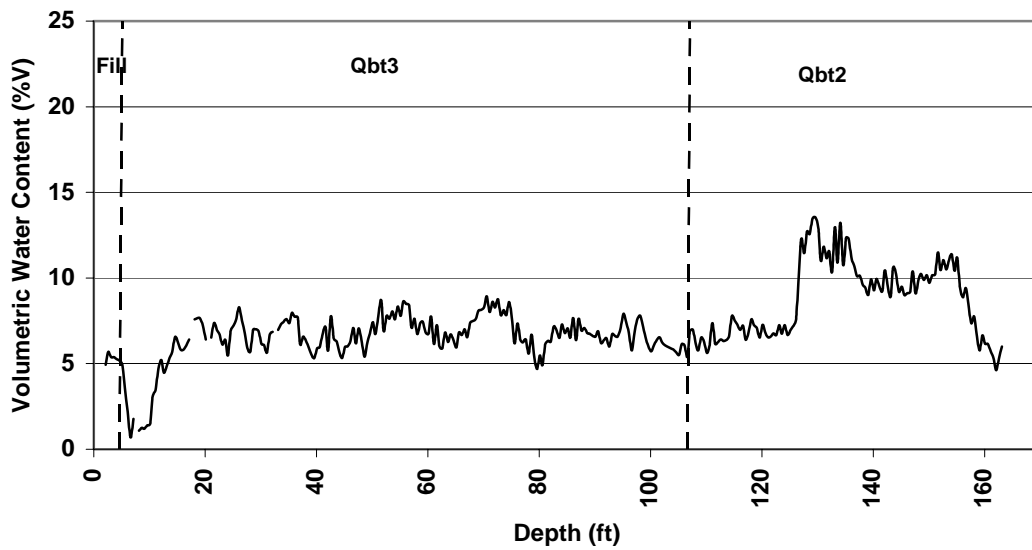
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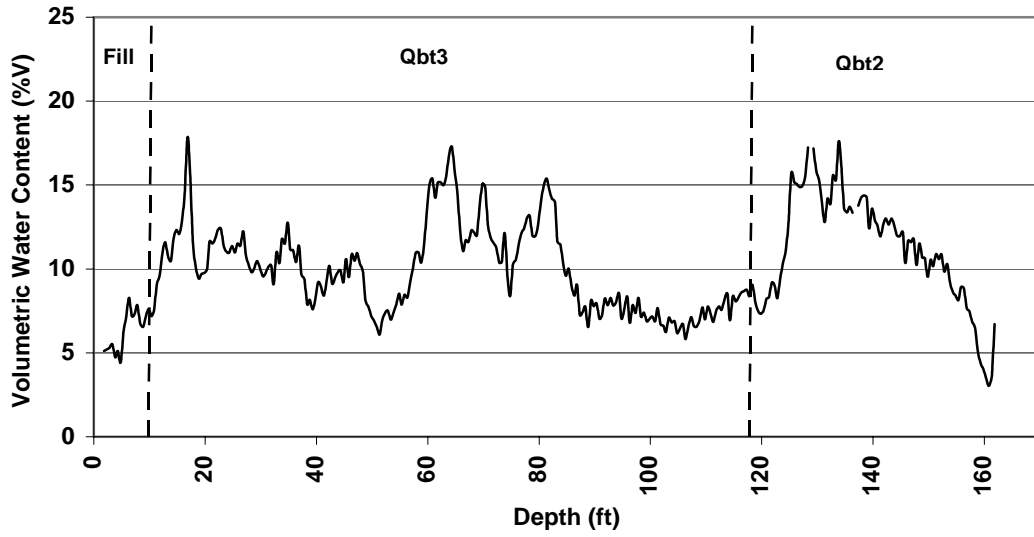
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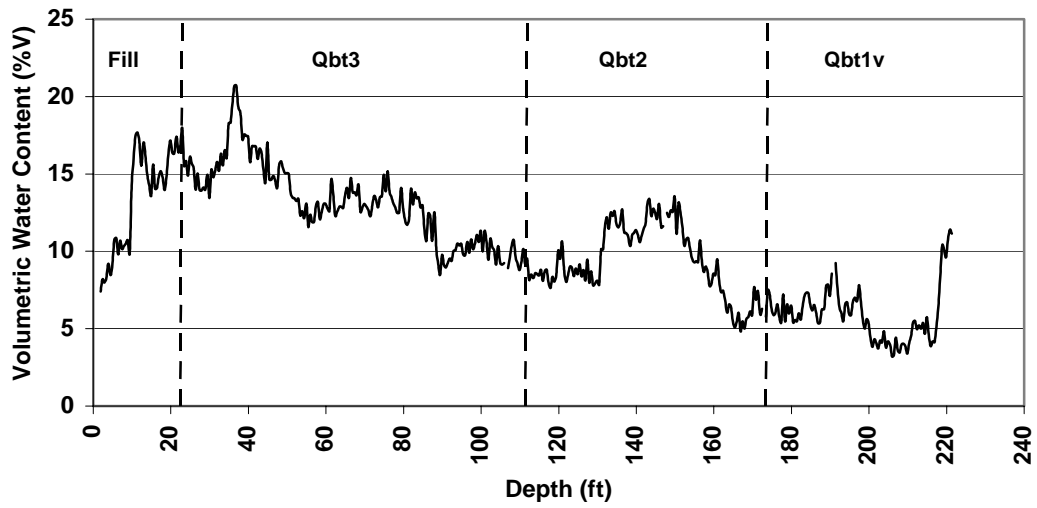
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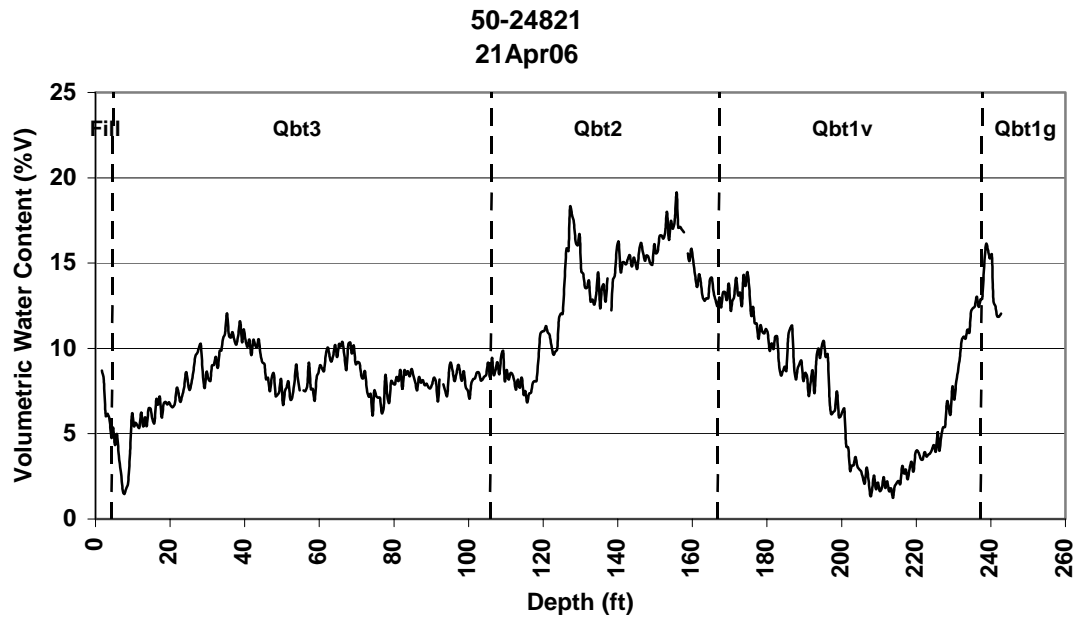
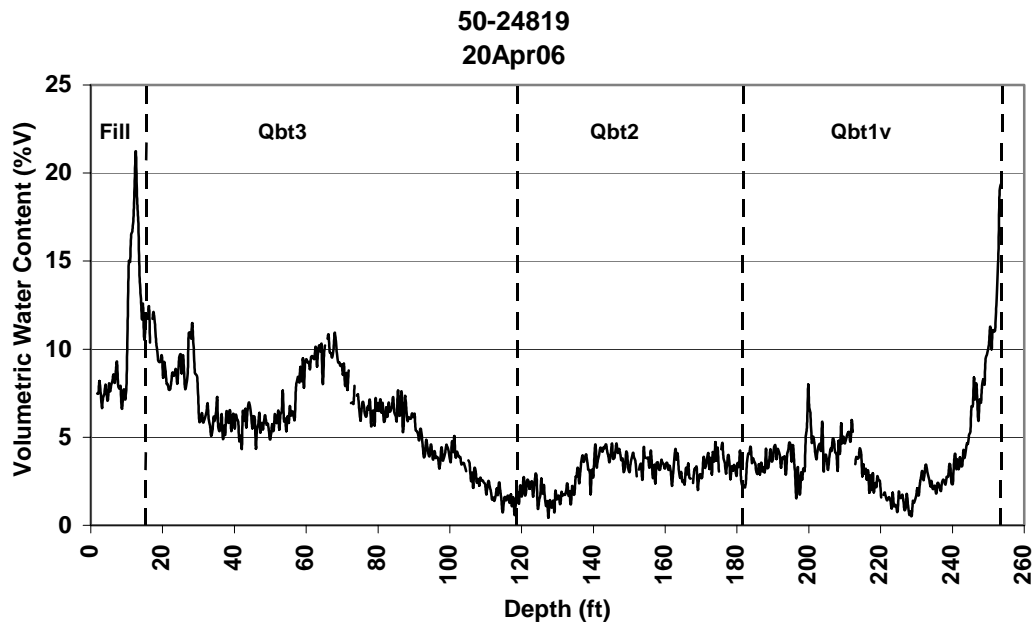


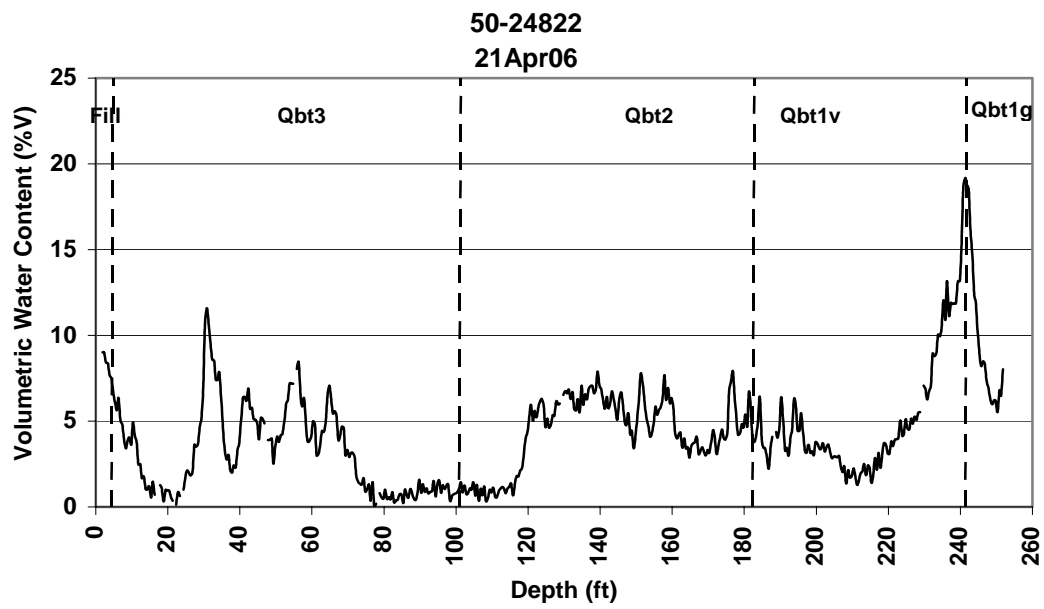
50-24815
5May06



50-24816
24Apr06







Appendix 2. Porewater anion and volumetric water content data from MDA C.
Volumetric water contents were derived from laboratory measurements of gravimetric water content.

50-24766 Anion Pore Water Concentration Estimates													
Sample ID	Depth (ft)	Depth (m)	Br- (mg/L)	Cl- (mg/L)	CLO3- (µg/L)	CLO4- (µg/L)	F- (mg/L)	NO2- (mg/L)	NO3- (mg/L)	Oxalate (mg/L)	PO4--- (mg/L)	SO4-- (mg/L)	%V
MD50-06-64611	19.4	5.9	BD	26	BD	BD	25	BD	38	1.0	15	25	11
MD50-06-64612	39.5	12.0	0.5	39	BD	BD	21	BD	99	0.6	20	61	13
MD50-06-64613	59.6	18.2	0.9	37	BD	BD	BD	BD	45	0.9	20	53	16
MD50-06-64614	79.5	24.2	1.2	33	BD	BD	4.9	BD	38	1.3	29	51	9
MD50-06-64615	100.0	30.5	0.8	37	BD	BD	8.9	BD	39	0.3	37	53	9
MD50-06-64616	123.3	37.6	0.9	121	BD	BD	BD	BD	43	1.6	53	59	8
MD50-06-64617	149.6	45.6	0.7	47	BD	BD	17	BD	20	1.4	17	43	11
BD-below detection													

50-24767 Anion Pore Water Concentration Estimates													
Sample ID	Depth (ft)	Depth (m)	Br- (mg/L)	Cl- (mg/L)	CLO3- (µg/L)	CLO4- (µg/L)	F- (mg/L)	NO2- (mg/L)	NO3- (mg/L)	Oxalate (mg/L)	PO4--- (mg/L)	SO4-- (mg/L)	%V
MD50-06-64643	19.9	6.1	1.4	105	BD	BD	17	BD	181	BD	30	63	6
MD50-06-64644	39.8	12.1	1.4	65	BD	BD	15	BD	176	1.8	8	23	8
MD50-06-64645	59.8	18.2	0.8	53	BD	BD	11	BD	27	0.6	20	78	6
MD50-06-64646	79.9	24.4	0.9	57	BD	BD	8.1	BD	2.5	0.5	9	19	7
MD50-06-64647	99.8	30.4	BD	41	BD	BD	23	BD	2.4	0.5	14	11	8
MD50-06-64648	119.8	36.5	1.3	52	BD	BD	64	BD	3.3	2.1	14	11	8
MD50-06-64649	149.8	45.7	2.2	64	BD	BD	53	BD	3.5	BD	24	6.6	5
BD-below detection													

50-24768 Anion Pore Water Concentration Estimates													
Sample ID	Depth (ft)	Depth (m)	Br- (mg/L)	Cl- (mg/L)	CLO3- (ug/L)	CLO4- (ug/L)	F- (mg/L)	NO2- (mg/L)	NO3- (mg/L)	Oxalate (mg/L)	PO4--- (mg/L)	SO4-- (mg/L)	%V
MD50-06-64675	19.7	6.0	1.1	38	BD	BD	20	BD	4.6	4.5	29	53	6
MD50-06-64676	39.6	12.1	1.8	275	BD	BD	11	BD	25	1.8	8	205	7
MD50-06-64677	59.2	18.0	1.7	169	BD	BD	12	BD	4.2	BD	9	66	6
MD50-06-64678	79.1	24.1	2.2	140	BD	BD	22	BD	2.0	BD	16	97	4
MD50-06-64679	99.5	30.3	5.0	287	BD	BD	54	BD	13	2.2	103	26	2
MD50-06-64680	118.8	36.2	3.1	91	BD	BD	37	BD	3.5	BD	40	29	5
MD50-06-64681	148.6	45.3	1.7	74	BD	BD	28	BD	5.2	0.7	48	25	4
BD-below detection													

50-24769 Anion Pore Water Concentration Estimates													
Sample ID	Depth (ft)	Depth (m)	Br- (mg/L)	Cl- (mg/L)	CLO3- (µg/L)	CLO4- (µg/L)	F- (mg/L)	NO2- (mg/L)	NO3- (mg/L)	Oxalate (mg/L)	PO4--- (mg/L)	SO4-- (mg/L)	%V
MD50-06-64707	19.9	6.1	1.35	82	BD	BD	11	BD	715	1.4	4	119	8
MD50-06-64708	39.9	12.2	BD	85	BD	BD	7	BD	258	0.8	15	50	7
MD50-06-64709	59.9	18.3	BD	74	BD	BD	9	BD	199	1.1	21	38	7
MD50-06-64710	79.4	24.2	BD	70	BD	BD	14	BD	23	0.8	30	76	5
MD50-06-64711	99.4	30.3	1.24	55	BD	BD	15	BD	13	1.5	35	39	4
MD50-06-64712	124.1	37.8	2.59	209	BD	BD	32	BD	43	3.3	42	60	6
MD50-06-64713	149.9	45.7	3.29	270	BD	BD	41	BD	35	3.4	121	40	2
BD-below detection													

50-24773 Anion Pore Water Concentration Estimates													
Sample ID	Depth (ft)	Depth (m)	Br- (mg/L)	Cl- (mg/L)	CLO3- (µg/L)	CLO4- (µg/L)	F- (mg/L)	NO2- (mg/L)	NO3- (mg/L)	Oxalate (mg/L)	PO4--- (mg/L)	SO4-- (mg/L)	%V
MD50-06-64789	19.8	6.0	7.2	410	BD	BD	36	BD	68	10	62	345	5
MD50-06-64790	40.0	12.2	3.9	210	BD	BD	9	BD	41	5.7	40	469	6
MD50-06-64791	60.0	18.3	28.4	1714	BD	38	9	BD	36	BD	3	1939	5
MD50-06-64792	80.0	24.4	BD	82	BD	BD	15	BD	8	BD	11	87	5
MD50-06-64793	100.0	30.5	1.8	70	BD	BD	28	BD	6	1.0	12	210	5
MD50-06-64794	125.0	38.1	3.2	527	BD	BD	117	BD	26	BD	56	758	3
MD50-06-64795	152.9	46.6	7.7	1154	BD	BD	65	BD	83	17	78	1464	3
BD-below detection													

50-24784 Anion Pore Water Concentration Estimates													
Sample ID	Depth (ft)	Depth (m)	Br- (mg/L)	Cl- (mg/L)	CLO3- (µg/L)	CLO4- (µg/L)	F- (mg/L)	NO2- (mg/L)	NO3- (mg/L)	Oxalate (mg/L)	PO4--- (mg/L)	SO4-- (mg/L)	%V
MD50-06-64387	19.0	5.8	1.1	55	BD	BD	10	1	230	10	13	87	9
MD50-06-64388	39.9	12.1	1.1	63	BD	BD	33	BD	37	4.6	50	106	9
MD50-06-64389	59.9	18.3	1.7	89	BD	BD	10	BD	37	1.4	36	107	7
MD50-06-64390	79.9	24.3	1.0	66	BD	BD	9	BD	61	1.0	11	100	10
MD50-06-64391	99.9	30.4	0.8	114	BD	BD	9	BD	32	BD	4.1	122	6
MD50-06-64392	119.9	36.5	1.4	178	BD	BD	20	BD	40	BD	9.1	162	3
MD50-06-64393	137.9	42.0	4.5	1394	BD	BD	105	BD	69	17.4	152	388	2
MD50-06-66642	168.3	51.3	3.9	1041	BD	BD	126	BD	87	58.8	106	367	3
MD50-06-66643	182.4	55.6	1.7	286	BD	BD	51	BD	54	0.5	13	65	4
MD50-06-66644	199.3	60.7	1.6	254	BD	BD	32	BD	50	1.3	13	56	3
MD50-06-66645	219.9	67.0	1.6	299	BD	BD	39	BD	46	1.1	12	29	4
MD50-06-66646	299.9	91.4	0.2	45	BD	BD	23	BD	12	0.9	0.4	17	11
BD-below detection													

50-24796 Anion Pore Water Concentration Estimates

Sample ID	Depth (ft)	Depth (m)	Br- (mg/L)	Cl- (mg/L)	CLO3- (ug/L)	CLO4- (ug/L)	F- (mg/L)	NO2- (mg/L)	NO3- (mg/L)	Oxalate (mg/L)	PO4--- (mg/L)	SO4-- (mg/L)	%V
MD50-06-64482	18.4	5.6	3.2	129	BD	BD	40	BD	179	3.9	82	136	7
MD50-06-64483	38.4	11.7	2.6	103	BD	BD	12	BD	25	0.8	66	89	5
MD50-06-64484	59.1	18.0	2.0	91	BD	BD	16	BD	21	1.1	68	68	5
MD50-06-64485	79.8	24.3	1.5	48	BD	BD	10	BD	13	0.4	62	57	5
MD50-06-64486	98.8	30.1	1.9	52	BD	BD	13	BD	13	1.0	55	51	4
MD50-06-64487	119.4	36.4	2.5	72	BD	BD	19	BD	15	1.8	87	57	3
MD50-06-64488	148.5	45.2	2.2	224	BD	BD	45	BD	32	27	61	235	3
BD-below detection													

50-24799 Anion Pore Water Concentration Estimates

Sample ID	Depth (ft)	Depth (m)	Br- (mg/L)	Cl- (mg/L)	CLO3- (ug/L)	CLO4- (ug/L)	F- (mg/L)	NO2- (mg/L)	NO3- (mg/L)	Oxalate (mg/L)	PO4--- (mg/L)	SO4-- (mg/L)	%V
MD50-06-64579	19.0	5.8	2.2	56	BD	BD	33	BD	93	3.7	24	112	9
MD50-06-64580	39.3	12.0	1.4	72	BD	BD	16	BD	89	3.5	44	95	7
MD50-06-64581	59.9	18.3	0.7	47	BD	BD	18	BD	28	1.5	30	100	9
MD50-06-64582	79.9	24.4	1.7	55	BD	26	10	BD	36	0.5	16	108	5
MD50-06-64583	99.6	30.3	3.9	55	BD	BD	12	BD	95	1.3	8.0	91	5
MD50-06-64584	119.2	36.3	BD	64	BD	BD	28	BD	32	2.2	13	75	6
MD50-06-64585	159.3	48.5	1.9	159	BD	BD	54	BD	26	BD	2.3	374	9
BD-below detection													

50-24803 Anion Pore Water Concentration Estimates

Sample ID	Depth (ft)	Depth (m)	Br- (mg/L)	Cl- (mg/L)	CLO3- (ug/L)	CLO4- (ug/L)	F- (mg/L)	NO2- (mg/L)	NO3- (mg/L)	Oxalate (mg/L)	PO4--- (mg/L)	SO4-- (mg/L)	%V
MD50-06-64921	19.9	6.1	0.5	52	BD	BD	10	BD	42	1.4	60	43	7
MD50-06-64922	39.9	12.1	1.1	62	BD	BD	7.9	BD	33	2.1	28	95	8
MD50-06-64923	59.9	18.3	1.3	70	BD	BD	10	BD	53	1.4	15	207	7
MD50-06-64924	79.9	24.4	0.5	45	BD	BD	18	BD	39	1.1	7.8	193	10
MD50-06-64925	99.9	30.4	0.6	48	BD	BD	17	BD	75	0.6	18	97	8
MD50-06-64926	124.9	38.1	0.5	59	BD	BD	33	BD	24	0.8	26	108	8
MD50-06-64927	154.0	46.9	1.5	214	BD	BD	42	BD	39	1.1	7.9	270	7
BD-below detection													

50-24810 Anion Pore Water Concentration Estimates													
Sample ID	Depth (ft)	Depth (m)	Br- (mg/L)	Cl- (mg/L)	CLO3- (ug/L)	CLO4- (ug/L)	F- (mg/L)	NO2- (mg/L)	NO3- (mg/L)	Oxalate (mg/L)	PO4-- (mg/L)	SO4-- (mg/L)	%V
MD50-06-65013	19.2	5.8	BD	102	BD	BD	9.5	BD	1.9	BD	29	15	10
MD50-06-65014	39.4	12.0	BD	121	BD	9.3	10	BD	6.3	0.8	39	20	10
MD50-06-65015	59.9	18.3	0.4	146	BD	BD	9.5	BD	14	1.7	8.9	128	27
MD50-06-65016	78.8	24.0	BD	493	BD	BD	2.7	BD	27	BD	12	77	10
MD50-06-65017	99.1	30.2	BD	680	BD	13	3.6	BD	14	BD	6.7	69	10
MD50-06-65018	124.0	37.8	BD	373	BD	BD	8.4	BD	17	BD	11	99	9
MD50-06-65019	151.7	46.2	1.7	333	BD	BD	3.8	BD	55	BD	0.2	448	11
BD=below detection													

50-24812 Anion Pore Water Concentration Estimates													
Sample ID	Depth (ft)	Depth (m)	Br- (mg/L)	Cl- (mg/L)	CLO3- (ug/L)	CLO4- (ug/L)	F- (mg/L)	NO2- (mg/L)	NO3- (mg/L)	Oxalate (mg/L)	PO4-- (mg/L)	SO4-- (mg/L)	%V
MD50-06-65108	19.4	5.9	1.8	514	BD	BD	46	BD	70	3.7	11	268	7
MD50-06-65109	39.1	11.9	0.7	384	BD	BD	34	BD	39	1.1	11	75	7
MD50-06-65110	59.4	18.1	0.8	441	BD	BD	33	BD	44	BD	11	101	8
MD50-06-65111	80.0	24.4	0.9	317	BD	BD	17	BD	38	BD	13	101	11
MD50-06-65112	99.0	30.2	1.0	BD	BD	13	29	BD	36	BD	11	120	9
MD50-06-65113	123.8	37.7	0.7	88	BD	BD	31	BD	27	BD	22	81	8
MD50-06-65114	147.6	45.0	0.5	130	BD	BD	101	BD	25	BD	2.7	201	16
BD=below detection													

50-24814 Anion Pore Water Concentration Estimates													
Sample ID	Depth (ft)	Depth (m)	Br- (mg/L)	Cl- (mg/L)	CLO3- (µg/L)	CLO4- (µg/L)	F- (mg/L)	NO2- (mg/L)	NO3- (mg/L)	Oxalate (mg/L)	PO4--- (mg/L)	SO4-- (mg/L)	% V
MD50-06-65165	19.9	6.1	BD	218	BD	BD	30.6	BD	326	2.8	11	124	5
MD50-06-65166	39.6	12.1	BD	45	BD	BD	10.6	BD	5.4	1.4	42	29	5
MD50-06-65167	59.6	18.2	0.6	50	BD	BD	40.2	BD	21	1.4	16	71	9
MD50-06-65168	79.6	24.2	0.5	61	BD	BD	72.1	BD	3.2	0.4	19	19	6
MD50-06-65169	100.0	30.5	BD	92	BD	BD	32.3	BD	4.6	BD	21	145	7
MD50-06-65170	124.9	38.1	BD	144	BD	BD	17.0	BD	27	BD	3.0	820	7
MD50-06-65171	149.6	45.6	2.1	178	BD	BD	35.7	BD	51	0.6	13	33	8
BD-below detection													

50-24816 Anion Pore Water Concentration Estimates													
Sample ID	Depth (ft)	Depth (m)	Br- (mg/L)	Cl- (mg/L)	CLO3- (µg/L)	CLO4- (µg/L)	F- (mg/L)	NO2- (mg/L)	NO3- (mg/L)	Oxalate (mg/L)	PO4--- (mg/L)	SO4-- (mg/L)	% V
MD50-06-65228	23.9	7.3	BD	397	BD	BD	11	BD	2.3	0.7	4.3	16	18
MD50-06-65222	33.1	10.1	BD	531	BD	BD	4.9	BD	2.9	0.3	3.8	17	18
MD50-06-65223	59.9	18.2	0.3	267	BD	BD	6.1	BD	4.6	0.7	8.6	27	11
MD50-06-65224	79.9	24.4	0.3	213	BD	BD	6.4	BD	27	0.6	6.1	11	13
MD50-06-65225	99.9	30.4	0.2	41	BD	BD	7.6	BD	16	0.2	25	3.2	8
MD50-06-66062	107.6	32.8	1.5	56	BD	BD	17	BD	8.8	4.1	10	142	14
MD50-06-65226	118.6	36.1	BD	25	BD	BD	5.1	BD	13	BD	11	5.7	8
MD50-06-65227	224.2	68.3	0.9	60	BD	BD	20	BD	2.3	BD	16	6.9	5
BD-below detection													

50-24817 Anion Pore Water Concentration Estimates													
Sample ID	Depth (ft)	Depth (m)	Br- (mg/L)	Cl- (mg/L)	CLO3- (µg/L)	CLO4- (µg/L)	F- (mg/L)	NO2- (mg/L)	NO3- (mg/L)	Oxalate (mg/L)	PO4--- (mg/L)	SO4-- (mg/L)	% V
RE50-05-62054	19.2	5.9	BD	81	BD	BD	67	BD	12	6.0	63	262	4
RE50-05-62055	38.5	11.7	1.0	87	BD	BD	17	BD	19	1.1	18	141	7
RE50-05-62056	59.8	18.2	4.7	564	BD	BD	5.5	BD	17	BD	2.0	868	5
RE50-05-62057	79.8	24.3	3.7	435	BD	14	3.5	BD	11	BD	0.6	592	12
RE50-05-62058	99.4	30.3	0.8	45	BD	BD	5.7	BD	44	0.4	19	94	6
RE50-05-62059	119.8	36.5	0.9	57	BD	BD	6.8	BD	99	0.6	35	87	8
RE50-05-62060	139.0	42.4	0.6	95	BD	BD	11	BD	72	1.7	41	78	9
RE50-05-62061	159.8	48.7	1.3	148	BD	BD	17	BD	12	0.3	3.3	185	9
RE50-05-63819	179.8	54.8	3.2	411	BD	BD	16	BD	29	BD	0.9	107	9
RE50-05-63820	199.8	60.9	0.3	41	BD	BD	23	BD	40	0.6	17	24	11
MD50-05-63850	249.1	75.9	0.8	69	BD	BD	30	BD	25	BD	0.7	26	22
BD-below detection													

50-24818 Anion Pore Water Concentration Estimates

Sample ID	Depth (ft)	Depth (m)	Br- (mg/L)	Cl- (mg/L)	CLO3- (µg/L)	CLO4- (µg/L)	F- (mg/L)	NO2- (mg/L)	NO3- (mg/L)	Oxalate (mg/L)	PO4--- (mg/L)	SO4-- (mg/L)	Cr (mg/L)	% V
MD50-06-66074	9.3	2.8	0.9	39	BD	BD	28	BD	357	3.5	BD	76	0.0	8
MD50-06-66058	29.3	8.9	1.4	88	BD	BD	18	BD	140	2.1	23	289	---	8
MD50-06-66059	49.2	15.0	1.4	93	BD	BD	11	BD	71	0.8	5.1	213	0.1	10
MD50-06-66060	69.0	21.0	1.6	118	BD	BD	8.8	BD	6.4	2.8	6.0	105	0.0	10
MD50-06-66075	94.9	28.9	0.4	38	BD	BD	9.1	BD	0.9	2.8	16	74	0.0	8
MD50-06-66076	129.9	39.6	0.5	129	BD	BD	15	BD	3.7	1.7	60	11	---	9
MD50-06-66077	148.4	45.2	0.9	84	BD	BD	17	BD	4.8	2.4	38	13	---	7
MD50-06-66078	169.9	51.8	0.5	54	BD	BD	9.8	BD	4.3	1.1	23	9.5	---	5
MD50-06-66079	190.0	57.9	0.5	44	BD	BD	5.8	BD	5.2	0.6	12	10	---	7
MD50-06-66716	209.9	64.0	0.4	48	BD	BD	8.0	BD	8.6	0.6	8.3	13	---	8
MD50-06-66064	229.9	70.1	0.2	15	BD	BD	4.8	BD	8.9	0.2	4.2	8.3	---	20
MD50-06-66065	247.6	75.5	0.4	64	BD	BD	22	BD	22	3.8	2.0	23	---	14
MD50-06-66066	269.8	82.2	0.2	45	BD	BD	16	BD	6.6	4.7	0.6	34	---	14
MD50-06-66067	289.8	88.3	0.3	48	BD	BD	18	BD	5.3	0.2	0.4	36	---	13
MD50-06-66068	309.9	94.5	0.2	32	BD	BD	15	BD	4.4	0.1	0.2	22	---	17
MD50-06-66069	329.6	100.5	0.1	18	BD	BD	34	BD	5.1	0.2	1.1	5.3	---	32
MD50-06-66070	354.9	108.2	BD	98	BD	BD	53	BD	BD	4.9	4.1	83	---	15
MD50-06-66071	380.9	116.1	BD	33	BD	BD	52	BD	6.6	1.1	3.4	12	---	8
MD-50-06-66072	447.3	136.3	0.3	39	BD	BD	47	BD	1.0	0.8	3.9	25	---	8
MD-50-06-66073	495.9	151.2	0.2	27	BD	BD	23	BD	2.0	0.5	1.9	18	---	14
MD-50-06-66717	545.9	166.4	0.3	29	BD	BD	18	BD	1.6	1.8	0.2	21	---	15
MD-50-06-66718	596.8	181.9	0.2	21	BD	BD	18	BD	4.8	BD	0.4	9.2	---	17
BD-below detection														

50-24819 Anion Pore Water Concentration Estimates

Sample ID	Depth (ft)	Depth (m)	Br- (mg/L)	Cl- (mg/L)	CLO3- (µg/L)	CLO4- (µg/L)	F- (mg/L)	NO2- (mg/L)	NO3- (mg/L)	Oxalate (mg/L)	PO4--- (mg/L)	SO4-- (mg/L)	% V
RE50-05-62152	19.25	5.9	0.8	277	BD	BD	39	BD	21	4.0	22	326	9
RE50-05-62153	48.75	14.9	0.7	194	BD	BD	6.5	BD	11	1.6	20	143	6
RE50-05-62154	78.75	24.0	2.1	389	BD	BD	6.9	BD	51	BD	0.9	501	7
RE50-05-62155	98.75	30.1	1.0	163	BD	BD	8.7	BD	38	0.6	3.6	36	5
RE50-05-62156	119.50	36.4	1.1	172	BD	BD	16	BD	27	0.9	14	114	3
RE50-05-62157	138.75	42.3	1.2	280	BD	BD	20	BD	31	4.5	40	29	2
RE50-05-62158	166.25	50.7	BD	137	BD	BD	54	BD	16	2.7	46	23	2
RE50-05-62159	178.75	54.5	0.7	153	BD	BD	61	BD	13	3.2	58	26	3
RE50-05-62160	199.05	60.7	BD	89	BD	BD	47	BD	12	1.7	38	20	3
RE50-05-62161	248.25	75.7	BD	19	BD	BD	19	BD	5.3	0.5	2.9	7.6	12
RE50-05-62162	274.25	83.6	BD	24	BD	BD	39	BD	6.5	0.4	1.3	12	11
BD-below detection													

50-24820 Anion Pore Water Concentration Estimates

Sample ID	Depth (ft)	Depth (m)	Br- (mg/L)	Cl- (mg/L)	CLO3- (µg/L)	CLO4- (µg/L)	F- (mg/L)	NO2- (mg/L)	NO3- (mg/L)	Oxalate (mg/L)	PO4--- (mg/L)	SO4-- (mg/L)	%V
RE50-05-62174	18.75	5.7	6.7	686	BD	BD	83	BD	33	10	152	634	2
RE50-05-62175	39.75	12.1	8.8	1026	BD	BD	28	BD	41	12	11	1397	4
RE50-05-62176	49.20	15.0	8.4	990	BD	BD	25	BD	53	4.1	4.7	652	3
RE50-05-62177	59.75	18.2	15	704	BD	BD	FALSE	BD	38	BD	4.7	337	2
RE50-05-62178	79.75	24.3	4.9	172	BD	BD	18	BD	42	0.6	4.2	18	3
RE50-05-62179	98.75	30.1	3.8	86	BD	BD	46	BD	28	2.4	7.3	19	3
RE50-05-62181	119.75	36.5	1.9	253	BD	BD	131	BD	22	4.3	56	27	3
RE50-05-62182	139.35	42.5	1.8	657	BD	BD	199	BD	33	4.8	58	38	2
RE50-05-62183	159.75	48.7	1.7	158	BD	BD	61	BD	12	3.9	28	15	2
RE50-05-62184	179.75	54.8	5.4	148	BD	BD	86	BD	2.1	9.9	12	24	2
RE50-05-62180	199.10	60.7	1.1	185	BD	BD	86	BD	7.7	2.0	21	23	2
RE50-05-63498	248.75	75.8	0.5	94	BD	BD	122	BD	12	3.1	3.7	37	7
BD-below detection													

50-24821 Anion Pore Water Concentration Estimates

Sample ID	Depth (ft)	Depth (m)	Br- (mg/L)	Cl- (mg/L)	CLO3- (µg/L)	CLO4- (µg/L)	F- (mg/L)	NO2- (mg/L)	NO3- (mg/L)	Oxalate (mg/L)	PO4--- (mg/L)	SO4-- (mg/L)	%V
RE50-05-62196	19.80	6.04	BD	57	BD	BD	10	BD	1.88	0.97	14	11	6
RE50-05-62197	49.30	15.03	0.41	41	BD	BD	7.1	BD	1.63	0.61	7.63	4.69	7
RE50-05-62198	99.20	30.24	BD	22	BD	BD	22	BD	2.39	0.34	9.34	3.40	12
BD-below detection													

50-24822 Anion Pore Water Concentration Estimates

Sample ID	Depth (ft)	Depth (m)	Br- (mg/L)	Cl- (mg/L)	CLO3- (µg/L)	CLO4- (µg/L)	F- (mg/L)	NO2- (mg/L)	NO3- (mg/L)	Oxalate (mg/L)	PO4--- (mg/L)	SO4-- (mg/L)	%V
RE50-05-62206	19.30	5.9	15	1304	BD	BD	53	BD	5.8	12	94	2023	1
RE50-05-62207	39.75	12.1	41	3951	BD	214	44	BD	7.2	6.1	19	1150	1
RE50-05-62208	59.75	18.2	6.7	536	BD	43	41	BD	8.7	3.3	15	52	1
RE50-05-62209	77.75	23.7	2.3	225	BD	BD	49	BD	67	3.3	70	44	1
RE50-05-62110	99.30	30.3	BD	175	BD	BD	49	BD	45	2.7	70	46	1
RE50-05-62111	119.25	36.3	0.7	115	BD	BD	41	BD	74	3.4	38	58	3
RE50-05-62212	138.35	42.2	0.6	32	BD	BD	14	0.5	40	1.7	4.9	48	1
RE50-05-62213	159.75	48.7	0.5	65	BD	BD	30	BD	60	1.2	39	21	4
RE50-05-62214	179.75	54.8	BD	83	BD	BD	22	BD	61	1.7	45	17	1
RE50-05-62215	199.25	60.7	BD	111	BD	BD	16	BD	65	1.1	34	17	3
RE50-05-62116	219.75	67.0	BD	71	BD	BD	16	BD	29	0.7	8.9	14	1
RE50-05-63499	239.75	73.1	0.2	22	BD	BD	21	BD	7.1	0.3	3.0	4.9	13
BD-below detection													

50-25621 Anion Pore Water Concentration Estimates													
Sample ID	Depth (ft)	Depth (m)	Br- (mg/L)	Cl- (mg/L)	CLO3- (µg/L)	CLO4- (µg/L)	F- (mg/L)	NO2- (mg/L)	NO3- (mg/L)	Oxalate (mg/L)	PO4--- (mg/L)	SO4-- (mg/L)	% V
MD50-06-68036	29.9	9.1	2.6	143	BD	BD	11	BD	122	2.6	25	125	6.2
MD50-06-68038	49.9	15.2	205	109	BD	BD	13	BD	BD	BD	BD	113	7.5
MD50-06-68039	59.9	18.2	1.8	80	BD	BD	BD	BD	18	5.0	9.3	583	10
MD50-06-68040	69.9	21.3	BD	29	BD	BD	19	BD	10	1.6	12	68	13
MD50-06-68037	89.5	27.3	BD	35	BD	BD	15	BD	11	2.0	13	42	15
BD-below detection													

Appendix 3. Porewater anion depth profiles.

