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DEPARTMENT OF ENERGY
Environmental Management Los Alamos Field Office (EM-LA)
Los Alamos, New Mexico 87544

RECEIVED JUN 30 2021 NMED Hazardous Waste Bureau

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Mr. Ricardo Maestas
Acting Bureau Chief
Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Drive East, Building 1
Santa Fe, NM 87505-6313

Subject: Submittal of the Corrective Measures Evaluation Report for Material Disposal Area C, Solid Waste Management Unit 50-009 at Technical Area 50, Revision 1

Dear Mr. Maestas:

Enclosed please find two hard copies with electronic files of the "Corrective Measures Evaluation Report for Material Disposal Area C, Solid Waste Management Unit 50-009, at Technical Area 50, Revision 1." This report documents the corrective measures evaluation (CME) conducted for Material Disposal Area (MDA) C, Solid Waste Management Unit (SWMU) 50-009, located at Los Alamos National Laboratory's Technical Area 50. MDA C, which was in operation from 1948 to 1974, consists of 115 subsurface disposal units (7 pits and 108 shafts). The wastes disposed of in these disposal units contain both hazardous constituents that are regulated by the New Mexico Environment Department (NMED) and radionuclides that are regulated by the U.S. Department of Energy (DOE).

The goal of the CME is to recommend a corrective measures alternative for SWMU 50-009 in accordance with the requirements of the 2016 Compliance Order on Consent (the Consent Order). The corrective measures alternative must also meet requirements for radiation protection under DOE regulations and orders. Five alternatives were evaluated for closing MDA C, and the CME proposes a recommended alternative.

The MDA C CME was previously submitted to NMED in September 2012. NMED did not provide comments on the report. Since that submission, additional site data have been collected. The MDA C CME was revised to include the additional site data and is being submitted as Revision 1. This report fulfills a proposed fiscal year 2021 milestone in Appendix B of the Consent Order. As per Section XXIII C of the Consent Order, a pre-submission meeting was held with NMED on April 19, 2021, to discuss the content of the report and review the five corrective measures alternatives.

If you have any questions, please contact David Diehl at (505) 551-2496 (david.diehl@em-la.doe.gov) or Cheryl Rodriguez at (505) 414-0450 (cheryl.rodriguez@em.doe.gov).

Sincerely,

ARTURO DURAN Digitally signed by ARTURO DURAN Date: 2021.06.22 08:38:12 -06'00'

Arturo Q. Duran
Compliance and Permitting Manager
Environmental Management
Los Alamos Field Office

Enclosure(s):

1. Two hard copies with electronic files – Corrective Measures Evaluation Report for Material Disposal Area C, Solid Waste Management Unit 50-009 at Technical Area 50, Revision 1 (EM2021-0177)

cc (letter with hard-copy enclosure[s]):
Cheryl Rodriguez, EM-LA

cc (letter with CD/DVD enclosure[s]):
Laurie King, EPA Region 6, Dallas, TX
Raymond Martinez, San Ildefonso Pueblo, NM
Dino Chavarria, Santa Clara Pueblo, NM
Chris Catechis, NMED-DOE-OB/-RPD
Steve Yanicak, NMED-DOE-OB
emla.docs@em.doe.gov
n3brecords@em-la.doe.gov
Public Reading Room (EPRR)
PRS website

cc (letter emailed without enclosure[s]):
Jennifer Payne, LANL
William Alexander, N3B
Emily Day, N3B
David Diehl, N3B
Michael Erickson, N3B
Erich Evered, N3B
Jeff Holland, N3B
John Hopkins, N3B
Kim Lebak, N3B

Joseph Legare, N3B
Dana Lindsay, N3B
Pamela Maestas, N3B
Christian Maupin, N3B
Joseph Murdock, N3B
Joseph Sena, N3B
Troy Thomson, N3B
Peter Maggiore, NA-LA
M. Lee Bishop, EM-LA
John Evans, EM-LA
Stephen Hoffman, EM-LA
David Nickless, EM-LA

June 2021
EM2021-0177

Corrective Measures Evaluation Report for Material Disposal Area C, Solid Waste Management Unit 50-009, at Technical Area 50, Revision 1

EM2021-0177

Corrective Measures Evaluation Report for Material Disposal Area C, Solid Waste Management Unit 50-009, at Technical Area 50, Revision 1

June 2021

Responsible program director:

Printed Name	Signature	Title	Organization	Date
Michael O. Erickson		Program Director	RCRA Remediation Program	6/21/2021

Responsible N3B representative:

Printed Name	Signature	Title	Organization	Date
Troy Thomson		Acting Program Manager	N3B Environmental Remediation Program	6/21/2021

Responsible DOE EM-LA representative:

Printed Name	Signature	Title	Organization	Date
Arturo Q. Duran	ARTURO DURAN Digitally signed by ARTURO DURAN Date: 2021.06.30 06:49:16 -06'00'	Compliance and Permitting Manager	Office of Quality and Regulatory Compliance	

EXECUTIVE SUMMARY

This report documents the corrective measures evaluation (CME) conducted for Material Disposal Area (MDA) C, Solid Waste Management Unit (SWMU) 50-009, located at Los Alamos National Laboratory's Technical Area 50 (TA-50). MDA C consists of 115 subsurface disposal units (7 pits and 108 shafts). MDA C was in operation from 1948 to 1974. The wastes disposed of in these disposal units contain both hazardous constituents that are regulated by the New Mexico Environment Department (NMED) and radionuclides that are regulated by the U.S. Department of Energy (DOE).

The goal of the CME is to recommend a corrective measures alternative for SWMU 50-009 in accordance with the requirements of the 2016 Compliance Order on Consent (the Consent Order). The corrective measures alternative must also meet requirements for radiation protection under DOE regulations and orders. Compliance with DOE radiation protection standards may necessitate more stringent technical design requirements than are needed to comply with those under the Consent Order. These technical requirements will be identified during the corrective measures implementation (CMI) phase of the project and incorporated into the design of the final remedy.

The MDA C CME was submitted to NMED in September 2012. NMED did not provide comments on the report, and additional site data have been collected since the submittal in 2012. Therefore, the DOE Environmental Management Los Alamos Field Office is revising the report to include the additional data collected since 2012 and update the remedial alternatives.

A subsurface volatile organic compound (VOC) vapor plume is present in the vadose zone beneath MDA C. The sources of VOC vapors at MDA C are thought to be associated with wastes disposed of in the pits and shafts.

The objectives of this CME are to identify and evaluate technically appropriate corrective measures alternatives that will

- achieve cleanup objectives in a timely manner,
- protect human and ecological receptors,
- control or eliminate the sources of contamination,
- control migration of released contaminants, and
- manage remediation waste in accordance with state and federal regulations.

A conceptual site model (CSM) was developed to evaluate primary and secondary release mechanisms from the source areas (pits and shafts). The CSM evaluates the exposure pathways and potential risks. The remedial action objectives (RAOs) for these source areas are as follows:

- Prevent human and ecological exposure to the waste through excavation and erosion.
- Prevent biointrusion to the waste from burrowing animals.
- Prevent human and ecological exposure to the contaminated surface soil and/or subsurface soil through excavation.
- Prevent groundwater from being impacted above a regulatory standard by the transport of VOCs through soil vapor.
- Prevent the creation of contaminated leachate by restricting the infiltration of water into the waste.

To complete the CME, treatment technologies were identified and screened for applicability to the sources of contamination present at MDA C. Applicable technologies were then combined into corrective measures alternatives to address the RAOs for MDA C. The corrective measures alternatives were screened against the threshold criteria per Section XVI.C.1 of the Consent Order. Alternatives that satisfy the threshold criteria were then evaluated and ranked against the remedial alternative evaluation criteria (i.e., balancing criteria) identified in Section XVI.C.2 of the Consent Order. The highest-ranking alternative was selected as the recommended corrective measures alternative.

As a result of this evaluation, the recommended corrective measures alternative includes constructing an evapotranspiration (ET) cover over the pits and shafts to provide a barrier against human and ecological exposure to waste and contaminated soil. The ET cover also restricts meteoric water from migrating into the buried waste, minimizes erosion, provides a soil medium to allow establishment of native vegetation, and, with a surface layer composed of a mixture of rock and cover soil, discourages animals from burrowing into the cover system. The alternative also includes retrofitting existing open boreholes for passive soil vapor extraction (SVE) to reduce the downward migration of VOCs to the groundwater. Passive SVE has been tested at MDA C and shown to produce acceptable flow rates.

Performance monitoring and institutional controls will be included to ensure the RAOs have been satisfied. The impact of the recommended alternative on the CSM demonstrates the resulting reduction in exposure potential and future risk. Long-term monitoring at MDA C that couples vapor monitoring in the vadose zone near the disposal units with regional aquifer monitoring will provide a defense-in-depth approach to demonstrate the effectiveness of the final remedy.

Although not part of the CME, a preliminary radiological dose assessment was performed to determine whether the recommended corrective measures alternative would also meet DOE radiation-protection requirements. The results of this evaluation demonstrate that an ET cover would provide long-term radiological protection to on- and off-site receptors. A detailed evaluation to establish specific design criteria will be performed during the CMI.

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1.0 INTRODUCTION

This report documents the corrective measures evaluation (CME) 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 consists of 115 subsurface waste disposal units (7 pits and 108 shafts) and is located within the boundaries of Technical Area 50 (TA-50) (Figures 1.0-1 and 1.0-2). This CME is developed and submitted pursuant to the 2016 Compliance Order on Consent (the Consent Order).

The Laboratory is a multidisciplinary research facility owned by the U.S. Department of Energy (DOE) and managed by Triad 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 approximately 36 mi^2 of the Pajarito Plateau, which consists of a series of fingerlike mesas that are separated by deep canyons containing perennial and intermittent streams running from west to east. Mesa tops range in elevation from approximately 6200 ft to 7800 ft above mean sea level (amsl). The eastern portion of the Pajarito Plateau stands 300 ft to 1000 ft above the Rio Grande.

The Laboratory has been part of a national effort by DOE to clean up sites and facilities formerly involved in weapons research and development. The goal of this effort was to ensure past operations do not threaten human or environmental health and safety in and around Los Alamos County, New Mexico. To achieve this goal, the Laboratory has investigated sites potentially contaminated by past Laboratory operations. These sites are designated as either SWMUs or areas of concern (AOCs).

The Laboratory is divided into numerous technical areas based upon facility operations. Several of the TAs include MDAs where waste was previously disposed of. MDA C comprises subsurface pits and shafts used for the disposal of solid waste containing hazardous constituents and radionuclides.

The objectives of this CME are to identify and evaluate technically appropriate corrective measures alternatives that will

- achieve cleanup objectives in a timely manner,
- protect human and ecological receptors,
- control or eliminate the sources of contamination,
- control migration of released contaminants, and
- manage remediation waste in accordance with state and federal regulations.

The New Mexico Environment Department (NMED), pursuant to the New Mexico Hazardous Waste Act, regulates cleanup of hazardous wastes and hazardous constituents. DOE regulates cleanup of radioactive contamination, pursuant to DOE Order 458.1, Administrative Change 3, “Radiation Protection of the Public and the Environment,” and DOE Order 435.1, “Radioactive Waste Management.” Information on radioactive materials and radionuclides, including the results of sampling and analysis of radioactive constituents, is voluntarily provided to NMED in accordance with DOE policy.

Remediation of MDA C requires integration of solutions that address waste and regulatory issues specific to MDA C. Both recent and historical characterization data have been used as the basis for defining the nature and extent of contamination at MDA C. The CME report identifies and evaluates appropriate technologies that manage potential unacceptable future risk from MDA C. Finally, this CME report screens and evaluates alternatives based on known performance data that have demonstrated the technologies’ abilities to meet regulatory threshold criteria and remedial alternative evaluation criteria (i.e., balancing criteria) and recommends an alternative as the proposed remedy.

This CME report is organized according to the Consent Order requirements. Table 1.0-1 summarizes the Consent Order requirements and identifies where the applicable requirements are addressed in this report. Section 1 provides an overview of the CME. Section 2 provides a brief site history, discusses the waste inventory, and summarizes the results of previous investigations. Section 3 describes surface and subsurface site conditions. Section 4 summarizes the conceptual site model (CSM) and includes a description of sources, pathways, and receptors. Section 5 details the regulatory criteria for the CME, including applicable cleanup standards, risk-based screening levels, and risk-based cleanup goals for each pertinent medium at MDA C subsurface units. Section 5 also includes a discussion of the Consent Order evaluation criteria process used for screening and evaluating the available treatment technologies as well as the recommended corrective measures alternatives. Section 6 presents the identification and screening of technologies. The corrective measures alternatives are developed from the retained technologies identified and described in section 7. Section 7 also presents the screening of these alternatives against the four threshold criteria identified in Section XVI.C.1 of the Consent Order. In section 8, the alternatives that pass the threshold criteria are further evaluated against the five balancing criteria of Section XVI.C.2 of the Consent Order. The recommended corrective measures alternative is selected in section 9. The design criteria to meet cleanup objectives are presented in section 10, the proposed schedule is provided in section 11, and references and map data sources are presented in section 12.

This CME report includes appendixes that provide supporting information. Appendix A provides the acronyms and abbreviations used throughout the report as well as a metric conversion table and data qualifier definitions. Appendix B presents an evaluation of subsurface moisture content data. Appendix C presents the results of the Consent Order investigations conducted at MDA C. Appendix D provides an evaluation of the extent of the trichloroethene (TCE) vapor plume beneath MDA C. Appendix E presents an evaluation of groundwater data collected from the MDA C groundwater monitoring wells. Appendix F provides a summary of DOE's radiological-protection requirements applicable to the MDA C corrective measure and includes a preliminary radiological dose assessment. Appendix G presents conceptual design information for soil-vapor extraction (SVE). Appendix H provides the cost estimates for the corrective measures alternatives identified and carried through sections 7 and 8. Appendix I presents a conceptual design and preliminary specifications for the recommended MDA C cover. Appendix J (on DVD included with this document) contains the vapor-monitoring data collected after the Phase III investigation. Appendix K (on DVD included with this document) contains the groundwater monitoring data collected from November 2012 through November 2020.

2.0 BACKGROUND INFORMATION

MDA C is located within TA-50 at the head of Ten Site Canyon. TA-50 is bounded on the north by Effluent and Mortandad Canyons, on the east by the upper reaches of Ten Site Canyon, on the south by Twomile Canyon, and on the west by TA-55. Facilities at TA-50 include a radioactive liquid waste treatment facility (RLWTF); a waste characterization, reduction, and repackaging facility; offices and several storage areas; SWMUs and AOCs; and MDA C. Figure 1.0-1 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 1.0-2). Solid waste containing hazardous constituents as well as radioactive waste was 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 4 to 25 ft below the original ground surface. The original ground surface is defined as the surface beneath the operational 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 1320 ft below ground surface (bgs) (LANL 2011, 204370, p. 13). 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.

The following subsections provide a summary of site information. Additional information is provided in the MDA C investigation work plan (LANL 2005, 091493) and report (LANL 2006, 094688); the Phase II investigation work plan (LANL 2007, 098425) and report (LANL 2009, 107389); the Phase III investigation work plan (LANL 2010, 109260) and report (LANL 2011, 204370) and the periodic monitoring report for 2019 vapor-sampling activities at MDA C (N3B 2020, 700990). These documents describe the site and include information on the disposal units, waste inventories, characterization activities, analytical results from sampling, and assessments of potential present-day risks to human health and the environment.

2.1 Site History

MDA C was 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 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 1.0-2). 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. Fill dirt was used to cover the material disposed of in the pits as they were being filled. The dirt acted as a temporary cover. The pits were filled with crushed tuff when they were decommissioned. The shafts were sealed by filling them with crushed tuff, followed by concrete. The dimensions and operation dates of the pits and shafts are listed in Table 2.1-1.

2.2 MDA C Inventory

The waste disposal records for MDA C are contained in a series of Los Alamos Scientific Laboratory (LASL) disposal logbooks (LASL 1948–1969, 076035). The radioactive waste disposal records provide some basis for estimating the location, type, and volume of the waste disposed of and the number of curies present in specific pits and shafts. However, few data exist on the volume of nonradioactive waste (i.e., hazardous constituents) disposed of at MDA C. Waste inventory information gleaned from the logbooks is summarized in the Resource Conservation and Recovery Act (RCRA) facility investigation (RFI) work plan for Operable Unit (OU) 1147 (LANL 1992, 007672, pp. 2-52–2-56).

2.2.1 MDA C Disposal Pit Inventory

The pits at MDA C (Figure 1.0-2) were reported to dispose of solid wastes containing hazardous constituents, uncontaminated classified materials, and low-level waste (LLW). Operating dates for each disposal pit and a discussion of the waste inventory for each disposal pit compiled from disposal records for MDA C are summarized below.

Pit 1 (November 1948–September 1951)

Based on LASL logbooks 2587 and 3478, materials disposed of in Pit 1 included TCE, boron, sulfuric acid, graphite, medical laboratory solutions, contaminated materials and trash, tritium, americium-241, uranium, classified materials, plutonium, cyanide, mercury, radium-226, acids, lead, and waste oil (LANL 2006, 094688, pp. 3–4).

Pit 2 (April 1950–September 1951)

Based on LASL logbooks 2587 and 3478, materials disposed of in Pit 2 included TCE, contaminated materials and trash, boron, tritium, americium-241, uranium, sulfuric acid, biological waste, graphite, classified materials, plutonium, cyanide, mercury, radium-226, acids, lead, and waste oil (LANL 2006, 094688, p. 4).

Pit 3 (October 1951–April 1953)

Based on LASL logbook 4644, materials disposed of in Pit 3 included mercury teplers, tritium-contaminated glassware, cyanide solutions, contaminated materials and trash, TCE, boron, americium-241, uranium, sulfuric acid, biological waste, graphite, classified materials, plutonium, radium-226, acids, lead, waste oil, and beryllium (LANL 2006, 094688, p. 4).

Pit 4 (October 1951–February 1955)

Based on LASL logbooks 4644 and 6030, materials disposed of in Pit 4 included 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 materials, plutonium, acids, lead, waste oil, and beryllium (LANL 2006, 094688, p. 4).

Pit 5 (April 1953–September 1959)

Based on LASL logbooks 6030, 7277, and 9593, materials disposed of in Pit 5 included 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 materials, and plutonium (LANL 2006, 094688, p. 4).

Pit 6 (October 1956–September 1959)

Based on LASL logbooks 9293, 9593, and 11363, materials disposed of in Pit 6 included 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 materials, mercury, actinium-227, radium-226, acids, and lead (LANL 2006, 094688, p. 4).

Chemical Pit (Early 1960–June 1964)

No logbook entries were made for specific wastes disposed of in the Chemical Pit at MDA C. The RFI work plan for OU 1147 states that 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" (LANL 1992, 007672, p. 2-54). The RFI work plan also notes that plutonium- and uranium-contaminated objects were inadvertently placed in the pit but that no high explosives were ever disposed of there. The work plan also states that "low-level radioactive waste placed in the pit may have included cardboard boxes containing materials from 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, 007672, p. 2-54). Disposal of wastes at the Chemical Pit ceased in June 1964 when Area L at TA-54 became the Laboratory's chemical waste disposal site.

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 Chemistry and Metallurgy Research building at TA-03. However, other Laboratory groups used the MDA C shafts for waste disposal as well. Radionuclide activities currently in the shafts are considerably lower than the as-disposed activities since most of the radionuclides associated with the waste are relatively short-lived. Estimated activities (decayed to January 2005) for Shaft Groups 1 through 3 were presented in the investigation report (LANL 2006, 094688, pp. J-37–J-38).

Three groups of shafts were used sequentially over time. Shaft Group 1 consists of 12 shafts numbered 56–67. These shafts were originally numbered 1–12, but they were renumbered in 1962 to make them 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 1.0-2. All 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.

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 [February 1958–October 1959])

Based on LASL logbook 9593, materials disposed of in Shaft Group 1 included 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 (LANL 2006, 094688, p. 5).

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

Based on LASL logbooks 9593 and 11363, materials disposed of in Shaft Group 2 included 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, Oak Ridge alloy (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) (LANL 2006, 094688, p. 5).

Shaft Group 3 (Shafts 68–107 [October 1962–April 1974])

Based on LASL logbooks 11363 and 12442, materials disposed of in Shaft Group 3 included 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, Oak Ridge alloy solution, iridium-192, tantalum, indium-114, animal tissues, solvents, a Los Alamos Molten Plutonium Reactor Experiment rod assembly, waste oil, detonator components, Navy reactor experiment reactor parts, trinitrotoluene 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” (LANL 2006, 094688, p. 6).

Strontium Disposal Shaft

A single, unnumbered shaft located a few feet from the south corner of the MDA C fence (Rogers 1977, 005707, p. C-7) was used to dispose of a strontium-90 source sometime in the 1950s or 1960s.

2.3 Site Description

MDA C is located on Mesita del Buey, a finger-shaped mesa that trends southeast (Figure 2.3-1). The elevation of Mesita del Buey at MDA C ranges from 7210 to 7280 ft above sea level. 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. At MDA C, Mesita del Buey is approximately 2000 ft wide and is bounded by Ten Site and Effluent Canyons to the north and Twomile Canyon 750 ft to the south, across Pajarito Road (Figure 2.3-1).

2.3.1 Surface Soil

The soil of Mesita del Buey is derived from the weathering of the Tshirege Member tuffs (phenocrysts and phenocryst fragments, devitrified glass, and minor lithic fragments) and from windblown sources. Soil on the flanks of the mesa is developed on Tshirege Member tuffs and colluvium with additions from windblown and water-transported sources. Native soil has been disturbed by waste management operations over much of the surface of Mesita del Buey, but when present, native soils are generally thickest near the center of the mesa and thinner toward the edges.

In general, soil can be considered thin and poorly developed on the mesa surface; it tends to be sandy in texture near the surface and more clay-like beneath the surface. More highly developed soil profiles exist on the north-facing slopes; they tend to be richer in organic matter. Soil profiles on the south-facing slopes tend to be poorly developed. Soil-forming processes have been identified along fractures in the upper part of the mesa, and the translocation of clay minerals from surface soil into fractures has been described at Mesita del Buey.

The original soil in the vicinity of MDA C was poorly developed, as is typical of soils derived from Bandelier Tuff and formed under semiarid climate conditions. In general, undisturbed soil on the mesa tops consist of the Carjo loam, the Hackroy loam, and the Seaby loam. At MDA C, natural or undisturbed surface soil cover is limited as a result of disposal unit and cover construction. The present-day surface of MDA C is predominantly fill (crushed tuff) and imported topsoil.

Canyon bottoms near MDA C (Cañada del Buey, Twomile Canyon, Pajarito Canyon, Mortandad Canyon, and Ten Site Canyon) are covered with colluvium and alluvium that has eroded from the tuff and soil on the mesa top and canyon walls. The canyon rims and slopes are composed of soil from the Hackroy Rock outcrop complex; canyon bottoms are composed of the Tocal, a very fine sandy loam. Since disposal activities began at MDA C, Ten Site Canyon has experienced a period of accretion, and eroded soil from MDA C as well as other SWMUs and AOCs at TA-50 has been deposited on the canyon bottom and on the stream banks.

2.3.2 Subsurface Geology

A generalized stratigraphic cross-section of the Bandelier Tuff is shown in Figure 2.3-2. Detailed cross-sections through MDA C, as defined by the stratigraphy encountered during drilling of the vapor-monitoring wells and regional wells R-46 and R-60, are shown in Figure 2.3-3. The stratigraphic units present at the MDA C site are summarized below.

The predominant tuff unit at the surface is unit 3 of the Tshirege Member of the Bandelier Tuff (Qbt 3), a series of volcanic ash-fall and ash-flow deposits. Qbt 3 is poorly welded and nonindurated to slightly indurated and forms cliffs. Qbt 3 is approximately 100 ft thick at MDA C.

Below unit 3 is unit 2 of the Tshirege Member (Qbt 2). Qbt 2 is a competent, resistant unit that forms cliffs where it is exposed on the sides of the mesa. The rock is described as a moderately welded ash-flow tuff composed of crystal-rich, devitrified pumice fragments in a matrix of ash, shards, and phenocrysts. Unit 2 is extensively fractured as a consequence of contraction during post-depositional cooling. The cooling-joint fractures are visible on the mesa edges. In general, the fractures dissipate at the bottom of the unit. Qbt 2 is approximately 65 ft thick at MDA C.

Below unit 2 is unit 1v of the Tshirege Member (Qbt 1v). Qbt 1v is a devitrified cooling unit that forms sloping outcrops, which contrast with the near-vertical cliffs of Qbt 2. Qbt 1v is approximately 75 ft thick at MDA C. Unit 1v is further subdivided into units 1v-u (Qbt 1v-u), where u stands for upper, and 1v-c (Qbt 1v-c), where c stands for colonnade. Qbt 1v-u is the uppermost portion of unit 1v and consists of ash-fall and ash-flow tuff. Qbt 1v-u is unconsolidated at its base and becomes moderately welded nearer the overlying Qbt 2. Only the more prominent cooling fractures originating in Qbt 2 continue into the more welded upper section of Qbt 1v-u but not into the less-consolidated lower section. More typically, fractures in Qbt 2 do not extend into unit 1v-u. Unit 1v-c is a poorly welded, devitrified ash-flow tuff at its base and top, becoming more welded in its interior.

Below unit 1v is unit 1g of the Tshirege Member (Qbt 1g). Qbt 1g is a vitric, pumiceous, nonwelded ash-flow tuff underlying the devitrified Qbt 1v-c. Few fractures are observed in the visible outcrops of this unit, and the weathered cliff faces have a distinctive Swiss-cheese appearance because of the softness of the tuff. Qbt 1g is approximately 75 ft thick at MDA C.

Below unit, 1g is the Tsankawi pumice (Qbtt). Qbtt is the basal air-fall deposit of the Tshirege Member of the Bandelier Tuff. It is a thin bed of gravel-sized vitric pumice approximately 2 ft thick at MDA C.

Below Qbtt is the Cerro Toledo interval (Qct). Qct consists of thin beds of tuffaceous sandstones, paleosols, siltstones, ash, and pumice falls that separate the Tshirege and Otowi Members of the Bandelier Tuff. Qct is approximately 65 ft thick at MDA C.

Below the Cerro Toledo interval is the Otowi Member of the Bandelier Tuff (Qbof). Qbof is a massive, nonwelded, pumice-rich, and mostly vitric ash flow. The pumices are fully inflated, supporting tubular structures that have not collapsed as a result of welding. The matrix is an unsorted mix of glass shards, phenocrysts, perlite clasts, and minute broken pumice fragments. Qbof is approximately 230 ft thick at MDA C.

Below the Otowi Member lies the Guaje Pumice Bed (Qbog). Qbog is the basal ash-fall deposit of the Otowi Member of the Bandelier Tuff and is approximately 35 ft thick at MDA C.

Below the Guaje Pumice Bed is the Tschicoma Formation (Tvt 2). At regional well R-60 (Figure 2.3-3), Tvt 2 is 244 ft thick and consists of a thick section of generally massive, light gray dacite lava (LANL 2011, 111798). The dacite chips collected during drilling were too small to provide information about fractures and/or joints. However, the dacite lava flows at nearby regional well R-46 (Figure 2.3-3) and seismic hazard characterization borehole SHB-1 (located approximately 2400 ft to the northwest of R-60) are observed to be moderately to strongly fractured. Regional well R-46 contains an upper vesicular and scoriaceous unit that transitions to moderately to strongly fractured massive and nonvesicular dacite lava (LANL 2009, 105592). The fractures/joints are partially filled with iron-oxide precipitates. The basal dacite unit (921 ft–955 ft bgs) consists of breccia and scoria, containing fractures with iron-oxide precipitates. In addition, a dacite lava flow (644 ft–700 ft bgs) was intersected at the bottom of the 700-ft-deep borehole SHB-1 (Gardner et al. 1993, 012582). The dacite chips are intensely oxidized and exhibit faulting with cataclastic brecciation and shearing at 638 and 656 ft bgs. The intensity of oxidation noted in the dacite chips from the three wells is similar, and it is most likely that the thick, massive dacite lava flow in R-60 is also intensely fractured and jointed.

Below the Tschicoma Formation is the Puye Formation (Tpf), which contains the regional groundwater aquifer below MDA C. As described in the completion report for well R-60, Tpf is volcaniclastic sediment consisting of poorly sorted to unsorted, moderately indurated, medium to coarse gravels, fine to coarse sand, and varying amounts of silt. Well R-60 penetrated 513 ft of Tpf before drilling was completed (LANL 2011, 111798).

2.3.3 Surface Water

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 northeast corner of the site. No significant drainage channels exist on the site.

2.3.4 Vadose Zone Hydrology

The region beneath the ground surface and above the regional aquifer is called the vadose (unsaturated) zone. This discussion focuses on the vadose zone beneath the mesa at MDA C. Precipitation in the area either runs off or infiltrates, whereby it is later removed via evapotranspiration (ET) (Hollis et al. 1997, 063131). In the Los Alamos area, potential evapotranspiration (PET) significantly exceeds precipitation (Figure 2.3-4). Although PET exceeds precipitation, there are rainfall events that can lead to flow past the root zone. These events are limited and consequently, long-term deep percolation is quite low (Birdsell et al. 2005, 092048; Kwicklis et al. 2005, 090069).

The geologic property of the Bandelier Tuff that most influences fluid flow in the unsaturated zone is the degree of welding. Welded tuff tends to have less matrix porosity and more fractures than nonwelded tuff. Fractures in welded tuff may include relatively close-spaced cooling joints as well as tectonic fractures. Although nonwelded tuff also has fractures, they are generally less abundant than in welded tuff.

Several competing effects determine moisture content and fluid flux in welded, devitrified tuff. While water moves slowly through the unsaturated tuff matrix, it can move relatively rapidly through fractures if nearly saturated conditions exist (Hollis et al. 1997, 063131). The degree of saturation in soils measured at MDA C is very low (1%–10% gravimetric moisture content) (LANL 2005, 091493, pp. B-88–B-90). At these saturation levels, most of the fractures beneath the site are expected to be dry, and the water will exist predominantly in the tuff matrix. Modeling studies predict that when fractures disappear at contacts between stratigraphic subunits, when fracture fills are encountered, or when coatings are interrupted, fracture moisture is absorbed into the tuff matrix (Soll and Birdsell 1998, 070011).

Analyses of moisture content and chloride data were performed on core collected from 20 boreholes during the Phase I investigation at MDA C. This core was collected predominantly from units Qbt 3, Qbt 2, Qbt 1v, and Qbt 1g (LANL 2006, 094688, Appendix L). That study found the water contents beneath the mesa were low, with average water contents below about 13% by volume and the majority less than 10%. Measured capillary pressure data in the Bandelier tuff suggests very low relative permeability to water at these low water contents (Robinson et al. 2005, 091682; Springer 2005, 098534).

The chloride mass-balance method is useful for estimating vadose zone fluxes and residence times in semiarid and arid environments. Downward water fluxes using the chloride method were estimated to be low at less than 0.12 in./yr (0.3 cm/yr), with about half the boreholes having flux estimates of less than 0.04 in./yr (0.1 cm/yr). Residence times for water to flow from the surface through the mesa were estimated to be greater than 1000 yr, with 2 of the boreholes having predicted residence times of greater than 10,000 yr. Additional moisture content data from 14 new or deepened boreholes extending into Qct and Qbo were collected during the Phase II investigation (LANL 2009, 107389). The data, which are evaluated in Appendix B of this report, also indicate the mesa has low average water contents.

Tuff samples were collected to test for potential contaminants in and adjacent to substantial fractures at MDA C (LANL 2009, 107389). Five major fractures from four boreholes were sampled. That study provided evidence that the fractures and the tuff adjacent to the fractures did not contain higher concentrations of contaminants or facilitate downward infiltration of contaminants. Therefore, fractures in the tuff units beneath MDA C are not likely to have a controlling impact on the fate and transport of water-soluble contaminants at the site.

No perched groundwater or intermediate-depth saturated horizons were encountered during any of the investigations conducted at MDA C or during the drilling of nearby regional wells R-14, R-46, or R-60. Perched groundwater was encountered in the Puye Formation and dacite lavas at wells R-17 and PCI-2, located in Pajarito Canyon 3000 ft southeast of MDA C. Based on the results of drilling beneath the mesa, these perched zones do not appear to extend under Mesita del Buey at MDA C. 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 or northeast of MDA C.

2.3.5 Regional Aquifer Hydrology and Groundwater Monitoring Network

The regional aquifer is the only known aquifer in the Los Alamos area capable of producing a municipal and industrial water supply. Beneath MDA C, the regional water-table elevation is approximately 5920 ft amsl or approximately 1320 ft (400 m) bgs.

Beneath MDA C, the shallow portion of the regional aquifer is located within the Puye Formation (Tpf). Puye Formation sediments within the regional aquifer appear to be highly heterogeneous. Estimates of Puye Formation hydraulic conductivity in the regional aquifer at the monitoring wells downgradient of MDA C vary between 0.3 and 20 m/day (~1–60 ft/day) (LANL 2011, 204370).

Near MDA C, the groundwater velocity is approximately 450 ft/yr, the hydraulic gradient is approximately 0.014, and the direction of groundwater flow in the regional aquifer is to the east-southeast toward the Rio Grande (LANL 2012, 209658). More detailed information about groundwater flow directions beneath MDA C is presented in Appendix E of this report and Appendix G of the Phase III investigation report (LANL 2011, 204370).

Groundwater monitoring wells in the MDA C monitoring group include regional wells R-14, R-46, and R-60 (Figure 2.3-1) (LANL 2011, 208811). Nearby regional well R-17 is part of general surveillance monitoring because it is not downgradient of MDA C, but it helps define the water table map and general chemistry of regional aquifer water near MDA C.

Well R-14 was installed in 2002 as a regional aquifer characterization well (LANL 2003, 076062). Well R-14 is located approximately 3200 ft east of MDA C in Ten Site Canyon (Figure 2.3 1). This well was installed primarily to determine the potential impacts of TA-50 effluent discharges on groundwater quality in the regional aquifer south of Mortandad Canyon (LANL 2003, 076062, p. 2).

Well R-17 was installed in 2005 as a regional aquifer characterization well (Kleinfelder 2006, 096578). Well R-17 is located approximately 3000 ft southeast of MDA C in Pajarito Canyon (Figure 2.3 1). This well was required by the Consent Order as part of the Pajarito Canyon investigation and was installed to evaluate perched and intermediate groundwater in the west-central region of the Laboratory (Kleinfelder 2006, 096578, p. 1).

Well R-46 was installed in 2009 to serve as a monitoring well for MDA C (LANL 2009, 105592). Well R-46 is located 880 ft downgradient (east-southeast) of MDA C on Mesita del Buey (Figure 2.3-1). Installation of well R-46 was directed by NMED as part of the approval of the Mortandad Canyon Groundwater Monitoring Well Network Evaluation (NMED 2007, 098775). Well R-46 was installed to increase the probability of detecting releases from MDA C before they can migrate to water-supply well PM-5 and the Laboratory boundary.

Regional monitoring well R-60 was installed in 2010 as an additional monitoring well for the site (LANL 2011, 111798). Well R-60 is located 100 ft downgradient (east) of MDA C on Mesita del Buey (Figure 2.3-1). Installation of well R-60 was directed by NMED as part of the second notice of disapproval for the MDA C Phase II investigation report (NMED 2009, 107361). One of the purposes of well R-60 was to monitor potential releases of contaminants from MDA C to groundwater (LANL 2011, 111798, p. 1).

2.4 Summary of Previous Investigations

A variety of investigations have previously been performed at MDA C. These include investigations performed before 1990 when the corrective action requirements of RCRA became effective, investigations performed as part of the MDA C RFI, and investigations performed under the Consent Order. Results of these investigations are summarized below. The pre-1990 investigations and RFI are described in the MDA C historical investigation report (LANL 2005, 091493, Appendix B), which also contains relevant data, figures, and tables. Descriptions of the Consent Order investigations and relevant data, figures, and tables are presented in Appendix C.

2.4.1 Summary of Pre-RFI Investigations

The scope and results of pre-RFI investigations are summarized in Table 2.4-1 and briefly described below.

Water Infiltration Study

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 maintained for 99 days in a 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, 007672, p. 2-57).

In separate studies in the 1960s, the Laboratory and USGS conducted a series of water-injection tests near TA-50 using uncontaminated water to explore the possible use of vadose-zone injection wells for water disposal (Purtymun et al. 1989, 006889). The injection wells were completed in unit Qbt 3. Three longer-duration (89-day) injection tests were performed in which the water content was monitored to track the movement of fluids through the unsaturated tuff. The researchers measured the lateral migration of the moisture front and constructed cross-sections of water content at various times throughout the tests, and they concluded the tuff could retain or arrest the movement of water-soluble contaminants originating from liquid or solid wastes stored in the tuff (Purtymun et al. 1989, 006889). The injection results and subsequent modeling of the test indicate unsaturated flow and transport through the Bandelier Tuff units tested should be represented using a formulation that favors matrix flow and transport rather than fracture-controlled transport. This behavior is believed to be a consequence of the high matrix permeability of the Bandelier Tuff (Robinson et al. 2005, 092040), which can transmit water away from the saturated injection borehole without saturating the surrounding tuff.

Surface Radiation Surveys and Sampling

Between 1976 and 1984, radiation surveys were conducted on the surface of MDA C to identify localized areas of elevated radioactivity (LANL 1992, 007672, p. 2-57). Surface soil and vegetation samples were subsequently collected from areas with elevated radiation levels and analyzed for radionuclides. Based on the results of these radiation surveys, MDA C was covered with crushed tuff, except in the northeast corner where no disposal pits or shafts are located.

In 1985, radiation surveys were conducted around the MDA C perimeter. Thermoluminescent dosimeters (TLDs) were used to estimate external penetrating radiation doses. TLD readings taken at 18 locations were all near local background levels. The TLD survey was repeated in 1986 with similar results (LANL 2005, 091943).

A Phoswich detector was used to perform a second 1985 radiation survey for the low end of the energy spectrum to detect the presence of x-ray and gamma-ray emitters on the soil surface using a 64 ft × 64 ft grid over the entire site. A high-pressure ion chamber was used to measure radiation doses at the high end. Both surveys indicated background conditions over most of the site; however, elevated levels of radioactivity were measured in the northeast corner of MDA C (LANL 2005, 091943).

Surface (0- to 1-cm) soil samples were collected in 1985 and analyzed for tritium, plutonium-238, plutonium-239, plutonium-240, and uranium. Tritium samples from the eastern half of MDA C were below the local background concentration of 4.0 pCi/mL (LANL 1998, 059730). Isotopic plutonium (up to 10 pCi/g of plutonium-239 and plutonium-240 and 30 pCi/g of plutonium-238) was detected on the north and east sides of MDA C. Concentrations of uranium were all less than the soil background value (BV) within the MDA C boundary. The areas with elevated radionuclides correspond to the portion of MDA C that was not covered with soil in 1984. Additional surface soil sampling was performed in 1986, and samples were analyzed for americium-241, cesium-137, plutonium-238, plutonium-239, and tritium. The results of these analyses were consistent with the 1985 results (LANL 2005, 091943). Because the cover soil radiation levels were found to be below background levels, it can be concluded that biointrusion through the interim soil cover has not produced pathways for radon from the buried wastes.

Perimeter Pore-Gas and Sediment Sampling

In 1989, pore-gas samples were collected from a depth of 4 ft at 6 locations near the chemical pit and 12 perimeter locations immediately surrounding MDA C and analyzed for volatile organic compounds (VOCs). No VOCs were detected (DOE 1989, 015364).

Three sediment samples were also collected at 0- to 12-in. intervals from a drainage channel at the head of Ten Site Canyon and analyzed for pesticides, polychlorinated biphenyls (PCBs), VOCs, semivolatile organic compounds (SVOCs), metals, and radionuclides. Organic chemicals detected were one VOC, eight SVOCs, and four pesticides. Metals detected were barium, chromium, nickel, and zinc. Radionuclides detected were americium-241, cesium-137, plutonium-238, plutonium-239 and plutonium-240, radium-226, uranium-235, and total uranium (all isotopes) (DOE 1989, 015364).

2.4.2 Summary of RFI Investigations

Phase I RFI fieldwork was conducted at MDA C from 1993 to 2003. The scope and results of RFI investigations are summarized in Table 2.4-1 and briefly described below.

RFI fieldwork included the following activities (LANL 2005, 091493):

- surface investigations that included surface soil and fill sampling (1993) and VOC surface flux measurements (2000);
- subsurface investigations that included core sampling (1995–1996), pore-gas sampling (2001–2003), tritium probe sampling (2003), and borehole air-flow velocity measurements (1995–1996);
- three geophysical surveys in 1994, 2001, and 2002;
- biota screening and sampling in 2003; and
- tritium air monitoring in 2003 and 2004.

The key findings from these studies are summarized below:

- In surface samples collected in 1993, lead and silver were detected above soil BVs in 9 and 2 of 68 samples, respectively. Five organic chemicals were detected in 1 to 4 samples each. Radionuclides detected above BVs/fallout values (FVs) in 1 to 15 samples each were americium-241, plutonium-238, plutonium-239, thorium-232, and uranium-238. All inorganic chemicals detected above BVs, detected organic chemicals, and radionuclides detected above BVs/FVs were below respective residential soil screening levels (SSLs) and screening action levels (SALs) (LANL 2005, 091493, pp. B-56, B-58–B-59). The low frequency of detection and low detected concentrations and activities indicated minor historical releases may have occurred. Americium-241 and plutonium isotopes were elevated in the northeast corner of MDA C compared with the remainder of the site.

- VOC surface flux samplers detected six VOCs above laboratory quantitation limits with tetrachloroethene (PCE) being detected most frequently (i.e., detected in all but one sample) (LANL 2005, 091493, pp. B-60–B-62). The highest PCE fluxes were measured south of Pit 6 in the vicinity of the Chemical Pit and near the southeast corner of Pit 5.
- Inorganic chemicals detected above BVs for tuff in borehole samples were aluminum, antimony, arsenic, barium, beryllium, calcium, chromium, cobalt, copper, lead, magnesium, nickel, selenium, and thallium. These inorganic chemicals were detected above BVs in 1 to 9 of 82 samples each. Six organic chemicals [acetone; bis(2-ethylhexyl)phthalate; 1,1-dichlorethene; methylene chloride; 2-methylphenol; and toluene] were detected in 1 to 8 samples each (LANL 2005, 091493, pp. B-81–B-87). Radionuclides detected or detected above BVs were americium-241, cesium-134, cesium-137, cobalt-60, europium-152, plutonium-238, plutonium-239, sodium-22, strontium-90, tritium, uranium-235, and uranium-238. These radionuclides were detected in 1 to 16 samples each, except for tritium, which was detected in 64 samples (LANL 2005, 091493, pp. B-84–B-86). All inorganic chemicals detected above BVs, detected organic chemicals, and radionuclides detected or detected above BVs/FVs were below respective residential SSLs and SALs, except for arsenic (1 sample) and tritium (5 samples) (LANL 2005, 091493, pp. B-81–B-82, B-84–B-86, B-87). With the exception of tritium, the low frequency of detection and low detected concentrations and activities indicate limited mobility and transport from the disposal units. Lateral and vertical extent of metals, cyanide, and radionuclides were not defined.
- Twenty-four VOCs were detected in pore-gas samples collected from two boreholes near the Chemical Pit. Consistent with surface flux results, PCE and TCE were detected most frequently and at the highest concentrations. The nature and extent of VOC contamination in pore gas was not defined.
- Results for the tritium probe sampling showed tritium detected in all 15 shallow vapor probe samples. The two highest activities were detected west of Shaft Group 3 and north of the west end of Pit 6.
- The borehole air velocity study demonstrated air flow into and out of the MDA C boreholes in response to changes in atmospheric pressure. Instantaneous flow rates for the MDA C boreholes were in the range of 0.2 to 2 ft^3/min (SEA 1997, 076055, p. 6).
- Results of the August 1994 magnetometry demonstration survey were inconclusive because ferrous materials could be identified only within 12 ft of the surface. The 2001 geophysical survey identified the pit boundaries, although there was interference from a chainlink fence at the site. The results indicated most metal objects were buried in the southern part of Pit 5 and the cover thickness ranged from 0 ft to 8.8 ft, with a mean of 3.4 ft. The 2002 geophysical survey was conducted after the fence had been removed and found no evidence of disposal pits outside the fenceline in the surveyed areas.
- Biota sampling results indicated 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 in their needles, indicating that trees are able to transport radionuclides from the subsurface.
- Airborne tritium samples were collected at the MDA C air monitoring station biweekly from February 3, 2003, to March 15, 2004. The average airborne tritium concentration was 11.5 pCi/m^3.

2.4.3 Summary of Consent Order Investigations

2004–2007 Site Investigation

Field investigations conducted from 2004 to 2007 at MDA C under the Consent Order are reported in the MDA C investigation report (LANL 2006, 094688) and a supplemental data report (LANL 2007, 097285) and results are presented in Appendix C, section C-2.0, of this CME report. Under this investigation, a radiological survey was conducted and surface samples were collected at 6 locations and analyzed for radionuclides to supplement the surface sample data from the Phase I RFI. Geophysical and seismic surveys were performed to better define pit boundaries and to map the walls between Pits 1–4. Thirty-three boreholes were drilled, and 209 core samples were collected and analyzed for inorganic and organic chemicals and radionuclides to characterize the nature and extent of subsurface contamination. Core samples for geotechnical characterization were also collected from 1 of the boreholes. A total of 378 pore-gas samples were collected from the 33 boreholes and 2 existing boreholes in 2 sampling rounds and analyzed for VOCs and tritium to characterize subsurface vapor contamination. Three additional boreholes were drilled, and 40 pairs of core and pore-gas samples were collected to determine the relationship between VOC and tritium concentrations in core and pore gas. Four additional boreholes were drilled between Pits 2 and 3, and 25 core and 25 pore-gas samples were collected to characterize potential contamination beneath the pits. A risk-screening assessment was conducted that concluded surface and shallow subsurface contamination did not pose a potential unacceptable risk to human health and the environment based on current (i.e., industrial) site use.

The soil and rock sample results indicated a number of inorganic and organic chemicals were detected at low concentrations beneath the former disposal units and were consistent with the results obtained during the Phase I RFI. Inorganic chemicals detected above BVs during the 2005–2006 study were generally less than 5 times the BV. The interpretation of these results indicates little if any migration of metals and other inorganic chemicals from the disposal units. Although several inorganic chemicals were detected above BV or the maximum background concentration in samples collected at the total depth (TD) of the borehole, the detections above background in TD samples were generally only slightly above background and were generally not accompanied by detections above background in higher lithologic units. The results appear to indicate the detections above background in TD samples are associated with natural variability of the tuff rather than indicative of unbounded releases.

Thirty-six organic compounds were detected in core samples. These compounds consisted of 2 VOCs, 18 SVOCs (primarily polycyclic aromatic hydrocarbons), 3 PCBs, 9 dioxin or furan congeners, and 4 explosive compounds or degradation products. All detected concentrations were low (i.e., below 1 mg/kg) and many were below the estimated quantitation limits. Detections were generally sporadic with no discernible spatial pattern indicative of a release.

Forty-two VOCs were detected in pore-gas samples collected during the first round of sampling. The VOCs with the highest frequency of detection were chloroform (209 of 210 samples), dichlorodifluoromethane (208 of 210 samples), PCE (209 of 210 samples), and TCE (210 of 210 samples). The VOCs with the highest detected concentrations were PCE (maximum concentration 24,000 μg/m^3) and TCE (maximum concentration 54,000 μg/m^3). All other VOCs had maximum concentrations less than 10,000 μg/m^3. Similar results were obtained from the second round of pore-gas sampling and the paired core–pore-gas sampling. The pore-gas results indicated a release of VOCs from the disposal units. The results of the paired core–pore-gas samples indicated vapor diffusion was the mode of VOC release and transport (i.e., concentrations in core samples were too low to indicate liquid-phase migration).

Uranium isotopes were detected above BVs in core samples, and five fallout radionuclides (americium-241, cesium-137, plutonium-238, plutonium-239, and strontium-90) were detected in core samples. Uranium-235 was detected most frequently above BV, but all results were less than 4 times BV. All fallout radionuclides were detected at low activities (less than 1 pCi/g). Detections were generally sporadic with no discernible spatial pattern indicative of a release.

Tritium was not analyzed in core samples but was detected in pore-gas samples. Tritium was detected in 197 of 210 samples during the first round of pore-gas sampling and 162 of 168 samples during the second round. The highest activities (up to 1.94×10^8 pCi/L) were detected near the southwest corner of Pit 5 and southeast corner of Pit 6, indicating a release in this area.

2008–2009 Phase II Site Investigation

Phase II investigations conducted in 2008 and 2009 at MDA C under the Consent Order are reported in the Phase II MDA C investigation report (LANL 2009, 107389), and results are presented in Appendix C, section C-3.0, of this CME report. The specific objectives for the Phase II investigation were (1) to define the nature and extent of target analyte list (TAL) metals at the surface at MDA C and (2) to characterize subsurface pore-gas concentrations of VOCs and tritium (LANL 2007, 098425). Under this investigation, 59 surface and near-surface samples were collected at 30 locations to define the extent of TAL metals and conduct risk-screening assessments. Subsurface investigation activities included installing 5 new boreholes at locations without existing boreholes, extending 8 existing boreholes, installing 7 new deep boreholes next to existing shallow boreholes, and installing 1 new pilot-test borehole. Fourteen vapor-monitoring wells were constructed in the new boreholes and associated existing boreholes. A total of 104 core and 91 pore-gas samples were collected from these boreholes and vapor-monitoring wells to better define the vertical and lateral extent of contamination in tuff and pore gas.

The surface and near-surface samples showed 6 metals detected above BVs in 1 to 15 samples each. Detected concentrations above BVs were low, with maximum concentrations less than 5 times BV. The low concentrations and low frequency of detection above BVs are not indicative of releases from the site. The vertical and lateral extent of contamination were defined for all TAL metals in the surface and near surface at MDA C.

The core sample results for inorganic chemicals were consistent with the results obtained during the 2004–2007 investigation. With the exception of chromium, detections of inorganic chemicals above BV were generally sporadic and not indicative of a release. Chromium was generally detected above BV only in deeper tuff units (Qbt 1g, Qct, and Qbo). Detections were only slightly above BVs and appeared to be associated with natural variability. With the possible exception of borehole 50-603470, vertical and lateral extent of contamination were defined for all inorganic chemicals in tuff at MDA C. Borehole 50-603470 penetrated the Tschicoma dacite and the TD sample was collected in the dacite. Concentrations of inorganic chemicals in this sample were generally higher than in overlying samples, but it was not possible to determine whether concentrations were above BV since no background data are available for dacite.

The core sample results for organic chemicals showed organic chemicals were not detected or were detected infrequently (i.e., in one to eight samples each) and at low concentrations. All detected concentrations were less than 1 mg/kg, and most results were less than the estimated quantitation limits. The vertical and lateral extent of contamination were defined for all organic chemicals in tuff at MDA C.

With the exception of uranium-235/236, radionuclides were not detected in core samples or were detected in only 1 or 2 samples at low activities (less than 1 pCi/g for fallout radionuclides). Uranium-234 and uranium-238 were not detected above BV in any samples but were detected in the dacite sample from borehole 50-603470. Uranium-235/236 was detected above BV in 35 samples, but all results were less than 2 times BV. The vertical and lateral extent of contamination were defined for all radionuclides in tuff at MDA C.

The results of the pore-gas sampling for VOCs were similar to the results from the 2004–2007 investigation in terms of the VOCs detected and the frequency of detection. The samples from the new boreholes showed that VOC concentrations decreased with depth and decreased with distance away from the disposal units. Therefore, the lateral and vertical extent of VOCs were defined in terms of decreasing concentration trends. Concentrations of PCE and TCE in the deepest samples at several locations were, however, above screening levels based on protection of groundwater. Therefore, extent was not defined to screening levels, which was one of the objectives of the Phase II investigation.

Pore-gas tritium samples from the new boreholes installed for the Phase II investigation showed tritium activities decreasing with depth and with distance from disposal units. The lateral and vertical extent of tritium in pore gas were defined at MDA C.

2010–2011 Phase III Investigation

Phase III investigations conducted in 2010 and 2011 at MDA C under the Consent Order are reported in the Phase III MDA C investigation report (LANL 2011, 204370) and results are presented in Appendix C, section C-4.0, of this CME report. Based on the results of the Phase II investigation, NMED directed DOE and LANL to conduct a Phase III investigation to define the vertical extent of VOCs in pore gas to screening levels, evaluate concentrations of metals in the Tschicoma dacite, and determine whether contaminants had migrated to groundwater (NMED 2009, 107361). Four new boreholes were advanced into the top of the Tschicoma dacite. Dacite samples were collected at two depths from each of the two boreholes located outside the MDA C boundary and analyzed for TAL metals. Because the lateral and vertical extent of inorganic chemicals, organic chemicals, and radionuclides in tuff had been defined previously, no samples were collected from the overlying tuff in any of the new boreholes. The four new boreholes were completed as vapor-monitoring wells. Six quarterly rounds of vapor sampling were performed in 2010 and 2011. The first 4 rounds were performed using the 14 existing Phase II vapor-monitoring wells, and the final 2 rounds were performed using the Phase II wells and the 4 new Phase III wells. To evaluate potential groundwater contamination, a new regional well, well R-60, was installed approximately 100 ft east of MDA C. Two quarterly rounds of groundwater samples were collected from well R-60 in January and April 2011.

The concentrations of most metals detected in the dacite samples were much lower than the concentrations previously detected in the sample from borehole 50-603470. Because the concentrations of metals in the sample from borehole 50-603470 appeared more representative of soil and a soil horizon was video-logged at the top of the dacite in nearby well R-60, it was concluded the metals detected in dacite at borehole 50-603470 were not associated with a contaminant release.

The results of pore-gas samples collected from the deep Phase III monitoring wells showed VOC concentrations decreasing with depth to concentrations below screening levels for the protection of groundwater. The lateral and vertical extent of VOC contamination in pore gas at MDA C were defined.

Groundwater samples collected from well R-60 showed one VOC (acetone) detected in the first sample, but no VOCs were detected in the second sample. Tritium was not detected in either sample. These results indicate vapor-phase migration of VOCs and tritium from MDA C to the regional aquifer has not occurred.

2.4.4 Status of Vapor Monitoring

Vapor monitoring conducted after submittal of the Phase III investigation report has not previously been reported and results are presented in Revision 1 of the periodic monitoring report for 2019 vapor-sampling activities at MDA C (N3B 2021, 701220) and in Appendix C, section C-5.0, of this CME report. The Phase III investigation report recommended quarterly monitoring from 46 sampling ports at 7 locations and annual monitoring from 108 ports at 10 locations (LANL 2011, 204370, pp. 96–97). The first two rounds of quarterly sampling using this recommended network and schedule were performed in August 2011 and October/November 2011. In December 2011, NMED approved the Phase III investigation report (NMED 2011, 208797) and directed vapor monitoring that replaced the monitoring recommended in the Phase III investigation report. NMED's approval requires semiannual monitoring from 80 sampling ports at 18 locations, with all samples analyzed for VOCs and tritium. The first semiannual monitoring event using this network was performed in March–April 2012 and continued through October 2017. Semiannual monitoring restarted in 2019.

VOCs detected in vapor samples collected during the August 2011 and October–November 2011 sampling events are presented in Tables C-5.0-1 through C-5.0-2, respectively. VOCs detected from March 2012–October 2017 are presented in Tables C-5.0-4 through C-5.0-10 and in the two 2019 sampling events in Tables C-5.0-11 and C-5.0-12. Tritium detected in vapor samples from these events is presented in Tables C-5.0-13 through C-5.0-15.

Data from the October 2011 through 2019 monitoring events are included in Appendix J (on DVD included with this report).

2.4.4.1 TA-63 Pore-Gas Sampling

Pore-gas sampling is conducted quarterly at the Transuranic Waste Facility (TWF) east of MDA C. The permit for the TWF includes requirements for monitoring subsurface vapors to prevent worker exposure to potentially harmful levels of VOCs at the TWF (Permit Section 3.14.3). The Quarter 14 TWF Vapor Monitoring System Report, dated May 3, 2021 (LANL 2021, 603633), states the following: "Sampling and analyses for the fourteenth quarter of waste management operations at TWF continue to confirm that soil vapor concentrations at the site are stable and do not exceed the screening levels established by the Permit. This report also presents a statistical analysis of the data as part of an on-going review to determine the need to sample the site on a quarterly basis."

2.4.5 Summary of Canyons Investigations

Sediment, surface water, and groundwater data were collected as part of the canyons investigations required by the Consent Order. These data are very useful at helping determine whether SWMUs and AOCs (particularly those with outfall/mesa slope aspects) have contamination or release histories that manifest in the canyon floor and whether they are at levels that represent potentially unacceptable human-health risk or adverse ecological affects. These data are presented in canyons investigation reports. For MDA C, potential releases are also discussed within previous documents (LANL 2007, 097285; LANL 2009, 107389; LANL 2011, 204370) that address the nature and extent of contamination from the subsurface units comprising MDA C.

The data from adjacent canyons, specifically Ten Site and Pajarito Canyons, are used to address potential impacts from MDA C on shallow surface media including sediment, surface water, alluvial groundwater, and biota. The possible impact of releases from MDA C on sediment in Ten Site Canyon was evaluated using data collected from sediment investigation reaches downcanyon from MDA C as part of the Mortandad Canyon investigation (LANL 2006, 094161). These sediment data indicate no potential impacts from MDA C in canyon-bottom sediment. The spatial distribution of chemicals of potential concern (COPCs) indicates that other sources in TA-35 and TA-50 are the main sources of contaminants in sediment in Ten Site Canyon. The COPCs detected in reach TS-1W, which is the first reach downgradient of MDA C, were 4 metals, 26 organic chemicals, and 10 radionuclides. These COPCs are consistent with industrial operations in TA-35 and TA-50, and their concentrations and activities generally increased in the next downstream reach, which receives additional runoff from TA-35 sources. The potential impact on surface water was evaluated using data from surface-water samples collected in Ten Site Canyon downstream of reach TS-1W. The COPCs identified in filtered water samples from the sampling location nearest to MDA C were 26 inorganic chemicals (metals and anions) and 7 radionuclides. The COPCs identified in unfiltered water samples at the same location were 41 inorganic chemicals (metals and anions), 2 organic chemicals, and 10 radionuclides. These COPCs are consistent with industrial operations in TA-35 and TA-50 and do not indicate impacts from MDA C.

At the time of the Mortandad Canyon investigation, no alluvial, intermediate, or regional monitoring wells had been drilled in Ten Site Canyon, other than regional well R-14 and intermediate and regional wells farther downstream near the confluence with Mortandad Canyon. Therefore, no groundwater evaluation had been specifically directed to MDA C. The overall conclusion of the report, however, was that spatial distributions of inorganic chemical and radionuclide concentrations and activities indicate only a few key sources of the COPCs observed in groundwater and vadose-zone pore water. The most important source is the outfall from the TA-50 RLWTF into Effluent Canyon. Other sources include the former TA-35 wastewater treatment plant outfall in Ten Site Canyon and possible discharges from cooling towers and radiochemistry laboratories at TA-48 in Effluent Canyon west of the TA-50 outfall (LANL 2006, 094161, p. 68). The data did not indicate impacts from MDA C.

All surface water runoff from MDA C goes into Ten Site Canyon, and none runs off into the Pajarito Canyon watershed. The Pajarito Canyon investigation, therefore, did not address potential impacts from MDA C on sediment and surface water in Pajarito Canyon. The groundwater evaluations in the Pajarito Canyon investigation report did describe elevated tritium activities in pore water from core samples collected during installation of regional monitoring well R-17 and perched-intermediate monitoring well PCI-2. These wells are located at the confluence of Twomile and Pajarito Canyons, approximately one-half mile south-southeast of MDA C. The source of this tritium was not known. Possible sources identified in the investigation report were historical sources in the upper watershed or possibly MDA C (LANL 2009, 106939, p. 60).

2.4.6 Status of Groundwater Monitoring

Groundwater monitoring under the Consent Order is conducted in accordance with an Interim Facility-Wide Groundwater Monitoring Plan (IFGMP). The IFGMP is updated annually to revise monitoring suites, frequencies, and locations based on evaluation of previous monitoring results and installation of new wells. Data from groundwater monitoring wells in the vicinity of MDA C have previously been reported in the periodic monitoring reports for the Pajarito Canyon watershed (wells R-17, R-60, and PCI-2) and the Mortandad and Sandia Canyons watershed (wells R-14 and R-46). The well locations are shown in Figure 2.3-1. The current monitoring requirements for the MDA C monitoring group are specified in the 2021 IFGMP (N3B 2020, 700927) and are summarized in Table 2.4-2. In April 2012 the Consent Order was modified to allow groundwater monitoring to be performed and reported on an area-specific basis rather than by watershed (NMED 2012, 520171). Beginning with the periodic monitoring report submitted in May 2012, data from wells R-14, R-46, and R-60 are included in the MDA C monitoring group (LANL 2012, 218416). Data from wells R-17 and PCI-2, which are not specific to MDA C, are part of the General Surveillance monitoring group.

The second notice of disapproval for the MDA C Phase II investigation report required installation of two regional groundwater monitoring wells at MDA C (NMED 2009, 107361). One well was to be located near the southeast corner of MDA C and the other approximately 300 ft to the south. Based on the results of a network evaluation performed by the Laboratory, the MDA C Phase III investigation work plan (LANL 2010, 109260) specified revised locations approximately 200 ft to the north of those originally proposed. The investigation work plan also proposed installing the southern well (identified as well R-59) first, so groundwater elevation data could be collected and used to refine the location of the second well (identified as well R-60). Because of limited access caused by construction activities at the proposed location of well R-59, the Laboratory requested a deviation from the approved work plan to allow installation of the well R-60 first (LANL 2010, 109611). This revised approach was incorporated into the drilling work plan for well R-60 (TerranearPMC 2010, 109963), which was approved by NMED (2010, 109635). After well R-60 was installed, the Laboratory evaluated the water-level data and determined that installing an additional regional well at the proposed location of well R-59 would do little to improve the effectiveness of the MDA C monitoring network. The Laboratory therefore requested an extension for proposing a location for R-59 until vapor-monitoring and groundwater data collected during the Phase III investigation could be evaluated (LANL 2011, 203595).

The Phase III investigation report includes a groundwater monitoring network evaluation for MDA C (LANL 2011, 204370, Appendix G). The purpose of this network evaluation was to determine the effectiveness of the existing network (i.e., wells R-46 and R-60) in detecting releases of contaminants from MDA C. This network evaluation was an update of the network evaluation performed during preparation of the Phase III investigation work plan that was used to propose locations for wells R-59 and R-60. The previous evaluation was updated using groundwater-elevation data from recently installed well R-60. The results of the evaluation show a detection efficiency for wells R-46 and R-60 of greater than 99% for TCE and greater than 95% for tritium (LANL 2011, 204370, p. G-9). Based on the results of the network evaluation, an evaluation of data from the vapor-monitoring network at MDA C, and an evaluation of groundwater data from wells R-46 and R-60, the MDA C Phase III investigation report recommended that well R-59 not be installed for monitoring purposes (LANL 2011, 204370). Instead, the investigation report recommended that the need for an additional regional well or wells at MDA C be identified during the CME based on other monitoring objectives.

Appendix E of this report further evaluates the network efficiency with respect to potential releases of tritium at vapor-monitoring well location 50-603383 and 2-hexanone at vapor-monitoring well 50-603467. The evaluation showed detection efficiencies of greater than 98%.

The regional monitoring-well network around MDA C is designed to provide reliable detection of potential contaminants from MDA C reaching the regional aquifer. Appendix E provides a reliability assessment indicating the three deep monitoring wells in the MDA C monitoring group, R-14, R-46, and R-60, as well as nearby well R-17, are capable of producing reliable detection efficiency.

3.0 SITE DESCRIPTION

3.1 Surface Conditions

Currently, MDA C has a vegetated surface cover consisting primarily of a native grama grass mixture. The vegetation was initially established after the 1984 addition of fill and topsoil to the site. MDA C is posted as a radiologic controlled area/underground radiological materials area and is surrounded by an 8-ft-high chainlink fence. Access to the site is controlled by Newport News Nuclear BWXT-Los Alamos, LLC (N3B). Pajarito Road, which is used to access the site, is open only to DOE badge holders. Access to MDA C is gained through a locked gate only. No on-site activity may be conducted without prior review and approval of the activity by the N3B facility manager.

3.1.1 Nature and Extent of Surface Contamination

As described in section 2.4.3 and Appendix C of this CME report, the Consent Order investigation data indicate very limited and minor contamination of surface and shallow subsurface soil and tuff. All sampling results for inorganic chemicals in surface and shallow subsurface soil and tuff were below residential and industrial SSLs. The Consent Order investigations did not include collection of surface and shallow subsurface samples for organic chemical analysis, but results of previous investigations showed all organic chemicals in surface samples to be below residential and industrial SSLs (LANL 2005, 091493, p. B-59). The nature and extent of surface radionuclide contamination is discussed in Appendix F.

3.2 Subsurface Conditions

3.2.1 Subsurface Utilities

The location of subsurface utilities is shown in Figure 3.2-1. Underground utilities next to the site include electrical, communication, gas, and water lines along the south and west sides of the site and a liquid radioactive waste line along the north side of the site. No utilities lie within the boundary of the site, with the exception of a short water line.

3.2.2 Disposal Pits

The subsurface waste disposal units at MDA C include seven unlined disposal pits excavated into unit Qbt 3 of the Bandelier Tuff. Disposal pit dimensions are summarized in Table 2.1-1. The waste in the pits was covered with crushed tuff at the time of pit closure and the closed pits have been covered with additional fill.

3.2.3 Disposal Shafts

The subsurface waste disposal units at MDA C include 98 unlined disposal shafts and 10 lined disposal shafts excavated into unit Qbt 3 of the Bandelier Tuff. Disposal shaft dimensions are summarized in Table 2.1-1. The waste in the shafts was covered with crushed tuff at the time of shaft closure and tops of the shafts sealed with concrete. The closed shafts were later covered with additional fill.

3.2.4 Nature and Extent of Vadose Zone Contaminants

3.2.4.1 Contaminants in Tuff

As described in section 2.4.3, the Consent Order investigation data indicate very limited and minor releases of contaminants from the MDA C disposal units into underlying tuff. No analytical results for tuff samples exceeded industrial SSLs for inorganic and organic chemicals. The nature and extent of radionuclide contamination in tuff is discussed in Appendix F.

3.2.4.2 VOCs in Pore Gas

Thirty-eight VOCs have been detected in subsurface vapor samples collected at MDA C from October 2012 to February 2020. These VOCs are listed in Table 3.2-1, along with Tier 1 vapor-phase screening levels. Frequency of detection status for each of the 13 sampling events is summarized in Tables 3.2-2 through 3.2-14. Most VOCs were detected infrequently (i.e., in less than 25% of samples). The only VOCs that have been detected at more than half the sampling ports are carbon tetrachloride; chloroform; cis-1,2-dichloroethene; dichlorodifluoromethane; methylene chloride; PCE; TCE; 1,1,1-trichloroethane (1,1,1-TCA); trichlorofluoromethane; and 1,1,2-trichloro-1,2,2-trifluoroethane.

Carbon tetrachloride, chloroform, dichlorodifluoromethane, and TCE were detected in more than half the sampling events in every event. TCE is the most frequently detected VOC, being detected at 98% to 100% of the sampling ports, and is also the VOC detected at the highest concentrations. The nature and extent of tritium contamination in pore gas is discussed in Appendix F.

The sources of VOC vapors at MDA C are thought to be associated with wastes disposed of in the pits and shafts. The highest concentrations of VOCs are generally detected at depths ranging from 100 ft to 400 ft bgs. This vertical distribution of VOCs indicates the source is not ongoing. If the subsurface VOCs are from past releases, the center of mass of the plume would have migrated vertically downward when the source was ongoing and the rate of release exceeded the rate at which VOCs could diffuse to the surface and volatilize. After release from the source stopped, concentrations near the surface would decrease, producing the vertical distribution that is observed. If subsurface VOCs were from an active, ongoing source, higher concentrations would be observed at higher elevations (i.e., shallower depths) near the base of the disposal units. This distribution is not observed.

As part of the Phase III investigation, a two-tiered screening evaluation method was developed to identify vapor-phase VOCs that could potentially affect groundwater at concentrations exceeding applicable screening levels (LANL 2011, 204370, Appendix F; LANL 2012, 209658). This screening evaluation was expanded to include all VOC vapor data collected during and after the Phase III investigation. The results of the screening evaluation are summarized below.

Tier 1 Soil-Vapor Screen Based on Henry's Law Partitioning

The Tier 1 screening analysis employs a simplified approach based on conservative assumptions to identify those VOCs that clearly do not pose a risk of groundwater contamination and those requiring a more detailed, less conservative screening. The analysis evaluates the groundwater concentration that would be in equilibrium with the maximum soil-vapor concentrations of VOCs detected in soil vapor if the soil-vapor concentration were in equilibrium with groundwater according to Henry's Law partitioning. The equilibrium between air and water concentrations is described by the following equation:

$$\boldsymbol{H' = {}^{C_{air}}/_{C_{water}}}$$ **Equation 3.2-1**

Where C_{air} = the volumetric concentration of the contaminant in air (or soil vapor),

C_{water} = the volumetric concentration of the contaminant in water, and

H' = the dimensionless Henry's law constant [(µg/m^3 vapor)/(µg/m^3 liquid)].

Equation 3.2-1 can be used to calculate the Tier 1 soil vapor screening level (SL_I) (µg/m^3) as follows:

$$\boldsymbol{SL_I = 1000 \times H' \times SL_{gw}}$$ **Equation 3.2-2**

Where SL_{gw} = the groundwater screening level (µg/L) and

1000 = a conversion factor [to convert liters (L) to cubic meters (m^3)].

The groundwater screening levels used are equivalent to the groundwater screening values used in periodic groundwater monitoring reports prepared under the Consent Order. The lower of the New Mexico Water Quality Control Commission (NMWQCC) groundwater standard or U.S. Environmental Protection Agency (EPA) maximum contaminant level (MCL) is used as the screening level, if available. If an NMWQCC groundwater standard or an MCL has not been established for a specific substance for which toxicological information is published, the NMED screening level for tap water (NMED 2019, 700550), Appendix A is used as the screening level. If an NMED screening level for tap water has not been established for a specific substance for which toxicological information is published, the EPA regional screening level for tap water (https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables) is used as the screening level. EPA screening levels for carcinogens are adjusted to 10^{-5} risk. If toxicological information has not been published and there is no EPA regional screening level, screening cannot be performed.

The source of Henry's law constants is the NMED technical background document (NMED 2019, 700550, Appendix B). If there is no Henry's law constant in the NMED guidance, the Henry's law constant is obtained from EPA regional screening tables.

The Tier 1 methodology conservatively assumes that the groundwater is in equilibrium with the maximum detected concentration of a VOC. This assumption would be true only if the sample containing the maximum concentration were collected from pore gas immediately above the water table. At MDA C, the samples with maximum VOC concentrations are hundreds of feet above the water table, and VOC concentrations decrease with depth below the maximum concentrations. The Tier 1 methodology also assumes that the equilibrium groundwater concentration is representative of the aquifer. This equilibrium exists only at the air-water interface, and water concentrations in the aquifer away from the interface decrease because of mixing with clean water.

The Tier 1 soil-vapor screening levels calculated using Equation 3.2-2 represent the concentration of a VOC in soil vapor that would result in an equilibrium groundwater concentration equal to the groundwater screening level. If the maximum concentration of a VOC detected in soil vapor is less than the Tier 1 soil vapor screening level, the VOC passes Tier 1 screening and does not pose a risk of potential groundwater contamination.

Tier 1 Screening Results

Tier 1 screening levels for all VOCs detected in pore-gas samples collected from October 2012 to February 2020 are presented in Tables 3.2-2 through 3.2-14. Data from February 2020 are the most current discussed here. As of writing of this report, FY 2019 data are the most recent available. The maximum VOC concentrations detected in each sampling event from October 2012 to February 2020 are compared with Tier 1 screening-level events in Tables 3.2-2 through 3.2-14. As shown by this screening, maximum concentrations of five VOCs have exceeded Tier 1 screening levels:

- 2-hexanone (October–November 2012, March–April 2013, and April–May 2014 events only)
- methylene chloride (all events)
- propanol[2-] (January–February 2020 event only)
- TCE (all events)
- 1,1,2-trichloroethane (1,1,2-TCA) (October–November 2014, October–November 2015, April 2016, April 2017, October 2017, and January–February 2020 events only)

Hexanone[2-] was detected in only 4 of 1020 samples collected since October 2012 and was detected in only one sampling port (600 ft bgs) at one location (50-603467). Three of the detected concentrations (319 μg/m^3 to 696 μg/m^3) exceeded the Tier 1 screening level (145 μg/m^3). Concentrations above the Tier 1 screening level have not been detected since the April–May 2014 event, and the most recent detection (21.7 μg/m^3 in October 2017) was below the Tier 1 screening level.

Methylene chloride was detected in 44% of the 1020 vapor samples collected at MDA C since October 2012. Methylene chloride was detected above the Tier 1 screening level (665 μg/m^3) in 58 samples (694 μg/m^3 to 1840 μg/m^3) from 4 locations (50-24813, 50-603470, 50-603471, and

50-603472) at depths ranging from 203 ft bgs to 360 ft bgs. These results indicate the highest levels of methylene chloride contamination in the central part of MDA C (i.e., in the vicinity of Pits 1–5). Concentrations decreased with depth below the maximum concentration at all locations.

Propanol[2-] was detected in only 11 of 1020 vapor samples collected at MDA C since October 2012 and was detected above the Tier 1 screening level (136 µg/m^3) in only 1 sample (470 µg/m^3 at location 50-603467 from 143 ft bgs). Propanol[2-] was detected in only 1 sample at 9 locations and in 2 samples at 2 locations, indicating infrequent and sporadic detection with no discernible spatial or temporal trends.

TCA[1,1,2-] was detected in 35 of 1020 vapor samples collected at MDA C since October 2012. TCA[1,1,2-] was detected above the Tier 1 screening level (169 µg/m^3) in 6 samples (170 µg/m^3 to 213 µg/m^3). All detections of 1,1,2-TCA above the Tier 1 screening level were from samples collected at location 50-24813 from 150 ft bgs. The frequency of detection of 1,1,2-TCA has increased over time with 1 detection in 2014, 4 detections in 2015, 5 detections in 2016, 9 detections in 2017, 6 detections in 2019, and 10 detections in 2020.

TCE is the most frequently detected VOC and was detected in all but 6 of the 1020 vapor samples collected at MDA C since October 2012 (i.e., detected in 99.4% of samples). TCE is also the VOC most frequently detected above the Tier 1 screening level, with 796 sampling results (2040 µg/m^3 to 85,900 µg/m^3) exceeding the Tier 1 screening level (2020 µg/m^3). In addition, TCE is the VOC detected at the highest concentrations in vapor samples at MDA C. Because of the frequency and magnitude of TCE detections, the nature and extent of vapor-phase TCE contamination was thoroughly evaluated in the Phase III investigation report (LANL 2011, 204370, Appendix F). Vapor data were used to develop a three-dimensional model of the TCE plume. The TCE plume evaluation was updated to include the vapor-monitoring data collected during the 2 most recent sampling events. This updated evaluation is presented in Appendix D. Figure 3.2-2 shows a summary representation of the plume. The model results demonstrate that the extent of TCE concentrations exceeding the Tier 1 screening level is defined in all directions. The highest TCE concentrations are beneath the southeast corner of MDA C at approximately 200 ft to 350 ft bgs.

Tier 2 Soil-Vapor Screen Based on Transport to and Dilution in the Regional Aquifer

VOCs that fail Tier 1 are further evaluated using a Tier 2 screening analysis. As noted above, the Tier 1 screening levels are based on the assumption that vapors present in the vadose zone located several hundred feet above the water table are in equilibrium with groundwater. However, the vapors must actually migrate downward to the water table and then mix with groundwater. When contaminants reach the water table of the regional aquifer, they mix with the clean groundwater flowing under ambient flux conditions, and contaminants are diluted. The resulting contaminant concentration in the groundwater is therefore lower than at the source in the vadose zone. A dimensionless dilution factor is used to account for this process, and its application is described in EPA and other regulatory documents (EPA 1996, 059902; NMED 2006, 092513).

The Tier 2 evaluation considers transport in the water phase (i.e., pore-water transport) as well as vapor-phase transport. When contaminants migrate through the vadose zone in the water phase, the following equation can be applied to calculate the dimensionless dilution factor for water-phase transport (F_{dw}):

$$\boldsymbol{F_{dw} = \frac{C_{wt}^{w}}{C_{aq}^{w}} = 1 + \frac{kId_m}{RL}} \qquad \textbf{Equation 3.2-3}$$

where C_{wt}^{w} is the contaminant concentration in the infiltrating water [M/L^3], C_{aq}^{w} is the contaminant concentration in the regional aquifer within the mixing zone [M/L^3], I is the hydraulic gradient in the regional aquifer [L/L], R is the infiltration rate through the vadose zone [L/T], L is the length of the source at the top of the regional aquifer parallel to groundwater flow [L], k is the aquifer hydraulic conductivity [L/T], and d_m is aquifer mixing zone depth [L], which is calculated as

$$d_m = \begin{cases} if\ d_a \le d_c & d_a \\ if\ d_a > d_c & d_c \end{cases}$$ **Equation 3.2-4**

where

$$d_c = 0.106\ L + d_a\left(1 - \exp\left(-\frac{RL}{kId_a}\right)\right)$$ **Equation 3.2-5**

and d_a [L] is the aquifer thickness where the mixing is expected to occur (e.g., well screen length) and d_c [L] is the computed depth within which the contaminants are expected to migrate. If $d_a > d_c$, a conservative assumption is made that the mixing zone is equal to the well screen length. Equations 3.2-3 and 3.2-5 are based on EPA guidance document (EPA 1996, 059902, Equations 37 and 45, respectively). Equation 3.2-4 represents the statement in the EPA guidance document that "aquifer thickness also serves as a limit for mixing zone depth" (EPA 1996, 059902, p. 46). These equations account for the impact of infiltration, which carries the contaminants, on the structure of groundwater flow in the regional aquifer.

If the contaminant concentration in the aquifer within the mixing zone (C_{aq}^{w}) is set equal to the groundwater screening level, and the contaminant concentration in the infiltrating water (C_{wt}^{w}) is set equal to the contaminant concentration in pore gas above the water table (C_{wt}^{g}) divided by the dimensionless Henry's law constant (Equation 3.2-1), Equation 3.2-3 can be rearranged to yield

$$C_{wt}^{g} = F_{dw}H'SL_{gw}1000$$ **Equation 3.2-6**

Substituting Equation 3.2-2 into Equation 3.2-6 yields

$$C_{wt}^{g} = F_{dw}SL_{I}$$ **Equation 3.2-7**

Thus, the Tier 2 pore-gas screening level for pore water transport, which considers only aquifer dilution, is equal to the Tier 1 pore-gas screening level multiplied by the aquifer dilution factor.

If the contaminants migrate through the vadose zone in the vapor phase, then diffusion of contaminants through the vadose zone and partitioning of the contaminants at the water table should be taken into account. In the case of contaminant diffusion through the vadose zone, the water table can be viewed as a boundary at which contaminants leave the vadose zone and migrate into the regional aquifer. The diffusive flux depends on the contaminant concentrations at the vadose-zone source and at the water table. When the groundwater flux along the water table is relatively slow compared with diffusive vapor flux in the vadose zone, it is important to account for the contaminant concentration at the water table (the concentration is initially equal to zero but increases with time).

Diffusion coefficients [L^2/T] in air, D_a, and water, D_w, are available to characterize migration of contaminants at MDA C in the free air and water phases. These coefficients can be modified to account for diffusion through a porous medium using the following equation (Millington and Quirk 1961, 110521):

$$D_{ap} = D_a\frac{(n-\theta)^{10/3}}{n^2}$$ **Equation 3.2-8**

$$D_{wp} = D_w n^{4/3}$$ **Equation 3.2-9**

where *n* is porosity of the porous medium [L^3/L^3], and θ [L^3/L^3] is the volumetric water content.

Henry's law defines the amount of the gas-phase (soil-vapor) contaminant that will be dissolved in the regional groundwater, as defined by Equation 3.2-1. At the water table, Henry's law is expressed using the concentrations of the gas, C_{wt}^{g} [M/L^3] and the water, C_{wt}^{w} [M/L^3], phases along the regional water table at equilibrium:

$$C_{wt}^{w} = \frac{C_{wt}^{g}}{H'}$$ **Equation 3.2-10**

where *H′* is the dimensionless Henry's law constant. Henry's law constant depends on the properties of the VOC, and on the temperature and pressure.

Truex et al. (2009, 108331) have proposed a technique to compute the dimensionless dilution factor of the vapor-phase contaminants (F_{dg}) next to the water table when mixed into the regional aquifer:

$$F_{dg} = \frac{C_{wt}^{a}}{C_{aq}^{w}} = \frac{2H' d_a}{d_m}$$ **Equation 3.2-11**

where the mixing zone depth is calculated as

$$d_m = \sqrt{\frac{2 d_a D_{wp}}{kI}}$$ **Equation 3.2-12**

It is important to note that the mixing zone is created only by molecular diffusion. Truex et al. (2009, 108331) also proposed an approach to compute the dilution factor of the vapor-phase contaminants into the regional aquifer taking into account diffusion of the contaminant in the vadose zone under steady-state conditions:

$$F_{dg} = \frac{C_{vz}^{a}}{C_{aq}^{w}} = \frac{2Hd_a\left[1+\frac{d_{vz}}{H' d_a D_{ap}}\sqrt{\frac{kId_a D_{wp}}{2}}\right]}{d_m}$$ **Equation 3.2-13**

where d_{vz} is the vertical distance between the contaminant source and the regional water table (if the contaminant source is at the ground surface, it will be the thickness of the vadose zone) and C_{vz}^{a} is the source vapor concentration in the vadose zone. A steady-state condition is a conservative assumption for the expected values for diffusion coefficients (0.1–0.01 m^2/day), vadose-zone thickness (~400 m), and available time for contaminant migration through the vadose zone (at least 40 yr). Equation 3.2-13 takes into account the impact of the contaminant concentration at the water table on the diffusive flux occurring through the vadose zone. However, it does not account for aquifer dispersion. If vertical dispersion causes the plume to exceed the aquifer thickness under consideration in this analysis, the dispersion will increase mixing in the regional aquifer. However, this is not expected to occur within the current range of aquifer thickness values considered (aquifer thickness greater than 3 m). On the other hand, dispersion may increase the vapor-phase contaminant flux since it will decrease the contaminant concentrations near the regional water table. As a result, it is not expected that the vertical dispersion will increase vertical mixing of contaminants in the regional aquifer.

The analysis presented above follows the methodology of Truex et al. (2009, 108331), which is based on an assumption that the considered thickness of the regional aquifer (d_a above; *U* in Truex et al. [2009, 108331]) is equal to the lateral length of the source area parallel to groundwater flow (*L*). However, this is not the case in the present analyses where the considered thickness of the regional aquifer is 3 m (~10 ft), representing the length of a typical monitoring screen in the regional aquifer beneath MDA C, and the source length is considered to be on the order of 100 m (based on spatial analyses of the observed concentrations presented in Appendix D). As a result, Equation 3.2-13 is modified accordingly:

$$F_{dg} = \frac{d_a}{L} \frac{2H' d_a \left[1 + \frac{d_{vz}}{H' d_a D_{ap}} \sqrt{\frac{kI d_a D_{wp}}{2}}\right]}{d_m}$$ **Equation 3.2-14**

Equations 3.2-3 and 3.2-14 are used to calculate the dilution factors for VOCs failing Tier 1 screening at MDA C. These dilution factors are applied to compute screening levels representing the pore water and the vapor-phase pathways, respectively. The dilution factor calculated using Equation 3.2-3 can be multiplied by the Tier 1 screening level to obtain a Tier 2 screening level based on the conservative assumption of transport through the vadose zone by pore-water migration with no vadose zone attenuation, followed by mixing into the aquifer. This Tier 2 screening level for pore water can then be compared with the maximum VOC concentration in soil vapor.

The dilution factor calculated using Equation 3.2-14 is based on vapor-phase diffusion from a VOC source to the water table, with subsequent dilution and mixing, and represents the ratio of the vapor concentration at the source to the water concentration in the aquifer. This dilution factor is a function of the distance from the VOC source to the water table. The closer the source is to the water table, the lower the dilution factor and the lower the Tier 2 screening level. To perform screening, the distance from the source to the water table is calculated as the difference between the depth of the sample and the depth to the water table. Equation 3.2-14 is used to calculate a dilution factor based on the distance from the sample port to the water table, and this dilution factor is multiplied by the groundwater screening level to obtain the Tier 2 screening level for the vapor-phase pathway for that sample port. Equation 3.2-14 can also be used to generate plots of Tier 2 screening level versus sample port depth.

The dilution factor calculated using Equation 3.2-14 is based on vapor-phase transport through porous media. Transport through fractures may be associated with less attenuation than through porous media, and Tier 2 screening levels representative of fracture flow may be lower than those calculated using Equation 3.2-14. The spatial distribution of VOC contamination beneath MCA in the Bandelier Tuff is consistent with vapor diffusion through porous media and does not indicate an influence from fracture flow. The uncertainty associated with potential future fracture flow is expected to be most pronounced in the Tschicoma dacite (LANL 2011, 204370). Therefore, the potential effects of fracture flow through the dacite were accounted for in the Tier 2 evaluation by conservatively applying the groundwater protection standard at the top of the dacite rather than at the water table. That is, the value for depth to water table used in Equation 3.2-14 is taken as the difference between the depth to the sample port and the depth to the top of the dacite, rather than the difference between the depth to the sample port and the depth to the water table. This approach is conservative in that it does not take credit for any attenuation in the dacite or in the unsaturated portion of the Puye Formation, which is not fractured.

Tier 2 Screening Results

Tier 2 screening levels for 2-hexanone; methylene chloride; 2-propanol; 1,1,2-TCA; and TCE were calculated using Equations 3.2-3, 3.2-14, and the data presented in Table 3.2-15. The Tier 2 screening levels for pore-water transport and the minimum Tier 2 screening levels for vapor transport are presented in Table 3.2-16. The minimum vapor-phase transport screening level is representative of fracture flow with the source at the top of the dacite. As shown in Table 3.2-16, the maximum concentrations of 2-hexanone, methylene chloride, 2-propanol, and 1,1,2-TCA are less than the Tier 2 pore-water screening levels and the minimum Tier 2 vapor-transport screening levels. Therefore, these VOCs pass Tier 2 screening and no additional Tier 2 screening evaluation is needed. The maximum TCE concentration exceeds both the Tier 2 pore-water screening level and the minimum Tier 2 vapor-transport screening level, and further evaluation of TCE is therefore needed.

Figure 3.2-3 presents the Tier 2 vapor-transport screening levels for TCE for fracture flow and porous media as a function of sample depth, and also presents the Tier 2 pore-water screening level, which is independent of depth. As shown in Figure 3.2-3, for the depths of interest (i.e., ground surface to top of dacite), the Tier 2 vapor-transport screening level for fracture flow will be lower than the Tier 2 pore-water screening level except for depths from the surface to 100 ft bgs. Therefore, the Tier 2 screening level for vapor transport will also be protective of groundwater for pore-water transport, except for depths to 100 ft. The pore-water transport screening level was evaluated only for the depth interval 0 ft to 100 ft bgs, and all TCE results for samples collected within this interval were below the Tier 2 screening level for pore-water transport. Further evaluation of the pore-water transport pathway is not warranted.

The Tier 2 vapor-transport screening evaluation for TCE is presented in Table 3.2-17, which shows the depth-dependent Tier 2 screening level for porous media and fracture flow for each sampling port, along with analytical results for 13 sampling events from October 2012 through February 2020. The Tier 2 screening evaluation shows Tier 2 screening levels based on porous media flow (which are higher than the Tier 2 screening levels based on fracture flow) to be exceeded at four locations: 50-24813 (288 ft bgs and 358 ft bgs), 50-24822 (351 ft bgs), 50-603470 (278 ft bgs), and 50-603471 (288 ft bgs and 360 ft bgs). These results are consistent with the three-dimensional TCE plume model presented in Appendix D, which shows the highest TCE concentrations to be bounded by these locations. Tier 2 screening levels based on fracture flow were exceeded at six additional locations (50-603063, 50-603064, 50-603467, 50-603068, 50-603472, and 50-613183). The screening levels were exceeded in samples collected from depths ranging from 113 ft bgs to 450 bgs. Five of these locations are north, south, and west of the four locations where Tier 2 screening levels for porous media flow were exceeded, and one is collocated with a shallower well where the Tier 2 screening levels for porous media flow were exceeded. These results are consistent with the plume model presented in Appendix D. The area where Tier 2 screening levels were exceeded is bounded laterally in all directions by locations where Tier 2 screening levels were not exceeded (50-24784, 50-603061, 50-603062, 50-603383, 50-603503, and 50-613185). At each location where Tier 2 screening levels were exceeded, the deepest sample collected at that location was less than Tier 2 screening levels. Therefore, the depth where Tier 2 screening levels were exceeded is bounded vertically at all locations.

The results of the Tier 2 screening evaluation indicate that 2-hexanone; methylene chloride; 2-propanol; 1,1,2-TCA; and TCE do not currently pose a risk of groundwater contamination. Hexanone[2-]; methylene chloride; 2-propanol; and 1,1,2-TCA results were below Tier 2 screening levels in all cases. Although some TCE results exceeded Tier 2 screening levels, the deepest exceedance was at 360 ft bgs for porous media flow and 450 ft bgs for fracture flow. All TCE exceedances were at least 880 ft above the regional aquifer and 220 ft above the top of the dacite.

3.2.5 Nature and Extent of Groundwater Contaminants

Data from MDA C monitoring wells (R-14, R-46, and R-60) do not indicate any release of contaminants from MDA C to the regional aquifer. Groundwater monitoring at the Laboratory is currently conducted in accordance with the 2021 Interim Facility-Wide Groundwater Monitoring Plan, Revision 1 (hereafter, the 2021 IFGMP) (N3B 2020, 700927). Wells assigned to the MDA C monitoring group include three regional (hereafter, “deep”) wells: R-14, R-46, and R-60. No perched-intermediate water has been encountered in boreholes advanced to approximately 600 ft bgs at this site (LANL 2007, 099128; LANL 2011, 204370). R-17 is also included in this discussion as a non-impacted well that provides a point of comparison for wells at MDA C. R-17 is part of the general surveillance monitoring group in the 2021 IFGMP, with a stated purpose of monitoring MDA C and other potential sources in the upper Pajarito watershed. Table 3.2-18 summarizes information about screened intervals and sampling systems installed in these wells and the range of sampling dates for which water-quality data are available.

Section 3.2.5.1 summarizes COPCs detected in water-quality samples from these wells. COPC detections in groundwater are then compared with those known or potentially expected to be present in the vadose zone below MDA C, and potential sources of the COPCs detected in groundwater are discussed.

Section 3.2.5.2 presents conclusions concerning the transport of COPCs from the vadose zone below MDA C to the deep groundwater downgradient based on the data evaluations in section 3.2.5.1.

3.2.5.1 COPC Detections in MDA C Monitoring Wells

Screening Protocol

Sampling of the monitoring network wells for MDA C began in 2003 following the completion of well R-14. Well R-14 was drilled to characterize groundwater in Mortandad Canyon. Wells R-46 and R-60 were drilled in 2009 and 2010, respectively, with the specific objective of monitoring MDA C. Water-quality data from these wells are screened against the Laboratory's groundwater background values. For screening purposes, groundwater sampling results are also compared with the groundwater standards and screening levels specified in the 2021 IFGMP (N3B 2020, 700927) and described in section 5.1.2 of this report.

The outcome of the screening protocol is presented in frequency-of-detection tables that summarize detections of organic compounds as well as inorganic constituents detected above groundwater background concentrations. The detection status for an analytical result is established using the combined set of laboratory-assigned validation qualifiers and reason codes assigned during data validation. For detected organic constituents, the screening tables include summary information such as

- the total number of samples collected for each analyte at the location where it was detected,
- the numbers of detections,
- the mean and maximum detected values,
- the number of detections exceeding the lowest applicable regulatory or risk-based screening levels, and
- the number of detections exceeding one-half the lowest applicable screening levels.

For metals and general chemistry parameters, which were evaluated in the 2016 revision of the groundwater background investigation report (GBIR) (LANL 2016, 601920), the screening tables compare maximum concentrations detected in MDA C wells with background values and applicable regulatory or risk-based screening levels.

Organic COPC Detections

Table 3.2-19 presents a summary of organic COPCs detected in MDA C wells from November 2012 through November 2020. As shown in Table 3.2-19, eight organic constituents have been detected at least once in wells R-14, R-17, R-46, and/or R-60 during this period, including seven SVOCs and one VOC.

The majority of these cases are sporadic detections at low concentrations slightly above the method detection limit (MDL) of the analytical method. Of the eight organic constituents, only three have been detected more than once in the same screened interval. Table 3.2-20 summarizes the occurrences of the three organic constituents detected more than once at the same location for more than one sampling event. Table 3.2-21 shows nondetected organic analytes with MDLs greater than applicable regulatory standards or other screening levels.

Among the detected organic compounds, two have been detected at concentrations that exceed one-half the groundwater standard/screening levels: bis(2-ethylhexyl)phthalate (R-17) and di-n-butylphthalate (R-46). None of the detections exceeded a groundwater standard/screening level (Table 3.2-19).

Review of the data provided in Table 3.2-19 show the following.

Acetone

Acetone was detected in one sample from well R-14, two samples from well R-17, three samples from well R-46, and one sample from well R-60. The maximum detected concentration of 10.9 µg/L was well below the NMED tap water screening level of 14,100 µg/L. All but one of the eight detections were below the practical quantitation limit (PQL) (10 µg/L).

Benzoic Acid

Benzoic acid was detected in one sample from well R-17 and two samples from well R-46. All three detected results (13.1 mg/kg to 14.4 mg/kg) were below PQLs (20 mg/kg to 20.8 mg/kg) and well below the EPA tap water screening level of 75,000 µg/L.

Bis(2-ethylhexyl)phthalate

Bis(2-ethylhexyl)phthalate was detected in one sample from well R-17 and two samples from well R-46. All three detected results (0.354 µg/L to 3.51 µg/L) were below PQLs (1.04 µg/L to 10 µg/L). The detected result from well R-17 and one detected result from well R-46 were slightly greater than one-half the EPA MCL of 6 µg/L.

Di-n-butylphthalate

Di-n-butylphthalate was detected in one sample from well R-46. The detected result (4.01 µg/L) was below the PQL (10 µg/L) and well below the EPA tap water screening level of 900 µg/L.

Diethylphthalate

Diethylphthalate was detected in one sample from well R-46. The detected result (3.82 µg/L) was below the PQL (10.2 µg/L) and well below the EPA tap water screening level of 15,000 µg/L.

Nitrosodiethylamine[N-]

Nitrosodiethylamine[N-] was detected in one sample from well R-60. The detected result (0.000183 µg/L) was below the PQL (0.0005 µg/L) and well below the NMED tap water screening level of 0.00167 µg/L.

Nitrosodimethylamine[N-]

Nitrosodimethylamine[N-] was detected in one sample from well R-46. The detected result (0.000621 μg/L) was slightly above the PQL (0.0005 μg/L) and well below the NMED tap water screening level of 0.00491 μg/L.

Phenol

Phenol was detected in one sample from well R-17. The detected result (3.62 μg/L) was below the PQL (10 μg/L) and well below the NMED tap water screening level of 5760 μg/L.

Metal and General Chemistry Detections

Metals and general chemistry parameters detected in groundwater were evaluated using data from Revision 5 of the GBIR (LANL 2016, 601920). The GBIR evaluated groundwater monitoring data collected from 2010 through early 2016 to identify background wells (i.e., wells monitoring groundwater not impacted by anthropogenic sources of contamination) and to determine representative background concentrations of metals and general chemistry parameters based on data collected from background wells. Background wells met criteria specified by NMED, including threshold concentrations of mobile contaminants indicative of anthropogenic sources (e.g., chloride and tritium). All of the wells and screens used to monitor MDA C (R-14 screen 1, R-17 screen 1, R-17 screen 2, R-46, and R-60) were identified as background wells. Therefore, the monitoring results from these wells for the period 2010 through early 2016 were determined to be representative of background concentrations, with the exception of statistically identified outliers. The monitoring results from the background wells were used to determine summary statistics, including

- total number of observations;
- number of detections and nondetections;
- minimum detected concentrations and detection limits;
- maximum detected concentrations and detection limits;
- 25th, 50th, 75th, and 95th percentiles;
- averages; and
- Kaplan-Meier means.

If there were at least 50% detected results, the 95% upper tolerance limit (UTL) was also calculated. The GBIR recommended use of the UTLs as background screening values for those constituents for which UTLs could be calculated. No background screening value was recommended for those constituents for which UTLs could not be calculated.

Monitoring data for inorganic chemicals for the MDA C wells were evaluated by comparing the maximum detected concentrations with the maximum concentrations in the background well data set presented in the GBIR and with UTLs, if available. These results are presented in Table 3.2-22. Metals and general chemistry parameters having maximum concentrations exceeding the range of the background data set include iron, nickel, thallium, bromide, chloride, cyanide, total dissolved solids (TDS), total Kjeldahl nitrogen (TKN), and total organic carbon (TOC). Results for these constituents are discussed below. Maximum concentrations of barium, potassium, fluoride, silicon dioxide, and sulfate were greater than UTLs but less than the maximum concentrations in the background data set. Concentrations of these constituents are considered to be within the range of background concentrations and these results are not discussed further.

Bromide was detected above the maximum background concentration of 0.116 mg/L in one sample (a UTL for bromide is not available). Bromide was detected at a concentration of 0.118 mg/L in the sample from well R-14, screen 1 collected during November 2018. This result was only 0.002 mg/L above the maximum background concentration and was one of only three detections of bromide in samples collected since November 2012.

Chloride was detected above the UTL of 2.7 mg/L in one sample. Chloride was detected at a concentration of 3.82 mg/L in the sample from well R-60 collected during November 2020. The result was also greater than the maximum concentration in the background data set (3.28 mg/L). The background data set in the GBIR also contained a result of 4.73 mg/L that was determined to be an outlier (LANL 2016, 601920, Table 3.2-22). The November 2020 result from well R-60 is less than that result and may also be an outlier.

Cyanide was detected above the maximum background concentration of 0.00246 mg/L in one sample (a UTL for cyanide is not available). Cyanide was detected at a concentration of 0.0025 mg/L in the sample from well R-14, screen 1 collected during November 2017. This result was only 0.00004 mg/L above the maximum background concentration and was the only detected result since November 2012.

Iron was detected above the maximum background concentration of 184 μg/L in one sample (a UTL for iron is not available). Iron was detected at a concentration of 353 μg/L in the sample from well R-17, screen 1 in the sample collected during April 2015. This result was evaluated in the GBIR and determined to be an outlier (LANL 2016, 601920, Table 3.2-22).

Nickel was detected above the UTL of 2.9 μg/L in three samples: 8.97 μg/L, 11.1 μg/L, and 59.7 μg/L in samples from well R-17, screen 1 collected during April 2014, September 2020, and April 2015, respectively. The results were also greater than the maximum concentration in the background data set (7.23 μg/L). The results from April 2014 and April 2015 were evaluated in the GBIR and determined to be outliers (LANL 2016, 601920, Table 3.2-22). The result from September 2020 is within the range of those two results and is also likely an outlier.

Thallium was detected above the maximum background concentration of 0.687 μg/L in one sample (a UTL for thallium is not available). Thallium was detected at a concentration of 1.16 μg/L in the sample from well R-17, screen 1 collected during April 2014. This result was evaluated in the GBIR and determined to be an outlier (LANL 2016, 601920, Table 3.2-22).

TDS was detected above the UTL of 161 mg/L in one sample. TDS was detected at a concentration of 244 mg/L in the sample from well R-46 collected during November 2018. The result was also greater than the maximum concentration in the background data set (187 mg/L). The background data set in the GBIR also contained a result of 204 mg/L that was determined to be an outlier (LANL 2016, 601920, Table 3.2-22). The November 2018 result from well R-46 is similar to that result and may also be an outlier.

TKN was detected above the maximum background concentration of 0.193 mg/L in one sample (a UTL for TKN is not available). TKN was detected at a concentration of 0.317 mg/L in the sample from well R-46 collected during November 2014. This result was evaluated in the GBIR and determined to be an outlier (LANL 2016, 601920, Table 3.2-22).

TOC was detected above the UTL of 1.08 mg/L in eight samples. TOC was detected at concentrations of 1.22 mg/L, 2.06 μg/L, and 2.44 μg/L in samples from well R-17, screen 1 collected during April 2013, September 2020, and April 2015, respectively. TOC was detected at concentrations of 1.35 mg/L, 1.56 mg/L, 1.56 mg/L, 1.73 mg/L, and 1.95 mg/L in samples from well R-46 collected during November 2013, November 2012, November 2019, May 2014, and May 2013, respectively. Six of these results were also greater than the maximum concentration in the background data set (1.37 μg/L). The six results from November 2012, April 2013, May 2013, November 2013, May 2014, and April 2015 were evaluated in the GBIR. Two results above the UTL but less than the maximum were included in the background data set, and the four results above the UTL were determined to be outliers (LANL 2016, 601920, Table 3.2-22). The results from November 2019 and September 2020 are within the range of outliers and are also likely outliers.

All detections of metals and general chemistry parameters were less than the applicable groundwater screening level (Table 3.2-22).

Tritium Detections

Tritium was detected once at well R-46 in June 2014 at 13.11 pCi/L. This result was evaluated in the GBIR (LANL 2016, 601920) and included in the background data set for tritium. This detection was substantially less than the screening level of 20,000 pCi/L.

3.2.5.2 COPC Sources

As described in section 3.2.4.2, 38 VOCs have been detected in pore-gas samples collected from October 2012 to February 2020. Of these 38 VOCs, the only one also detected in groundwater was acetone. Acetone was detected in 7 groundwater samples collected from 4 wells over the period April 2015 to November 2020. Acetone was detected in 1 sample from well R-14, screen 1 at a concentration of 2.16 μg/L; 2 samples from well R-17, screen 1 at concentrations of 3.51 μg/L and 10.9 μg/L; 3 samples from well R-46 at concentrations of 2.03 μg/L, 2.5 μg/L, and 2.84 μg/L; and 1 sample from well R-60 at a concentration of 2.21 μg/L. Acetone was detected in 2 pore-gas samples collected from the deep (650 ft bgs) sample port from well 50-630470, which is the vapor well most immediately upgradient of groundwater monitoring well R-60. Dividing the maximum acetone concentration detected in the deep port at vapor well 50-603470 (33.2 $\mu g/m^3$) by the dimensionless Henry's law constant for acetone (0.00144) yields an equilibrium groundwater concentration of 23.1 μg/L, which exceeds the concentration detected at groundwater monitoring well R-60. Although it is possible that the source of the acetone detected in groundwater samples is the MDA C vapor plume, the spatial distribution of groundwater results does not suggest this is the likely source. That is, the highest concentrations of acetone were detected in well R-17, which is approximately 1500 ft distant from MDA C.

The other organic chemicals detected in groundwater were SVOCs, which were detected infrequently (only one or two detections per well) and at low concentrations, with all but one result less than PQLs. These sporadic low-level detections may be the result of field or laboratory contamination or analytical errors and do not appear to be associated with releases from MDA C.

As described in section 3.2.5.1, all detections of metals and general chemistry parameters were within the range of background concentrations or the range of statistically determined outliers. All detections of metals and general chemistry parameters were also below screening levels.

In addition to acetone, the only other constituent detected in both vapor samples and groundwater samples was tritium. Tritium was detected at an activity of 13.11 pCi/L in well R-46 in June 2014. No tritium was detected in this well before May 2010, and tritium has not been detected since June 2014.

Tritium has not been detected in well R-60, which is immediately adjacent to MDA C (minimum detectable activities ranged from 2 pCi/L to 2.73 pCi/L). MDA C does not appear to be the source of tritium detected in groundwater.

4.0 CONCEPTUAL SITE MODEL FOR MDA C

A CSM is a representation of site conditions that conveys what is known or suspected about the sources, releases and release mechanisms, contaminant fate and transport, exposure pathways, potential receptors, and potential exposures (EPA 1989, 008021, pp. 4-10). CSMs are developed based on analyses and interpretations of existing site knowledge, observations, and data. The sources, pathways, and receptors applicable to MDA C are shown pictorially in Figure 4.0-1. The MDA C CSM was used to support risk-based decision-making and to aid in identifying potential remedial alternatives.

A schematic diagram of the CSM that displays the release mechanisms from the sources (the disposal pits and shafts) and the potential exposures to receptors is shown in Figure 4.0-2.

The CSM diagram describes whether the exposure pathways are complete under current and future site conditions. The future scenario conservatively assumes that institutional controls are not maintained and no remedy is implemented. Current and future risks are also qualitatively evaluated for the purpose of the CME.

4.1 Sources and Release Mechanisms

4.1.1 Primary Sources of Contamination

The primary sources of buried waste at MDA C are the disposal pits and shafts. MDA C was used as a disposal area for Laboratory-derived waste 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 research and development activities conducted at the Laboratory. These wastes included uncontaminated classified materials, metals, hazardous materials, and radioactively contaminated materials (section 2.1). For this CME, the CSM is concerned with the transport and risks associated with the hazardous constituents present at MDA C.

4.1.2 Primary Release Mechanisms

Six primary release mechanisms for the waste from the pits and shafts are identified (Figure 4.0-2):

- release of waste into subsurface soil by biointrusion and leaching,
- volatilization of VOCs to become soil vapor,
- excavation into the waste,
- biointrusion into the waste,
- surface soil erosion and subsidence of the waste, and
- cliff retreat and seismic events that expose waste.

Surface soil is defined here as that which extends from the ground surface to 1 ft bgs. Subsurface soil is defined here as unconsolidated subsurface materials and consolidated rock located at depths greater than 1 ft bgs.

Biointrusion into the waste has the potential to spread contaminants into subsurface soils or to the surface through (1) adsorption of soluble chemicals by plant roots or (2) movement of wastes by burrowing animals. The majority of plants in the MDA C area are shallow rooting plants that will not likely send roots deep enough in the profile to extend into buried waste. For plants common to Mesita del Buey, roots are most abundant in the upper 6.6 ft (2 m) but may extend deeper for some bushes and trees (Tierney and Foxx 1987, 006669). Burrow depths for ants and small mammals are generally less than 3.3 ft (1 m), although a small fraction of burrows extend to 6.6 ft (2 m) (Tierney and Foxx 1987, 006669). The crushed tuff covering the pits and shafts is subject to biointrusion, and the rooting and burrow depths cited are similar to the estimated crushed tuff thickness that currently covers the pit waste at the site (section 2.4.2). Shallow rooting plants and animal burrows are present across MDA C. The 2003 biota sampling indicated that burrowing mammals and ants did not transport radionuclides to the surface but that trees had transported radionuclides from the subsurface into their needles (section 2.4.2). An assumption of the CSM is that if trees transport radionuclides, they may also transport hazardous constituents such as metals. Under current conditions, the site is periodically mowed during the growing season for fire suppression. Pine trees and juniper were removed from the site several years ago, and mowing inhibits deeper-rooted plants (shrubs and trees) from reestablishing, although one juniper is currently present at the site. Currently, no efforts are made to fill animal burrows or limit small-animal activity. Under the future conditions assumed in the CSM, which includes loss of institutional controls, deeper-rooted plant communities and larger animal populations may be established.

Leaching of waste constituents into the subsurface soil beneath and next to the pits and shafts potentially began during waste disposal. During disposal, open pits collected precipitation and runoff for periods ranging from approximately 1.5 yr to 4 yr; therefore, leaching rates were probably elevated compared with rates following pit closure. Because the shafts have a much smaller surface area and were commonly covered, collection of precipitation and runoff was probably minimal during disposal. Most of the shafts were unlined, although 10 were lined with 12-in.-thick concrete. Following pit/shaft closure, leaching of contaminants by water that infiltrates the disposal units continues. Leach rates are currently expected to be controlled by infiltration rates, which are estimated to be less than 0.1 in./yr (0.3 cm/yr) across the site (section 2.3.4). Investigation data indicate little if any migration of metals and other inorganic chemicals from the disposal units. Therefore, leaching from the disposal units has likely been minimal (section 3.2.4 of this report and LANL 2005, 090513).

The source of VOC vapors in the subsurface at MDA C is not well documented. The VOCs may be from waste solvents as well as solid wastes with incidental solvent contamination disposed of in the MDA C pits and shafts. While volatilization of VOCs within the disposal units may occur and represent an ongoing source, the spatial distribution of the subsurface TCE vapor plume indicates current-day releases are less than previous releases (section 3.2.4.2). Volatilization of VOCs present in the waste will affect soil vapor in fill material within the disposal units before diffusing further to subsurface soil vapor.

The third primary release mechanism is excavation (i.e., accidental human intrusion), which would take place through the crushed tuff covering the pits. Shafts have concrete covers (Rogers 1977, 005708), which may be less susceptible to excavation than is the pit waste. Exposure by excavation is a function of the volume and depth of waste excavated and will depend largely on site access. Excavation into wastes is currently prohibited by site controls, but lack of these controls in the future may increase the potential for this release mechanism.

Erosion is another primary release mechanism that can expose waste. Erosional rills and gullies sometimes form in the crushed tuff covers at the Laboratory (Broxton and Eller 1995, 058207). Historically, at MDA C, some erosion of the soil cover in the vicinity of Pit 5 was observed and repaired (LANL 2005, 091493, p. 6). While the current interim cover has sufficient thickness to prevent waste exposure though erosion, erosion could degrade the cover over time. For the most part, surface erosion will result in a gradual thinning of the crushed tuff cover over extended periods of time, and eroded sediment will be transported into the adjacent canyons. However, the quantities and intensities of precipitation falling on the disposal units will determine the generation of surface runoff and, hence, rates and patterns of erosion (Wilson et al. 2005, 092034; French et al. 2008, 106890).

Subsidence of the waste within the disposal units has the potential to expose wastes, although evidence of waste settling is not currently observed. Subsidence could occur in the future, but the existing soil cover should minimize the potential for waste exposure.

Exposure of the waste by cliff retreat is not currently observed, because the majority of the disposal units are set back several hundred feet from the mesa edge, except for the northern side of Pit 5, which is appropriately 125 ft from the mesa edge. Cliff retreat and seismic events are potential release mechanisms that may expose wastes over long timeframes (i.e., thousands to tens of thousands of years) (Miller et al. 2020, 701480). In addition, seismic rupture studies at TA-3 and TA-55 and detailed geological and structural analyses at the Chemistry and Metallurgy Research Replacement Nuclear Facility pit located west of MDA C show no evidence of faulting or high-density fractures, which are indicative of ground motion (Gardner et al. 1999, 063492; Gardner et al. 2008, 104727).

4.1.3 Secondary Sources of Contamination

Two secondary sources, subsurface soil and soil vapor, are generated directly from primary release mechanisms (Figure 4.0-2). Direct release of waste from the pits and shafts to surface soil is not included as a secondary source because all indications are solid wastes were successfully disposed of in the disposal units rather than spilled and left at the surface. However, surface soil is included as an additional secondary source because migration of contaminants from subsurface soil to surface soil may occur through biointrusion, volatilization, excavation, erosion, and subsidence (via upward movement through the soil column).

4.1.4 Secondary Release Mechanisms

Several secondary release mechanisms can further spread contaminants from secondary sources toward potential receptors (Figure 4.0-2). For surface soil, these mechanisms are (1) storm water runoff and erosion, (2) volatilization/vapor diffusion of VOCs, (3) excavation, (4) biointrusion, and (5) wind. For subsurface soil, the secondary release mechanisms are (1) leaching by percolating water (e.g., rain, snowfall), (2) volatilization and vapor diffusion of VOCs, (3) excavation, and (4) biointrusion. For soil vapor, the secondary release mechanism is vapor transport, consisting predominantly of vapor diffusion through the tuff units and Puye Formation, and a combination of vapor diffusion and advection in the dacite. Excavation, biointrusion, erosion/subsidence, and cliff retreat/seismic events may result in direct exposure of receptors to waste without an associated secondary release mechanism.

Currently, limited contaminant transport by storm water runoff and erosion of surface soils may occur at MDA C. Soil and sediment sampling during the pre-RFI studies (section 2.4.1) showed evidence of soil and sediment contamination at the top of the Ten Site Canyon drainage channel. Soil sampling during the RFI studies (section 2.4.2) and the Consent Order investigations (section 2.4.3) showed evidence of soil contamination. These pathways will become even more viable with a loss of institutional control.

Volatilization and vapor diffusion of VOCs can occur in both surface soil and in subsurface soil with subsequent migration in soil vapor. VOCs in waste or in pore water volatilize to form soil vapor as determined by Henry's law partitioning. Vapor-phase diffusion is a relatively rapid process, which, under existing conditions (low infiltration rates), is faster than unsaturated water flow and accounts for the observed migration to depth of VOCs in soil vapor within the Bandelier Tuff (Stauffer et al. 2005, 090537).

Topography is an important control on vapor transport within Mesita del Buey. With low contaminant concentrations in the air phase along the top and sides of the mesas, the steepest concentration gradients are toward the surface, which leads to preferential VOC transport toward the external mesa boundaries and yields releases of VOCs to the atmosphere, as observed from the surface-flux survey conducted at the site (section 2.4.2). Shallow vapor-phase contaminants will tend to diffuse out at the surface, while deeper vapor-phase contaminants may diffuse deeper. In paved areas, asphalt decreases this mechanism somewhat because it blocks the diffusive transport of VOC vapors from exiting at the surface (Stauffer et al. 2005, 090537). Diffusive gradients may also spread vapor-phase contaminants downward toward the regional aquifer. Although uniform diffusive contaminant migration is observed in the high-porosity tuff, it is uncertain whether or not diffusion through the low-porosity, fractured Tschicoma dacite is uniform. In addition, air flow within the dacite may also contribute to migration of vapor-phase VOCs.

Vapor-phase VOCs originating from the pits and shafts are spread in soil vapor in the vadose zone; pore-gas data indicate a vapor plume, dominated by TCE, from the surface to a depth of approximately 600 ft, with the highest concentrations ranging from 250 ft to 300 ft bgs (N3B 2021, 701220). The TCE vapor plume is centered near the eastern end of Pits 1 through 4. Surface-flux measurements detected six VOCs with PCE being detected most frequently (Trujillo et al. 1998, 058242). Vapor-phase diffusion from the pits and shafts impacts air and may potentially impact regional groundwater in the future. The future impact to groundwater is not known because of uncertainty related to vapor transport through the dacite beneath the site, although only TCE exceeds the Tier 2 screening level for its potential to impact groundwater.

Leaching of contaminants from the disposal units and downward migration by percolation will continue at a slow rate because water will infiltrate into the surface of the site, as discussed in section 2.3.4. Shallow-rooting plants are well established at the site, which leads to low leaching and percolation rates. Travel times for leached, dissolved-phase, nonsorbing species (such as general inorganic anions and nonvolatile organic compounds) from the source areas to the regional aquifer on the order of 1000 yr or longer are predicted under this scenario, based on an assessment using the chloride mass balance technique (section 2.3.4 and Appendix B). Absorbing constituents, like metals, have longer travel times than adsorbing constituents. Both vadose zone and regional groundwater data indicate this release mechanism to groundwater is currently incomplete for both inorganic and organic chemicals.

4.2 Exposure Pathways

Contact with contaminated environmental media creates exposure pathways for both human and ecological receptors. Seven potential exposure media are identified for the site: (1) sediment, (2) surface water, (3) air, (4) soil, (5) dust, (6) groundwater, and (7) waste (Figure 4.0-2).

4.3 Receptors and Risks

Three potential receptors have been identified: (1) humans, (2) ecological receptors, and (3) groundwater. Groundwater is an exposure medium because it is used by both human and ecological receptors. Groundwater is also included in the CSM as a receptor because it is a resource. Human and ecological receptors may be exposed if pathways are complete through exposure routes such as inhalation, ingestion, or dermal contact. The air pathway from surface soils includes releases both to outside air and vapor intrusion into buildings. Risks to human health and the environment may occur if elevated concentrations of contaminants are present in the exposure media. Both current and future exposures are qualitatively evaluated below and in the CSM (Figure 4.0-2). The future exposure scenario includes the loss of institutional controls.

Under current conditions, several transport pathways are considered to be complete or potentially complete.

- Based on field data, the storm water runoff, erosion of surface soil/sediment, and wind pathways are complete. The potential exposure is very low because current surface and subsurface contaminant levels do not pose a potential unacceptable risk to human health or ecological receptors (LANL 2005, 090513; LANL 2007, 098644).
- The air pathway (volatilization/vapor diffusion) is complete for VOCs. However, based on the low vapor fluxes emitted at the surface (Trujillo et al. 1998, 058242) the potential exposure from ambient air is low. The potential exposure from vapor intrusion into buildings is very low (LANL 2012, 215002, Appendix C). Exposure via the air pathway is currently limited to industrial workers and is regulated and controlled under occupational safety and health regulations.
- Previously obtained data in the Performance Assessment and Composite Analysis for Los Alamos National Laboratory Material Disposal Area G, Revision 4 (French et al. 2008, 106890) demonstrated that risk due to biointrusion is very low. The completeness of the biointrusion pathway differs with depth because the density of plant roots and animal burrows decreases with depth (section 4.1.2). It is complete for surface soil and potentially complete for subsurface soil and wastes. Mowing minimizes the establishment of deeper-rooting plants, which helps to keep the exposure very low. The thickness of the operational cover helps to limit animal burrows and minimize direct exposure to the waste.
- The excavation pathway is potentially complete for site workers for surface soil and subsurface soil. However, excavation directly into the waste is an incomplete pathway because of current site controls. The exposure to site workers is very low because of operational controls. For the general public, the excavation pathway is not complete.
- All other pathways (leaching and diffusion/volatilization of contamination in subsurface soils to groundwater, diffusion of soil vapor to groundwater, erosion/waste subsidence, and cliff retreat/seismic events) are currently incomplete.

Under future conditions, the transport processes have longer to develop and pathways may become complete. For the CSM, institutional controls are assumed to cease and no corrective measures are implemented. These changes impact the following pathways and exposure scenarios. Most exposures are for human and ecological receptors unless groundwater is specified.

- Storm water runoff and erosion of surface soil/sediment remain complete pathways. In the future, sediment and surface-water concentrations may increase as these processes erode the existing cover, resulting in a low future exposure.
- The air pathway (volatilization/vapor diffusion) remains complete for VOCs. Air concentrations in the future may increase if new releases of VOCs occur in the disposal units. However, based on the current configuration of the plume, it appears that VOC releases are less than in the past (LANL 2011, 204370). The future exposure, including vapor intrusion into buildings, is very low to low and would be controlled under occupational safety and health regulations as long as institutional controls are maintained.
- Wind remains a complete pathway for exposure to dust. The future exposure from this pathway increases from very low to low because surface-soil concentrations may increase without site controls.

- The potential for excavation into surface soil, subsurface soil, and waste increases in the future if people inadvertently enter the site. Exposures range from low/medium for surface soil to medium for subsurface soil and waste because concentrations closer to the waste are assumed to be higher. The assumed future medium exposure is based on uncertainty related to the inventory and concentrations of hazardous constituents in the waste.
- Leaching of water-soluble contaminants from subsurface soils to groundwater is a potentially complete future pathway. However, completion of the pathway is expected to occur over a long timeframe (e.g., several hundred to several thousand years) because of low infiltration rates across the mesa top, the distance to groundwater, and because many of the water-soluble contaminants (such as metals) strongly adsorb to subsurface soils and rocks. This pathway results in a very low future exposure.
- Uncertainties are associated with transport of vapor-phase contaminants through the fractured dacite; therefore, there are uncertainties about the potential of vapor-phase diffusion to impact groundwater in the future. Vapor-phase concentrations of TCE exceed the Tier 2 screening level (section 3.2.4.2). In the current configuration of the TCE vapor plume, the maximum vapor concentrations for TCE are present between 250 ft and 300 ft bgs, which is beneath the disposal units. This indicates the vapors have transported downward. For this reason, the future pathway is considered to be potentially complete. Because of uncertainty associated with this pathway, it is ranked as a future medium exposure to the groundwater resource.
- The future human and ecological receptor exposure to contaminated groundwater (from vapor-phase transport of contaminants to groundwater) is low. The groundwater exposure location for receptors is not likely to occur within the bounds of MDA C. Therefore, the concentrations of any contaminants reaching groundwater in the future will decrease because of dilution, dispersion, and attenuation before reaching a groundwater well. It is unlikely that groundwater would be extracted from a location having significant VOC concentrations.
- Erosion and subsidence may result in a potentially complete pathway to the waste. If these processes directly expose wastes, a low to medium exposure could result. The assumed future low to medium exposure is based on uncertainty related to the inventory and concentrations of hazardous constituents in the waste.
- Exposure of waste from cliff retreat and seismic activities may result in a potentially complete pathway. The disposal units are located over 100 ft from the mesa edge and are not expected to be impacted by cliff retreat for more than 10,000 yr (Broxton and Eller 1995, 058207; Reneau and Raymond 1995, 054709, and Appendix E of this report), which results in a very low future exposure.

4.4 Remedial Action Objectives

The remedial action objectives (RAOs) address exposure pathways with the potential for medium and high exposure. Based on the CSM, the RAOs for MDA C are as follows:

- Prevent human and ecological exposure to the waste through excavation and erosion.
- Prevent biointrusion to the waste from burrowing animals.
- Prevent human and ecological exposure to the contaminated surface soil and/or subsurface soil through excavation.

- Prevent groundwater from being impacted above a regulatory standard by the transport of VOCs through soil vapor.
- Prevent the creation of contaminated leachate by restricting the infiltration of water into the waste.

The last RAO listed above is defined to address uncertainty related to potential leachate production from the unlined pits and shafts at MDA C. If excess water accumulates in the units, contaminated leachate may be generated and migrate downward from the site. Although water accumulation has not been observed, it is an undesired condition that warrants long-term prevention.

5.0 REGULATORY CRITERIA

The MDA C subsurface disposal units are subject to a CME as outlined in Section XVI of the Consent Order. The corrective action requirements for the MDA C disposal units are discussed below. The MDA C disposal units also contain radioactive materials that are regulated by DOE under the Atomic Energy Act and its implementing regulations and orders. Corrective action requirements applicable to radioactive materials are described in Appendix F.

5.1 Media Cleanup Standards

The cleanup and screening levels described in Section IX of the Consent Order were followed in this CME to determine the recommended corrective measures alternative. Cleanup levels are based on the NMWQCC groundwater and surface-water standards and NMED's cleanup levels for protection of human health. They are consistent with EPA's National Oil and Hazardous Substance Pollution Contingency Plan, 40 Code of Federal Regulations (CFR) Section 300.430(e)(2)(i)(A)(2).

NMED selected a human health target risk level of 1×10^{-5} and a hazard index (HI) of 1 for establishing site-specific cleanup levels for one or more contaminants for which toxicological data are published. NMED and the EPA have developed SSLs, EPA has established MCLs, and NMWQCC has adopted groundwater and surface-water standards that are described below.

5.1.1 Soil

For residential and industrial land use, NMED has specified SSLs that are based on a target total excess cancer risk of 1×10^{-5} and, for noncarcinogenic contaminants, a target HI of 1.0. Residential and industrial SSLs are from NMED guidance (NMED 2019, 700550). If an NMED SSL has not been established for a contaminant for which toxicological information is published, the most recent version of the EPA regional human health medium-specific screening level for residential and industrial soil is used (https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables).

If an excavation alternative is selected, these SSLs will be used as cleanup levels as specified in Section IX of the Consent Order.

5.1.2 Groundwater

The corrective measures alternative chosen will be required to meet the groundwater-quality standards given in Section IX of the Consent Order. These standards include the NMWQCC groundwater standards, including alternative abatement standards (20.6.2.4103 New Mexico Administrative Code [NMAC]), and the drinking water MCLs adopted by EPA under the federal Safe Drinking Water Act (42 U.S. Code Sections 300f to 300j-26) or the Environmental Improvement Board (20.7.10 NMAC). If both an NMWQCC standard and an MCL have been established for an individual substance, then the lower of the two levels is the cleanup level for that chemical.

If no MCL or NMWQCC standard is available, EPA regional tap water screening levels are used, which are adjusted to the 1×10^{-5} risk for carcinogens and/or an HI of 1 for noncarcinogens as the basis for proposing a cleanup level for the contaminant. If the naturally occurring (background) concentration of a contaminant exceeds the standard, then the cleanup level defaults to the background concentration for that specific contaminant.

5.1.3 Surface Water

No permanent surface water is present at MDA C, and any impacts to surface water quality from MDA C would be caused by storm water runoff. Discharge of storm water runoff from MDA C is regulated under the Laboratory's National Pollutant Discharge Elimination System (NPDES) individual permit for discharge of storm water from SWMUs and AOCs (NPDES Permit No. NM0030759). Because storm water runoff from MDA C is subject to a permit under Section 402 of the federal Clean Water Act, additional controls under the Consent Order are not necessary.

5.1.4 Vapor-Phase Contamination

While the Consent Order does not specifically address cleanup standards, screening levels, or other regulatory criteria for contaminants in subsurface vapor, the two-tiered approach to screen vapor-phase VOCs detected in the vadose zone, described in section 3.2.4, is the recommended approach to identify vapor-phase constituents as potential sources of groundwater contamination potentially requiring corrective action. NMED has developed vapor-intrusion screening levels, which apply to potential vapor intrusion into buildings.

5.2 Consent Order CME Requirements

The purpose of the CME is to identify and evaluate potential remedial alternatives for MDA C. This CME focuses on realistic remedies, is tailored to this site, and is consistent with expected future land uses. Consent Order–specified evaluation criteria were used to select the recommended corrective measures alternative for the MDA C subsurface units based on evaluation of specific site conditions, including the contaminant inventory, the design of the disposal units, the environmental setting, and the nature and extent of contamination. Section XVI of the Consent Order provides threshold and balancing criteria for screening and evaluation of prospective corrective measures, respectively. These criteria are listed in sections 5.2.1 and 5.2.2. Figure 5.2-1 presents a flow chart of the selection process used to determine the recommended corrective measures alternative.

5.2.1 Threshold Criteria

All alternatives must be screened based on the threshold criteria described in Section XVI of the Consent Order:

- be protective of human health and the environment,
- attain media cleanup objectives,
- control the source(s) of releases, and
- comply with applicable standards for management of wastes.

5.2.2 Remedial Alternative Evaluation Criteria

Section XVI of the Consent Order identifies five evaluation criteria (also known as balancing criteria) against which each alternative shall be evaluated in proposing a recommended alternative:

- long-term reliability and effectiveness (including sustainability, long-term stewardship considerations, and long-term environmental impacts);
- reduction of toxicity, mobility, or volume of waste and contaminated media;
- short-term effectiveness (including near-term environmental impacts);
- implementability; and
- cost.

The justification for the recommended corrective measures alternative includes the supporting rationale based on the factors listed in sections 7 and 8, as well as a discussion of short- and long-term objectives for the site, and the benefits and possible risks of the recommended alternative.

5.2.3 RCRA Requirements

Waste disposal at MDA C ceased before the effective date of the RCRA hazardous waste regulations. Therefore, although wastes disposed of at MDA C might meet the current definition of hazardous or mixed wastes, MDA C is not a RCRA-regulated land disposal unit and is not subject to RCRA closure or post-closure care requirements. Wastes removed from MDA C disposal units as part of a corrective measure would be subject to the waste characterization requirements for newly generated wastes. If these wastes were characterized as RCRA-regulated hazardous or mixed wastes, they would be subject to RCRA requirements for storage, treatment, and disposal.

6.0 IDENTIFICATION OF TREATMENT TECHNOLOGIES

Section 6.1 describes the process used to identify treatment technologies, and section 6.2 screens treatment technologies applicable at MDA C. The technologies retained in section 6.2 are summarized in section 6.3 and carried forward to section 7 for inclusion in the corrective measures alternatives.

6.1 Classification of Treatment Technologies

General types of corrective measures technologies potentially applicable to MDA C site conditions and waste types were selected from the comprehensive technology list developed by the Federal Remediation Technologies Roundtable (https://frtr.gov/matrix2/section3/table3_2.pdf).

For wastes disposed of at MDA C, potentially appropriate technologies fall into four general categories:

- containment,
- in situ treatment,
- excavation/retrieval, and
- ex situ treatment.

Within the containment category, the subcategories evaluated are vertical barriers, deep and near-surface horizontal barriers, and surface barriers. Within the treatment categories, the subcategories include biological, chemical, physical, and thermal treatment. The excavation/retrieval technology will require either on-site waste disposal, off-site waste disposal, or ex situ treatment.

The majority of waste disposed of at MDA C was LLW. Pre-1970 transuranic (TRU) and mixed LLW (MLLW) may also have been disposed of at MDA C. Although a vapor-phase VOC plume exists in the subsurface of MDA C, the characteristics of the plume do not indicate an active, ongoing source or the presence of liquid VOCs in the pits or shafts. The screening of technologies is focused on (1) containment, in situ treatment, excavation/retrieval, or ex situ treatment of the hazardous constituents in the pits and shafts and (2) in situ treatment of the VOC plume in the vadose zone.

6.2 Screening of Technologies

Corrective action guidance from EPA (1994, 095975, p. 58) requires that potential corrective measures technologies be screened to eliminate those that prove impractical to implement, that rely on technologies not likely to perform satisfactorily or reliably, or that do not achieve the corrective action objectives within a reasonable timeframe. When technologies provide similar benefits, cost is often also used as a screening tool.

For the MDA C CME, the screening of technologies included the following:

- review of site setting, characterization data, and the CSM to identify conditions that may limit or promote the use of certain technologies;
- identification of the waste characteristics that limit the effectiveness or feasibility of technologies; and
- identification of the level of technology development, performance record and inherent construction, and operations and maintenance (O&M) requirements for each technology considered.

6.2.1 Containment Technologies

Containment technologies are intended to isolate the waste/contaminated materials. Such technologies may include surface and subsurface barriers, and various orientations and compositions of barriers may be used. The general functionality and potential applicability of each containment technology considered at MDA C are discussed below.

6.2.1.1 Vertical Barriers

Vertical barrier technologies, such as grout curtains, synthetic membranes, and reactive barriers, were considered of limited benefit for MDA C applications because the absence of near-surface groundwater at the site already limits lateral migration of most contaminants. Limiting the lateral component of vapor-phase transport of a limited number of volatile contaminants at the site is one potential application for vertical barriers at MDA C. However, this technology has been demonstrated primarily with groundwater contamination, and its applicability with vapor-phase contamination is unproven.

Vertical barrier technologies were not retained.

6.2.1.2 Deep Subsurface Horizontal Barriers

The purpose of a deep subsurface horizontal barrier, such as forced grout injection, is to contain downward aqueous-phase contaminant transport. It is generally suitable for sites with known aqueous-phase releases and/or climates with significant infiltration from the surface. Bottom barriers are horizontal subsurface barriers (i.e., underground barriers that run parallel to the surface) that prevent vertical liquid migration by providing a floor of impermeable materials beneath the waste. Subsurface tuff sampling data have not demonstrated that aqueous phase transport of contaminants from MDA C disposal units is occurring.

Deep subsurface horizontal barrier technologies were not retained.

6.2.1.3 Near-Surface Horizontal Barriers

Near-surface horizontal barriers created by a soil-grout mixture or vitrification could potentially provide protection from exposure by controlling intrusion into the waste by plants, animals, or people. Additionally, these barriers could limit the transport of contaminants by reducing infiltration of water through the waste. However, these technologies do not provide water storage. Rainfall that does not infiltrate may migrate to the edge of the treated area, potentially creating a focused area of recharge and increasing infiltration in those areas.

Near-surface horizontal barrier technologies were not retained.

6.2.1.4 Surface Barriers

Barriers placed on the surface of disposal sites can provide exposure protection, restrict deep percolation of water, provide resistance to surface water runoff and wind erosion, prevent or minimize intrusion into wastes by plants or animals, act as a deterrent to inadvertent human intrusion, and limit flux of gas-phase contaminants. Surface barriers can allow MDA C to meet the threshold criteria for protecting human health and the environment.

Surface barriers would likely be drawn from the following readily available technologies.

Asphalt Cover

Asphalt provides protection from contaminated soil and waste as well as a substantial barrier to surface erosion processes but has been shown at another Laboratory site, MDA AB Area 2 at TA-49 (LANL 1999, 063918, p. 22), to trap moisture that would otherwise be evaporated or transpired from the subsurface. Such trapped moisture could induce vertical transport of contaminants in the subsurface. As maintaining low moisture content is a desirable feature for MDA C, an asphalt cover is not suitable for this site. In addition, a permeable cover allows the gradual diffusion of VOC vapors from the subsurface to the atmosphere, thereby reducing the subsurface contaminant inventory. A low-permeability asphalt cover would prevent the natural attenuation of subsurface VOC contamination by surface diffusion.

An asphalt cover was determined to be inadequate at the Los Alamos Airport Landfill. It allowed 100% infiltration via stress cracks due to differential settlement while eliminating removal of water via ET.

Asphalt cover technology was not retained.

Concrete Cap

A concrete cap consists of a single layer of concrete that provides protection from contaminated soils and waste. However, as with the asphalt cover, moisture trapped under the cap is of concern. Such trapped moisture could induce vertical transport of contaminants in the subsurface. In addition, because of the size of the cap required to cover the pits/impoundments and shafts, the potential exists for significant cracking, thus limiting its effectiveness. A low-permeability concrete cover would also prevent natural attenuation of subsurface VOC contamination by surface diffusion.

Heavily reinforced concrete cracked dramatically at the Los Alamos Airport Landfill and was deemed inadequate and removed.

Concrete cap technology was not retained.

Soil Barrier

A soil barrier consists of adding soil and planting vegetation over the disposal unit to provide an exposure barrier to contaminated soils and waste. The existing vegetated soil cover at MDA C is an example of a soil barrier. Subsurface tuff data have demonstrated the existing soil cover at MDA C to be effective in preventing aqueous-phase transport of contaminants from MDA C disposal units resulting from infiltration and leaching. A soil barrier may thus be effective at the MDA C site.

The soil barrier technology was retained.

Biointrusion Barriers

Various materials have been used as biointrusion barriers to control the intrusion of plants and animals into hazardous waste landfills. Installation of horizontal barriers constructed of angular cobbles inhibits deep-rooting plants and discourages burrowing animals. The filter layer is designed to prevent fine soils in the overlying cover soil from migrating into the barrier. Results of an animal-intrusion experiment conducted at the Laboratory using pocket gophers demonstrated that cobbles and cobbles with gravel effectively prevented animal intrusion. The weight and size of the cobbles prevented these animals from burrowing below the barrier. Cobbles were also effective in limiting root intrusion, as the spaces between the cobbles are relatively free of soil and water (Nyhan 1989, 006876).

Chainlink fencing laid on the surface of a cover has been successfully used at a Laboratory site to discourage burrowing animals while having no observable impact on beneficial vegetation (LANL 1999, 063919) but would not last 1000 yr.

Because biointrusion presents minimal risk, biointrusion barrier technology was retained.

Compacted Clay Cover

Compacted clay covers have successfully controlled excess infiltration at RCRA-regulated landfills. However, clay liners are far less effective in arid and semiarid climates than in more humid environments because the clay tends to dry out and crack, allowing moisture to flow directly into disposal units (Suter II et al. 1993, 701418; Dwyer 2001, 071298). As a standalone technology, compacted clay covers are not suitable for MDA C. However, compacted clay layers can be incorporated into multilayer cover designs considered for MDA C.

Compacted clay cover technology was not retained as a standalone technology.

Multilayer Cover

Multilayer covers consist of different geologic and/or synthetic materials layered in a specific order to control various potentially detrimental processes and conditions (e.g., infiltration, erosion, and biointrusion). RCRA Subtitle D and Subtitle C covers belong in this category. A standard RCRA Subtitle C cover consists of the following: a surface vegetation layer, a drainage layer, a composite liner composed of a flexible geomembrane, and a base layer of compacted soil (typically clay) to meet hydraulic conductivity limits. The geomembrane is a thin impermeable barrier of synthetic material that offers very little structural capacity. Multilayer covers can be compromised if any of their components are not suited for the site. Geomembranes have not been shown to be effective for more than a few decades. Furthermore, geomembranes, when placed within 3 to 6 ft of the surface, limit the storage medium for the long-term viability of native vegetation.

The multilayer cover technology was retained.

Evapotranspiration Cover

The concept of the ET cover relies on the soil to act as a sponge until infiltrated water can be removed via ET (Dwyer 2003, 097902). Generally, ET is defined as the combination of water removed by evaporation from the surface and transpiration through vegetation. ET covers are designed to provide infiltration protection for arid and semiarid environments, where materials such as clays and synthetic/geosynthetic membranes are less reliable. ET covers may consist of multiple layers of geologic materials suited to achieve the ET criteria. Suitable vegetation can improve the performance of ET covers. The vegetated ET cover was developed specifically for landfills located in arid and semiarid environments such as Los Alamos (Barnes et al. 1990, 070209, pp. 1201–1202). The earliest research in this area was conducted by the Laboratory at a test site approximately 2 mi from MDA C (Nyhan et al. 1984, 008797; Nyhan 1989, 006876; Nyhan et al. 1989, 006874).

The Los Alamos climate’s demand for water, or PET, far exceeds the annual supply of water, or precipitation. This is shown in Figure 2.3-4 where, for every month of the year, the demand for water (PET) exceeds the supply of water (precipitation). The Los Alamos climate is thus an excellent candidate for deployment of an ET cover. The ET cover also provides a medium for native vegetation.

Therefore, ET cover technology was retained.

6.2.2 In Situ Treatment Technologies

In situ waste treatment technologies are used to reduce the mobility and/or toxicity of wastes or to increase their stability without removing the wastes from their disposal location. In situ treatment generally requires longer time periods, and the uniformity of treatment is less certain because of the variability in soil and aquifer characteristics and because the effectiveness of the process is more difficult to verify. Different in situ methods (biological, chemical, physical, and thermal) are appropriate for different contaminants and disposal environments.

6.2.2.1 Natural Attenuation

Natural attenuation uses natural subsurface processes to reduce contaminant concentrations to acceptable levels. The natural attenuation processes include a variety of physical, chemical, or biological processes that, under favorable conditions, act without human intervention to reduce the mass, toxicity, mobility, volume, or concentration of contaminants in soil, soil vapor, or groundwater. These in situ processes include adsorption, biodegradation, dispersion, dilution, sorption, volatilization, radioactive decay, chemical reactions, and chemical or biological stabilization.

Consideration of the natural attenuation technology requires evaluating contaminant degradation rates and products as well as concentrations at potential downgradient receptor points. The primary objective is to demonstrate that natural processes of contaminant degradation will reduce contaminant concentrations below regulatory standards or risk-based levels before potential exposure pathways are completed. In addition, long-term monitoring is conducted to measure degradation rates to evaluate compliance with cleanup objectives. Commonly targeted contaminants for natural attenuation include halogenated VOCs, SVOCs, and fuel hydrocarbons. This technology may also be applicable to the VOCs in the vadose zone.

Therefore, natural attenuation was retained.

6.2.2.2 Biological Treatment Technologies

Biological methods using various microorganisms or vegetation have been effective in metabolizing a variety of organic contaminants and also in changing the solubility of certain inorganic chemical and radioactive species in low concentrations during the wastewater treatment processes. Potential in situ biological treatment technologies, including bioventing, enhanced bioremediation, and phytoremediation, provide limited benefit because of the dry soils present at MDA C. Biological treatment is also less viable for many chlorine-containing organic chemicals and may lead to more toxic byproducts than the original contaminant, such as TCE to vinyl chloride.

Biological treatment technologies were not retained.

6.2.2.3 Chemical Treatment Technologies

Chemical treatment, such as chemical oxidation or soil flushing, uses the physical properties of the contaminants or the contaminated medium to destroy (i.e., chemically convert), separate, or contain the contamination.

These technologies were not considered potentially applicable to the MDA C site because of difficulties in delivering the reactive chemicals uniformly to the soil. Incorporating large quantities of hazardous oxidizing materials or extraction fluids poses additional concerns for workers and possibly the environment.

Chemical treatment technologies were not retained.

6.2.2.4 Physical Treatment Technologies

In situ physical treatment technologies are a diverse group of technologies that include methods to remove mobile contaminants, to increase the mobility of contaminants, to further stabilize contaminants, and to destroy contaminants in place.

Physical treatments would likely be drawn from the following technologies.

Soil-Vapor Extraction

SVE can be either a passive or an active system. Passive SVE uses natural atmospheric pressure changes to pull VOCs from depth through open boreholes. Active SVE uses vacuum blowers to accelerate the removal of vapor-phase contaminants, primarily VOCs, from the vadose zone. The blowers create a negative pressure or vacuum in one or more boreholes. The vacuum removes the gases or vapors from boreholes by advective transport. This technology commonly requires a treatment system for the contaminated vapor that is extracted from the subsurface. SVE is generally applicable to contaminants having a dimensionless Henry's law constant greater than 0.01 (http://www.frtr.gov/matrix2/section4/4-7.html). The dimensionless Henry's law constant for TCE is 0.404 [(µg/m^3 vapor)/(µg/m^3 liquid)] (NMED 2019, 700550); therefore, SVE would be an applicable technology for removing TCE and other VOCs from the vadose zone at MDA C. In some geologic settings, passive SVE is enhanced by using a wellhead control device that restricts the inward flow of ambient air into the subsurface under high atmospheric pressure conditions, allowing only outward flow of air during low atmospheric pressure conditions.

The active SVE pilot studies conducted by the Laboratory at MDA L in 2006 and 2014–2017 (LANL 2006, 094152; N3B 2018, 700039) and at MDA G in 2008 and 2010 (LANL 2009, 105112; LANL 2010, 109657) and the 2015 interim measure at MDA L (N3B 2018, 700039) support retaining this technology for further consideration. Studies of passive SVE at MDA C, MDA L, and MDA H also support retaining this technology (SEA 1997, 076055, p.6; Neeper and Stuaffer 2012, 601587; Neeper and Stauffer 2012, 601588).

Pneumatic Fracturing

Pneumatic fracturing uses the injection of a fluid under pressure to create open fractures in an area where a contaminant plume exists. Opening subsurface flow paths allows access to the contaminated media for removal or treatment. Pneumatic fracturing has the potential to introduce large amounts of water into a formation that has optimal low moisture content and is not desirable.

Pneumatic fracturing technology was not retained.

Dynamic Compaction

Dynamic compaction is used to compact and consolidate wastes in place to reduce the potential for settling or sinking over time. The technology has been successfully demonstrated on landfills where subsidence (i.e., settling) over large areas is likely and where waste is near the surface and of a homogeneous waste form (EPA 2002, 102739, p. 1). Dynamic compaction may adversely affect existing waste forms, creating the potential for release.

Dynamic compaction technology was not retained.

Jet Grouting Stabilization

Jet grouting employs high-pressure injection of a cementitious grout slurry into a soil stratum to hydraulically mix the in situ material with the grout. The grout slurry is injected into and/or around the waste to fill void spaces and to reduce the porosity within and between buried objects. The objective of this treatment is to stabilize the waste form to reduce the infiltration and movement of surface water into and through the waste and to reduce the future potential for subsidence of waste and overburden.

One method involves injecting grout into holes drilled through the waste while simultaneously pulverizing the waste and mixing it with the grout. This approach is applicable only for homogeneous, soil-like wastes. Because of the heterogeneous nature of the waste at MDA C, this technology is not viable.

A second waste stabilization method involves the direct injection of grout into void spaces surrounding the waste. A pipe or auger is drilled into the subsurface and slowly rotated and pressurized. The high pressure (4000–13,000 psi) forces the grout laterally through special ports on the sides of the pipe or auger. The slurry exits the jet port at very high velocity, penetrating the soil several inches to several feet away from the ports. The rotating ports destroy soft soil formations while mixing the native soil with cement. Finally, the rotating pipe/auger is drawn slowly upward at a controlled rate to create a nearly cylindrical column of treated soil.

The waste material in the pits and shafts ranges from 10 ft to 25 ft bgs. Use of high pressure at shallower depths could be hazardous to workers. A breach may occur with the high-pressure application of grout. In addition, the integrity of the drums and other waste containers in the disposal units could be damaged by high-pressure injection of grout.

Jet grouting stabilization technology was not retained.

6.2.2.5 Thermal Treatment Technologies

Thermal treatment technologies have been developed and implemented to decompose heat-sensitive contaminants into less toxic or less mobile forms or to enhance the extractability of a contaminant by heating it into a vapor phase. Heat is generated or delivered using several types of radiation (e.g., microwave, radio frequency, or thermal), using direct conductance of electricity, or injecting already heated materials (e.g., steam). VOCs present at MDA C are already readily extractable given the highly fractured subsurface where air readily travels through the mesa. Therefore, application of this technology at MDA C would provide minimal benefit.

Thermal treatment technologies were not retained.

6.2.3 Excavation/Retrieval Technologies

Excavation/retrieval technologies are used to remove wastes from the subsurface disposal units for disposal at another site. Factors affecting the viability of excavation/retrieval include the potential to reduce long-term human health and environmental risk versus increased short-term risk to human health and the environment during excavation, availability of treatments necessary to meet disposal requirements, and costs and risks of shipping large quantities of material off-site.

Excavation/retrieval of materials will require disposal in an appropriate facility (see section 6.2.5). Various methods for excavation and disposal are evaluated below.

6.2.3.1 Excavation

Excavation is the primary option for removing waste from the MDA C subsurface units. Waste in the larger disposal areas (i.e., pits) of MDA C would require large-scale soil moving and excavating equipment (remotely operated, if necessary) to safely remove the waste from the subsurface. The disposal shafts at MDA C are next to and at approximately the same depth as the pits. Therefore, it is anticipated the shaft waste would be excavated in conjunction with the pit waste. The maximum reported depth of the pits and shafts is 25 ft (Table 2.1-1). The Laboratory successfully excavated waste from disposal pits to this depth at MDA B (LANL 2012, 215119).

The excavation technology was retained.

6.2.3.2 Overcoring Retrieval—Shafts

Overcoring retrieval is a technology for retrieving an entire shaft without digging a trench. This method typically involves using a crane to lift and suspend a large-diameter steel casing over the shaft. The diameter of the casing is larger than that of the shaft. The casing is then driven into the ground by a vibratory driver until the casing encompasses the entire shaft. Once the casing has reached the appropriate depth, the casing's open bottom is sealed shut by injecting grout into the ground within the casing to the base of the core. When the seal has cured and hardened, the entire casing is lifted to retrieve the intact shaft contained within. The excavated core is then backfilled.

This technology has been demonstrated at the DOE facility in Hanford, Washington, to a depth of 25 ft, which is the maximum depth of the MDA C shafts. As noted above, the shafts at MDA C are next to the pits, therefore, they could be retrieved at the same time as all other wastes and there would be no need to retrieve the shaft wastes separately.

Overcoring retrieval technology was not retained.

6.2.3.3 Waste Container Retrieval—Shafts

Waste container retrieval involves removing the concrete cap and cover soil from a waste shaft and retrieving waste containers from the shafts. The small diameter of the MDA C shafts (1 to 2 ft in diameter) provides limited space for manipulating retrieval equipment. Additionally, the type and condition of the containers in the shafts is not known, and it is possible uncontainerized waste is also present in the shafts. As noted above, the depths of the shafts and their location next to the pits eliminate the need to consider separate retrieval of shaft waste.

Waste container retrieval technology was not retained.

6.2.4 Ex Situ Treatment Technologies

If excavated, MDA C waste materials and/or contaminated media will require characterization to determine whether the waste material meets the waste acceptance criteria (WAC) of the appropriate treatment, storage, and disposal facility. Some of the waste may require treatment before it is reused as backfill or placed in an approved facility. General treatment technologies include neutralization, extraction, thermal treatment, stabilization, and the various debris treatments specified under RCRA.

During the recent remediation activities at MDA B, the only excavated wastes that required treatment before shipment off-site were gas cylinders (LANL 2012, 215119). Liquid residuals in some cylinders removed from MDA B required treatment by elementary neutralization. It is expected similar wastes may be present at MDA C, and thus elementary neutralization was retained as a treatment technology to use in conjunction with excavation.

6.2.5 Waste Management and Disposal

Waste management and disposal are not treatment technologies that apply directly to the RAOs for MDA C, but because many technologies require waste removal, waste management options are discussed below.

On-Site RCRA Landfill

This technology would require the construction of a new landfill at the Laboratory designed to meet the RCRA Subtitle C minimum technology requirements (MTRs). A RCRA Subtitle C landfill is defined as a disposal facility or part of a facility where hazardous waste is placed. Consolidation or placement of wastes into a RCRA landfill has strict requirements, such as land disposal restrictions (LDRs).

At this time, the Laboratory is not considering the construction of a RCRA landfill. A new RCRA landfill would require a lengthy siting study and permit modification approval process. This option would delay final action through the permitting approval process and construction of the new landfill, which would impact the Consent Order corrective action requirements.

An on-site RCRA landfill is not a preferred option for waste management and disposal.

On-Site Corrective Action Management Unit

Corrective action management units (CAMUs) are used for the on-site management of remediation wastes under RCRA. A CAMU under RCRA is used for on-site treatment, storage, or disposal of hazardous wastes managed during cleanup. Consolidation or placement of remediation wastes into a CAMU is not considered land disposal and does not trigger LDRs or create a unit subject to MTRs. CAMUs can be temporary or permanent (i.e., can be closed after removing waste or become a disposal unit).

A CAMU would require prior approval by the New Mexico Secretary of the Environment, a process that includes submittal of a Class 3 permit modification. This option would delay final action through the approval process and construction of the CAMU, which would impact the Consent Order corrective action requirements.

For these reasons, an on-site CAMU is not a preferred option for waste management and disposal.

Off-Site Disposal

Off-site disposal allows waste to be shipped off-site to permitted facilities. Transportation of wastes in approved trucking containers would occur on public highways. Facilities considered for this option include the Nevada National Security Site; Energy Solutions in Clive, Utah; and other approved facilities. The off-site disposal option is readily available and applicable to MDA C wastes. Off-site disposal has previously been used for soil/waste excavation projects at Los Alamos National Laboratory.

Therefore, off-site disposal is the preferred option for waste management and disposal and was retained.

6.3 Summary of Technologies Retained for Further Evaluation at MDA C

Technologies considered applicable to MDA C and retained for further consideration in developing corrective measures alternatives in section 7 are summarized below.

6.3.1 Containment Technologies

The following technologies are suitable for waste containment in the pits and shafts at MDA C:

- surface barriers—soil barrier
- surface barriers—biointrusion barrier
- surface barriers—multilayer cover
- surface barriers—ET cover

6.3.2 In Situ Treatment Technologies

The following technologies are suitable for managing and treating the subsurface vapor plume at MDA C:

- Natural attenuation
- Physical treatment—passive and/or active SVE

6.3.3 Excavation/Retrieval Technologies

The following technology is suitable for removal of the waste in the pits and shafts at MDA C:

- Excavation

6.3.4 Ex Situ Treatment Technologies

The following technology is suitable for use on-site to treat wastes removed from the pits and shafts at MDA C:

- Elementary neutralization

6.3.5 Waste Management and Disposal

The following option is suitable for managing and disposing of waste removed from MDA C:

- Off-site disposal

7.0 IDENTIFICATION AND SCREENING OF CORRECTIVE MEASURES ALTERNATIVES

The process for alternative identification and screening employed in this CME began with identifying and screening technologies that can be used to address previously identified RAOs. Table 7.0-1 presents a matrix of the potential corrective measures alternatives using the technologies that were carried forward from section 6. The corrective measures alternatives are as follows:

- Alternative 1—no action
- Alternative 2—soil barrier, natural attenuation, and institutional controls
- Alternative 3A—multilayer cover, passive and/or active SVE, and institutional controls
- Alternative 3B—ET cover, passive and/or active SVE, and institutional controls
- Alternative 4—excavation, plume monitoring, and institutional controls

The Consent Order specifies in Section XVI.C that "Any corrective measure alternative proposed in the CME Report must meet the following threshold criteria, which are evaluation standards derived from EPA's RCRA Corrective Action Plan, OSWER Directive 9902.3-2A (May 1994)." The threshold criteria as listed in Consent Order Section XVI.C follow:

1) Threshold Criteria

    a) Be protective of human health and the environment.

    b) Attain media cleanup objectives.

c) Control the source(s) of releases.

d) Comply with applicable standards for management of wastes

Section 7.1 presents the screening of alternatives against the threshold criteria. The alternatives that satisfy all four of the threshold criteria are carried forward into section 8, where they are evaluated against the remedial alternative evaluation criteria (also referred to as balancing criteria) defined in Section XVI.C.2 of the Consent Order.

7.1 Description and Screening of Alternatives

This section describes the potential corrective measures alternatives for MDA C and presents a qualitative evaluation of these alternatives against the threshold criteria contained in Section XVI.C.1 of the Consent Order. Table 7.1-1 summarizes the evaluation presented in section 7.1.

7.1.1 Alternative 1: No Action

Alternative 1 represents a true no-action alternative. Under this alternative, no action will be taken. Institutional controls will not be maintained and vapor monitoring will not be performed. No maintenance of the surface soil will be performed. In summary, this alternative entails

- no monitoring of groundwater or soil vapor,
- no maintenance, and
- no institutional controls.

7.1.1.1 Protection of Human Health and the Environment

The surface soil will likely erode, which will increase the potential for exposure to waste and contaminated surface and subsurface soil. The potential will exist for exposure through direct contact and biointrusion. This alternative is not protective of human health and the environment.

7.1.1.2 Attain media cleanup objectives

Under the no-action alternative, the existing waste inventory, which includes hazardous constituents and wastes subject to regulation as hazardous wastes under RCRA, will not be removed or treated. This alternative does not comply with the EPA guidance for attaining media cleanup standards when waste is left in place, because engineered or institutional controls will not be implemented. This alternative does not attain media cleanup standards.

7.1.1.3 Control the source(s) of releases.

Soil erosion has the potential to expose buried waste, resulting in potential releases. No monitoring will be performed to determine whether the existing VOC plume is migrating to groundwater or if additional releases are occurring. This alternative will not control sources and releases.

7.1.1.4 Comply with applicable standards for management of wastes

No wastes will be generated under the no-action alternative; therefore, it complies with applicable waste management standards.

7.1.1.5 Summary

Although the no-action alternative satisfies only one of the threshold criteria, it is carried forward for comparison with the other alternatives.

7.1.2 Alternative 2: Soil Barrier, Natural Attenuation, and Institutional Controls

Under Alternative 2, the existing soil cover at MDA C will be graded, 4 in. of topsoil added, and the site revegetated. The site will be inspected and maintained, including repair of damage from animal burrows and removal of deep-rooted vegetation. Institutional controls will also be implemented to control access to the site. Vapor and groundwater monitoring will be performed to verify natural attenuation of the VOC plume and to confirm that groundwater contamination from vapor migration is not occurring.

Institutional and engineering controls will be implemented to limit the potential for future exposure to buried waste and potentially contaminated surface and subsurface soils. These controls are assumed to remain in place for 100 yr. A certificate of completion with controls will be requested from NMED.

Active monitoring and maintenance will be performed for 100 yr. Vapor monitoring will be performed to determine whether additional releases have occurred and to evaluate whether VOC vapors are migrating vertically toward the regional aquifer. Groundwater monitoring will be performed to verify that contamination because of vapor migration from MDA C has not occurred. Maintenance activities will be performed to address erosion and animal burrowing and to manage vegetation. Fencing will be used to restrict site access.

If monitoring indicates vertical migration of VOC vapors at concentrations exceeding action levels or groundwater contamination, additional corrective actions will need to be implemented.

7.1.2.1 Protection of Human Health and the Environment

The results of the investigations conducted at MDA C have shown very limited migration of contaminants (other than vapors) from the wastes into the subsurface. Therefore, the existing cover appears to be effective in controlling infiltration and subsequent leaching and transport of contaminants. The existing cover also prevents direct contact with the buried waste by potential receptors. The results of the risk-screening assessments for MDA C show no potential unacceptable risk to human or ecological receptors under current conditions (LANL 2009, 107389). Maintenance of current conditions into the future would therefore be protective of human health and the environment.

Results from the MDA C groundwater monitoring wells show no migration of contaminants from MDA C to the regional aquifer. These results are consistent with results of vapor monitoring, which show vapor concentrations to decrease to concentrations well below screening levels in deeper stratigraphic units. Human health and the environment will be protected if the vapor plume remains in its current state and the portion of the plume above screening levels does not migrate vertically downward or if concentrations decrease in the future as a result of natural attenuation.

Institutional controls will be implemented to provide access controls, thereby restricting human exposure.

Alternative 2 is protective of human health and the environment.

7.1.2.2 Attain media cleanup objectives

Under Alternative 2, the existing waste inventory, which includes hazardous constituents and wastes subject to regulation as hazardous wastes under RCRA, would not be removed or treated. Maintenance of the existing soil cover attains media cleanup standards when waste is left in place by breaking the exposure pathway and reducing risk for human and ecological receptors. Though not specifically designed to do so, the existing cover appears to control infiltration of precipitation that could otherwise mobilize subsurface contaminants.

Contaminant releases from the site currently do not exceed media cleanup standards for soil or groundwater. If current conditions are maintained into the future, or if concentrations decrease in the future as a result of natural attenuation, this alternative will attain media cleanup standards.

7.1.2.3 Control the source(s) of releases.

The existing soil cover reduces infiltration of precipitation that could otherwise mobilize subsurface contaminants. The existing cover, when maintained, will also limit exposure to waste and contaminated surface and subsurface soils and will reduce the potential for erosion and dust generation of contaminated surface soils.

The potential exists for continued release of VOCs to the vadose zone that may diffuse to the groundwater. This alternative does not actively control such releases but instead relies on natural attenuation and the physical properties of the stratigraphic units at the site to prevent diffusion to groundwater at concentrations exceeding cleanup levels.

This alternative will control sources and releases.

7.1.2.4 Comply with applicable standards for management of wastes

No waste is projected to be generated during implementation of Alternative 2.

This alternative complies with applicable waste management standards

7.1.2.5 Summary

Alternative 2 satisfies each of the four threshold criteria. Therefore, this alternative is retained for further consideration.

7.1.3 Alternative 3A: Multilayer Cover, Passive and/or Active SVE, and Institutional Controls

Under Alternative 3A, a multilayer cover (RCRA cover) will be installed over MDA C (Figure 7.1-1). The area of the cover will be approximately 11.8 acres. The conceptual multilayer cover design (Figure 7.1-2) and construction consists of (from bottom to top)

- site preparation of the existing soil surface, which includes 4 ft of existing operational cover above the waste material;
- construction of a concrete retaining wall;
- a 2-ft layer of compacted natural or amended soil (e.g., a clay layer) with a maximum saturated hydraulic conductivity of 1×10^{-7} cm/s;

- a 40-mil flexible geomembrane liner to limit downward moisture movement (the geomembrane will not maintain its integrity for the performance period required for closure of this site); and
- a 2-ft soil and vegetation layer graded at slopes between 3% and 5%.

Note: A drainage layer is included in the generic prescriptive cover for RCRA Subtitle C covers. However, it has no practical application in a semiarid climate such as that of Los Alamos, where PET exceeds precipitation for every month of the year.

The required volumes of materials for the cover are estimated as follows:

Rock	12,691 yd^3
Soil	25,383 yd^3
Sand	19,037 yd^3
Clay	38, 075 yd^3

for a total of 95,186 yd^3 of material.

In addition, geomembranes will be installed over 11.8 acres.

This alternative will require an estimated 6776 20-ton truckloads of material to be delivered to MDA C over an estimated 57-wk period. There is a substantial increase in truck traffic along East Jemez Road (truck route) and within the Pajarito Road corridor for a long duration of time. This amount of trucking would likely delay traffic flow on East Jemez Road, increase noise level around the area, and impact the life span of existing road surface. It may be necessary to regulate traffic flow during peak travel hours under this alternative. It may be necessary to consider an alternate truck entry point and assess whether turn lanes/acceleration lanes need to be constructed along Pajarito Road at NM 4 to alleviate some of the truck traffic on East Jemez Road. A traffic study and analysis will have to be conducted to better analyze impacts to traffic flow. For this alternative, additional consideration of cumulative impacts would need to occur as other projects ramp up within the Pajarito corridor. The impacts of transporting various nonradiological materials were evaluated in the 2008 Site-Wide Environmental Impact Statement (SWEIS) (DOE 2008, 102731). These impacts are presented in terms of distance traveled and numbers of expected traffic accidents and fatalities (1.13 per 10 million km) (DOE 2008, 102731, Appendix K) and fatalities (1.18 per 100 million km). The transportation impacts under this alternative for the multilayer cover would be estimated for 412,000 mi traveled, 0.075 traffic accidents, and 0.0078 fatalities. Under this alternative, the number of shipments would present an increased short-term risk to the public and LANL personnel of potential accidents. Risks to on-site personnel from transporting this material could be reduced but preventive measures must be evaluated.

Any cover installed at MDA C must meet the performance objectives and regulatory criteria shown in Table 7.1-2 to satisfy DOE requirements for radiological protection.

SVE is quite effective in the Bandelier Tuff and its applicability to MDA C is supported by extensive data (see Appendix G). Passive SVE has been tested at MDA C and shown to produce acceptable flow rates.

The conceptual SVE design (Appendix G) includes the following principal assumptions and components.

Passive SVE

- Initially, a subset of 22 existing open boreholes at MDA C will be retrofitted to remove VOC mass from the subsurface via passive SVE. Monitoring data collected after installation of the passive SVE system will be used to demonstrate the effectiveness of passive SVE in the open boreholes. The retrofit will include
    - ❖ extending the current wellbores so that they extend beyond the height of the planned cover,
    - ❖ armoring the wellbores to minimize the risk of destroying them while installing the cover,
    - ❖ adding one-way check valves (if found to be effective at the site) and rain/bio shields to the tops of the wellbores,
    - ❖ installing solar-powered flow meters and data loggers to each wellbore, and
    - ❖ installing sampling ports that will allow the LumaSense photoacoustic multi-gas monitor to be easily hooked up to measure off-gas concentration.
- Passive SVE will slowly remove mass from the subsurface. The timing of mass removal will become clearer as the system is allowed to operate. Expected operation and monitoring is on the order of 10–20 yr, with annual analysis to show progress in plume remediation.

Active SVE

- In addition to passive SVE, a more aggressive active SVE system will be designed based on data and experience from SVE operations at MDA L. The active SVE system will be installed and activated only if increases in source concentrations show significant leakage. EM-LA and N3B will meet with NMED to develop trigger mechanisms for starting and stopping active SVE at MDA C.
- Figure 7.1-3 depicts the contingent installation of angled SVE boreholes, each to a depth of approximately 100 ft bgs within the lower reaches of the Qbt 3 unit. The boreholes will be cased to TD to prevent sloughing and screened from 50 ft to 100 ft bgs. These contingent SVE boreholes are designed to intercept potential new leakage from the VOC source area at MDA C. In the event that significant new leakage is detected, the boreholes will be located to provide effective extraction of vapors where drilling access is not impeded by the disposal pits and shafts, surrounding infrastructure, or the ET cover. An example design for these contingent SVE wells can be found in Appendix G.
- A single, portable skid-mounted SVE unit will be cycled between the extraction boreholes during operations. The SVE unit will utilize a 15-horsepower (hp) blower motor capable of providing up to 320 standard cubic feet per minute (scfm) at a vacuum of 120 in. of water. The system will be optimized during the initial setup, although a vacuum between 50 in. and 70 in. of water has been demonstrated to be effective in pilot tests previously performed at TA-54. Measured concentrations and flow rates of the off-gas will be used to determine the need for treatment, based on NMED requirements.
- Active extraction boreholes are projected to provide a 125-ft radius of influence (ROI), providing an effective area of extraction of approximately 49,000 ft^2 for each borehole. Borehole spacing will target the vapor plume areas but may be impacted by the inability to drill through the pits and shafts and the new ET cover. Because the active SVE system is contingent on the observation of a significant new leak, the plan for operating the SVE system is based on maximizing the removal of such a hypothetical leak. The operational plan for the SVE system is provided in Appendix G. Based on the results of previous pilot testing at TA-54, SVE will be conducted at an extraction borehole until after a peak in concentrations is seen. After peak concentration is observed in a given SVE borehole, decrease in total concentration will be monitored until levels fall below Tier 2 values. The SVE units will then be connected to other SVE boreholes and the extraction cycle will

be repeated. Performance monitoring, which will provide data to guide additional SVE operations at select pore-gas monitoring wells, will be conducted at the end of each 90-day operational period. Performance monitoring will provide data to guide additional SVE operations targeting all areas of high concentrations caused by releases in the VOC source area at MDA C.

Institutional and engineering controls will be implemented to limit the potential for future exposure to buried waste and potentially contaminated surface and subsurface soil. These controls are assumed to remain in place for 100 yr. A restrictive covenant will be placed on the deed and recorded locally and in the EPA institutional controls database. Active monitoring and maintenance will be performed for 100 yr. Vapor monitoring will be performed to evaluate the performance of the SVE systems. Groundwater monitoring will be performed to verify that groundwater contamination has not occurred. Maintenance activities will be performed to address erosion and animal burrowing and to manage vegetation. Fencing will be used to restrict site access.

The multilayer cover minimizes exposure on the surface of the waste facility, prevents vertical infiltration of water into wastes that would potentially create contaminated leachate, and creates a land surface that can support vegetation. Multiple penetrations through the geomembrane of the multilayer cover will exist with the passive SVE system. Each penetration can be sealed and booted. However, these seals have been shown to be preferential flow paths for liquids, given movements such as earthquakes, differential settlement, or disturbances of the surface projections.

7.1.3.1 Protection of Human Health and the Environment

A multilayer cover will provide protection against erosion, direct contact, biointrusion, and moisture infiltration. The multilayer cover, as described above, places a minimum of 5 ft of varying soil layers between a potential human or ecological receptor and the top of the existing operational cover, thereby breaking the exposure pathway. The multilayer cover is designed to restrict infiltration of water, thereby breaking the contaminant transport pathway (via leaching) to groundwater. However, the multilayer cover is protective only for decades, not 1000 yr, because the geomembrane has a finite performance period. Also, the concrete retaining wall will likely not last 1000 yr.

Passive SVE will remove vapor-phase contaminants from the subsurface, thereby preventing the potential future migration to groundwater.

The contingent active SVE system will be implemented if evidence of significant new VOC leakage is seen in the periodic monitoring data. This will ensure that hypothetical future releases of VOC vapor-phase contaminants from the subsurface are prevented from migrating to groundwater.

Institutional controls will be implemented as access controls, thereby restricting human exposure.

Alternative 3A is protective of human health and the environment.

7.1.3.2 Attain media cleanup objectives

Under Alternative 3A, the existing waste inventory, which includes hazardous constituents and wastes subject to regulation as hazardous wastes under RCRA, will not be removed or treated. The installation of a multilayer cover attains media cleanup standards when waste is left in place by breaking the exposure pathway and reducing risk for human and ecological receptors. A multilayer cover will also minimize or eliminate infiltration of precipitation that could otherwise mobilize subsurface contaminants. Passive SVE will ensure media cleanup standards are not exceeded in the future by removing vapor-phase contaminants from the subsurface.

This alternative attains media cleanup standards.

7.1.3.3 Control the source(s) of releases.

A multilayer cover will minimize or eliminate infiltration of precipitation that could otherwise mobilize subsurface contaminants, especially for the finite life of the geomembrane. Furthermore, the clay will likely go through pedogenic processes that will increase its saturated hydraulic conductivity by orders of magnitude. It may still store and release water in a manner similar to an ET cover, but clay does not have the water-holding capacity that loamy soils do. A multilayer cover will also limit exposure to waste and contaminated surface and subsurface soil and will reduce the potential for erosion and dust generation of contaminated surface soil.

Vapor-phase contaminants in the vadose zone are a potential source of groundwater contamination. Passive SVE will reduce this contaminant source. Active SVE will be implemented if evidence of significant new VOC leakage is seen in the periodic monitoring data. This will control hypothetical future releases of VOC vapor-phase contaminants from the subsurface VOC source area of MDA C.

This alternative will control sources and releases.

7.1.3.4 Comply with applicable standards for management of wastes

No waste is projected to be generated during the construction of the multilayer cover. The drill cuttings and off-gas waste streams generated from construction and operation of the SVE system can be effectively managed to comply with waste management standards.

This alternative complies with applicable waste management standards

7.1.3.5 Summary

Alternative 3A satisfies each of the four threshold criteria. Therefore, this alternative is retained for further consideration.

7.1.4 Alternative 3B: ET Cover, Passive and/or Active SVE, and Institutional Controls

Under this alternative, an ET cover will be installed over MDA C (Figure 7.1-1). A concrete retaining wall is not required for the ET cover. The existing interim soil cover will serve as the final cover system with the addition of a surface admixture layer to resist erosion and burrowing animals. The area of the cover will be approximately 11.8 acres. The conceptual ET cover design is shown in Figure 7.1-4. Construction activities include the following:

- site preparation (regrading, clearing, and grubbing) of the existing soil surface, which includes a minimum of 4 ft of existing operational cover above the waste material; and
- mixing 2.5-in.-diameter D50 durable rock into the top 2 ft of the existing interim cover to attain a uniform 1-to-2 mixture of rock to soil by volume.

The durable rock will likely require purchase and transport from areas such as Española. The required volume of 2.5-in.-diameter D50 durable rock spread over 11.8 acres is estimated to be 12,692 yd^3. This alternative will require an estimated 881 20-ton truckloads of material to be delivered to MDA C over an estimated 8-wk period. There will still be a substantial increase in truck traffic along East Jemez Road (truck route) and within the Pajarito Road corridor. Although fewer truckloads are required than for Alternative 3A, the truck volume remains the same but for a shorter duration of time (8 wk). As with

Alternative 3A, this amount of trucking is also likely to cause delays in traffic flow on East Jemez Road, increase noise level around the area, and impact the life span of existing road surface. It may be necessary to regulate traffic flow during peak travel hours under this alternative. It may be necessary to consider an alternate truck entry point and assess whether turn lanes/acceleration lanes need to be constructed along Pajarito Road at NM 4 to alleviate some of the truck traffic on east Jemez Road. A traffic study and analysis will have to be conducted to better analyze impacts to traffic flow. For this alternative, additional consideration of cumulative impacts would need to occur as other projects ramp up within the Pajarito corridor. The transportation impacts under this alternative would be for 54,000 mi traveled, 0.0097 traffic accidents, and 0.0012 fatalities.

The conceptual SVE design and operation are the same as discussed in section 7.1.3.

Institutional and engineering controls will be implemented to limit the potential for future exposure to buried waste and potentially contaminated surface and subsurface soil. These controls are assumed to remain in place for 100 yr. A restrictive covenant will be placed on the deed and recorded locally and in the EPA institutional controls database. Active monitoring and maintenance will be performed for 100 yr. Vapor monitoring will be performed to evaluate the performance of the SVE system. Moisture monitoring will be performed to evaluate the performance of the ET cover. Groundwater monitoring will be performed to verify that groundwater contamination has not occurred. Maintenance activities will be performed to address erosion and animal burrowing and to manage vegetation. Fencing will be used to restrict site access.

The ET cover minimizes exposure on the surface of the waste facility, prevents vertical infiltration of water into wastes that could create contaminated leachate, and creates a land surface that can support vegetation.

The ET cover takes advantage of the semiarid site conditions by evaporating and transpiring water from the cover. The admixture of rock and soil in the surface of the cover, given the expected slope and slope lengths and soil texture, will mitigate the formation of rills and gullies as well as minimize soil loss due to erosion. The ET cover includes no geosynthetic membrane materials, which are more likely to fail because the polymer degrades in less time than the performance period of 1000 yr.

Engineered ET covers have demonstrated effectiveness in reducing infiltration in semiarid regions (Davenport et al. 1998, 069674, p. 1; Dwyer et al. 2000, 069673, pp. 23–26). ET covers can be adapted to enhance specific desired properties for a given application, such as

- increasing erosion resistance by adding gravel surface amendments,
- enhancing or limiting plant growth and types for transpiration by varying depths of enriched soil,
- modifying the size of the ET reservoir layer above the waste layer by varying the depths of the soil or amended crushed-tuff ET layer, or
- preventing biointrusion by using barriers such as rocks.

The passive SVE system and contingent active SVE system will be operated as described in section 7.1.3.

7.1.4.1 Protection of Human Health and the Environment

The ET cover will provide protection against erosion, direct contact, biointrusion, and moisture infiltration. The ET cover, as described above, places a minimum of 6.5 ft of varying soil layers between a potential human or ecological receptor and the top of the existing operational cover, thereby breaking the exposure pathways associated with erosion, direct contract, and biointrusion. The ET cover is designed to restrict infiltration of water, thereby breaking the contaminant transport pathway (via leaching) to groundwater.

Passive SVE will remove vapor-phase contaminants from the subsurface, thereby preventing the potential future migration to groundwater.

A contingent active SVE system will be implemented if evidence of significant new VOC leakage is seen in the periodic monitoring data. This will ensure that hypothetical future releases of VOC vapor-phase contaminants from the subsurface are prevented from migrating to groundwater.

Institutional controls will be implemented to provide access controls, thereby restricting human exposure.

This alternative is protective of human health and the environment.

7.1.4.2 Attain media cleanup objectives

Under Alternative 3B, the existing waste inventory, which includes hazardous constituents and wastes subject to regulation as hazardous wastes under RCRA, will not be removed or treated. The installation of an ET cover attains media cleanup standards when waste is left in place by breaking the exposure pathway and reducing risk for human and ecological receptors. The ET cover will also minimize or eliminate infiltration of precipitation that could otherwise mobilize subsurface contaminants. SVE will ensure media cleanup standards are not exceeded in the future by removing vapor-phase contaminants from the subsurface.

Alternative 3B attains media cleanup standards.

7.1.4.3 Control the source(s) of releases.

The ET cover will minimize or eliminate infiltration of precipitation that could otherwise mobilize subsurface contaminants. The ET cover will also limit exposure to waste and contaminated surface and subsurface soils and will reduce the potential for erosion and dust generation of contaminated surface soil.

Vapor-phase contaminants in the vadose zone are a potential source of groundwater contamination. Passive SVE will reduce this contaminant source. Active SVE will be implemented if evidence of significant new VOC leakage is seen in the periodic monitoring data. This will control hypothetical future releases of VOC vapor-phase contaminants from the subsurface VOC source area of MDA C.

This alternative will control sources and releases

7.1.4.4 Comply with applicable standards for management of wastes

No waste is projected to be generated during the construction of the ET cover. The drill cuttings and off-gas waste streams generated from construction and operation of the SVE system can be effectively managed to comply with waste management standards.

This alternative complies with applicable waste management standards.

7.1.4.5 Summary

Alternative 3B satisfies each of the four threshold criteria. Therefore, this alternative is retained for further consideration.

7.1.5 Excavation, Plume Monitoring and Institutional Controls

Under Alternative 4, the shafts and the pits will be excavated. Excavation of the pits and shafts will be accomplished using standard excavation methods. However, the excavation will be performed within enclosures to control releases and to provide weather protection for the excavation. The pits at MDA B were excavated with nearly vertical side walls with an entry ramp on one end. The remediation activities at MDA C may employ excavation using a similar configuration, with nearly vertical slopes (1 ft horizontal to 6 ft vertical) (Figure 7.1-5). The disposal shafts are next to and at the same depth as the disposal pits. The shafts would, therefore, be excavated in conjunction with the pit excavations. The estimated volume of excavated materials is provided in Appendix H. Confirmatory sampling will be conducted to ensure all contaminated material has been removed from the excavations.

Based on the recent excavation of waste from MDA B (LANL 2012, 215119), it is likely the wastes excavated from MDA C will include gas cylinders containing corrosive liquids. The liquid in the cylinders will need to be treated on-site using elementary neutralization before the waste is shipped off-site.

All waste from the pits and shafts is assumed to be classified as MLLW that will be transported to Energy Solutions, Clive, Utah, for disposal. Some waste may be classified as newly generated TRU waste. This waste was not included in the original permit of the Waste Isolation Pilot Plant (WIPP) facility, and a permit modification may be required for disposal of this waste at WIPP.

A summary of activities for excavation of the pits and shafts follows:

- construction of relocatable excavation enclosures with supplied air and high-efficiency particulate air filters to control releases and provide weather protection,
- waste removal activities using standard excavation techniques (digging up the waste will likely destroy the existing monitoring boreholes),
- analysis and segregation of the waste for off-site shipment and disposal based on the WAC of the receiving facility,
- treatment of corrosive liquids by elementary neutralization,
- collection and analysis of confirmation samples from the excavation sidewalls and floor,
- replacement within the original excavation of any environmental media meeting industrial SSLs and then backfilling to grade with erosion controls, and
- off-site shipment and disposal of wastes that do not meet industrial SSLs.

Under this alternative, an estimated 412,000 yd^3 of MLLW will be generated and require disposal (20,600 20-ton truckloads). A similar amount of clean material will be required to backfill the site. There will be a very substantial increase in truck traffic along East Jemez Road (truck route) and within the Pajarito Road corridor over an undetermined amount of time. This amount of trucking is likely to cause delays in traffic flow on East Jemez Road, increase noise level around the area, and impact the lifespan of existing road surface. It will be necessary to regulate traffic flow during peak travel hours under this alternative. It may be necessary to consider an alternate truck entry point and assess whether turn lanes/acceleration lanes need to be constructed along Pajarito Road at NM 4 to alleviate some of the truck traffic on East Jemez Road. A traffic study and analysis will have to be conducted to better analyze impacts to traffic flow. For this alternative, additional consideration of cumulative impacts would need to occur as other projects ramp up within the Pajarito corridor. The impacts of transporting nonradiological materials increase in comparison with the impacts of Alternatives 3A and 3B. The transportation impacts under this excavation and disposal alternative would be for nonradiological material estimated at 24,000,000 mi traveled, 0.075 traffic accidents, and 0.0078 fatalities plus the additional risk associated with shipping radiological waste. Additional analysis would need to be conducted to determine the potential for impacts caused by shipping this amount of LLW off-site.

Pore-gas monitoring of the VOC plume will continue after excavation and backfill activities have been completed. Based on the location of the pits and shafts and the existing monitoring boreholes, up to seven monitoring boreholes may have to be replaced (Figure 7.1-6). The number of boreholes requiring replacement will be determined during the corrective measures implementation (CMI) design phase, if this alternative is chosen.

Institutional and engineering controls (e.g., fencing) will be implemented to restrict access to the area during site activities. Following waste removal and site restoration, the site will be restricted to industrial land use. A restrictive covenant, which is assumed to remain in place for 100 yr, will be placed on the deed and recorded locally and in the EPA institutional controls database.

7.1.5.1 Protection of Human Health and the Environment

Excavation of the pits and shafts will remove source material.

Institutional controls will be implemented to ensure that future land use is consistent with the residual contamination (i.e., industrial SSLs).

This alternative is protective of human health and the environment.

7.1.5.2 Attain Media Cleanup Objectives

Wastes will be excavated from the pits and shafts to a level that meets industrial SSLs. Investigation sampling has indicated that soil concentrations beneath the pits and shafts are currently below the cleanup standards. Environmental media with concentrations below industrial SSLs may be returned to the original disposal unit.

This alternative meets media cleanup standards.

7.1.5.3 Control the Source(s) of Releases

Excavation of the pits and shafts will remove source material.

This alternative eliminates or reduces sources and releases.

7.1.5.4 Comply with Applicable Standards for Management of Wastes

Excavated wastes and media that exceed cleanup standards will be prepared for off-site shipment to meet the WAC of the permitted disposal facility.

This alternative complies with applicable waste management standards

7.1.5.5 Summary

Alternative 4 satisfies each of the four threshold criteria. Therefore, this alternative is retained for further consideration.

8.0 EVALUATION OF CORRECTIVE MEASURES ALTERNATIVES

Corrective measures alternatives appropriate for MDA C were screened against the Consent Order threshold criteria in section 7. Alternatives found to meet the Consent Order threshold criteria have been brought forward for further evaluation along with the no-action alternative. These alternatives are evaluated against the remedial alternative evaluation criteria (also known as the balancing criteria) from Section XVI.C.2 of the Consent Order.

8.1 Remedial Alternative Evaluation Criteria (Consent Order Section XVI.D)

Section XVI.C.2 of the Consent Order requires the evaluation of each remedial alternative for the balancing criteria listed below. These factors shall be balanced in proposing a recommended alternative.

8.1.1 Long-Term Reliability and Effectiveness (Consent Order Section XVI.D.a.1)

The remedy shall be evaluated for long-term reliability and effectiveness, including the consideration of the magnitude of risks that will remain after implementation of the remedy; the extent of long-term monitoring or other management that will be required after implementation of the remedy; the uncertainties associated with leaving contaminants in place; DOE's long-term stewardship of the site environmental impacts; sustainability; and the potential for failure of the remedy. Other criteria being equal, DOE shall give preference to a remedy that reduces risks with minimal long-term management and that has proven effective under similar conditions.

8.1.2 Reduction of Toxicity, Mobility, or Volume (Consent Order Section XVI.D.2)

The remedy shall be evaluated for its reduction of the toxicity, mobility, and volume of contaminants. Other criteria being equal, DOE shall give preference to a remedy that uses treatment to more completely and permanently reduce the toxicity, mobility, and volume of contaminants.

8.1.3 Short-Term Effectiveness (Consent Order Section XVI.D.3)

The remedy shall be evaluated for its short-term effectiveness, including the consideration of the short-term reduction in existing risks that the remedy would achieve; the time needed to achieve that reduction; the near-term environmental impacts; and the short-term risks that might be posed to the community, workers, and the environment during implementation of the remedy. Other criteria being equal, DOE shall give preference to a remedy that quickly reduces short-term risks, as well as near-term environmental impacts, without creating significant additional risks.

8.1.4 Implementability (Consent Order Section XVI.D.4)

The remedy shall be evaluated for its implementability or the difficulty of implementing the remedy, including the consideration of installation and construction difficulties; operation and maintenance difficulties; difficulties with cleanup technology; permitting and approvals; and the availability of necessary equipment, services, expertise, and storage and disposal capacity. Other criteria being equal, DOE shall give preference to a remedy that can be implemented quickly and easily and poses fewer and lesser difficulties.

8.1.5 Cost (Consent Order Section XVI.D.5)

The remedy shall be evaluated for its cost, including a consideration of both capital costs and O&M costs. Capital costs shall include, without limitation, construction and installation costs; equipment costs; land development costs; and indirect costs including engineering costs, legal fees, permitting fees, startup and shakedown costs, and contingency allowances. O&M costs shall include, without limitation, operating labor and materials costs; maintenance labor and materials costs; replacement costs; utilities; monitoring and reporting costs; administrative costs; indirect costs; and contingency allowances. All costs shall be calculated based on their net present value. Other criteria being equal, DOE shall give preference to a remedy that is less costly but does not sacrifice protection of human health and the environment.

8.2 Evaluation of Alternatives for MDA C

8.2.1 Alternative 1: No Action

The no-action alternative is described in section 7.1.1.

8.2.1.1 Long-Term Reliability and Effectiveness

An increase in future risk is associated with implementation of this alternative because it removes institutional controls. No long-term monitoring or other management will be required because no remedy is implemented. Uncertainty is associated with future exposure to waste resulting from the lack of institutional controls. This alternative does not involve implementation of any action; therefore, no potential exists for remedy failure. This alternative does not provide long-term reliability and effectiveness.

8.2.1.2 Reduction of Toxicity, Mobility, or Volume

Under the no-action alternative, no reduction in toxicity, mobility, or volume occurs.

8.2.1.3 Short-Term Effectiveness

Under the no-action alternative, risk is neither created nor alleviated in the short term.

8.2.1.4 Implementability

Under the no-action alternative, no remedy is implemented.

8.2.1.5 Cost

Under the no-action alternative, no costs are incurred.

8.2.2 Alternative 2: Soil Barrier, Natural Attenuation, and Institutional Controls

This alternative is described in section 7.1.2.

8.2.2.1 Long-Term Reliability and Effectiveness

The existing soil cover is effective in controlling migration of contaminants from infiltration and leaching. Long-term maintenance, including periodic inspections and repairs, would be needed to maintain the effectiveness of the cover. Site access and land-use controls would also be needed to prevent intrusion into the waste inventory.

Vapor and groundwater monitoring currently shows that vapor-phase contaminants from MDA C have not migrated to the regional aquifer at detectable levels. Assuming no future releases of VOCs occur, the vapor plume may be expected to naturally attenuate through diffusion, with the primary pathway being toward the surface. Long-term vapor and groundwater monitoring would be needed to verify that migration to the regional aquifer is not occurring.

The effectiveness of this alternative relies entirely on institutional controls, with no engineered controls, redundancy, or defense-in-depth. Long-term reliability depends entirely on the ability to maintain these controls; thus, there is considerable uncertainty in long-term reliability and effectiveness.

8.2.2.2 Reduction of Toxicity, Mobility, or Volume

The existing soil cover, if maintained, will reduce mobility of waste by controlling erosion and infiltration but will have no impact on reduction of toxicity or volume. The soil cover will not reduce mobility associated with vapor transport.

This alternative does not include any actions to reduce the mobility and volume of vapor-phase contamination that has already been released to the vadose zone but instead relies on natural attenuation.

8.2.2.3 Short-Term Effectiveness

This alternative does not include any intrusive activities that would result in short-term risk to workers or the public. The site does not currently pose an unacceptable risk to human health or the environment and current site conditions would not be changed.

8.2.2.4 Implementability

The institutional controls associated with this alternative (e.g., fencing, inspections, maintenance, repairs, monitoring) can easily be implemented.

8.2.2.5 Cost

The O&M costs for inspections, maintenance, and reporting are not consistent from year to year. For the first 10 yr, vapor monitoring and reporting will occur at an annual cost of $214,000. Every 5 yr for 100 yr, some minor physical maintenance is assumed to be required at a cost of $9,200 per occurrence. Hydroseeding of the entire area is assumed to occur every 10 yr for 100 yr to minimize soil erosion at a cost of $149,000 per occurrence. At the end of 100 yr, reapplication of 4 in. of topsoil is assumed to be required because of soil erosion at a cost of $2,900,000. The present value (PV) of total O&M costs is estimated to be $6,747,000. Long-term vapor and groundwater monitoring are assumed to be performed as part of the Laboratory's long-term stewardship program and are not included in the O&M estimate.

Indirect O&M total costs are estimated to be $1,400,000, which includes professional management and construction management.

Management reserve costs are estimated to be $3,700,000.

The total PV cost is estimated to be $16,000,000 (Table 8.2-1). Assumptions and cost estimates are provided in Appendix H.

8.2.3 Alternative 3A: Multilayer Cover, Passive SVE, and Institutional Controls

This alternative is described in section 7.1.3.

8.2.3.1 Long-Term Reliability and Effectiveness

Installation of a multilayer cover will reduce erosion, biointrusion, and infiltration and will also reduce the potential for exposure. However, degradation of the geomembrane layer is an issue for long-term effectiveness. Los Alamos's semiarid climate is considered potentially incompatible with the typical clay layer of the cover as clay components may become desiccated and crack when installed in arid-to-semiarid environments. Long-term maintenance requirements for multilayer covers include visual inspection, removal of unwanted debris and large woody plants, erosion control, and mowing.

Operation of an SVE system will remove vapor-phase VOCs from the vadose zone and will manage future releases and exposure. Some uncertainty and long-term risks are associated with the continuing release of VOCs from the source area. This uncertainty is managed by performance monitoring to evaluate the effectiveness of the SVE system.

Residual uncertainty and long-term risk will be associated with waste that remains in place. Institutional controls will be used to manage this uncertainty by restricting site access.

8.2.3.2 Reduction of Toxicity, Mobility, or Volume

The multilayer cover will reduce mobility of waste by controlling erosion and infiltration but will have no impact on reduction of toxicity or volume. The multilayer cover will not reduce mobility associated with vapor transport.

Passive SVE will be effective in reducing the mobility and volume of VOC contamination and will have an impact on vapor-phase VOC concentrations.

8.2.3.3 Short-Term Effectiveness

A multilayer cover can be constructed in a relatively short timeframe (i.e., approximately 18 months). This cover poses relatively low risk to the community, workers, and the environment during construction because it does not involve any waste excavation or management. The greatest impacts to human health during cover installation are associated with the physical hazards of construction activities and traffic risks while transporting materials to the site. Workers will not be exposed to buried waste during cover construction.

The risk of traffic accidents associated with the remedy is generally considered a function of total miles of travel for the project vehicles. Based on an average accident rate for large trucks of 2.3 fatal accidents per 100 million mi (DOT 2002, 097082, p. 2), or 2.3×10^{-8} fatal accidents per mile, and approximately 396,000 truck transport mi on public roads for delivery of project resources, the overall incident rate for fatal traffic accidents for the project would be approximately 0.009.

The equipment required to retrofit existing open boreholes for passive SVE is commercially available. Active SVE equipment is commercially available and angled extraction boreholes can be constructed within a 12-month timeframe (after the drilling contractor has been sent a notice to proceed, if required). The SVE system poses relatively low risk to community, workers, and the environment during construction as demonstrated by previous SVE pilot studies at the Laboratory (LANL 2006, 094152; LANL 2009, 105112; LANL 2010, 109657).

This alternative is effective in the short term without creating significant additional risk.

8.2.3.4 Implementability

The multilayer cover is installed using standard construction techniques and presents minimal installation and construction difficulties. Following installation, low to moderate maintenance is required.

SVE is a well-developed technology, presenting minimal installation and construction difficulties. Operation of the SVE system may require a modification to the Laboratory's air permit.

8.2.3.5 Cost

The direct capital cost for installation of the multilayer cover and associated retrofitting of boreholes is estimated to be $15,333,000. Total capital cost for retrofitting 22 boreholes is estimated to be $360,000. For the first 10 yr, vapor monitoring and reporting will occur at an annual cost of $214,000. Every 5 yr for 100 yr, some minor physical maintenance is assumed to be required at a cost of $9,200 per occurrence. Hydroseeding of the entire area is assumed to occur every 10 yr for 100 yr to minimize soil erosion at a cost of $149,000 per occurrence. The PV of total O&M costs (exclusive of active SVE, operation, and monitoring) is estimated to be $3,950,000. Long-term vapor and groundwater monitoring are assumed to be performed as part of the Laboratory's long-term stewardship program and are not included in the O&M estimate.

The indirect capital costs are estimated to be $5,731,000, which includes design of the alternative as well as project management and construction management. Indirect O&M costs are estimated to be $228,000, which includes project management and construction management.

Total management reserve costs are estimated to be $13,268,000.

The total PV cost is estimated to be $39,336,000 (Table 8.2-2). Assumptions and cost estimates are provided in Appendix H.

8.2.4 Alternative 3B: ET Cover, Passive SVE, and Institutional Controls

This alternative is described in section 7.1.4.

8.2.4.1 Long-Term Reliability and Effectiveness

Installation of an ET cover will reduce erosion, biointrusion, and infiltration and will also reduce the potential for future exposure. The ET cover is reliable over the long term, and it does not suffer from desiccation issues associated with standard RCRA covers. Long-term maintenance requirements for ET covers include visual inspection, removal of unwanted debris and large woody plants, erosion control, and mowing. ET covers have demonstrated effectiveness in arid and semiarid climates and possibility of failure is relatively low (Dwyer et al. 2000, 069673; Dwyer 2007, 098276). The ET cover profile is easy to maintain and easy to repair, should differential settlement occur, by simply filling in any low areas created in the surface and reseeding.

Operation of an SVE system will remove vapor-phase VOCs from the vadose zone and will manage future releases and exposure. Some uncertainty and long-term risks are associated with the continuing release of VOCs from the source area. This uncertainty is managed by performance monitoring to evaluate the effectiveness of the SVE system.

Residual uncertainty and long-term risk will be associated with waste that remains in place. Institutional controls will be used to manage this uncertainty by restricting site access.

8.2.4.2 Reduction of Toxicity, Mobility, or Volume

The ET cover will reduce mobility of waste by controlling erosion and infiltration but will have no impact on reducing toxicity or volume. The ET cover will not reduce mobility associated with vapor transport.

SVE will be effective in reducing the mobility and volume of VOC contamination. SVE will have an immediate impact on vapor-phase VOC concentrations.

8.2.4.3 Short-Term Effectiveness

This ET cover can be constructed in a relatively short time frame (i.e., approximately 3 months). This cover poses relatively low risk to the community, workers, and the environment during construction because it does not involve any waste excavation or management. The greatest impacts to human health during cover installation are associated with the physical hazards of construction activities and traffic risks while transporting raw materials to the site. Workers will not be exposed to buried waste during ET cover construction.

The risk of vehicle traffic accidents associated with implementation of the remedy is generally considered a function of total miles of travel for the project vehicles. Based on an average fatal accident rate per vehicle miles for large trucks of 2.3 fatal accidents per 100 million mi (DOT 2002, 097082, p. 2) and approximately 51,000 truck transport mi on public roads for delivery of project resources, an overall incident rate for fatal traffic accidents for the project would be approximately 0.001.

The equipment required to retrofit existing open boreholes for passive SVE is commercially available. Active SVE equipment is commercially available and extraction boreholes can be constructed within a 12-month timeframe if required. The SVE system poses relatively low risk to community, workers, and the environment during construction as demonstrated by the SVE pilot study (LANL 2009, 105112).

This alternative is effective in the short term without creating significant additional risk.

8.2.4.4 Implementability

The rock admixture in the ET cover’s surface layer of the existing interim cover is installed using standard construction techniques and presents minimal installation and construction difficulties. Following installation, minimal or no maintenance is required.

SVE is a well-developed technology, presenting minimal installation and construction difficulties. Operation of the SVE system may require a modification to the Laboratory’s air permit.

8.2.4.5 Cost

The total unburdened capital cost for construction of the ET cover and retrofitting open boreholes for passive SVE is estimated to be $4,362,000. This includes retrofitting open boreholes at $360,000 for passive SVE and vapor monitoring. Passive SVE monitoring is estimated at $76,000 for 10 yr with annual passive SVE reporting at a total cost for 10 yr of $55,740. Passive SVE monitoring is estimated at $76,000 for 10 yr with annual reporting at a total cost for 10 yr of $55,740. The PV of total O&M costs, including passive SVE monitoring and vapor monitoring each for 10 yr and 100 yr of oversight and maintenance, is estimated to be $3,950,000. Long-term vapor and groundwater monitoring are assumed to be performed as part of the Laboratory's long-term stewardship program and are not included in the O&M estimate.

The indirect capital costs are estimated to be $1,583,000, which includes design of the alternative as well as project management and contingency. Indirect O&M costs are estimated to be $191,000, which includes project management and construction management.

Total management reserve costs are estimated to be $2,017,000.

The total PV cost is estimated to be $12,105,000 (Table 8.2-3). Assumptions and cost estimates are provided in Appendix H.

8.2.5 Alternative 4: Excavation, Vapor Monitoring, and Institutional Controls

This alternative is described in section 7.1.5.

8.2.5.1 Long-Term Reliability and Effectiveness

Removal of the waste in the pits and shafts will eliminate the primary source and the potential for future exposure. Uncertainties will be managed by collecting confirmatory samples to determine the required extent of the excavation. After the waste has been removed, the excavation will be backfilled and the area regraded, revegetated, and maintained to establish the vegetation. This alternative transfers the potential impact of the waste to the permitted off-site disposal facility.

Pore-gas monitoring will be used to evaluate concentration changes in the existing plume.

Institutional controls will be used to manage this uncertainty by restricting site access.

8.2.5.2 Reduction of Toxicity, Mobility, or Volume

The removal of waste in the pits and shafts will reduce toxicity and mobility of contaminants from the current site. However, the sorting and segregation of the excavated materials will increase the volume of waste to be disposed of by increasing the amount of packaging materials necessary for transport and disposal. A small volume of the waste excavated is expected to be corrosive liquids that will be treated on-site using elementary neutralization.

Pore-gas monitoring will be used to evaluate concentration changes in the vadose zone plume.

8.2.5.3 Short-Term Effectiveness

Based on previous excavation projects at the Laboratory (e.g., MDA B and North Ancho Canyon), excavation of the MDA C waste inventory is expected to require 3 yr. Clean fill will be imported from TA-61 or other borrow pits to backfill the excavation.

Removal activities have a higher risk for injuries and accidents. Disturbance and excavation of the units increase the possibility of accidental release of hazardous materials. The possibility of release upon disturbance of the units containing unknown chemical waste increases the short-term risk of contaminant dispersal. Excavation activities will be performed within enclosures to minimize short-term risks.

Potential accidents resulting from excavation and associated waste handling include industrial hazards/accidents, fires with release of hazardous materials, explosions and associated releases of radioactive materials, spills of hazardous and radioactive materials, inadvertent exposures to penetrating radiation, and transportation accidents.

The risk to the public from all activities, except potential fire and explosions and on-site/off-site transportation, is negligible. The risk of vehicle traffic accidents associated with implementation of the remedy is generally considered a function of total miles of travel for the project vehicles. Based on an average fatal accident rate per vehicle mile for large trucks of 2.3 fatal accidents per 100 million mi (DOT 2002, 097082, p. 2) and approximately 16 million truck transport mi on public roads for waste transport and material delivery, an overall incident rate for fatal traffic accidents for the project would be 0.4.

This alternative is effective in the short term because waste is removed. However, additional risk is created as a result of excavating, sorting, packaging, and transporting the waste.

8.2.5.4 Implementability

The pits and shafts will be excavated using a tiered approach based on hazard level and assessment of specific inventory. Excavation will be accomplished using standard excavation methods, unless potential or real hazards dictate remote handling. Following excavation of waste, the excavated area will be backfilled, brought up to grade, and revegetated.

One significant challenge of this alternative is ensuring the permitted off-site disposal facilities can receive all the various waste streams. There is also potential risk to workers performing the removal activities.

Replacing monitoring boreholes, if required, is readily implementable.

8.2.5.5 Cost

The total unburdened direct capital costs for the excavation of the pits and shafts are estimated to be $533,638,000, of which $375,013,000 is estimated for disposal of waste materials.

Vapor monitoring costs for 10 yr are estimated to be $2,145,000.

The indirect capital costs are estimated to be $110,565,000, which includes design of the alternative as well as project management and construction management. Indirect O&M costs are estimated to be $35,000, which includes project management and construction management.

Total management reserve costs are estimated to be $271,622,000.

The total unburdened PV cost is estimated to be $805,260,000 (Table 8.2-4). Assumptions and cost estimates are provided in Appendix H.

9.0 SELECTION OF THE RECOMMENDED CORRECTIVE MEASURES ALTERNATIVE

The purpose of this CME is to identify, develop, and evaluate corrective measures alternatives and recommend the corrective measure for MDA C. Alternatives that met the threshold criteria in section 7 were evaluated against the remedial alternative evaluation criteria (i.e., the balancing criteria) in section 8. A comparative analysis of the alternatives and their relative ranking for each of the balancing criteria is provided in section 9.1. The recommended alternative is discussed in section 9.2.

9.1 Comparative Analysis of the Alternatives for MDA C

Alternatives were evaluated against the five balancing criteria in section 8. Each alternative has been rated per the rating system shown in Table 9.1-1. The relative rating for each alternative against the balancing criteria is provided in Table 9.1-2.

9.1.1 Long-Term Reliability and Effectiveness

Alternative 1, no action, provides the least degree of long-term reliability and effectiveness because no action is taken and therefore is rated the lowest, at 1 on a scale of 5. Alternative 2, soil barrier, natural attenuation, and institutional controls, does not include any engineered controls and relies entirely on institutional controls. It is therefore ranked next lowest at 2.

An ET cover provides a higher degree of long-term reliability and effectiveness compared with the multilayer cover that relies on the integrity of the geomembrane that will not last the full performance period and potential desiccation in the clay layer of the multilayer cover. The ET cover is easier and cheaper to construct and performs as well or better. Therefore, Alternative 3B, ET cover with SVE and institutional controls, is rated higher, at 4, than Alternative 3A, multilayer cover with SVE and institutional controls, which is rated 3. SVE is a component of both alternatives and therefore does not affect their relative ratings when determining long-term reliability and effectiveness.

Alternative 4, excavation with SVE and institutional controls, provides the highest degree of long-term reliability and effectiveness at the site, because all the waste materials at the site are removed. Alternative 4 is therefore rated 5.

9.1.2 Reduction of Toxicity, Mobility, or Volume

Alternative 1, no action, provides the least degree of reduction of toxicity, mobility, or volume because no action is taken and therefore is rated the lowest, at 1 on a scale of 5.

Alternative 2, soil barrier and natural attenuation with institutional controls; Alternative 3A, multilayer cover with SVE and institutional controls; and Alternative 3B, ET cover with SVE and institutional controls, all reduce contaminant mobility by using a soil cover to control infiltration. However, in long-term reliability and effectiveness, the integrity of the geomembrane for the multilayer cover will not last the full performance period, and reduction of mobility will not last as long as the ET cover. The performance of Alternatives 3A and 3B should both be better than the performance of the existing soil cover, which is a component of Alternative 2, because the existing cover was not specifically engineered to reduce erosion. Alternatives 3A and 3B provide contaminant reduction through SVE, which is not a component of Alternative 2. However, Alternative 3A will not last for the 1000-yr performance period. Alternative 2 is therefore given a rating of 2, Alternative 3A is rated at 3, and 3B receives a rating of 4.

Alternative 4, excavation with plume monitoring and institutional controls, provides the greatest reduction of toxicity, mobility, and/or volume at the site, because all wastes at the site are removed. It therefore receives a rating of 5.

9.1.3 Short-Term Effectiveness

The site currently poses no potential unacceptable risk from exposure to site contaminants. Alternative 1, no action; Alternative 2, soil barrier and natural attenuation with institutional controls; Alternative 3A, multilayer cover with SVE and institutional controls; and Alternative 3B, ET cover with SVE and institutional controls, will not result in any change in short-term risk associated with the waste inventory.

Alternative 4, excavation with SVE and institutional controls, will result in an increase in short-term risk to site workers.

Alternative 1, no action, and Alternative 2, soil barrier and natural attenuation with institutional controls, do not include SVE and will result in no short-term reduction in risk associated with the vapor plume. Alternative 3A, multilayer cover with SVE and institutional controls, and Alternative 3B, ET cover with SVE and institutional controls, both include passive SVE (followed by active SVE if required) and will result in short-term reduction in risk associated with the vapor plume. Alternative 4, excavation with pore-gas monitoring and institutional controls, removes the source material but poses risk to workers during excavation and to the public when trucks are carrying the source material to disposal sites. Under Alternative 4, SVE would be implemented only if monitoring data show the plume is releasing significant amounts of VOCs.

Alternative 1, no action, and Alternative 2, soil barrier and natural attenuation with institutional controls, are each given a rating of 2 on a scale of 5, because they result in no increase or decrease in short-term risk. Alternative 3A, multilayer cover with SVE and institutional controls, and Alternative 3B, ET cover with SVE and institutional controls, are rated highest at 4, because they result in short-term risk reduction for the vapor plume and do not increase risk associated with the buried waste inventory. Alternative 4, excavation with plume monitoring and institutional controls, is given the lowest rating of 1 because even though the source is removed, it results in a short-term increase in risk to workers and the public.

9.1.4 Implementability

Alternative 1, no action, is the easiest to implement because no remedy is required, so it is rated the highest at 5 on a scale of 1 to 5. Alternative 2, soil barrier and natural attenuation with institutional controls, consists of easily implementable activities such as construction of a fence, monitoring, and maintenance. It therefore receives a rating of 4.

Alternatives 3A, multilayer cover with SVE and institutional controls, and 3B, ET cover with SVE and institutional controls, have similar design and construction requirements that have been shown to be implementable; they are rated equally at 3. SVE is a component of each of the cover alternatives and therefore does not affect their relative rating when determining implementability.

Excavation of waste materials in Alternative 4 adds complexity to implementability because of safety controls for performing the tasks and handling the waste. Because Alternative 4, excavation and institutional controls, includes excavation of all waste materials, it is rated the lowest at 2.

9.1.5 Cost

Alternative 1, no action, has no cost and thus receives the highest rating of 5 on a scale of 1 to 5. Alternative 2, soil barrier and natural attenuation with institutional controls, has cost lower than Alternatives 3A and 4, but higher than Alternative 3B, and is therefore given a rating of 3.

Alternative 3A, multilayer cover with SVE and institutional controls, has costs associated with purchasing and transporting cover material to the site and constructing the cover. Alternative 3B, ET cover with SVE and institutional controls, has costs associated with purchasing and transporting rock to the site and then mixing it in. Alternative 3A requires approximately 5 times the material required for Alternative 3B. Alternative 3A is thus rated 2, and Alternative 3B is rated 4. SVE is a component of each of the cover alternatives and therefore does not affect their relative ratings when costs are compared.

The cost criterion is impacted most by the excavation of waste materials, handling of the waste, and the disposal of the waste. Because Alternative 4, excavation with plume monitoring and institutional controls, includes excavation of all waste materials and has the highest cost, it is rated the lowest at 1.

9.2 Selection of Recommended Corrective Measure

Based on the alternatives evaluation, the recommended alternative for MDA C is Alternative 3B, ET cover, SVE, and institutional controls.

The recommended alternative effectively addresses the RAOs developed from the CSM (section 4.0):

- Prevent human and ecological exposure to the waste through excavation and erosion.
- Prevent biointrusion to the waste from burrowing animals.
- Prevent human and ecological exposure to the contaminated surface soils and/or subsurface soils through excavation.
- Prevent groundwater from being impacted above a regulatory standard by the transport of VOCs through soil vapor.
- Prevent the creation of contaminated leachate by restricting the infiltration of water into the waste.

The last of these RAOs is defined to address uncertainty related to potential leachate production from the unlined pits and shafts at MDA C. If excess water accumulates in the units, contaminated leachate may be generated and transported downward from the site. Although water accumulation has not been observed to date, it is an undesirable condition that warrants long-term prevention.

The ET cover (Alternative 3B) can be constructed in a relatively short timeframe of approximately 3 months. This cover poses relatively low risk to the community, workers, and environment during construction because it does not involve any waste excavation or management. SVE equipment is commercially available and extraction boreholes can be constructed within a 12-month timeframe. The SVE system poses relatively low risk to the community, workers, and environment during construction, as demonstrated by the SVE pilot studies conducted at TA-54. This alternative can be implemented in a timely manner.

The ET cover will provide protection against erosion, direct contact, and moisture infiltration. The ET cover puts a minimum of 4.7 ft of soil and rock between a potential human or ecological receptor and the top of the disposal pits, thereby breaking the exposure pathway. The ET cover is designed to restrict infiltration of water, thereby breaking the contaminant transport pathway (via leaching) to groundwater. SVE will remove soil-vapor contaminants and inhibit the downward migration of VOC-contaminated soil vapors, thereby breaking the contaminant transport pathway (via volatilization) to groundwater. Institutional controls will be implemented to provide access controls, thereby restricting human exposure. This alternative is protective of human health and the environment.

The ET cover will minimize or eliminate infiltration of precipitation that could otherwise mobilize subsurface contaminants. The ET cover will also limit exposure to waste and contaminated surface and subsurface soils and will reduce the potential for erosion and dust generation of contaminated surface soil. While the potential exists for continued release of VOCs to the vadose zone that may diffuse to the groundwater, these releases would be controlled by SVE, which removes vapor-phase contaminants and reduces their potential to diffuse to groundwater. This alternative will control sources and the migration of released contaminants.

No waste is expected to be generated during the construction of the ET cover. Any remediation wastes will be managed in accordance with state and federal regulations under this alternative.

The CSM has been refined to illustrate the impact of the recommended alternative on the source areas and release mechanisms and the resulting reduction in exposure potential (e.g., incomplete pathways). The refined CSM is shown in Figure 9.2-1.

Although not part of the Consent Order CME process, the recommended alternative was evaluated to determine whether it would comply with the radiological protection requirements of DOE Order 458.1. Specifically, a preliminary radiological dose assessment was conducted to evaluate the dose to industrial workers and members of the public from the radionuclide inventory contained in the MDA C waste disposal units with the recommended ET cover installed. The details of this assessment and the results are presented in Appendix F. The results show that DOE radiological protection requirements will be met over a 1000-yr period. Therefore, the corrective action alternative recommended under the Consent Order is consistent with and can meet DOE radiological protection requirements. Specific design features needed to ensure that the longevity and long-term performance of the cover will be developed as part of the final design during the CMI.

10.0 DESIGN CRITERIA TO MEET CLEANUP OBJECTIVES

This section presents a preliminary plan and key specifications for design and implementation of the recommended alternative.

10.1 ET Cover Design Approach

Selection of the recommended alternative requires designing an ET cover and finalizing the design of an SVE system during the CMI phase for MDA C. The ET cover design must meet the performance objectives and regulatory criteria described in Table 7.1-2. The design described below does not specifically address meeting the radiological protection requirements defined by DOE Order 458.1, Radiological Protection of the Public and the Environment. As summarized in section 9.2 and described in Appendix F, a preliminary radiological dose assessment has been performed to demonstrate that the ET cover described in this section is capable of meeting DOE radiological protection requirements over a 1000-yr period. Additional design features may be needed, however, to ensure the longevity of the cover, and these features will be addressed in the CMI phase. The final design of the ET cover will satisfy both Consent Order and DOE Order 458.1 performance objectives.

ET Cover

The ET cover will be installed over MDA C (Figure 7.1-1). The area of the cover will be approximately 11.8 acres. A preliminary conceptual design of the ET cover and preliminary specifications of the cover components are presented in Appendix I. The preliminary cover design includes

- mixing 8 in. of 2.5-in.-diameter D50 rock into the upper 2 ft of the existing interim cover,
- amending the existing soil as required to maintain native vegetation, and
- seeding the final cover system.

The preliminary ET cover design may be modified based on further evaluation of the critical design requirements. The critical design requirements include

- identifying critical infiltration events, including identification of the design precipitation event (i.e., maximum precipitation event that the design can endure) or series of events;
- determining the minimum thickness and contours required to ensure the ET cover can control erosion and infiltration over the 100-yr maintenance period based on precipitation events identified above, and determining the minimum soil thickness required to establish and maintain vegetation;
- verifying the actual minimum soil depths of the existing interim cover and soil hydraulic properties;
- determining the durability of available rock borrow source to ensure it meets long-term performance requirements;
- determining the minimum required water-storage capacity of MDA C soil based on design infiltration events identified above;
- identifying the seed mixture to be used and meeting with representatives of San Ildefonso Pueblo to ensure that the mixture has no adverse effect on downstream Pueblo lands, and identifying the surface treatment to be employed before seeding and the frequency of watering necessary to establish vegetation on the cover;
- planning long-term maintenance requirements of the ET cover that include annual inspection and repair for erosion and subsidence, removal of debris and large woody plants, removal of burrowing animals, and mowing as needed to maintain the ET cover; and
- satisfying DOE Order 458.1 radiological protection requirements.

Moisture monitoring probes will be installed in the ET cover to monitor moisture content in the cover. Specific performance criteria for cover performance (e.g., maximum moisture flux) will be developed during the design process.

10.2 SVE Design Approach

Remediation of the deep VOC plume at MDA C requires design of a system to remove VOCs from the subsurface. Passive SVE will be used to remove subsurface VOC mass by employing up to 22 existing open boreholes (Figure 10.2-1) that will be retrofitted for passive SVE. A contingent active SVE system will be implemented only if significant new leakage is observed in the MDA C pore-gas monitoring network. In the current CME, the contingent active SVE system is based on proven auger-drilling technology that can drill boreholes at angles of up to 45 degrees.

Results of passive SVE testing at MDAs C, H, and J (SEA 1997, 076055) in combination with numerical and analytical analysis of passive venting data (Neeper 2003, 098640; Neeper and Stauffer 2012, 601587; Neeper and Stauffer 2012, 601588) demonstrate that passive SVE can be used to remove VOC mass from the subsurface plume at MDA C.

The results and conclusions of the SVE pilot tests conducted at MDA L in 2006 and 2014–2017 (LANL 2006, 094152; N3B 2018, 700039) and MDA G in 2008 and 2010 (LANL 2009, 105112; LANL 2010, 109657) can be used to infer that a contingent active SVE system is a viable technology for removing VOCs from the subsurface at MDA C in the event of future leakage.

The passive and contingent active SVE designs are described below.

Passive SVE System

Initially a subset of 22 existing open boreholes at MDA C will be retrofitted to remove VOC mass from the subsurface via passive venting (passive SVE) (Figure 10.2-1). Monitoring data collected after installation of the passive SVE system will be used to demonstrate the effectiveness of passive SVE in the open boreholes. The retrofit will include

- extending the current wellbores beyond the height of the planned cover,
- armoring the wellbores to minimize the risk of destroying them while installing the cover,
- adding one-way check valves (if found to be effective at the site) and rain/bio shields to the tops of the wellbores,
- installing solar-powered flow meters and data loggers to each wellbore, and
- installing sampling ports that will allow the LumaSense photoacoustic multi-gas monitor to be easily hooked up for measurements of off-gas concentrations.

Contingent Active SVE System

- Figure 7.1-3 and Appendix G depict and describe installation of a number of SVE boreholes each to a depth of approximately 100 ft bgs within the Qbt 3 unit. The boreholes will be screened from 50 ft to 100 ft bgs to intercept hypothetical leakage. The exact number and locations of the contingent boreholes will be based on observed leakage from the source area and may require advanced drilling techniques such as direction-drilling to avoid boring through the ET cover. The boreholes will be located where vapor-phase TCE concentrations exceed Tier 2 screening levels for porous media flow but where drilling access is not impeded by the disposal pits and shafts.
- One portable skid-mounted SVE unit will be cycled between the extraction boreholes during operations. The SVE unit will utilize a 15-hp blower motor, providing up to 320 scfm at a vacuum of 120 in. of water. The system will be optimized during the initial setup, although a vacuum between 50 in. and 70 in. of water has been demonstrated to be effective in pilot tests previously performed at TA-54.
- Extraction boreholes in the Qbt 3 unit is projected to create a 125-ft ROI, providing an effective area of extraction of approximately 49,000 ft^2 for each borehole. Extraction boreholes in the Qct unit are expected to create a 150-ft ROI, providing an effective area of extraction of approximately 70,650 ft^2.
- Additional scoping will be done in the CMI phase to determine if directionally drilled SVE boreholes under the VOC source are a possible way to more efficiently intercept any future hypothetical VOC leakage.

10.3 Preliminary Design Criteria and Rationale

Preparation of the CMI plan includes a schedule for design of the recommended alternative, including development of design drawings, calculations, and supporting documentation that will be submitted to NMED according to the CMI schedule. The CMI plan will be written to ensure the following:

- The cover will have sufficient thickness and will be contoured to control runoff and erosion resulting from the design storm event.

- The cover will have sufficient capacity to store the "maximum" infiltration quantity resulting from the worst-case precipitation event until it can be removed through ET.
- The proposed seed mixture used to stabilize the cover with vegetation will closely emulate the local shallow-rooting plant community, will ensure the vegetative cover remains viable, and will have no detrimental effect on downstream Pueblo lands.
- The surface treatment method will encourage native vegetation establishment and growth and reduce erosion.
- The proposed passive SVE system will effectively remove VOC mass and limit VOC migration from the current plume.
- The contingent active SVE system will be installed in the event of significant new VOC leakage in the future.
- The cover design will comply with the performance objectives and regulatory criteria listed in Table 7.1-2.

10.3.1 Surface Treatment

Surface treatments, such as soil nutrients and a soil-gravel admixture, may be warranted in the semiarid climate at the Laboratory to help establish native vegetation and reduce erosion. During the CMI design phase, a seed mix will be specified to stabilize the cover with native vegetation similar to the undisturbed and well-established plant communities inhabiting Mesita del Buey.

The addition of a soil-rock admixture surface layer on the cover provides erosion protection for the design storm event and promotes ET from native species of grasses. Erosion and water-balance studies at the Laboratory indicate that moderate amounts of gravel mixed into the cover topsoil will control both water and wind erosion with little effect on the vegetation or the soil-water balance (Wilson et al. 2005, 092034). The protection from water erosion depends on the depth, velocity, and duration of storm water flowing across the MDA C cover. Flow values can be established from the physical properties (i.e., slope, convex or concave grading, slope uniformity, and length of flow paths) of the cover and the intensity of the precipitation (i.e., precipitation rates, infiltration versus runoff relationships, snowmelt, and off-site flows). As wind blows and water flows over the cover surface, some winnowing of fines from the admixture is expected, creating a vegetated, erosion-resistant surface.

The ET cover soil moisture characteristics and cover compaction density are crucial parameters. Compaction density requirements will be based on the design criteria used but generally will achieve a density in the upper soil layer that approximates the surrounding undisturbed soil. Uniformity of compaction is critical to avoid creating preferential infiltration pathways.

The recommendation on surface treatment is based on review of site-specific conditions at MDA C and Laboratory data from cover experiments at TA-51 (Nyhan et al. 1996, 063111). The best surface layer will be chosen during the CMI design phase and after discussion with NMED. Additional information and specifications for the surface treatment are provided in Appendix I.

10.3.2 Cover Soil

The soil from the existing interim cover shall be used as cover soil for the ET cover. Rock shall be uniformly mixed into the upper 2 ft to mitigate erosion. The performance of the ET cover relies on its thickness, materials, and placement. The ET cover for MDA C will be thick enough to ensure that the water-storage capacity exceeds the maximum infiltration resulting from the design precipitation event.

During the design of the final cover system, soil will be extracted from the existing cover and measured. These measured values will be remodeled to either validate the prior sensitivity analyses or revised to justify the minimum cover thickness required.

Additional information and specifications for the cover soil are provided in Appendix I.

10.4 General O&M Requirements

An O&M manual based on the design and monitoring requirements for the ET cover will be prepared and submitted as part of the CMI plan. O&M considerations will include moisture monitoring, erosion monitoring, biota monitoring, vegetation, differential settlement, and cover maintenance.

A second O&M manual will be prepared and submitted as part of the CMI plan based on the design and monitoring requirements for the passive SVE system. The passive SVE system will be operated as described in Appendix G.

10.4.1 Long-Term Monitoring Requirements

Groundwater monitoring of the regional aquifer will be conducted in accordance with the annually approved IFGMP.

Long-term subsurface vapor monitoring will be performed according to the plan in Appendix G or until NMED determines that monitoring is not necessary.

The coupled monitoring network for MDA C uses vapor monitoring in the vadose zone, along with regional aquifer monitoring, to provide a defense-in-depth monitoring approach that will demonstrate the effectiveness of the final remedy and satisfy long-term monitoring requirements.

10.5 Additional Engineering Data Requirements

Before the CMI design is completed, additional data are required, including but not limited to

- verifying actual interim cover soil thickness and hydraulic soil properties,
- testing the geotechnical properties of all materials used for the ET cover, and
- performing in situ air-permeability testing from pilot vapor-extraction boreholes.

10.6 Additional Requirements

10.6.1 Permits and Regulatory Requirements

NMED will select a final remedy, issue a statement of basis for the selected remedy, and designate a period of time for public comment (per Section XVII of the Consent Order). If it is decided to install an active SVE system, the emission source from the SVE system will be evaluated to determine if a permit is required to operate the SVE system.

10.6.2 Access, Easements, Right-of-Way Agreements

Access, easements, and right-of-way agreements are managed through N3B and will be developed as required once the corrective measure is selected.

10.6.3 Health and Safety Requirements

A site-specific health and safety plan will be prepared to describe the health and safety requirements to be followed during construction of the ET cover, upgrades to open boreholes for passive SVE, and—if it is decided to implement active SVE construction and installation of the SVE boreholes and system—O&M activities and monitoring activities.

11.0 SCHEDULE FOR COMPLETION OF ACTIVITIES

The Consent Order requires that a schedule for completion of activities be submitted in the CME report. Activities leading to completion of the remedy include

- planning, design, and construction of the ET cover;
- testing and upgrading open boreholes for passive SVE;
- semiannual monitoring of the vapor phase plume to analyze trends in VOC concentrations to determine if active SVE is required; and
- planning, design, installation, testing, and operation of an active SVE system if target-level concentrations of VOCs are exceeded.

Several milestones for completion of the corrective measure at MDA C are presented in the Consent Order, along with schedule updates. In addition to these milestones, the Consent Order requires that the CME report include a proposed schedule for implementation of the preferred remedy. The schedule identifies the duration of corrective action operations, the frequency of monitoring and sampling activities, and the dates for submitting inspection and monitoring reports to NMED, including all status reports and preliminary data.

Proposed milestones include the following:

- NMED will review the CME Report and issue comments within 280 days of receipt of the document.
- DOE will have 150 days to revise and resubmit the document.
- NMED will prepare a statement of basis for remedy selection and issue the statement for public comment.
- NMED will receive public comments on the statement of basis for at least 60 days following public notice.
- NMED will provide an opportunity for a public hearing that may extend the public comment period.
- Based upon DOE's preferred remedy in the CME, DOE will request to submit a CMI plan within 18 months after NMED selects a final remedy. The plan will contain detailed engineering design drawings and system specifications for all elements of the remedy and a schedule for implementation of the corrective action.
- The corrective measure will be implemented and a remedy completion report submitted according to the schedule in the CMI plan. Following approval of the CMI plan, construction of the Laboratory's preferred remedy is expected to take approximately 18 months.
- During the entire CME/CMI process, pore-gas monitoring will continue and passive SVE will be analyzed through field testing, as discussed in Appendix G.

- Monitoring and maintenance, including reporting requirements, will be completed according to the CMI plan.
- Following completion of the remedy, groundwater monitoring will be conducted and reported as required by the annually approved IFGMP.

12.0 REFERENCES AND MAP DATA SOURCES

12.1 References

The following reference list includes documents cited in this report. Parenthetical information following each reference provides the author(s), publication date, and ERID, ESHID, or EMID. This information is also included in text citations. ERIDs were assigned by the Laboratory's Associate Directorate for Environmental Management (IDs through 599999); ESHIDs were assigned by the Laboratory's Associate Directorate for Environment, Safety, and Health (IDs 600000 through 699999); and EMIDs are assigned by N3B (IDs 700000 and above). IDs are used to locate documents in N3B's Records Management System and in the Master Reference Set. The New Mexico Environment Department (NMED) Hazardous Waste Bureau and N3B maintain copies of the Master Reference Set. The set ensures that NMED has the references to review documents. The set is updated when new references are cited in documents.

Barnes, F.J., E.J. Kelley, and E.A. Lopez, 1990. "Pilot Study of Surface Stabilization Techniques for Shallow-Land Burial Sites in the South-Western U.S.A.," in *Contaminated Soil '90*, F. Arendt, M. Hinsenveld, and W.J. van den Brinks (Eds.), Kluwer Academic Publishers, Printed in the Netherlands, pp. 1201-1202. (Barnes et al. 1990, 070209)

Birdsell, K.H., B.D. Newman, D.E. Broxton, and B.A. Robinson, 2005. "Conceptual Models of Vadose Zone Flow and Transport beneath the Pajarito Plateau, Los Alamos, New Mexico," *Vadose Zone Journal,* Vol. 4, pp. 620–636. (Birdsell et al. 2005, 092048)

Broxton, D.E., and P.G. Eller (Eds.), June 1995. "Earth Science Investigations for Environmental Restoration—Los Alamos National Laboratory, Technical Area 21," Los Alamos National Laboratory report LA-12934-MS, Los Alamos, New Mexico. (Broxton and Eller 1995, 058207)

Davenport, D.W., D.D. Breshears, and J.W. Nyhan, 1998. "Two Landfill Cover Designs a Decade after Installation in a Semiarid Setting," Los Alamos National Laboratory, Los Alamos, New Mexico. (Davenport et al. 1998, 069674)

DOE (U.S. Department of Energy), November 1989. "Los Alamos National Laboratory Sampling and Analysis Data Document," Draft, technical report EGG-ES-8204, Vol. I, report prepared by DOE Environmental Survey and Idaho National Engineering Laboratory, Washington, D.C. (DOE 1989, 015364)

DOE (U.S. Department of Energy), December 1989. "Technical Approach Document," report no. DOE/UMTRA-050425-002, DE91-005807, Washington, D.C. (DOE 1989, 099296)

DOE (U.S. Department of Energy), May 2008. "Final Site-Wide Environmental Impact Statement for Continued Operation of Los Alamos National Laboratory, Los Alamos, New Mexico, Volume 1," DOE/EIS-0380, Los Alamos, New Mexico. (DOE 2008, 102731)

DOT (U.S. Department of Transportation), 2002. “2001 Large Truck Crash Overview,” Publication No. FMCSA-R1-02-012, Analysis Division, Federal Motor Carrier Safety Administration, Washington, D.C. (DOT 2002, 097082)

Dwyer, S.F., January 2001. “Finding a Better Cover,” *Civil Engineering,* Vol. 71, No. 1, pp. 58-63. (Dwyer 2001, 071298)

Dwyer, S.F., May 2003. “Water Balance Measurements and Computer Simulations of Landfill Covers,” Ph.D. dissertation, University of New Mexico, Albuquerque, New Mexico. (Dwyer 2003, 097902)

Dwyer, S.F., May 2007. “Conceptual Cover Design Report for the Corrective Measures Evaluation for Closure of MDA G,” report prepared for Los Alamos National Laboratory by Dwyer Engineering, LLC, Albuquerque, New Mexico. (Dwyer 2007, 098276)

Dwyer, S.F., R.E. Rager, and J. Hopkins, April 2007. “Cover System Design Guidance and Requirements Document,” Los Alamos National Laboratory document LA-UR-06-4715, Los Alamos, New Mexico. (Dwyer et al. 2007, 096232)

Dwyer, S.F., B. Reavis, and G. Newman, October 2000. “Alternative Landfill Cover Demonstration, FY2000 Annual Data Report,” report SAND2000-2427, Sandia National Laboratories, Albuquerque, New Mexico. (Dwyer et al. 2000, 069673)

EPA (U.S. Environmental Protection Agency), December 1989. “Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual (Part A), Interim Final,” EPA/540/1-89/002, Office of Emergency and Remedial Response, Washington, D.C. (EPA 1989, 008021)

EPA (U.S. Environmental Protection Agency), May 1991. “Design and Construction of RCRA/CERCLA Final Covers,” Seminar Publication, EPA/625/4-91/025, Office of Research and Development, Washington, D.C. (EPA 1991, 097899)

EPA (U.S. Environmental Protection Agency), August 1994. “Feasibility Study Analysis for CERCLA Municipal Landfill Sites,” EPA540/R-94/081, Office of Solid Waste and Emergency Response, Washington, D.C. (EPA 1994, 095975)

EPA (U.S. Environmental Protection Agency), May 1996. “Soil Screening Guidance: Technical Background Document,” EPA/540/R-95/128, Office of Solid Waste and Emergency Response, Washington, D.C. (EPA 1996, 059902)

EPA (U.S. Environmental Protection Agency), February 2002. “A Citizen's Guide to Incineration,” EPA 542-F-01-018, Office of Solid Waste and Emergency Response, Washington, D.C. (EPA 2002, 102739)

French, S., R. Shuman, G.L. Cole, K.J. Crowell, M.S. Day, C.W. Gable, M.O. Gard, J.J. Whicker, D.G. Levitt, B.D. Newman, B.A. Robinson, E.P. Springer, and P.H. Stauffer, October 2008. “Performance Assessment and Composite Analysis for Los Alamos National Laboratory Material Disposal, Area G, Revision 4,” Los Alamos National Laboratory document LA-UR-08-06764, Los Alamos, New Mexico. (French et al. 2008, 106890)

Gardner, J.N., T. Kolbe, and S. Chang, January 1993. "Geology, Drilling, and Some Hydrologic Aspects of Seismic Hazards Program Core Holes, Los Alamos National Laboratory, New Mexico," Los Alamos National Laboratory report LA-12460-MS, Los Alamos, New Mexico. (Gardner et al. 1993, 012582)

Gardner, J.N., A. Lavine, G. WoldeGabriel, D. Krier, J., D.T. Vaniman, F.A. Caporuscio, C.J. Lewis, M.R. Reneau, E.C. Kluk, and M.J. Snow, March 1999. "Structural Geology of the Northwestern Portion of Los Alamos National Laboratory, Rio Grande Rift, New Mexico: Implications for Seismic Surface Rupture Potential from TA-3 to TA-55," Los Alamos National Laboratory report LA-13589-MS, Los Alamos, New Mexico. (Gardner et al. 1999, 063492)

Gardner, J.N., E.S. Schultz-Fellenz, F.A. Caporuscio, C.J. Lewis, R.E. Kelley, and M.K. Greene, October 2008. "Geology and Structure of the Chemistry and Metallurgy Research Facility Replacement Site, Los Alamos National Laboratory, New Mexico," Los Alamos National Laboratory report LA-14378, Los Alamos, New Mexico. (Gardner et al. 2008, 104727)

Hollis, D., E. Vold, R. Shuman, K.H. Birdsell, K. Bower, W.R. Hansen, D. Krier, P.A. Longmire, B. Newman, D.B. Rogers, and E.P. Springer, March 27, 1997. "Performance Assessment and Composite Analysis for Los Alamos National Laboratory Material Disposal Area G," Rev. 2.1, Los Alamos National Laboratory document LA-UR-97-85, Los Alamos, New Mexico. (Hollis et al. 1997, 063131)

Kleinfelder, May 2006. "Final Completion Report, Characterization Well R-17," report prepared for Los Alamos National Laboratory, Project No. 49436, Albuquerque, New Mexico. (Kleinfelder 2006, 096578)

Kwicklis, E., M. Witkowski, K. Birdsell, B. Newman, and D. Walther, August 2005. "Development of an Infiltration Map for the Los Alamos Area, New Mexico," *Vadose Zone Journal,* Vol. 4, pp. 672–693. (Kwicklis et al. 2005, 090069)

LANL (Los Alamos National Laboratory), May 1992. "RFI Work Plan for Operable Unit 1147," Los Alamos National Laboratory document LA-UR-92-969, Los Alamos, New Mexico. (LANL 1992, 007672)

LANL (Los Alamos National Laboratory), September 22, 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, 059730)

LANL (Los Alamos National Laboratory), August 1999. "Interim Measures Report for Potential Release Sites 49-001(b), 49-001(c), 49-001(d), 49-001(g)," Los Alamos National Laboratory document LA-UR-99-2169, Los Alamos, New Mexico. (LANL 1999, 063919)

LANL (Los Alamos National Laboratory), August 1999. "Stabilization Plan for Implementing Interim Measures and Best Management Practices at Potential Release Sites 49-001(b), 49-001(c), 49-001(d), 49-001(g)," Los Alamos National Laboratory document LA-UR-98-1534, Los Alamos, New Mexico. (LANL 1999, 063918)

LANL (Los Alamos National Laboratory), June 2003. "Characterization Well R-14 Completion Report," Los Alamos National Laboratory document LA-UR-03-1664, Los Alamos, New Mexico. (LANL 2003, 076062)

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, 091493)

LANL (Los Alamos National Laboratory), September 2005. “Investigation Report for Material Disposal Area G, Consolidated Unit 54-013(b)-99, at Technical Area 54,” Los Alamos National Laboratory document LA-UR-05-6398, Los Alamos, New Mexico. (LANL 2005, 090513)

LANL (Los Alamos National Laboratory), October 2006. “Mortandad Canyon Investigation Report,” Los Alamos National Laboratory document LA-UR-06-6752, Los Alamos, New Mexico. (LANL 2006, 094161)

LANL (Los Alamos National Laboratory), November 2006. “Summary Report: 2006 In Situ Soil Vapor Extraction Pilot Study at Material Disposal Area L, Technical Area 54, Los Alamos National Laboratory,” Los Alamos National Laboratory document LA-UR-06-7900, Los Alamos, New Mexico. (LANL 2006, 094152)

LANL (Los Alamos National Laboratory), December 2006. “Investigation Report for Material Disposal Area C, Solid Waste Management Unit 50-009, at Technical Area 50,” Los Alamos National Laboratory document LA-UR-06-8096, Los Alamos, New Mexico. (LANL 2006, 094688)

LANL (Los Alamos National Laboratory), April 19, 2007. “Submittal of Drilling and Sampling Results from Boreholes Between Pit 2 and Pit 3 at Material Disposal Area C, Solid Waste Management Unit 50-009,” Los Alamos National Laboratory letter (EP2007-0231) to J.P. Bearzi (NMED-HWB) from C.A. Mangeng (LANL) and G.J. Rael (DOE-LASO), Los Alamos, New Mexico. (LANL 2007, 097285)

LANL (Los Alamos National Laboratory), July 2007. “Phase II Investigation Work Plan for Material Disposal Area C, Solid Waste Management Unit 50-009, at Technical Area 50, Revision 1,” Los Alamos National Laboratory document LA-UR-07-5083, Los Alamos, New Mexico. (LANL 2007, 098425)

LANL (Los Alamos National Laboratory), September 2007. “Mortandad Canyon Groundwater Monitoring Well Network Evaluation, Revision 1,” Los Alamos National Laboratory document LA-UR-07-6435, Los Alamos, New Mexico. (LANL 2007, 099128)

LANL (Los Alamos National Laboratory), September 2007. “Environmental Surveillance at Los Alamos During 2006,” Los Alamos National Laboratory report LA-14341-ENV, Los Alamos, New Mexico. (LANL 2007, 098644)

LANL (Los Alamos National Laboratory), March 2008. “Well R-14 Rehabilitation and Conversion Summary Report,” Los Alamos National Laboratory document LA-UR-08-1539, Los Alamos, New Mexico. (LANL 2008, 101462)

LANL (Los Alamos National Laboratory), January 2009. “Pilot Test Report for Evaluating Soil-Vapor Extraction at Material Disposal Area G at Technical Area 54, Revision 1,” Los Alamos National Laboratory document LA-UR-09-0565, Los Alamos, New Mexico. (LANL 2009, 105112)

LANL (Los Alamos National Laboratory), March 2009. "Completion Report for Regional Aquifer Well R-46," Los Alamos National Laboratory document LA-UR-09-1338, Los Alamos, New Mexico. (LANL 2009, 105592)

LANL (Los Alamos National Laboratory), August 2009. "Pajarito Canyon Investigation Report, Revision 1," Los Alamos National Laboratory document LA-UR-09-4670, Los Alamos, New Mexico. (LANL 2009, 106939)

LANL (Los Alamos National Laboratory), October 2009. "Phase II Investigation Report for Material Disposal Area C, Solid Waste Management Unit 50-009, at Technical Area 50, Revision 1," Los Alamos National Laboratory document LA-UR-09-6266, Los Alamos, New Mexico. (LANL 2009, 107389)

LANL (Los Alamos National Laboratory), April 2010. "Phase III Investigation Work Plan for Material Disposal Area C, Solid Waste Management Unit 50-009, at Technical Area 50, Revision 1," Los Alamos National Laboratory document LA-UR-10-2468, Los Alamos, New Mexico. (LANL 2010, 109260)

LANL (Los Alamos National Laboratory), May 2010. "Report for Supplemental Soil-Vapor Extraction Pilot Test at Material Disposal Area G, Technical Area 54," Los Alamos National Laboratory document LA-UR-10-3409, Los Alamos, New Mexico. (LANL 2010, 109657)

LANL (Los Alamos National Laboratory), June 1, 2010. "Request for Deviation from the Approval with Modifications Phase III Investigation Work Plan for Material Disposal Area C, Solid Waste Management Unit 50-009, Revision 1," Los Alamos National Laboratory letter (EP2010-0268) to J.P. Bearzi (NMED-HWB) from M. Graham (LANL) and D. Gregory (DOE-LASO), Los Alamos, New Mexico. (LANL 2010, 109611)

LANL (Los Alamos National Laboratory), March 2011. "Completion Report for Regional Aquifer Well R-60," Los Alamos National Laboratory document LA-UR-11-0189, Los Alamos, New Mexico. (LANL 2011, 111798)

LANL (Los Alamos National Laboratory), May 23, 2011. "Extension Request for Submittal of Proposed Location for Well R-59 and Well Completion Date," Los Alamos National Laboratory letter (EP2011-0192) to J. Kieling (NMED-HWB) from M.J. Graham (LANL) and G.J. Rael (DOE-LASO), Los Alamos, New Mexico. (LANL 2011, 203595)

LANL (Los Alamos National Laboratory), June 2011. "Phase III Investigation Report for Material Disposal Area C, Solid Waste Management Unit 50-009, at Technical Area 50," Los Alamos National Laboratory document LA-UR-11-3429, Los Alamos, New Mexico. (LANL 2011, 204370)

LANL (Los Alamos National Laboratory), December 2011. "2011 Interim Facility-Wide Groundwater Monitoring Plan, Revision 1," Los Alamos National Laboratory document LA-UR-11-6958, Los Alamos, New Mexico. (LANL 2011, 208811)

LANL (Los Alamos National Laboratory), January 13, 2012. "Submittal of the Response to the Approval for the Phase III Investigation Report for Material Disposal Area C, Solid Waste Management Unit 50-009, at Technical Area 50 and Replacement Pages," Los Alamos National Laboratory letter (EP2012-0001) to J. Kieling (NMED-HWB) from M.J. Graham (LANL) and G.J. Rael (DOE-LASO), Los Alamos, New Mexico. (LANL 2012, 209658)

LANL (Los Alamos National Laboratory), April 2012. "Investigation/Remediation Report for Material Disposal Area B, Solid Waste Management Unit 21-015, Revision 1," Los Alamos National Laboratory document LA-UR-12-20089, Los Alamos, New Mexico. (LANL 2012, 215119)

LANL (Los Alamos National Laboratory), April 16, 2012. "Response to Notice of Deficiency Administrative Completeness and Fee Assessment TA-63 Transuranic Waste Facility Permit Modification Request Los Alamos National Laboratory EPA ID# NM 0890010515," Los Alamos National Laboratory letter (ENV-RCRA-12-0076) to J.E. Keiling (NMED-HWB) from A.R. Grieggs (LANL) and G.E. Turner (DOE-LASO), Los Alamos, New Mexico. (LANL 2012, 215002)

LANL (Los Alamos National Laboratory), May 2012. "Periodic Monitoring Report for Material Disposal Area C Monitoring Group, November 8–November 28, 2011," Los Alamos National Laboratory document LA-UR-12-21144, Los Alamos, New Mexico. (LANL 2012, 218416)

LANL (Los Alamos National Laboratory), October 27, 2016. "Groundwater Background Investigation Report, Revision 5," Los Alamos National Laboratory document LA-UR-16-27907, Los Alamos, New Mexico. (LANL 2016, 601920)

LANL (Los Alamos National Laboratory), May 3, 2021. "Technical Area 63 (TA-63) Transuranic Waste Facility Soil Vapor Monitoring System Report, Quarter 14 March 2021, Los Alamos National Laboratory, EPA ID #NM0890010515," Los Alamos National Laboratory letter (EPC-DO-20-135) and enclosure to K. Pierard (NMED-HWB) from J. Payne (LANL) and Karen E. Armijo (NA-LA). (LANL 2021, 603633)

LASL (Los Alamos Scientific Laboratory), 1948 to 1969. "MDA C Waste Disposal Logbooks 1743, 2587, 3478, 4644, 6030, 7277, 8453, 9293, 9593, 12442, and 11363, 1948–1969," Los Alamos Scientific Laboratory, Los Alamos, New Mexico. (LASL 1948–1969, 076035)

Miller, E., K. Birdsell, P. Stauffer, E. Schultz-Fellenz, R. Kelley, B. Goehring, and S. French, October 2020. "Cliff Retreat Characterization at Technical Area 54, Los Alamos National Laboratory, Los Alamos, NM," Los Alamos National Laboratory document LA-UR-18-23663, Los Alamos, New Mexico. (Miller et al. 2020, 701480)

Millington, R.J., and J.P. Quirk, 1961. "Permeability of Porous Solids," *Transactions of the Faraday Society,* Vol. 57, pp. 1200–1207. (Millington and Quirk 1961, 110521)

N3B (Newport News Nuclear BWXT-Los Alamos, LLC), August 2018. "Interim Measures Final Report for Soil-Vapor Extraction of Volatile Organic Compounds from Material Disposal Area L, Technical Area 54," Newport News Nuclear BWXT-Los Alamos, LLC, document EM2018-0008, Los Alamos, New Mexico. (N3B 2018, 700039)

N3B (Newport News Nuclear BWXT-Los Alamos, LLC), August 2020. "Periodic Monitoring Report for 2019 Vapor-Sampling Activities at Material Disposal Area C, Solid Waste Management Unit 50-009, at Technical Area 50," Newport News Nuclear BWXT-Los Alamos, LLC, document EM2020-0281, Los Alamos, New Mexico. (N3B 2020, 700990)

N3B (Newport News Nuclear BWXT-Los Alamos, LLC), May 2020. “Interim Facility-Wide Groundwater Monitoring Plan for the 2021 Monitoring Year, October 2020–September 2021,” Newport News Nuclear BWXT-Los Alamos, LLC, document EM2020-0113, Los Alamos, New Mexico. (N3B 2020, 700927)

N3B (Newport News Nuclear BWXT-Los Alamos, LLC), February 2021. “Periodic Monitoring Report for 2019 Vapor-Sampling Activities at Material Disposal Area C, Solid Waste Management Unit 50-009, at Technical Area 50, Revision 1,” Newport News Nuclear BWXT-Los Alamos, LLC, document EM2021-0041, Los Alamos, New Mexico. (N3B 2021, 701220)

Neeper, D.A., 2003. “Harmonic Analysis of Flow in Open Boreholes Due to Barometric Pressure Cycles,” *Journal of Contaminant Hydrology,* Vol. 60, pp. 135-162. (Neeper 2003, 098640)

Neeper, D.A., and P.H. Stauffer, May 2012. “Transport by Oscillatory Flow in Soils with Rate-Limited Mass Transfer: 2. Field Experiment,” *Vadose Zone Journal,* Vol. 11, No. 2. (Neeper and Stauffer 2012, 601588)

Neeper, D.A., and P.H. Stauffer, May 2012. “Transport by Oscillatory Flow in Soils with Rate-Limited Mass Transfer: 1. Theory,” *Vadose Zone Journal,* Vol. 11, No. 2. (Neeper and Stauffer 2012, 601587)

NMED (New Mexico Environment Department), June 2006. “Technical Background Document for Development of Soil Screening Levels, Revision 4.0, Volume 1, Tier 1: Soil Screening Guidance Technical Background Document,” New Mexico Environment Department, Hazardous Waste Bureau and Ground Water Quality Bureau Voluntary Remediation Program, Santa Fe, New Mexico. (NMED 2006, 092513)

NMED (New Mexico Environment Department), October 29, 2007. “Notice of Approval, Mortandard Canyon Groundwater Monitoring Well Network Evaluation, Revision 1,” New Mexico Environment Department letter to D. Gregory (DOE-LASO) and D. McInroy (LANL) from J.P. Bearzi (NMED-HWB), Santa Fe, New Mexico. (NMED 2007, 098775)

NMED (New Mexico Environment Department), October 15, 2009. “Second Notice of Disapproval, Phase II Investigation Report for Material Disposal Area C, Solid Waste Management Unit 50-009, at Technical Area 50,” New Mexico Environment Department letter to D. Gregory (DOE-LASO) and D. McInroy (LANL) from J.P. Bearzi (NMED-HWB), Santa Fe, New Mexico. (NMED 2009, 107361)

NMED (New Mexico Environment Department), June 4, 2010. “Approval with Modification, Drilling Work Plan for Regional Aquifer Well R-60,” New Mexico Environment Department letter to G.J. Rael (DOE-LASO) and M.J. Graham (LANL) from J.P. Bearzi (NMED-HWB), Santa Fe, New Mexico. (NMED 2010, 109635)

NMED (New Mexico Environment Department), December 8, 2011. “Approval, Phase III Investigation Report for Material Disposal Area C, Solid Waste Management Unit 50-009, at Technical Area 50,” New Mexico Environment Department letter to G.J. Rael (DOE-LASO) and M.J. Graham (LANL) from J.E. Kieling (NMED-HWB), Santa Fe, New Mexico. (NMED 2011, 208797)

NMED (New Mexico Environment Department), April 20, 2012. "Approval, Modification to the March 1, 2005 Order on Consent to Change Periodic Groundwater Monitoring from Watershed-Spedicic to Area-Specific Monitoring," New Mexico Environment Department letter to K.W. Smith (DOE-LASO) and C. McMillan (LANL Director) from J.E. Kieling (NMED-HWB), Santa Fe, New Mexico. (NMED 2012, 520171)

NMED (New Mexico Environment Department), June 19, 2019. "Risk Assessment Guidance for Site Investigations and Remediation, Volume 1, Soil Screening Guidance for Human Health Risk Assessments," February 2019 (Revision 2, 6/19/19), Hazardous Waste Bureau and Ground Water Quality Bureau, Santa Fe, New Mexico. (NMED 2019, 700550)

Nyhan, J.W., February 1989. "Development of Technology for the Long-Term Stabilization and Closure of Shallow Land Burial Sites in Semiarid Environments," Los Alamos National Laboratory report LA-11283-MS, Los Alamos, New Mexico. (Nyhan 1989, 006876)

Nyhan, J.W., G.L. DePoorter, B.J. Drennon, J.R. Simanton, and G.R. Foster, 1984. "Erosion of Earth Covers Used in Shallow Land Burial at Los Alamos, New Mexico," *Journal of Environmental Quality,* Vol. 13, No. 3, pp. 361-366. (Nyhan et al. 1984, 008797)

Nyhan, J.W., B.J. Drennon, and T.E. Hakonson, February 1989. "Field Evaluation of Two Shallow Land Burial Trench Cap Designs for Long-Term Stabilization and Closure of Waste Repositories at Los Alamos, New Mexico," Los Alamos National Laboratory report LA-11281-MS, Los Alamos, New Mexico. (Nyhan et al. 1989, 006874)

Nyhan, J.W., T.G. Schofield, and R.H. Starmer, 1996. "A Water Balance Study of Four Landfill Cover Designs Varying in Slope for Semiarid Regions," Los Alamos National Laboratory document LA-UR-96-4093, Los Alamos, New Mexico. (Nyhan et al. 1996, 063111)

Purtymun, W.D., E.A. Enyart, and S.G. McLin, August 1989. "Hydrologic Characteristics of the Bandelier Tuff as Determined Through an Injection Well System," Los Alamos National Laboratory report LA-11511-MS, Los Alamos, New Mexico. (Purtymun et al. 1989, 006889)

Reneau, S.L., and R. Raymond, Jr. (Eds.), 1995. "Geological Site Characterization for the Proposed Mixed Waste Disposal Facility, Los Alamos National Laboratory," Los Alamos National Laboratory report LA-13089-MS, Los Alamos, New Mexico. (Reneau and Raymond 1995, 054709)

Robinson, B.A., D.E. Broxton, and D.T. Vaniman, 2005. "Observations and Modeling of Deep Perched Water beneath the Pajarito Plateau," *Vadose Zone Journal,* Vol. 4, pp. 637–652. (Robinson et al. 2005, 091682)

Robinson, B.A., S.G. McLin, and H.S. Viswanathan, 2005. "Hydrologic Behavior of Unsaturated, Fractured Tuff: Interpretation and Modeling of a Wellbore Injection Test," *Vadose Zone Journal,* Vol. 4, pp. 694–707. (Robinson et al. 2005, 092040)

Rogers, M.A., June 1977. "History and Environmental Setting of LASL Near-Surface Land Disposal Facilities for Radioactive Wastes (Areas A, B, C, D, E, F, G, and T)," Vol. I, Los Alamos Scientific Laboratory report LA-6848-MS, Los Alamos, New Mexico. (Rogers 1977, 005707)

Rogers, M.A., June 1977. "History and Environmental Setting of LASL Near-Surface Land Disposal Facilities for Radioactive Wastes (Areas A, B, C, D, E, F, G, and T)," Vol. II, Los Alamos Scientific Laboratory report LA-6848-MS, Los Alamos, New Mexico. (Rogers 1977, 005708)

SEA (Science & Engineering Associates, Inc.), October 1997. "Brief Tests of Passively Vented Boreholes at TA-54, MDA H, MDA J, and TA-50, MDA C during 1995 and 1996," Science & Engineering Associates report SEA-SF-TR-97-171, Santa Fe, New Mexico. (SEA 1997, 076055)

Soll, W., and K. Birdsell, February 1998. "The Influence of Coatings and Fills on Flow in Fractured, Unsaturated Tuff Porous Media Systems," *Water Resources Research,* Vol. 34, No. 2, pp. 193-202. (Soll and Birdsell 1998, 070011)

Springer, E.P., 2005. "Statistical Exploration of Matrix Hydrologic Properties for the Bandelier Tuff, Los Alamos, New Mexico," *Vadose Zone Journal,* Vol. 4, pp. 505–521. (Springer 2005, 098534)

Stauffer, P.H., K.H. Birdsell, M.S. Witkowski, and J.K. Hopkins, 2005. "Vadose Zone Transport of 1,1,1-Trichloroethane: Conceptual Model Validation through Numerical Simulation," *Vadose Zone Journal,* Vol. 4, pp. 760–773. (Stauffer et al. 2005, 090537)

Suter II, G.W., R.J. Luxmoore, and E.D. Smith, April-June 1993. "Compacted Soil Barriers at Abandoned Landfill Sites are Likely to Fail in the Long Term," *Journal of Environmental Quality,* Vol. 22, No. 2, pp. 217-226. (Suter et al. 1993, 701418)

TerranearPMC, June 2010. "Drilling Plan for Regional Aquifer Well R-60," plan prepared for Los Alamos National Laboratory, Los Alamos, New Mexico. (TerranearPMC 2010, 109963)

Tierney, G., and T.S. Foxx, January 1987. "Root Lengths of Plants on Los Alamos National Laboratory Lands," Los Alamos National Laboratory report LA-10865-MS, Los Alamos, New Mexico. (Tierney and Foxx 1987, 006669)

Truex, M.J., M. Oostrom, and M.L. Brusseau, 2009. "Estimating Persistent Mass Flux of Volatile Contaminants from the Vadose Zone to Ground Water," *Ground Water Monitoring and Remediation,* Vol. 29, No. 2, pp. 63–72. (Truex et al. 2009, 108331)

Trujillo, V., R. Gilkeson, M. Morgenstern, and D. Krier, June 1998. "Measurement of Surface Emission Flux Rates for Volatile Organic Compounds at Technical Area 54," Los Alamos National Laboratory report LA-13329, Los Alamos, New Mexico. (Trujillo et al. 1998, 058242)

Wilson, C.J., K.J. Crowell, and L.J. Lane, September 2005. "Surface Erosion Modeling for the Repository Waste Cover at Los Alamos National Laboratory Technical Area 54, Material Disposal Area G," Los Alamos National Laboratory document LA-UR-05-7771, Los Alamos, New Mexico. (Wilson et al. 2005, 092034)

12.2 Map Data Sources

Communication Lines; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 08 August 2002, as published 15 January 2009.

Dirt Road Arcs; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004, as published 15 January 2009.

Hypsography; Los Alamos National Laboratory, ENV Environmental Remediation and Surveillance Program; 1991.

Materials Disposal Areas; Los Alamos National Laboratory, ENV Environmental Remediation and Surveillance Program; ER2004-0221; 1:2,500 Scale Data; 23 April 2004.

Paved Parking; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 12 August 2002, as published 15 January 2009.

Paved Road Arcs; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004, as published 15 January 2009.

Point Feature Locations of the Environmental Restoration Project Database; Los Alamos National Laboratory, Waste and Environmental Services Division, EP2009-0162; 13 March 2009.

Primary Electric Grid; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 15 January 2009.

Primary Gas Distribution Lines; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 15 January 2009.

Primary Landscape Features; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 15 January 2009.

Road Centerlines; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 15 December 2005; as published 15 January 2009.

Security and Industrial Fences and Gates; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 15 January 2009.

Sewer Line System; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 15 January 2009.

Storm Drain Line Distribution System; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 15 January 2009.

Structures; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 15 January 2009.

Technical Area Boundaries; Los Alamos National Laboratory, Site Planning & Project Initiation Group, Infrastructure Planning Office; September 2007; as published 04 December 2008.

Waste Storage Features; Los Alamos National Laboratory, Environment and Remediation Support Services Division, GIS/Geotechnical Services Group, EP2007-0032; 1:2,500 Scale Data; 13 April 2007.

Water Lines; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 15 January 2009.

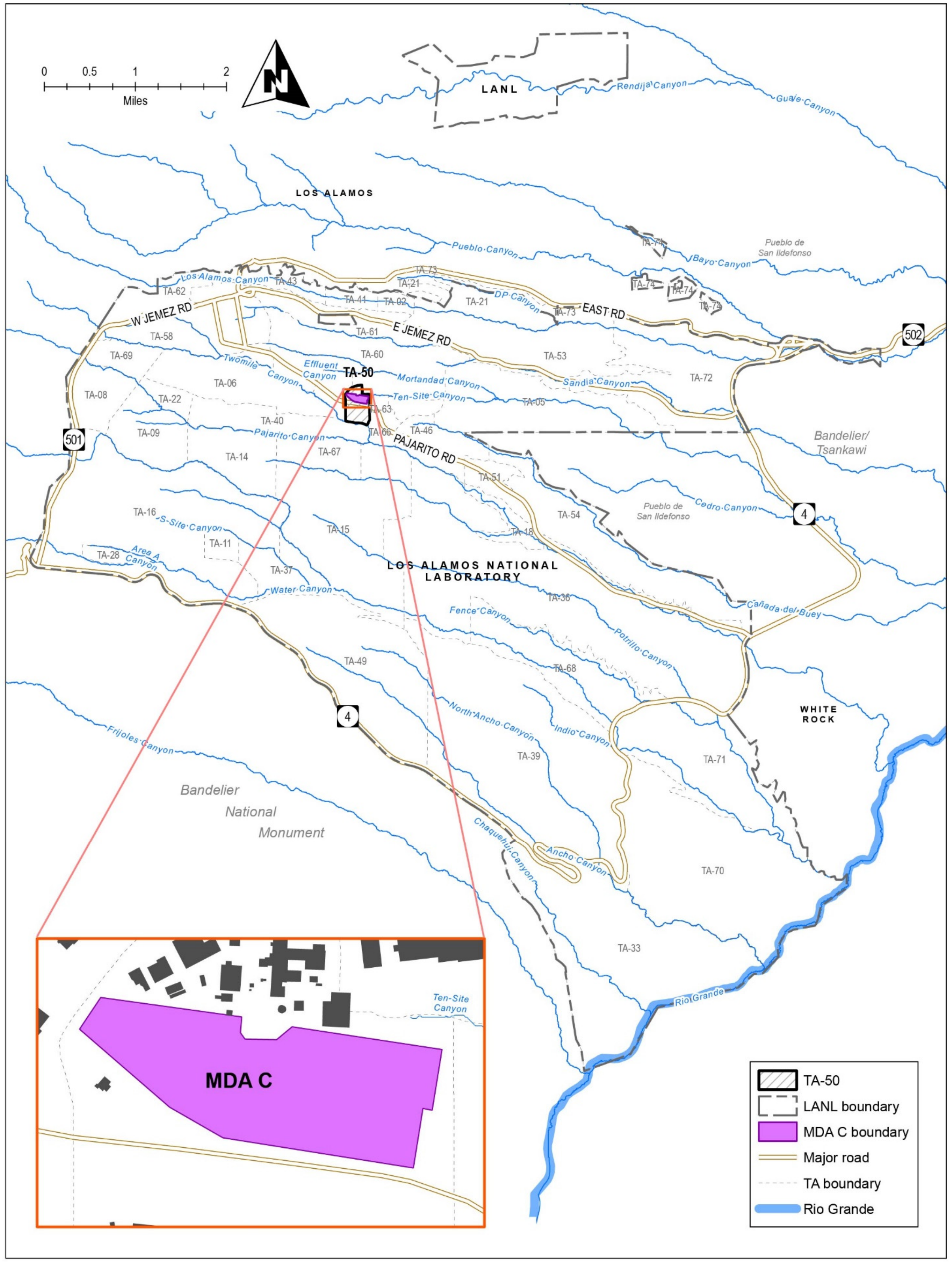


Figure 1.0-1 Location of MDA C and surrounding technical areas

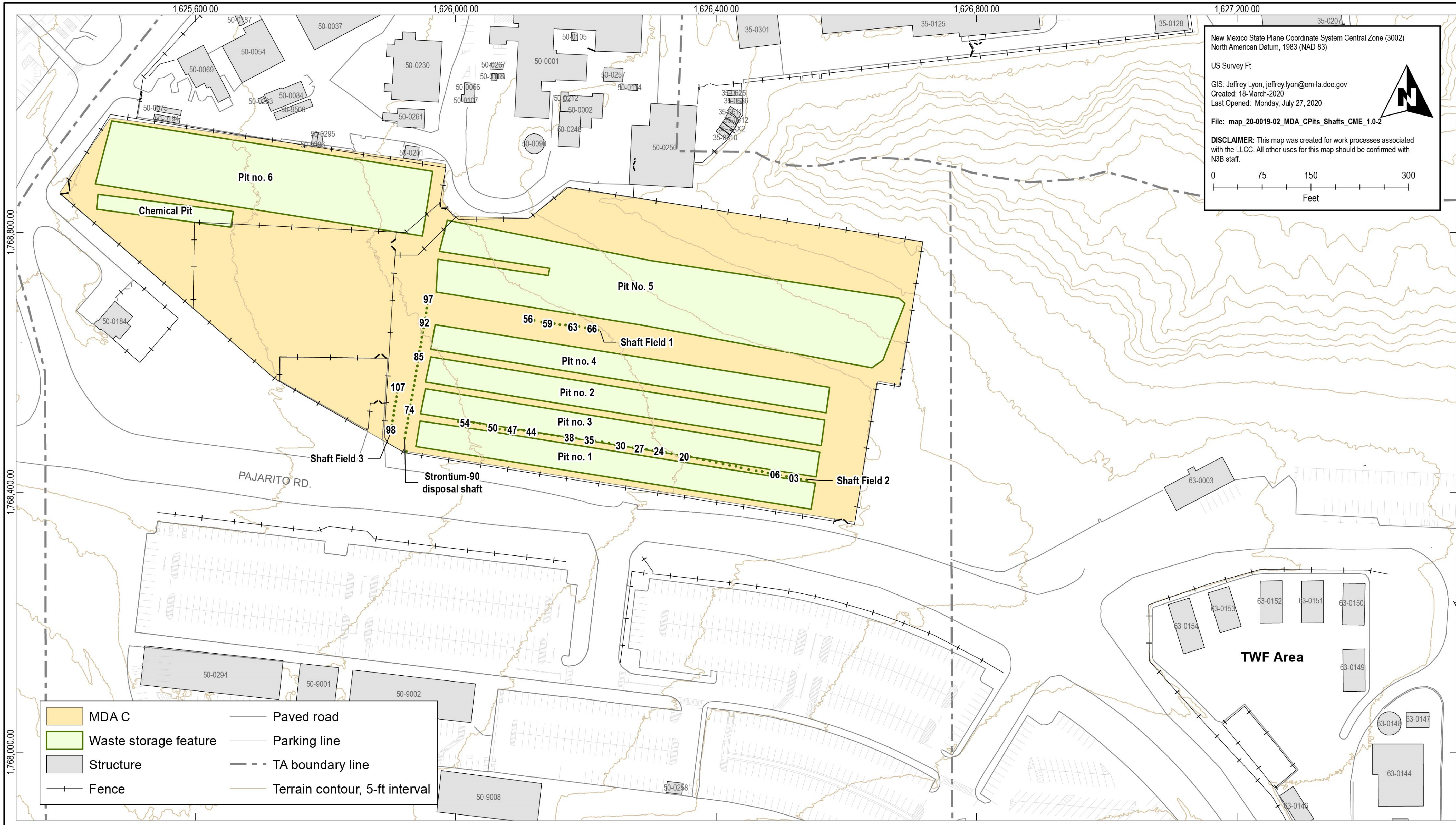


Figure 1.0-2 Locations of pits and shafts at MDA C

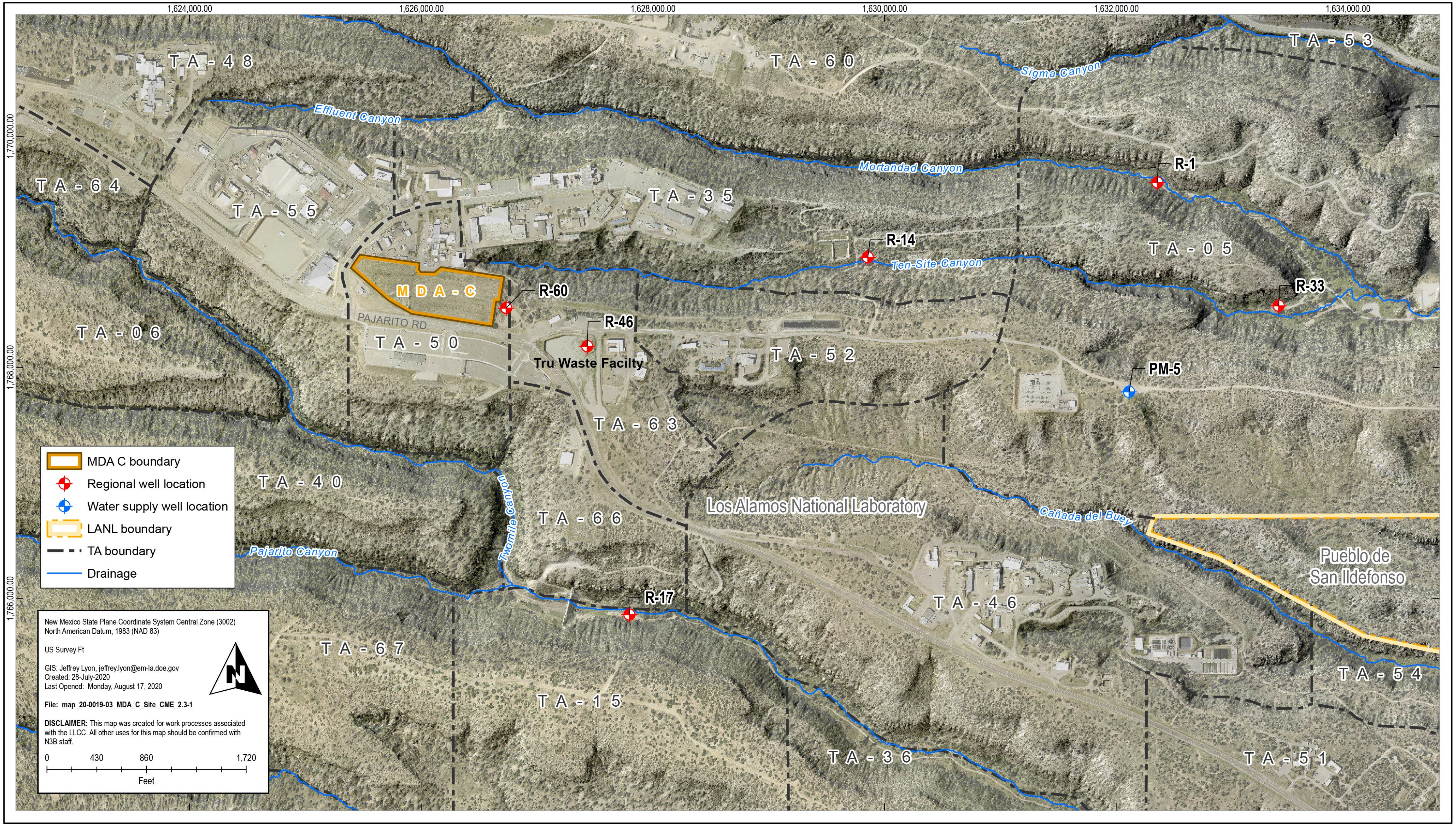


Figure 2.3-1 Area map of MDA C showing mesa-top setting, nearby technical areas, and related canyons

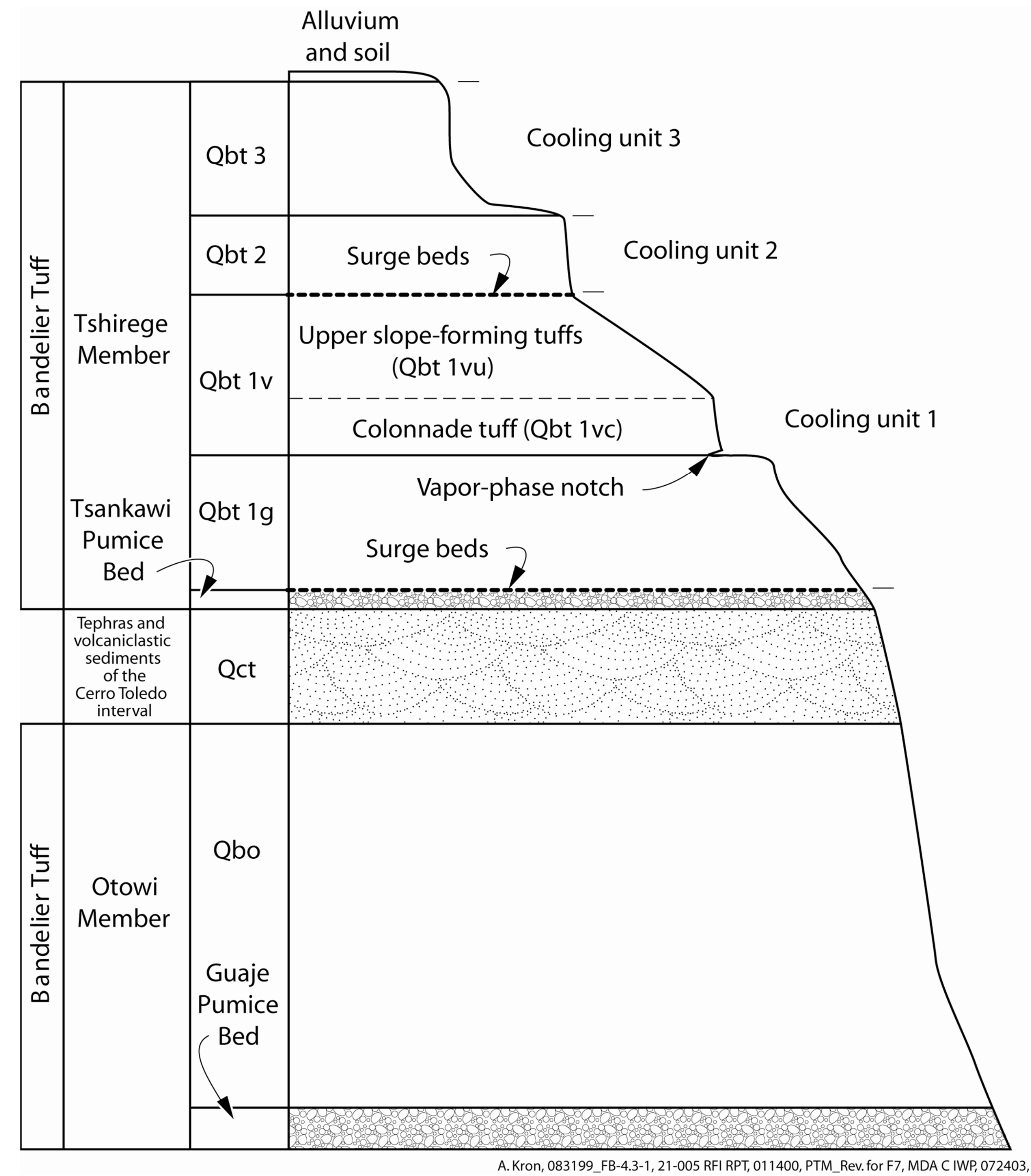


Figure 2.3-2 Generalized stratigraphy in the vicinity of MDA C

Figure 2.3-3 Stratigraphic units beneath MDA C, locations of vapor-monitoring wells and ports, and locations of regional wells R-60 and R-46 and their well screens

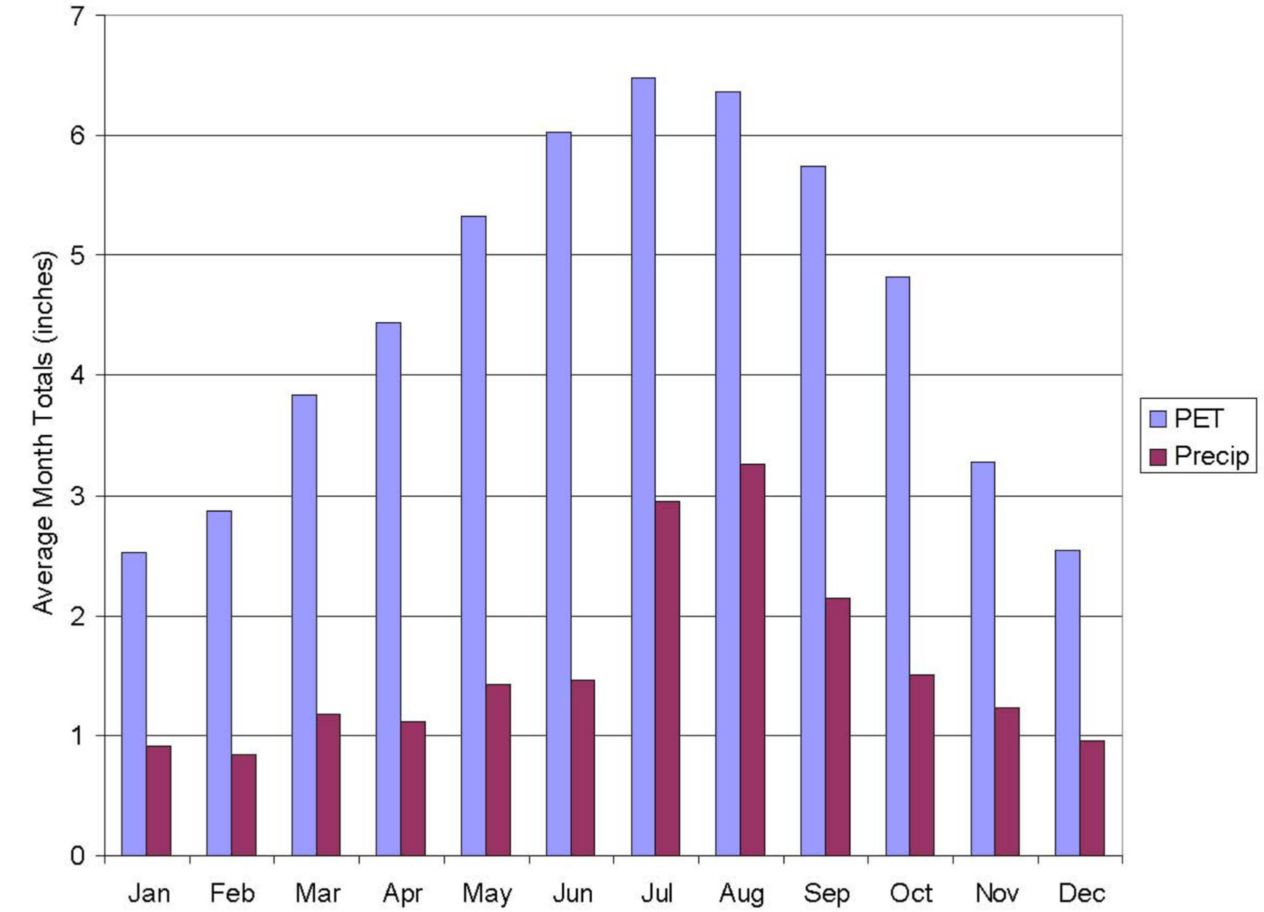


Figure 2.3-4 Typical climate demand for water (PET) versus actual supply of water (precipitation) for Los Alamos, New Mexico (year 1942)

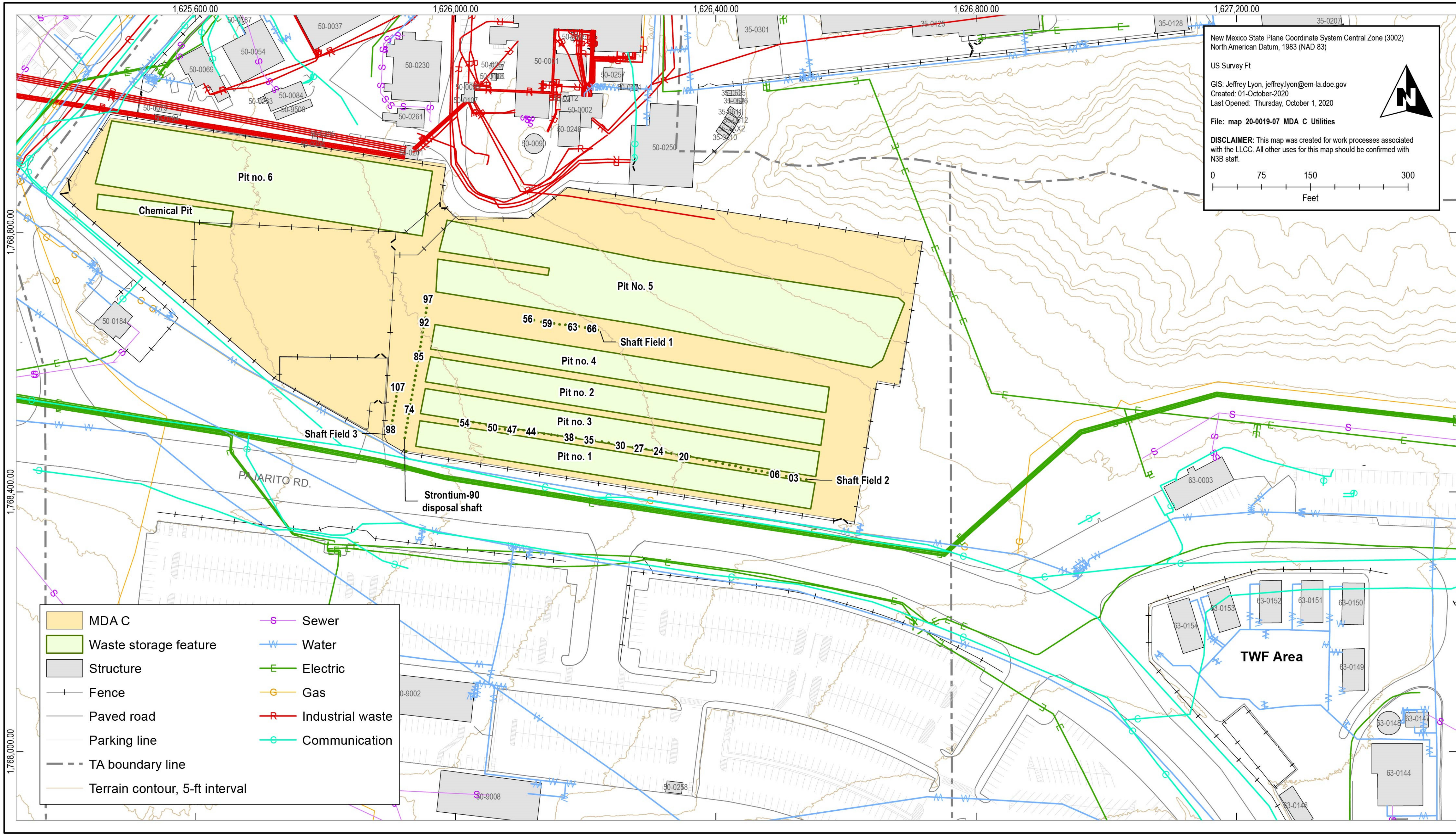
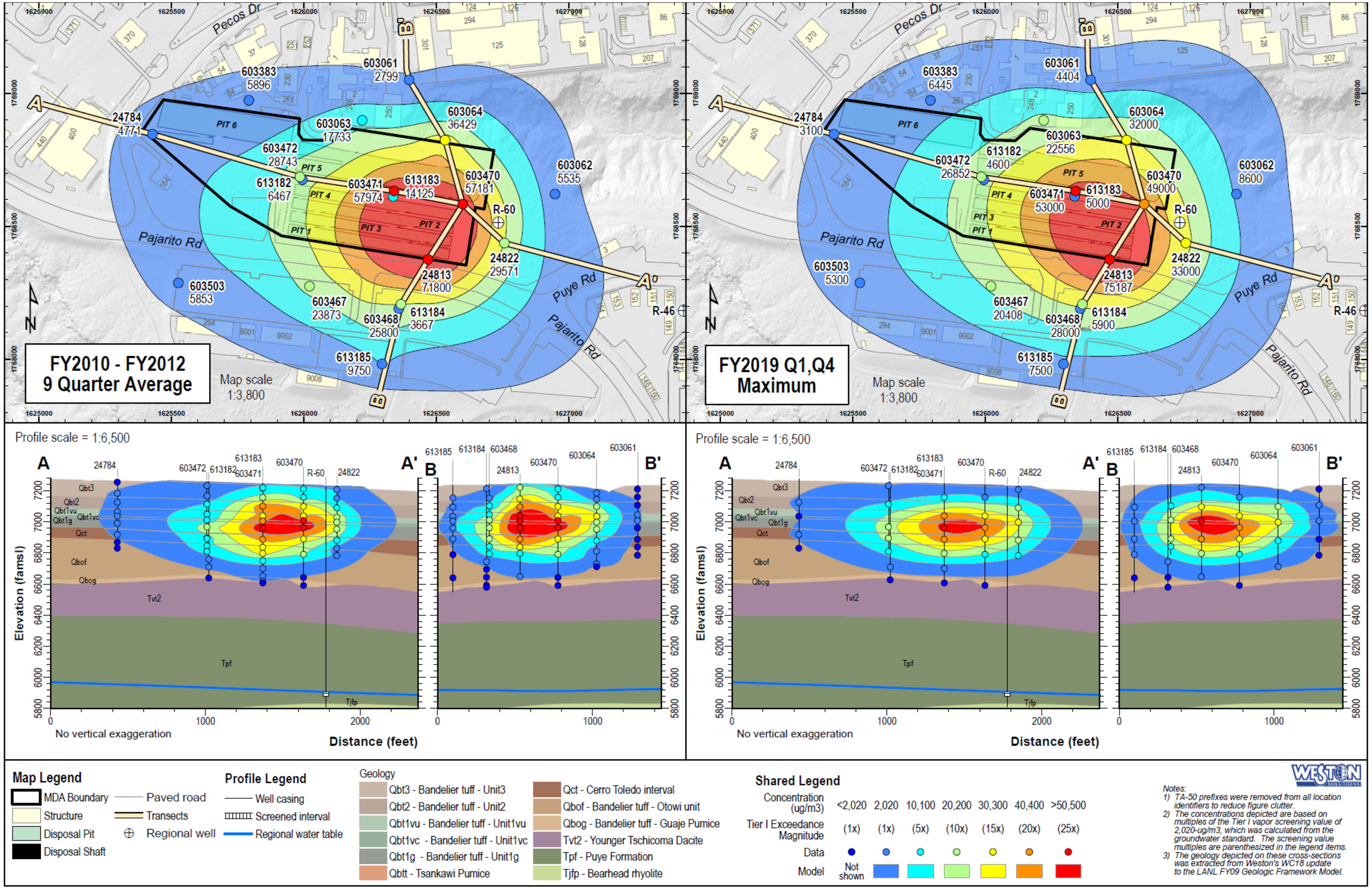
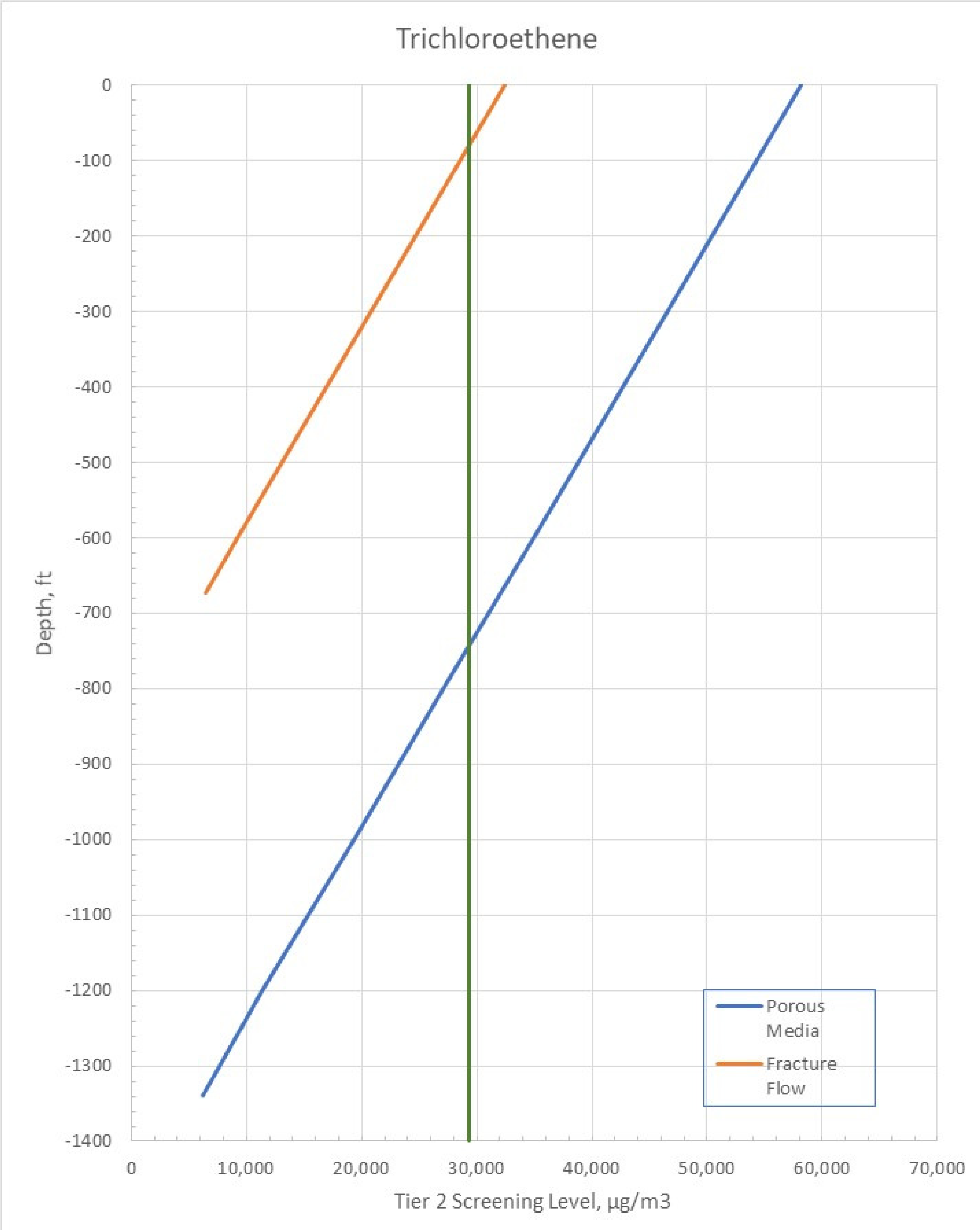


Figure 3.2-1 Utilities and other subsurface and surface structures at MDA C



Note: Figure shows the maximum plume from 2019 compared to the average plume from 2010-2012.

Figure 3.2-2 Three-dimensional representation of TCE vapor plume beneath MDA C



Note: Green vertical line = Tier 2 screening level based on transport in pore water.

Figure 3.2-3 Tier 2 screening levels for TCE as a function of depth

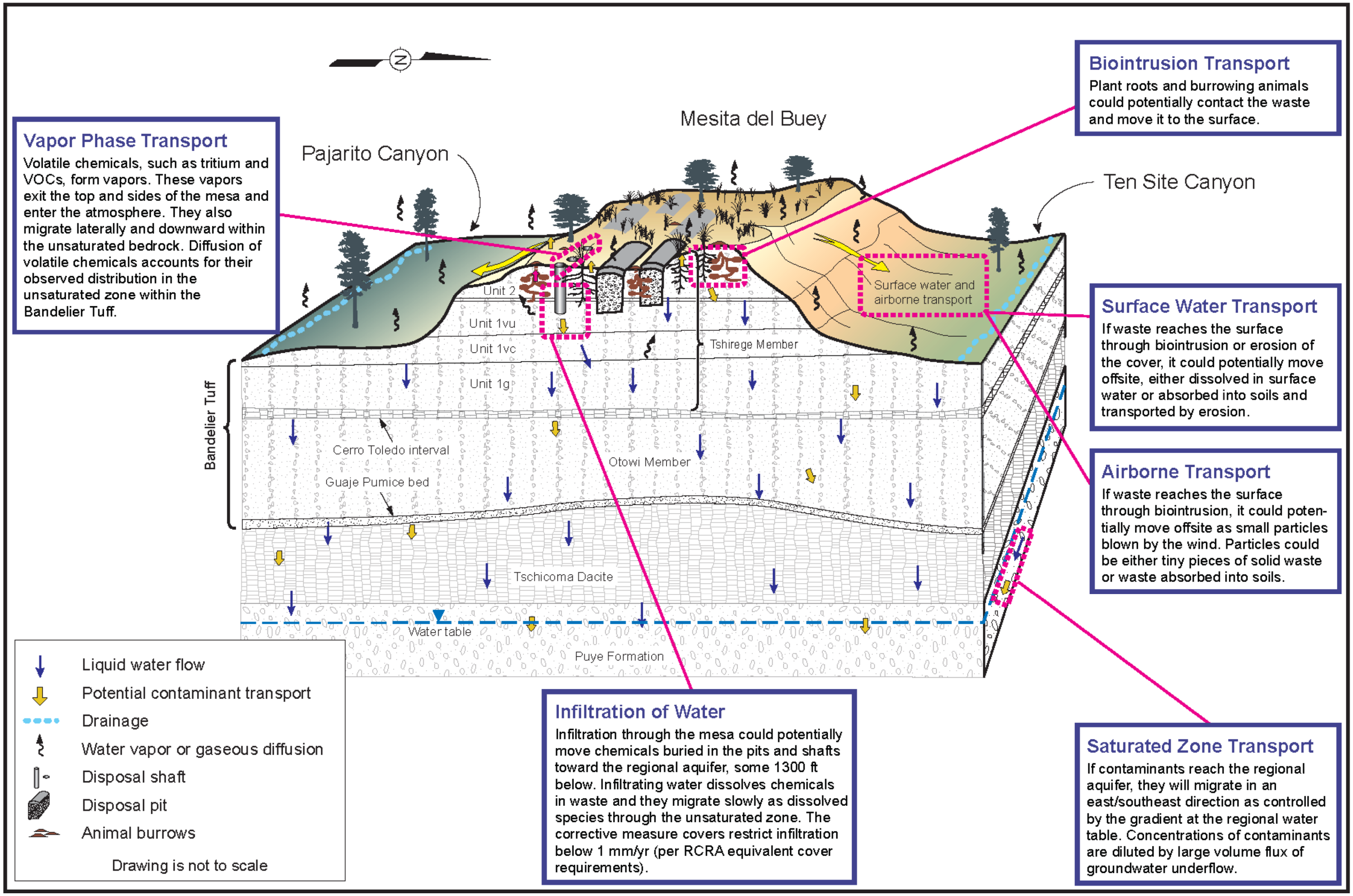
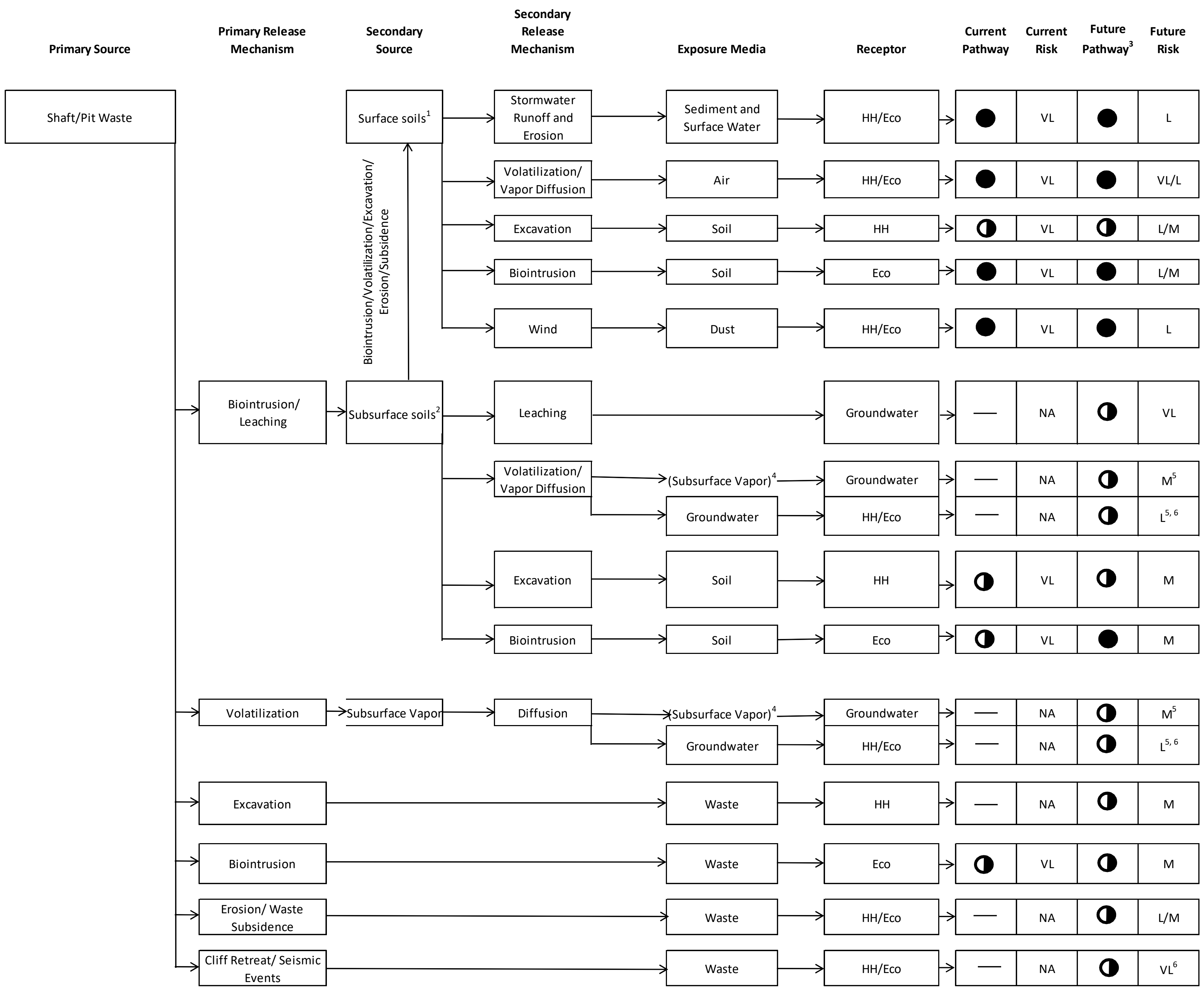


Figure 4.0-1 Hydrogeologic conceptual site model for MDA C



Exposure Pathways

● = Complete pathway

◐ = Potentially complete pathway

— = Incomplete pathway

Notes:

HH = Human Health

Eco = Ecological

Risks of Exposure

VL = Very Low

L = Low

M = Medium

NA = Not Applicable

Footnotes:

[1] = Surface soil is defined as 0 to 1 ft bgs.

[2] = Subsurface soil is defined as deeper than 1 ft bgs.

[3] = Future scenario assumes no remedy implemented and no institutional controls.

[4] = This is not an exposure media but a potential source to groundwater.

[5] = There is uncertainty associated with the contaminant transport of soil vapor to groundwater.

[6] = The risk associated with this pathway is quantified as low or very low due to the low potential of this pathway becoming complete.

Figure 4.0-2 Conceptual site model for pit and shaft waste at MDA C

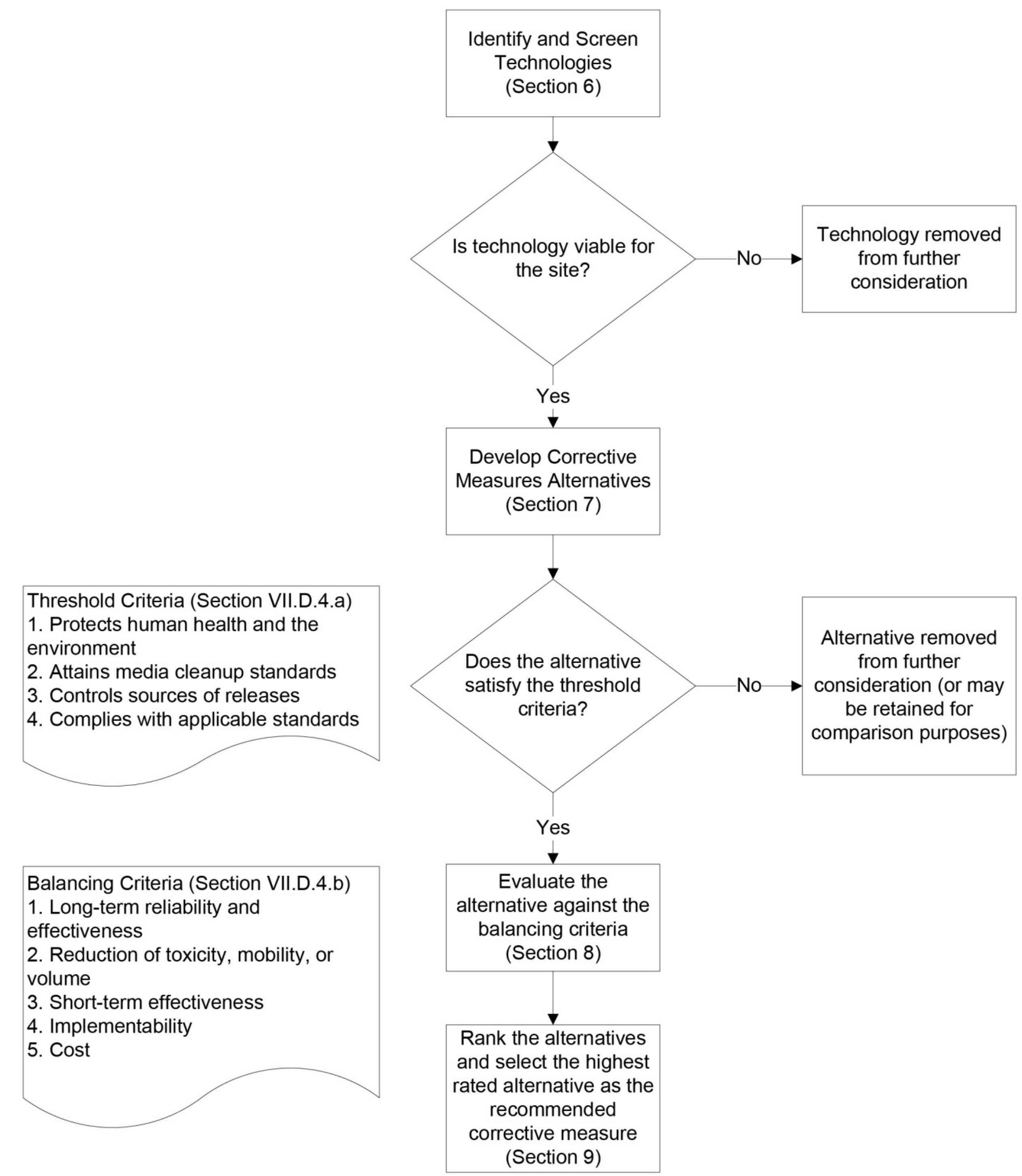


Figure 5.2-1 Selection process for the preferred corrective measures alternative

Figure 7.1-1 Conceptual cover layout for Alternatives 3A and 3B

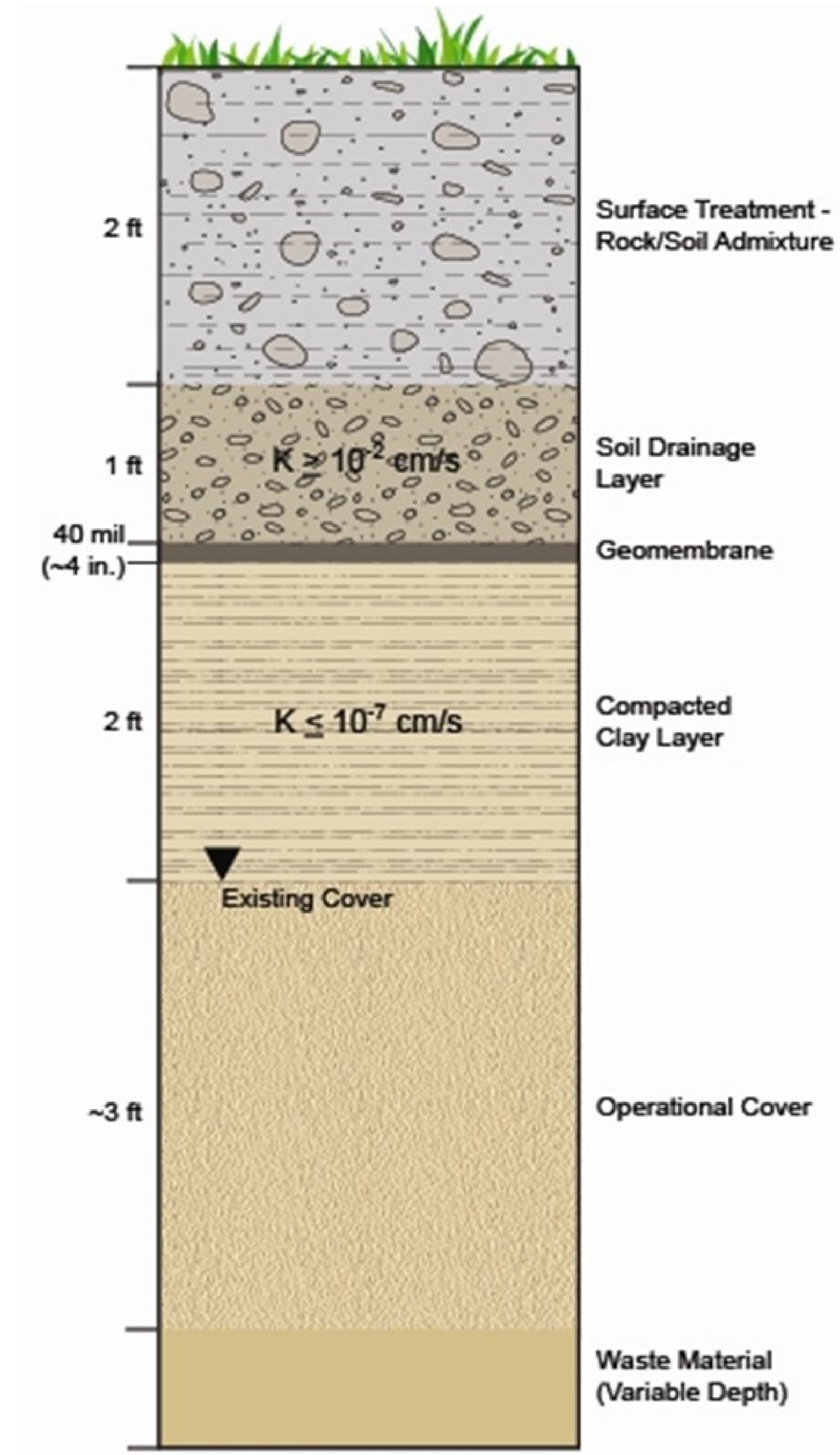


Figure 7.1-2 Cross-section of multilayer cover

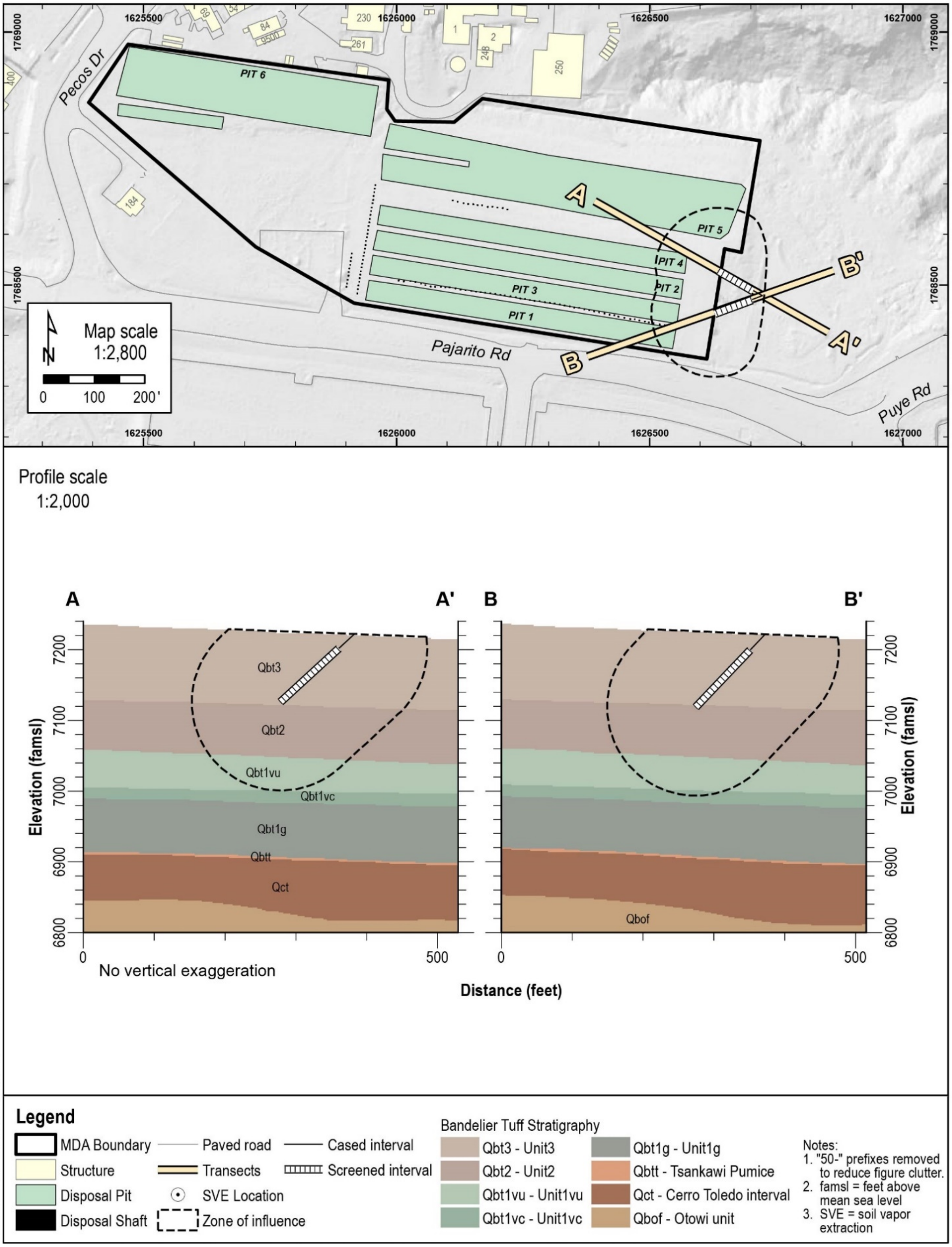


Figure 7.1-3 Example layout of contingent active SVE system

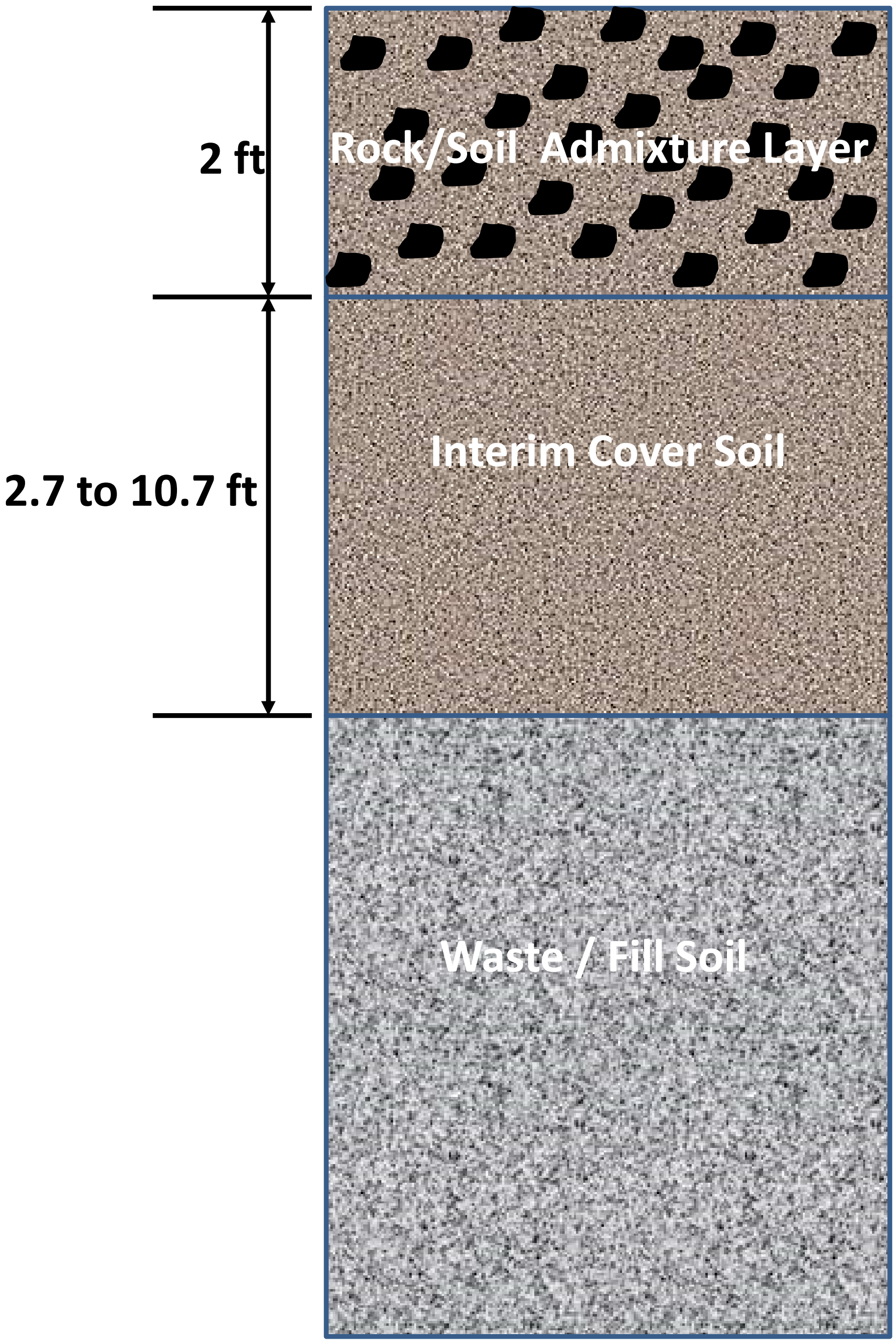


Figure 7.1-4 Cross-section of ET cover

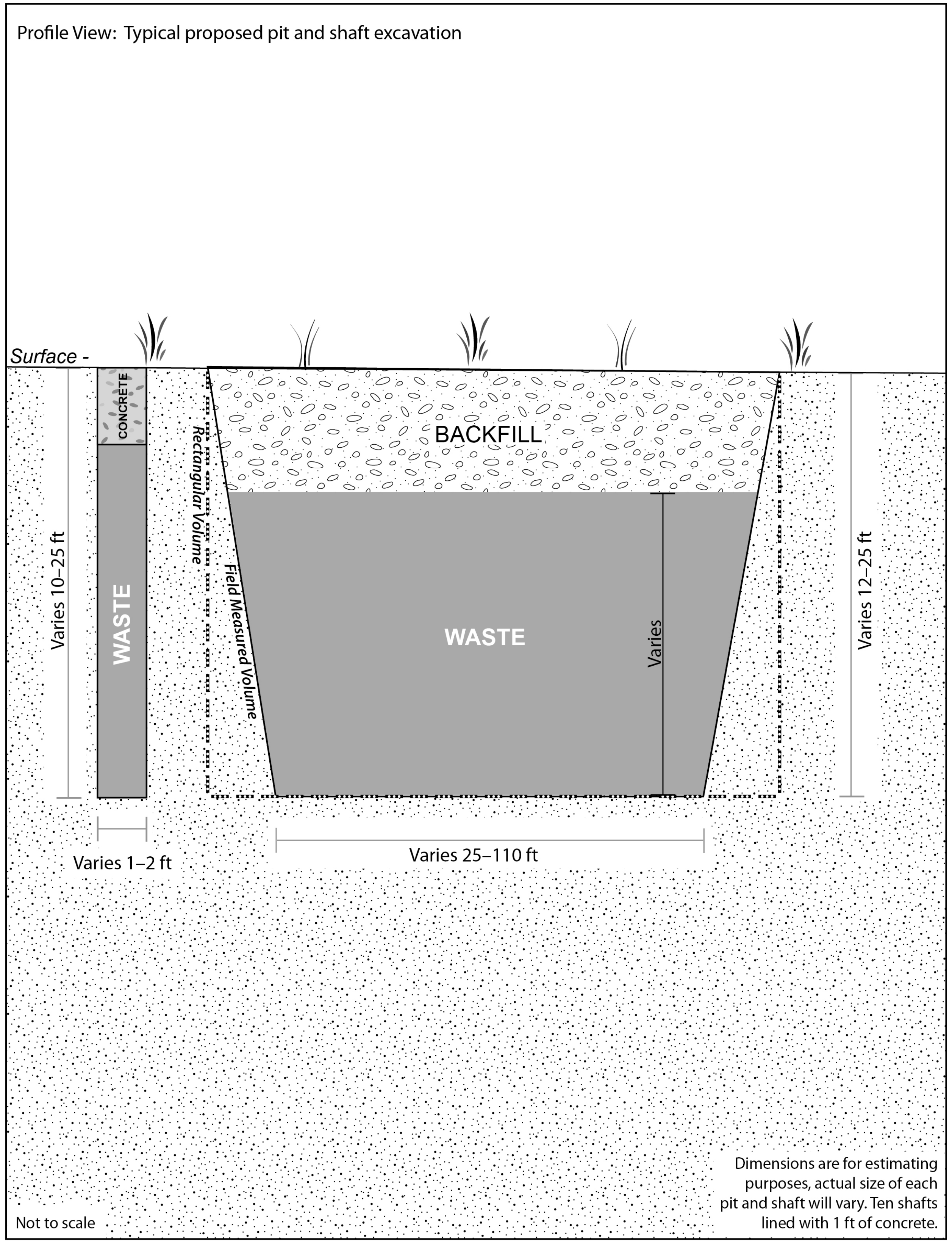


Figure 7.1-5 Typical cross-section of pit and shaft excavation

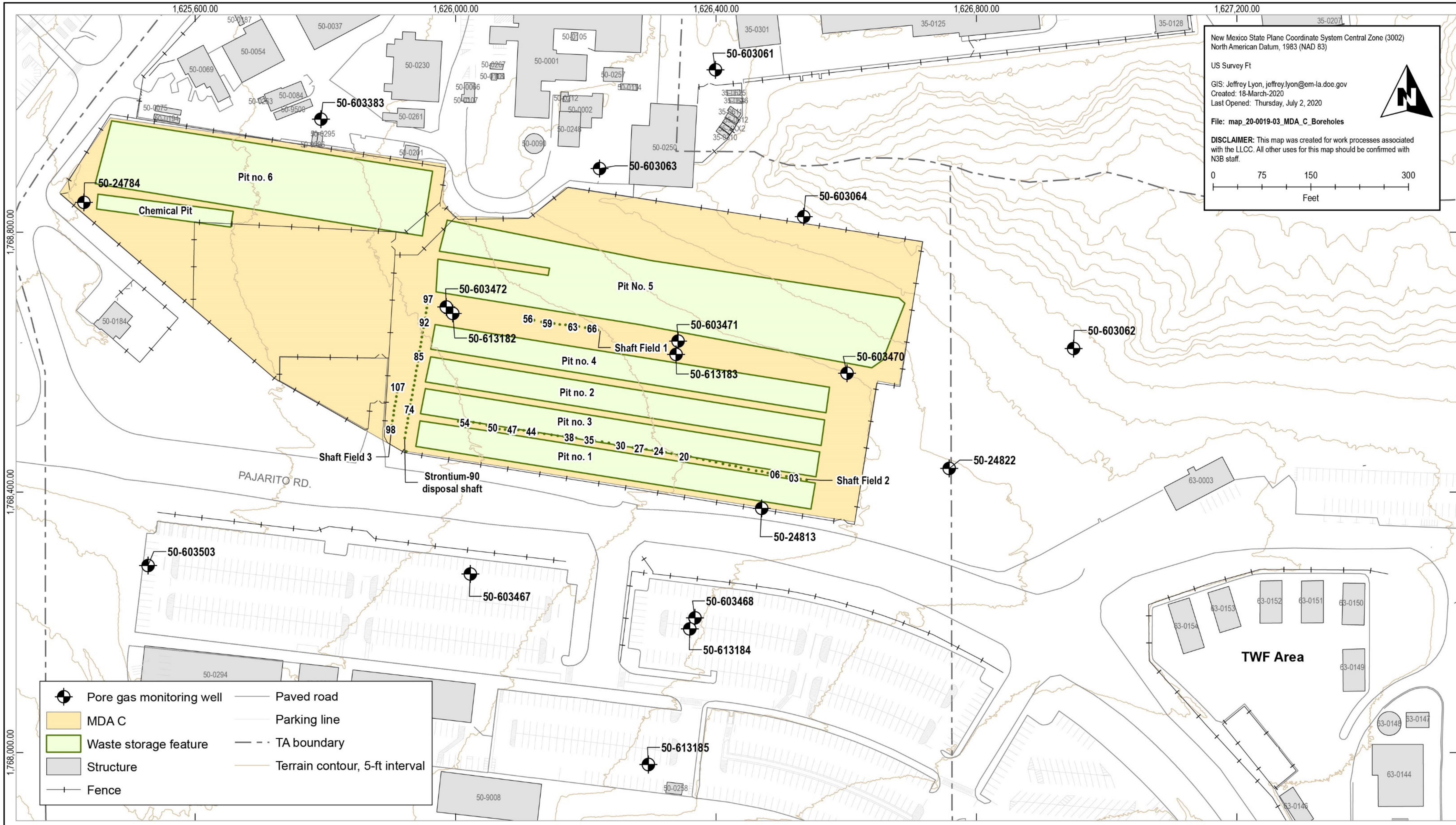
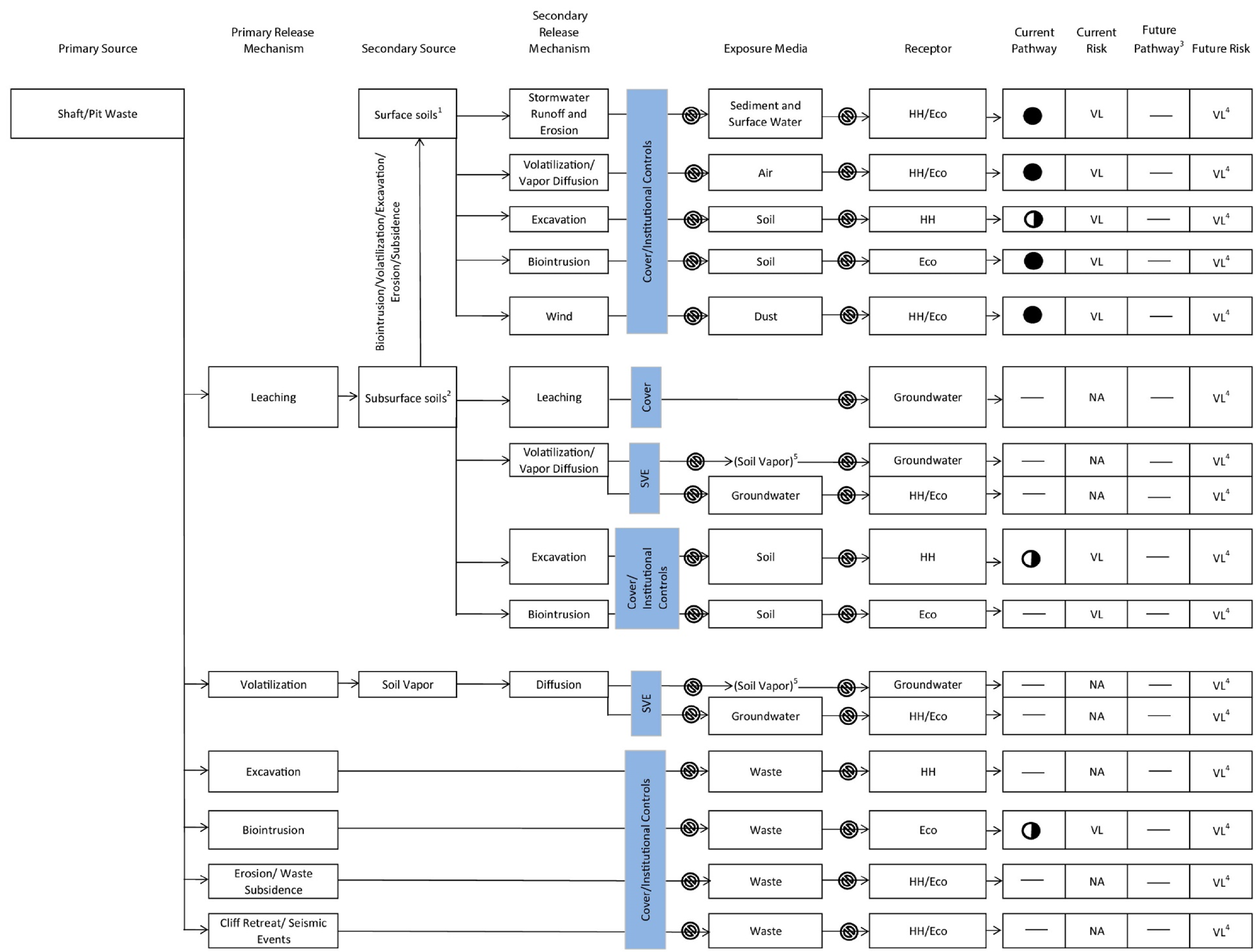


Figure 7.1-6 Location of MDA C pore-gas monitoring boreholes



<u>Exposure Pathways</u>
● = Complete pathway
◑ = Potentially complete pathway
— = Incomplete pathway
⊘ = Pathway broken by corrective measure
Notes:
HH = Human Health
Eco = Ecological

<u>Risks of Exposure</u>
VL = Very Low
L = Low
M = Medium
NA = Not Applicable

<u>Footnotes:</u>
1 = Surface soil is defined as 0 to 1 ft bgs.
2 = Subsurface soil is defined as deeper than 1 ft bgs.
3 = Future scenario assumes implementing the recommended alternative.
4 = Future risk is shown as very low because the transport/exposure pathway is incomplete based on implementation of the recommended alternative.
5 = This is not an exposure media but a potential source to groundwater.

Figure 9.2-1 Refined conceptual site model for pit and shaft wastes

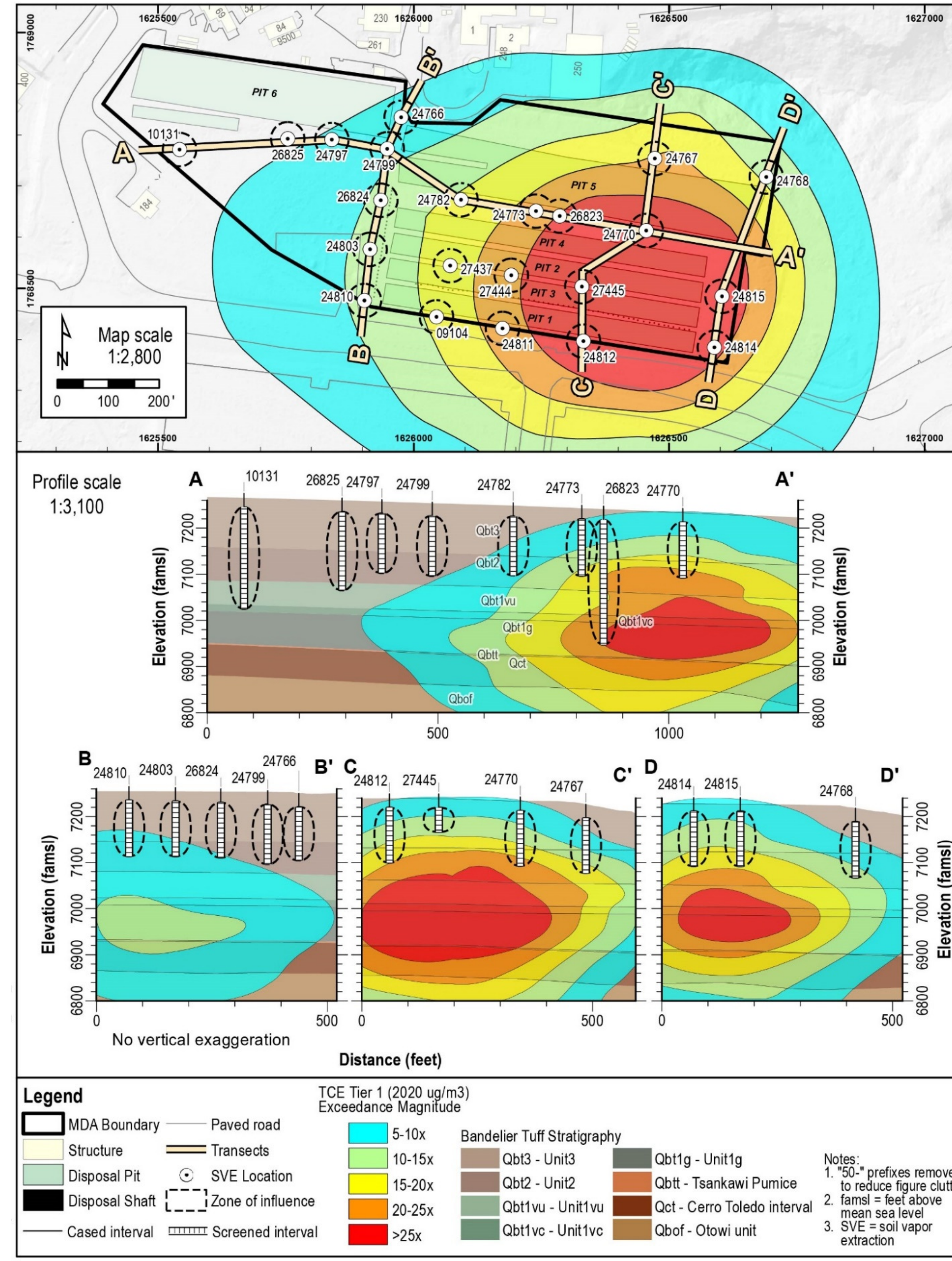


Figure 10.2-1 Layout of proposed passive soil-vapor extraction (SVE) system

Table 1.0-1
Crosswalk with Consent Order Requirements

No.	Consent Order Requirement	Consent Order Section Reference	CME Report Section or Other Source
1	DOE shall perform a CME when, based on the relevant RFI* report, NMED notifies DOE that a CME is required.	XVI.A	Section 1
2	CMEs will be performed to identify, develop, and evaluate potential corrective measures alternatives for removal, containment, and/or treatment of site-related contamination. CME(s) will focus on remedies based on consideration of site conditions and the extent, nature, and complexity of releases and contamination.	XVI.B	Sections 5 through 9
3	DOE shall conduct CME(s) that include evaluation of corrective measures alternatives using the following threshold and balancing criteria. 1) Threshold Criteria a) Be protective of human health and the environment. b) Attain media cleanup objectives. c) Control the source(s) of releases. d) Comply with applicable standards for management of wastes. 2) Balancing Criteria a) Long-term reliability and effectiveness (including sustainability, long-term stewardship considerations, and long-term environmental impacts) b) Reduction of toxicity, mobility, or volume of waste and contaminated media	XVI.C	Section 7
4	The remedy shall be evaluated for long-term reliability and effectiveness, including the consideration of the magnitude of risks that will remain after implementation of the remedy; the extent of long-term monitoring, or other management that will be required after implementation of the remedy; the uncertainties associated with leaving contaminants in place; DOE's long-term stewardship of the site, environmental impacts; sustainability; and the potential for failure of the remedy. Other criteria being equal, DOE shall give preference to a remedy that reduces risks with minimal long-term management, and that has proven effective under similar conditions.	XVI.D.1	Section 8
5	The remedy shall be evaluated for its reduction in the toxicity, mobility, and volume of contaminants. Other criteria being equal, DOE shall give preference to a remedy that uses treatment to more completely and permanently reduce the toxicity, mobility, and volume of contaminants.	XVI.D.2	Section 8

Table 1.0-1 (continued)

No.	Consent Order Requirement	Consent Order Section Reference	CME Report Section or Other Source
6	The remedy shall be evaluated for its short-term effectiveness, including the consideration of the short-term reduction in existing risks that the remedy would achieve; the time needed to achieve that reduction; the near-term environmental impacts; and the short-term risks that might be posed to the community, workers, and the environment during implementation of the remedy. Other criteria being equal, DOE shall give preference to a remedy that quickly reduces short-term risks as well as near-term environmental impacts, without creating significant additional risks.	XVI.D.3	Section 8
7	The remedy shall be evaluated for its implementability or the difficulty of implementing the remedy, including the consideration of installation and construction difficulties; operation and maintenance difficulties; difficulties with cleanup technology; permitting and approvals; and the availability of necessary equipment, services, expertise, and storage and disposal capacity. Other criteria being equal, DOE shall give preference to a remedy that can be implemented quickly and easily and poses fewer and lesser difficulties.	XVI.D.4	Section 8
8	The remedy shall be evaluated for its cost, including a consideration of both capital costs and operation and maintenance costs. Capital costs shall include, without limitation, construction and installation costs; equipment costs; land development costs; and indirect costs including engineering costs, legal fees, permitting fees, startup and shakedown costs, and contingency allowances. Operation and maintenance costs shall include, without limitation, operating labor and materials costs; maintenance labor and materials costs; replacement costs; utilities; monitoring and reporting costs; administrative costs; indirect costs; and contingency allowances. All costs shall be calculated based on their net present value. Other criteria being equal, DOE shall give preference to a remedy that is less costly but does not sacrifice protection of human health and the environment.	XVI.D.5	Section 8

* RFI = Resource Conservation and Recovery Act facility investigation.

Table 2.1-1
Dimensions of the Disposal Units at MDA C

Disposal Unit	Dimensions[a] (ft)	Period of Operations
Pit 1	610 × 40 × 25	1948–1951
Pit 2	610 × 40 × 25	1950–1951
Pit 3	610 × 40 × 25	1951–1953
Pit 4	610 × 40 × 25	1951–1955
Pit 5	705 × 110 × 18	1953–1959
Pit 6	505 × 100 × 25	1956–1959
Chemical Pit	180 × 25 × 12	1960–1964
Shaft Group 1 (12 [Shafts 56–67])	2 × 10	1958–1959
Shaft Group 2 (55 [Shafts 1–55])	2 × 15	1959–1967
Shaft Group 3 (40 [Shafts 68–107])	1–2[b] × 20–25	1962–1974
Shaft 108 (Strontium-90 Disposal Shaft)	4 × 4 × 4	1956

[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, 007672). Dimensions are approximate.

[b] Shafts 68–97 are 2 ft in diameter and unlined. Shafts 98–107 are 1 ft inside diameter and lined with 12-in.-thick concrete.

Table 2.4-1
Summary of Previous Investigations at MDA C from 1956 to 2004

Time of Investigation	Investigation Activities	Analysis Conducted/ Instrument Used	Investigation Result(s)
Pre-RFI Activities			
1956–1961	Water-infiltration tests	Subsurface moisture	Moisture predominantly moves laterally, not vertically, at MDA C.
1976–1984	Radiation surveys	Field instruments	Identified localized areas of elevated radioactivity and, in 1984, covered MDA C with crushed tuff and topsoil, except in the northeast corner.
1985–1986	Radiation surveys	TLD, Phoswich detector, and HPIC*	TLD monitoring at perimeter locations did not identify significant radiation source; Phoswich and HPIC detected elevated radioactivity in the northeast corner of MDA C.
1985	Surface soil sampling	Isotopic plutonium, isotopic uranium, and tritium	Detected elevated radioactivity on the north and east side of MDA C and to the west of Pits 2, 4, 5, and 6 and/or the associated disposal shafts.
1986	Surface soil sampling	Americum-241, cesium-137, isotopic plutonium, and tritium	Confirmed 1985 results.
1989	Shallow subsurface pore-gas sampling	VOCs	No VOCs detected.
1989	Sediment sampling at drainage channel to Ten Site Canyon	Inorganic chemicals, pesticides, PCBs, SVOCs, VOCs, and radionuclides	Four metals, one VOC, eight SVOCs, four pesticides, and radionuclides (americium-241, cesium-137, plutonium isotopes, radium-226, and uranium isotopes) detected.

Table 2.4-1 (continued)

Time of Investigation	Investigation Activities	Analysis Conducted/ Instrument Used	Investigation Result(s)
RFI Activities			
1993	Surface soil sampling	Inorganic chemicals, PCBs, SVOCs, and radionuclides (americium-241, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, strontium-90, and tritium)	Sporadic detects of SVOCs and Aroclor-1254 and Aroclor-1260; detected elevated concentrations of americium-241 and plutonium isotopes in the northeast area of MDA C.
1994	Geophysical survey	Magnetometer	Not conclusive—could identify only ferrous materials within 12 ft bgs.
1995–1996	Borehole air-flow velocity measurements	Air-flow velocity, oxygen content, and atmospheric pressure	Instantaneous air flow rates were 0.2–2 ft^3/min.
1995–1996	Subsurface tuff sampling (drilled 11 boreholes)	TAL metals, cyanide, pesticides and PCBs, SVOCs, VOCs, americium-241, gamma-emitting radionuclides, isotopic plutonium, isotopic thorium, isotopic uranium, strontium-90, and tritium	VOCs and radionuclides present in vadose zone; the vertical and lateral extent of contamination of metals, cyanide, and radionuclides not defined.
2000	EMFLUX measurements	VOC surface flux	Six VOCs detected with PCE being the most frequently detected organic chemical.
2001–2003	Pore-gas sampling in boreholes 50-09100 and 50-10131 (drilled in 2001)	VOCs	Nature and extent of VOCs in pore gas not defined.
2001–2002	Two consecutive geophysical surveys	Terrain conductivity, high-sensitivity metal detector, and digital ground-penetrating radar to locate pits and shafts; electrical resistivity technique to map thickness of cover materials	2001 survey indicated pit boundaries, while interference from a chainlink fence obscured pit boundaries along the southern and eastern edges of MDA C. Second survey conducted in 2002 after the fence was removed found no evidence of disposal pits outside the fence line.
2003	Biota screening and sampling	Ant mounds and animal burrows field-screened for gross-alpha, -beta, and -gamma activity; soil samples collected from ant mounds, animal burrows, and pine needles analyzed for gross-alpha, -beta, and -gamma activity.	Burrowing mammals and ants are not transporting radionuclides from the subsurface to the ground surface at MDA C; however, 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.
2003	Tritium in shallow subsurface pore gas	Pore-gas vapor probes	Two highest tritium concentrations were detected to the west of Shaft Group 3 and to the north of the west end of Pit 6.
2003–2004	Air monitoring of tritium	Biweekly airborne tritium data collection	Average tritium concentration = 11.5 pCi/m^3

* HPIC = High-pressure ion chamber.

Table 2.4-2
Monitoring Plan for MDA C Monitoring Group Specified in 2021 IFGMP

Location	Watershed	Monitoring Group	Surface Water Body or Source Aquifer	Metals	VOCs	SVOCs	Low-Level 1,4-dioxane	Low-Level Nitrosamines	PFAS[a]	PCBs	HEXP[b]	Dioxins/Furans	Radionuclides	Tritium	Low-Level Tritium	General Inorganics
R-14 S1[c, d]	Mortandad	MDA C	Regional	A	A	B (2022)[e]	B (2022)	B (2022)	A	B (2022)	A	—[f]	B (2022)	—	A	A
R-46[c]	Mortandad	MDA C	Regional	A	A	B (2022)	B (2022)	B (2022)	A	B (2022)	A	—	B (2022)	—	A	A
R-60[c]	Mortandad	MDA C	Regional	A	A	B (2022)	B (2022)	B (2022)	A	B (2022)	A	—	A	—	A	A

Notes: Sampling suites and frequencies: A = annual (1 time/yr); B = biennial (1 time/2 yr).

[a] Per- and polyfluoroalkyl substances (PFAS) = Perfluorohexane sulfonic acid (PFHxS), perfluorooctanoic acid (PFOA), and perfluorooctane sulfate (PFOS). No additional PFAS sampling will be performed after monitoring year (MY) 2021 unless a New Mexico Water Quality Control Commission regulatory standard has been exceeded.

[b] HEXP = Analytical suite for analysis of samples for high explosives by SW-846:8330 series.

[c] Background monitoring location as specified in the Groundwater Background Investigation Report, Revision 5 (LANL 2016, 601920).

[d] S1 = Screen 1.

[e] (2022) = Samples scheduled to be collected during implementation of MY 2022 IFGMP.

[f] — = This analytical suite is not scheduled to be collected for this type of water at locations assigned to this monitoring group.

Table 3.2-1
Henry's Law Constants, Groundwater Screening Levels, and
Tier 1I Vapor-Phase Screening Levels for VOCs Detected at MDA C

VOC	Henry's Law Constant[a] (dimensionless)	Groundwater SL (µg/L)	Source of Groundwater SL	Tier I Vapor-Phase SL (µg/m^3)
Acetone	0.00144	14,100	NMED Tap Water[b]	20,300
Benzene	0.228	5	NMWQCC[c]	1140
Bromodichloromethane	0.0869	80	EPA MCL[d, e]	6950
Carbon Disulfide	0.59	810	NMED Tap Water	478,000
Carbon Tetrachloride	1.13	5	NMWQCC	5650
Chlorodifluoromethane	1.66	80	EPA MCL[e]	129,000
Chloroform	0.15	80	EPA MCL[e]	12,000
Cyclohexane	6.13[f]	13,000	EPA Tap Water[g]	79,700,000
Dichloro-1,1,2,2-tetrafluoroethane[1,2-]	na[h]	na	na	na
Dichlorobenzene[1,2-]	0.0787	600	NMWQCC	47,200
Dichlorodifluoromethane	14.1	197	NMED Tap Water	2,780,000
Dichloroethane[1,1-]	0.23	25	NMWQCC	5750
Dichloroethane[1,2-]	0.0484	5	NMWQCC	242
Dichloroethene[1,1-]	1.07	7	NMWQCC	7490
Dichloroethene[cis-1,2-]	0.167	70	EPA MCL	11,700
Dichloropropane[1,2-]	0.116	5	NMWQCC	580
Ethanol	na	na	na	na
Ethyltoluene[4-]	na	na	na	na
n-Heptane	81.8[f]	6	EPA Tap Water	491,000
n-Hexane	73.8	319	NMED Tap Water	23,500,000
Hexanone[2-]	0.00381[f]	38	EPA Tap Water	145
Isooctane	na	na	na	na
Methyl tert-Butyl Ether	0.024[f]	14	EPA Tap Water	336
Methyl-2-pentanone[4-]	0.0566	1240	NMED Tap Water	70,200
Methylene Chloride	0.133	5	NMWQCC	665
Propanol[2-]	0.000331[f]	410	EPA Tap Water	136
Styrene	0.113	100	NMWQCC	11,300
Tetrachloroethene	0.726	5	NMWQCC	3630
Tetrahydrofuran	0.00288[f]	3400	EPA Tap Water	9790
Toluene	0.272	1000	NMWQCC	272,000
Trichloro-1,2,2-trifluoroethane[1,1,2-]	21.6	55,000	NMED Tap Water	1,190,000,000
Trichloroethane[1,1,1-]	0.705	200	NMWQCC	141,000
Trichloroethane[1,1,2-]	0.0338	5	NMWQCC	169
Trichloroethene	0.404	5	NMWQCC	2020
Trichlorofluoromethane	3.98	1140	NMED Tap Water	4,540,000

Table 3.2-1 (continued)

VOC	Henry's Law Constant[a] (dimensionless)	Groundwater SL (µg/L)	Source of Groundwater SL	Tier 1 Vapor-Phase SL (µg/m³)
Trimethylbenzene[1,2,4-]	0.252[f]	56	EPA Tap Water	14,100
Trimethylbenzene[1,3,5-]	0.358[f]	60	EPA Tap Water	21,500
Xylene[1,3-]+Xylene[1,4-]	0.212[i]	620[j]	NMWQCC[j]	131,000

[a] From NMED (2019, 700550, Appendix B) unless otherwise noted.

[b] NMED tap water screening level (NMED 2019, 700550, Appendix A).

[c] New Mexico Water Quality Control Commission (NMWQCC) standard (20 New Mexico Administrative Code 6.2.3103).

[d] MCL for organic contaminants (40 Code of Federal Regulations [CFR] 141.61).

[e] MCL for total trihalomethanes (40 CFR 141.64).

[f] Henry's law constant from EPA regional screening tables (https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables).

[g] EPA regional tap water screening level (https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables).

[h] na = Not available.

[i] Henry's law constant for xylenes.

[j] Screening level is for total xylenes.

Table 3.2-2
Summary of VOC Detection Status and Tier 1 Screening Results for October 2012–November 2012 Sampling Event

Analyte	Number of Analyses	Number of Detects	Number of Detected Locations	Concentration Range	Location and Depth of Maximum Detection	Maximum Detected Result	Tier 1 SL*
Carbon Tetrachloride	80	56	17	[53.4] to 1630	50-603471 (90 ft)	1630	5650
Chloroform	80	43	14	[41.5] to 1850	50-603471 (90 ft)	1850	12,000
Dichlorodifluoromethane	80	76	18	[6.92] to 1680	50-24813 (241 ft)	1680	2,780,000
Dichloroethane[1,1-]	80	1	1	[34.4] to [404]	50-603063 (128 ft)	56.6	5750
Dichloroethane[1,2-]	80	1	1	[34.4] to [404]	50-603471 (90 ft)	133	242
Dichloroethene[1,1-]	80	12	4	[33.7] to 1700	50-603061 (128 ft)	1700	7490
Dichloroethene[cis-1,2-]	80	20	10	[33.7] to 515	50-24813 (241 ft)	515	11,700
Dichloropropane[1,2-]	80	4	3	[39.3] to [462]	50-603383 (244 ft)	309	580
Hexane	80	1	1	[29.9] to [352]	50-613183 (642.5 ft)	42.3	23,500,00
Hexanone[2-]	80	1	1	[139] to [1640]	50-603467 (600 ft)	**409**	145
Methylene Chloride	80	34	12	[29.5] to 1740	50-603471 (288 ft)	**1740**	665
Tetrachloroethylene	80	55	16	[60.3] to 2300	50-24784 (155 ft)	2300	3630
Tetrahydrofuran	80	2	2	[25.1] to [295]	50-603467 (600 ft)	100	9790
Trichloro-1,2,2-trifluoroethane[1,1,2-]	80	30	9	[67.4] to 27,600	50-603061 (128 ft)	27,600	1,190,000,000
Trichloroethane[1,1,1-]	80	15	6	[46.9] to 5180	50-603061 (128 ft)	5180	141,000
Trichloroethylene	80	79	18	[7.52] to 69,800	50-24813 (241 ft)	**69,800**	2020

Notes: Units in µg/m^3. Brackets indicate nondetected result. Bold indicates maximum concentration greater than Tier 1 screening level.

* Tier 1 screening levels from Table 3.2-1.

Table 3.2-3
Summary of VOC Detection Status and Tier 1 Screening Results for March 2013–April 2013 Sampling Event

Analyte	Number of Analyses	Number of Detects	Number of Detected Locations	Concentration Range	Location and Depth of Maximum Detection	Maximum Detected Result	Tier 1 SL[a]
Acetone	80	1	1	[21.1] to [171]	50-603467 (600 ft)	109	20,300
Carbon Disulfide	80	1	1	[11.2] to 68.5	50-603063 (450 ft)	68.5	478,000
Carbon Tetrachloride	80	67	18	[6] to 1700	50-24813 (241 ft)	1700	5650
Chlorodifluoromethane	80	3	2	[12.7] to 269	50-603472 (27 ft)	269	173,000,000
Chloroform	80	51	15	[4.34] to 2830	50-24813 (150 ft)	2830	12,000
Dichlorodifluoromethane	80	76	18	5.93 to 1580	50-24813 (241 ft)	1580	2,780,000
Dichloroethane[1,1-]	80	2	1	[3.6] to 76.9	50-603063 (128 ft)	76.9	5750
Dichloroethane[1,2-]	80	4	3	[3.6] to 133	50-603471 (90 ft)	133	242
Dichloroethene[1,1-]	80	14	4	[3.53] to 1580	50-603061 (128 ft)	1580	7490
Dichloroethene[cis-1,2-]	80	35	10	[3.53] to 674	50-24813 (241 ft)	674	11,700
Dichloropropane[1,2-]	80	10	7	[4.11] to 323	50-603383 (244 ft)	323	580
Ethanol	80	1	1	[6.78] to [136]	50-603472 (27 ft)	64	na[b]
Ethyltoluene[4-]	80	1	1	[4.37] to 172	50-603467 (244 ft)	172	na
Heptane[n-]	80	1	1	[3.65] to [73.7]	50-613183 (642.5 ft)	39.3	491,000
Hexane	80	1	1	[3.14] to [63.4]	50-613183 (642.5 ft)	38.8	23,500,00
Hexanone[2-]	80	1	1	[23.6] to 696	50-603467 (600 ft)	**696**	145
Methylene Chloride	80	44	14	[29.5] to 1810	50-603471 (288 ft)	**1810**	665
Tetrachloroethylene	80	64	17	[6.03] to 2170	50-24784 (155 ft)	2170	3630
Tetrahydrofuran	80	3	2	[2.62] to 112	50-603467 (600 ft)	112	9790
Toluene	80	1	1	[3.35] to 86.6	50-603472 (27 ft)	86.6	272,000
Trichloro-1,2,2-trifluoroethane[1,1,2-]	80	42	11	[6.82] to 24,500	50-603061 (128 ft)	24,500	1,190,000,000
Trichloroethane[1,1,1-]	80	20	8	[4.85] to 5130	50-603061 (128 ft)	5130	141,000
Trichloroethylene	80	80	18	14 to 85,900	50-24813 (241 ft)	**85,900**	2020

Table 3.2-3 (continued)

Analyte	Number of Analyses	Number of Detects	Number of Detected Locations	Concentration Range	Location and Depth of Maximum Detection	Maximum Detected Result	Tier 1 SL[a]
Trichlorofluoromethane	80	4	3	[5] to [101]	50-603064 (214 ft)	67.4	4,540,000
Trimethylbenzene[1,2,4-]	80	2	1	[4.37] to 226	50-603467 (244 ft)	226	14,100
Trimethylbenzene[1,3,5-]	80	1	1	[4.37] to [88.4]	50-603467 (244 ft)	59	21,500

Notes: Units in µg/m^3. Brackets indicate nondetected result. Bold indicates maximum concentration greater than Tier 1 screening level.

[a] Tier 1 screening levels from Table 3.2-1.

[b] na = Not available.

Table 3.2-4
Summary of VOC Detection Status and Tier 1 Screening Results for November 2013–December 2013 Sampling Event

Analyte	Number of Analyses	Number of Detects	Number of Detected Locations	Concentration Range	Location and Depth of Maximum Detection	Maximum Detected Result	Tier 1 SL[a]
Acetone	80	3	1	[19.5] to [427]	50-613185 (145 ft)	380	20,300
Carbon Tetrachloride	80	59	17	[5.16] to 1510	50-24813 (150 ft)	1510	5650
Chlorodifluoromethane	80	3	2	[11.7] to [636]	50-603063 (228 ft)	262	173,000,000
Chloroform	80	50	15	[4] to 2730	50-24813 (150 ft)	2730	12,000
Dichlorodifluoromethane	80	73	18	[4.05] to 1140	50-24813 (241 ft)	1140	2,780,000
Dichloroethane[1,1-]	80	2	1	[3.32] to [178]	50-603063 (128 ft)	68.8	5750
Dichloroethane[1,2-]	80	3	3	[3.32] to [1785]	50-603471 (90 ft)	117	242
Dichloroethene[1,1-]	80	13	4	[3.25] to 1470	50-603061 (128 ft)	1470	7490
Dichloroethene[cis-1,2-]	80	30	10	[3.25] to 515	50-24813 (150 ft)	515	11,700
Dichloropropane[1,2-]	80	8	5	[3.79] to 346	50-603383 (244 ft)	346	580
Ethanol	80	1	1	[6.4] to [339]	50-613182 (632 ft)	22.6	na[b]
Methylene Chloride	80	35	13	[27.8] to 1390	50-603471 (288 ft)	**1390**	665
Propanol[2-]	80	1	1	7.86 to [442]	50-613182 (632 ft)	7.86	136
Tetrachloroethylene	80	61	17	[5.56] to 2170	50-24784 (155 ft)	2170	3630

Table 3.2-4 (continued)

Analyte	Number of Analyses	Number of Detects	Number of Detected Locations	Concentration Range	Location and Depth of Maximum Detection	Maximum Detected Result	Tier 1 SL[a]
Toluene	80	3	3	[3.2] to [166]	50-603383 (450 ft)	79.1	272,000
Trichloro-1,2,2-trifluoroethane[1,1,2-]	80	40	11	[6.28] to 27,600	50-603061 (128 ft)	27,600	1,190,000,000
Trichloroethane[1,1,1-]	80	19	7	[4.47] to 4360	50-603061 (128 ft)	4360	141,000
Trichloroethylene	80	79	18	10.7 to 64,400	50-24813 (241 ft)	**64,400**	2020
Trichlorofluoromethane	80	1	1	[4.64] to [247]	50-603063 (228 ft)	56.1	4,540,000
Xylene[1,3-]+xylene[1,4-]	80	1	1	[3.69] to [191]	50-613182 (632 ft)	3.99	40,900

Notes: Units in $\mu g/m^3$. Brackets indicate nondetected result. Bold indicates maximum concentration greater than Tier 1 screening level.

[a] Tier 1 screening levels from Table 3.2-1.

[b] na = Not available.

Table 3.2-5
Summary of VOC Detection Status and Tier 1 Screening Results for April 2014–May 2014 Sampling Event

Analyte	Number of Analyses	Number of Detects	Number of Detected Locations	Concentration Range	Location and Depth of Maximum Detection	Maximum Detected Result	Tier 1 SL[a]
Acetone	81	1	1	23.7 to [188]	50-603470 (650 ft)	23.7	20,300
Carbon Disulfide	81	1	1	[12.1] to [62.2]	50-603063 (228 ft)	56	478,000
Carbon Tetrachloride	81	63	17	6.92 to 1760	50-24813 (241 ft)	1760	5650
Chlorodifluoromethane	81	2	2	[13.8] to [279]	50-603472 (92 ft)	173	173,000,000
Chloroform	81	51	15	[4.78] to 2630	50-24813 (150 ft)	2630	12,000
Dichlorobenzene[1,2-]	81	1	1	[5.89] to [120]	50-24822 (235 ft)	56.5	47,200
Dichlorodifluoromethane	81	77	18	6.42 to 1380	50-24813 (241 ft)	1380	2,780,000
Dichloroethane[1,1-]	81	2	1	[3.96] to [80.9]	50-603063 (128 ft)	68.8	5750
Dichloroethane[1,2-]	81	6	3	[3.96] to 125	50-603471 (unknown)	125	242

Table 3.2-5 (continued)

Analyte	Number of Analyses	Number of Detects	Number of Detected Locations	Concentration Range	Location and Depth of Maximum Detection	Maximum Detected Result	Tier 1 SL[a]
Dichloroethene[1,1-]	81	14	5	[3.88] to 1350	50-603061 (128 ft)	1350	7490
Dichloroethene[cis-1,2-]	81	33	10	[3.88] to 555	50-24813 (241 ft)	555	11,700
Dichloropropane[1,2-]	81	9	5	[4.53] to 296	50-603383 (244 ft)	296	580
Ethanol	81	1	1	[7.34] to 301	50-603062 (122 ft)	301	na[b]
Hexanone[2-]	81	1	1	[16] to [323]	50-603467 (600 ft)	**319**	145
Methylene Chloride	81	38	13	[31.2] to 1600	50-603471 (288 ft)	**1600**	665
Tetrachloroethylene	81	65	16	[6.64] to 2030	50-24784 (155 ft)	2030	3630
Tetrahydrofuran	81	1	1	[2.89] to 64.8	50-603467 (600 ft)	64.8	9790
Toluene	81	1	1	[3.69] to [75.3]	50-603061 (25 ft)	37.7	272,000
Trichloro-1,2,2-trifluoroethane[1,1,2-]	81	41	11	[7.51] to 26,000	50-603061 (128 ft)	26,000	1,190,000,000
Trichloroethane[1,1,1-]	81	16	6	[5.34] to 3820	50-603061 (128 ft)	3820	141,000
Trichloroethylene	81	81	18	33.3 to 80,600	50-24813 (241 ft)	**80,600**	2020
Trichlorofluoromethane	81	1	1	[5.5] to [112]	50-603063 (228 ft)	61.8	4,540,000

Notes: Units in µg/m^3. Brackets indicate nondetected result. Bold indicates maximum concentration greater than Tier 1 screening level.

[a] Tier 1 screening levels from Table 3.2-1.

[b] na = Not available.

Table 3.2-6
Summary of VOC Detection Status and Tier 1 Screening Results for October 2014–November 2014 Sampling Event

Analyte	Number of Analyses	Number of Detects	Number of Detected Locations	Concentration Range	Location and Depth of Maximum Detection	Maximum Detected Result	Tier 1 SL[a]
Carbon Tetrachloride	80	60	17	[52.8] to 1630	50-24813 (241 ft)	1630	5650
Chloroform	80	48	14	[43.9] to 2290	50-24813 (150 ft)	2290	12,000
Dichlorodifluoromethane	80	73	18	[41.5] to 1140	50-24813 (241 ft)	1140	2,780,000
Dichloroethane[1,1-]	80	2	1	[34] to [178]	50-603063 (128 ft)	64.7	5750
Dichloroethane[1,2-]	80	3	1	[34] to [178]	50-603471 (unknown)	109	242
Dichloroethene[1,1-]	80	12	4	[33.3] to 1270	50-603061 (128 ft)	1270	7490
Dichloroethene[cis-1,2-]	80	32	10	[33.3] to 555	50-24813 (241 ft)	555	11,700
Dichloropropane[1,2-]	80	7	4	[38.8] to 319	50-603383 (244 ft)	319	580
Ethanol	80	1	1	[64] to 320	50-603063 (25 ft)	320	na[b]
Methylene Chloride	80	34	12	[29.8] to 1670	50-603471 (288 ft)	**1670**	665
Tetrachloroethylene	80	63	15	65.1 to 2030	50-24784 (155 ft)	2030	3630
Tetrahydrofuran	80	1	1	[24.8] to [130]	50-603467 (600 ft)	58.9	9790
Trichloro-1,2,2-trifluoroethane[1,1,2-]	80	37	10	[64.3] to 24,500	50-603061 (128 ft)	24,500	1,190,000,000
Trichloroethane[1,1,1-]	80	15	5	[45.8] to 3440	50-603061 (128 ft)	3440	141,000
Trichloroethane[1,1,2-]	80	1	1	[45.8] to [240]	50-24813 (150 ft)	**175**	169
Trichloroethylene	80	79	18	[53.7] to 75,200	50-24813 (241 ft)	**75,200**	2020
Trichlorofluoromethane	80	2	2	[47.2] to [247]	50-603063 (228 ft)	61.8	4,540,000

Notes: Units in µg/m^3. Brackets indicate nondetected result. Bold indicates maximum concentration greater than Tier 1 screening level.

[a] Tier 1 screening levels from Table 3.2-1.

[b] na = Not available.

Table 3.2-7
Summary of VOC Detection Status and Tier 1 Screening Results for March 2015–April 2015 Sampling Event

Analyte	Number of Analyses	Number of Detects	Number of Detected Locations	Concentration Range	Location and Depth of Maximum Detection	Maximum Detected Result	Tier 1 SL*
Carbon Tetrachloride	80	61	17	[55.3] to 1570	50-24813 (241 ft)	1570	5650
Chloroform	80	50	15	[42.9] to 2540	50-24813 (150 ft)	2540	12,000
Cyclohexane	80	1	1	[29.9] to 99.8	50-603063 (347 ft)	99.8	79,300,000
Dichlorodifluoromethane	80	74	18	[43.5] to 1140	50-24813 (241 ft)	1140	2,780,000
Dichloroethane[1,1-]	80	2	1	[35.2] to [76.8]	50-603063 (128 ft)	68.8	5750
Dichloroethane[1,2-]	80	5	3	[35.2] to 105	50-603471 (unknown)	105	242
Dichloroethene[1,1-]	80	13	4	[34.5] to 1430	50-603061 (128 ft)	1430	7490
Dichloroethene[cis-1,2-]	80	31	10	[34.5] to 555	50-24813 (241 ft)	555	11,700
Dichloropropane[1,2-]	80	13	7	40.2 to 379	50-603383 (244 ft)	379	580
Methylene Chloride	80	35	12	[30.2] to 972	50-603471 (288 ft)	**972**	665
Tetrachloroethylene	80	63	16	59.6 to 2030	50-24784 (155 ft)	2030	3630
Tetrahydrofuran	80	1	1	[25.6] to [56]	50-603467 (600 ft)	53.1	9790
Trichloro-1,2,2-trifluoroethane[1,1,2-]	80	41	11	[67.4] to 26,800	50-603061 (128 ft)	26,800	1,190,000,000
Trichloroethane[1,1,1-]	80	15	5	[47.4] to 4030	50-603061 (128 ft)	4030	141,000
Trichloroethylene	80	79	18	52.6 to 69,800	50-24813 (241 ft)	**69,800**	2020
Trichlorofluoromethane	80	2	2	[49.8] to [107]	50-603063 (228 ft)	61.8	4,540,000

Notes: Units in µg/m^3. Brackets indicate nondetected result. Bold indicates maximum concentration greater than Tier 1 screening level.
* Tier 1 screening levels from Table 3.2-1.

Table 3.2-8
Summary of VOC Detection Status and Tier 1 Screening Results for October 2015–December 2015 Sampling Event

Analyte	Number of Analyses	Number of Detects	Number of Detected Locations	Concentration Range	Location and Depth of Maximum Detection	Maximum Detected Result	Tier 1 SL[a]
Carbon Disulfide	80	1	1	[26.1] to [65.4]	50-6030631 (128 ft)	59.1	478,000
Carbon Tetrachloride	80	58	16	[54.1] to 1570	50-24813 (150 ft)	1570	5650
Chloroform	80	52	15	[41] to 2980	50-24813 (150 ft)	2980	12,000
Dichlorodifluoromethane	80	76	18	[42.5] to 988	50-24813 (241 ft) 50-24813 (358 ft)	988	2,780,000
Dichloroethane[1,1-]	80	2	1	[34] to [85]	50-603063 (128 ft)	68.8	5750
Dichloroethane[1,2-]	80	5	3	[34] to 133	50-603471 (209) 50-603471 (unknown)	133	242
Dichloroethene[1,1-]	80	15	4	[34.1] to 1470	50-603061 (128 ft)	1470	7490
Dichloroethene[cis-1,2-]	80	35	10	[33.3] to 555	50-24813 (150 ft)	555	11,700
Dichloropropane[1,2-]	80	12	6	[38.8] to 416	50-603383 (244 ft)	416	580
Ethanol	80	1	1	[64] to [158]	50-603064 (332 ft)	69.7	na[b]
Methylene Chloride	80	38	12	[29.2] to 1530	50-603471 (288 ft)	**1530**	665
Tetrachloroethylene	80	65	17	[61] to 2240	50-24784 (155 ft)	2240	3630
Tetrahydrofuran	80	1	1	[24.8] to [61.9]	50-603467 (600 ft)	35.4	9790
Toluene	80	1	1	[31.6] to [79.1]	50-613183 (642.5 ft)	52.7	272,000
Trichloro-1,2,2-trifluoroethane[1,1,2-]	80	41	11	[65.9] to 26,800	50-603061 (128 ft)	26,800	1,190,000,000
Trichloroethane[1,1,1-]	80	21	8	[46.9] to 3980	50-603061 (128 ft)	3980	141,000
Trichloroethane[1,1,2-]	80	4	3	[45.8] to 213	50-24813 (150 ft)	**213**	169
Trichloroethylene	80	80	18	[53.2] to 59,100	50-24813 (241 ft)	**59,100**	2020
Trichlorofluoromethane	80	2	2	[47.2] to [118]	50-603064 (214 ft)	61.8	4,540,000
Xylene[1,3-]+xylene[1,4-]	80	2	2	[36.4] to [91.1]	50-24784 (155 ft)	52.1	40,900

Notes: Units in $\mu g/m^3$. Brackets indicate nondetected result. Bold indicates maximum concentration greater than Tier 1 screening level.

[a] Tier 1 screening levels from Table 3.2-1.

[b] na = Not available.

Table 3.2-9
Summary of VOC Detection Status and Tier 1 Screening Results for April 2016 Sampling Event

Analyte	Number of Analyses	Number of Detects	Number of Detected Locations	Concentration Range	Location and Depth of Maximum Detection	Maximum Detected Result	Tier 1 SL[a]
Carbon Tetrachloride	80	64	17	[52.8] to 1630	50-24813 (241 ft)	1630	5650
Chloroform	80	53	15	[42] to 2630	50-24813 (150 ft)	2630	12,000
Dichlorodifluoromethane	80	73	18	[43.5] to 1140	50-24813 (241 ft)	1140	2,780,000
Dichloroethane[1,1-]	80	2	1	[33.2] to [84.9]	50-603063 (128 ft)	72.8	5750
Dichloroethane[1,2-]	80	5	2	[33.2] to 89	50-24813 (150 ft)	89	242
Dichloroethene[1,1-]	80	15	5	[32.5] to 1430	50-603061 (128 ft)	1430	7490
Dichloroethene[cis-1,2-]	80	36	10	[33.3] to 634	50-24813 (241 ft)	634	11,700
Dichloropropane[1,2-]	80	10	5	[37.9] to 360	50-603383 (244 ft)	360	580
Ethanol	80	1	1	[62.1] to 282	50-603061 (25 ft)	282	na[b]
Hexane	80	1	1	[28.9] to [74]	50-24784 (155 ft)	45.8	23,500,000
Isooctane	80	1	1	[38.3] to 299	50-24784 (155 ft)	299	na
Methylene Chloride	80	36	13	[28.5] to 1490	50-603471 (288 ft)	**1490**	665
Propanol[2-]	80	1	1	[81.1] to [206]	50-603503 (133 ft)	133	136
Tetrachloroethylene	80	64	17	[59.6] to 2030	50-24784 (155 ft)	2030	3630
Trichloro-1,2,2-trifluoroethane[1,1,2-]	80	40	11	[62.8] to 27,600	50-603061 (128 ft)	27,600	1,190,000,000
Trichloroethane[1,1,1-]	80	20	7	[44.7] to 3540	50-603061 (128 ft)	3540	141,000
Trichloroethane[1,1,2-]	80	2	2	[44.7] to 185	50-24813 (150 ft)	**185**	169
Trichloroethylene	80	80	18	[64.4] to 80,600	50-24813 (241 ft)	**80,600**	2020
Trichlorofluoromethane	80	6	4	[46] to [118]	50-603063 (228 ft)	61.8	4,540,000

Notes: Units in $\mu g/m^3$. Brackets indicate nondetected result. Bold indicates maximum concentration greater than Tier 1 screening level.

[a] Tier 1 screening levels from Table 3.2-1.

[b] na = Not available.

Table 3.2-10
Summary of VOC Detection Status and Tier 1 Screening Results for October 2016 Sampling Event

Analyte	Number of Analyses	Number of Detects	Number of Detected Locations	Concentration Range	Location and Depth of Maximum Detection	Maximum Detected Result	Tier 1 SL[a]
Acetone	80	1	1	[78.3] to [138]	50-603383 (244 ft)	90.2	20,300
Carbon Tetrachloride	80	65	17	[52.8] to 1510	50-24813 (241 ft)	1510	5650
Chloroform	80	53	15	[41] to 2240	50-24813 (150 ft)	2240	12,000
Cyclohexane	80	1	1	[28.2] to [48.2]	50-24784 (244 ft)	37.8	79,300,000
Dichlorodifluoromethane	80	74	18	[43.5] to 1090	50-24813 (241 ft)	1090	2,780,000
Dichloroethane[1,1-]	80	2	1	[33.2] to 84.9	50-603063 (128 ft)	84.9	5750
Dichloroethane[1,2-]	80	3	3	[33.2] to 105	50-603471 (unknown)	105	242
Dichloroethene[1,1-]	80	15	5	[32.5] to 1430	50-603061 (228 ft)	1430	7490
Dichloroethene[cis-1,2-]	80	37	10	[33.3] to 594	50-24813 (241 ft)	594	11,700
Dichloropropane[1,2-]	80	10	6	[38.8] to 393	50-603383 (244 ft)	393	580
Ethanol	80	1	1	[62.1] to 117	50-24822 (450 ft)	117	na[b]
Methylene Chloride	80	20	8	[118] to 1490	50-603471 (288 ft)	**1490**	665
Tetrachloroethylene	80	64	17	[59.6] to 2100	50-24784 (155 ft)	2100	3630
Trichloro-1,2,2-trifluoroethane[1,1,2-]	80	42	11	[64.3] to 25,300	50-603061 (128 ft)	25,300	1,190,000,000
Trichloroethane[1,1,1-]	80	19	7	[44.7] to 3600	50-603061 (228 ft)	3600	141,000
Trichloroethane[1,1,2-]	80	3	3	[44.7] to 153	50-24813 (150 ft)	153	169
Trichloroethylene	80	80	18	[64.4] to 64,400	50-24813 (241 ft)	**64,400**	2020
Trichlorofluoromethane	80	7	5	[47.2] to 84.2	50-603063 (228 ft)	84.2	4,540,000

Notes: Units in $\mu g/m^3$. Brackets indicate nondetected result. Bold indicates maximum concentration greater than Tier 1 screening level.

[a] Tier 1 screening levels from Table 3.2-1.

[b] na = Not available.

Table 3.2-11
Summary of VOC Detection Status and Tier 1 Screening Results for April 2017 Sampling Event

Analyte	Number of Analyses	Number of Detects	Number of Detected Locations	Concentration Range	Location and Depth of Maximum Detection	Maximum Detected Result	Tier 1 SL*
Carbon Tetrachloride	80	67	18	[51.6] to 1700	50-24813 (241 ft)	1700	5650
Chloroform	80	51	15	[43.9] to 2830	50-24813 (150 ft)	2830	12,000
Cyclohexane	80	1	1	[28.2] to 82.6	50-603470 (278 ft)	82.6	79,300,000
Dichlorodifluoromethane	80	72	18	[40.5] to 1090	50-24813 (241 ft)	1090	2,780,000
Dichloroethane[1,1-]	80	2	1	[33.2] to 76.9	50-603063 (128 ft)	76.9	5750
Dichloroethane[1,2-]	80	6	3	[33.2] to 109	50-603471 (unknown)	109	242
Dichloroethene[1,1-]	80	14	5	[32.5] to 1580	50-603061 (128 ft)	1580	7490
Dichloroethene[cis-1,2-]	80	34	11	[32.5] to 634	50-24813 (241 ft)	634	11,700
Dichloropropane[1,2-]	80	13	8	[37.9] to 425	50-603383 (244 ft)	425	580
Methylene Chloride	80	20	8	[115] to 1840	50-603471 (288 ft)	**1840**	665
Tetrachloroethylene	80	61	16	[61] to 2300	50-24784 (155 ft) 50-24784 (244 ft)	2300	3630
Trichloro-1,2,2-trifluoroethane[1,1,2-]	80	39	11	[62.8] to 27,600	50-603061 (128 ft)	27,600	1,190,000,000
Trichloroethane[1,1,1-]	80	18	6	[44.7] to 3870	50-603061 (128 ft)	3870	141,000
Trichloroethane[1,1,2-]	80	3	3	[44.7] to 196	50-24813 (150 ft)	**196**	169
Trichloroethylene	80	80	18	64.4 to 85,900	50-24813 (241 ft)	**85,900**	2020
Trichlorofluoromethane	80	4	3	[46] to [78.6]	50-603063 (228 ft) 50-603064 (214 ft) 50-603471 (288 ft)	67.4	4,540,000

Notes: Units in µg/m^3. Brackets indicate nondetected result. Bold indicates maximum concentration greater than Tier 1 screening level.
* Tier 1 screening levels from Table 3.2-1.

Table 3.2-12
Summary of VOC Detection Status and Tier 1 Screening Results for October 2017 Sampling Event

Analyte	Number of Analyses	Number of Detects	Number of Detected Locations	Concentration Range	Location and Depth of Maximum Detection	Maximum Detected Result	Tier 1 SL[a]
Acetone	80	16	9	14.5 to [166]	50-603063 (228 ft)	68.8	20,300
Benzene	80	10	4	5.11 to [57.5]	50-24822 (351 ft)	13.1	1140
Carbon Tetrachloride	80	76	18	10.7 to 1450	50-24813 (241 ft)	1450	5650
Chloroform	80	64	16	7.81 to 2590	50-24813 (150 ft)	2590	12,000
Cyclohexane	80	2	2	9.29 to [61.9]	50-24784 (155 ft)	13.1	79,300,000
Dichloro-1,1,2,2-tetrafluoroethane[1,2-]	80	1	1	15.4 to [126]	50-603063 (347 ft)	15.4	na[b]
Dichlorodifluoromethane	80	77	18	18.8 to 939	50-24822 (351 ft)	939	2,780,000
Dichloroethane[1,1-]	80	7	3	10.9 to 72.8	50-603063 (347 ft)	72.8	5750
Dichloroethane[1,2-]	80	11	5	6.47 to 125	50-603471 (209)	125	242
Dichloroethene[1,1-]	80	25	8	6.34 to 1390	50-603061 (128 ft)	1390	7490
Dichloroethene[cis-1,2-]	80	48	15	8.72 to 475	50-24813 (241 ft)	475	11,700
Dichloropropane[1,2-]	80	27	12	10.2 to 411	50-603383 (244 ft)	411	580
Ethanol	80	11	6	15.4 to [132]	50-603063 (25 ft)	109	na
Heptane[n-]	80	2	2	7.37 to [73.7]	50-24784 (155 ft)	35.6	491,000
Hexane	80	8	5	[26.1] to 634	50-603471 (90)	634	23,500,000
Hexanone[2-]	80	1	1	21.7 to [287]	50-603467 (600 ft)	21.7	145
Isooctane	80	2	1	7 to [84]	50-603383 (139 ft)	10.7	na
Methyl-2-pentanone[4-]	80	6	4	8.6 to [73.7]	50-603063 (25 ft)	32.7	70,200
Methylene Chloride	80	44	14	17.4 to 1080	50-603471 (209 ft)	**1080**	665
Propanol[2-]	80	4	4	17.4 to [172]	50-603063 (25 ft)	44.2	136
Styrene	80	2	1	3.24 to [76.7]	50-603063 (25 ft)	3.62	11,300
Tetrachloroethylene	80	74	18	10.2 to 1900	50-603063 (347 ft)	1900	3630
Toluene	80	11	6	7.91 to 71.6	50-603063 (228 ft)	71.6	272,000
Trichloro-1,2,2-trifluoroethane[1,1,2-]	80	54	13	[15.3] to 26,000	50-603061 (128 ft)	26,000	1,190,000,000

Table 3.2-12 (continued)

Analyte	Number of Analyses	Number of Detects	Number of Detected Locations	Concentration Range	Location and Depth of Maximum Detection	Maximum Detected Result	Tier 1 SL[a]
Trichloroethane[1,1,1-]	80	42	12	7.09 to 3540	50-603061 (128 ft)	3540	141,000
Trichloroethane[1,1,2-]	80	6	3	12 to 202	50-24813 (150 ft)	**202**	169
Trichloroethylene	80	78	18	[51.6] to 75,200	50-24813 (241 ft)	**75,200**	2020
Trichlorofluoromethane	80	58	18	4.72 to [73]	50-603063 (347 ft)	67.4	4,540,000
Xylene[1,3-]+xylene[1,4-]	80	5	3	6.94 to [78.1]	50-603063 (25 ft)	17.8	40,900

Notes: Units in µg/m^3. Brackets indicate nondetected result. Bold indicates maximum concentration greater than Tier 1 screening level.

[a] Tier 1 screening levels from Table 3.2-1.

[b] na = Not available.

Table 3.2-13
Summary of VOC Detection Status and Tier 1 Screening Results for January 2019–February 2019 Sampling Event

Analyte	Number of Analyses	Number of Detects	Number of Detected Locations	Concentration Range	Location and Depth of Maximum Detection	Maximum Detected Result	Tier 1 SL[a]
Acetone	80	2	2	12.3 to [926]	50-603503 (450 ft)	66.5	20,300
Bromodichloromethane	80	1	1	10.7 to [656]	50-613182 (632.5 ft)	10.7	6950
Carbon Disulfide	80	1	1	43.6 to [1210]	50-24784 (244 ft)	43.6	478,000
Carbon Tetrachloride	80	74	18	16.4 to 1630	50-24813 (241 ft)	1630	5650
Chloroform	80	67	18	5.86 to 2100	50-24813 (241 ft)	2100	12,000
Dichloro-1,1,2,2-tetrafluoroethane[1,2-]	80	1	1	18.2 to [685]	50-603383 (244 ft)	18.2	na[b]
Dichlorodifluoromethane	80	79	18	12.8 to 1090	50-24813 (241 ft)	1090	2,780,000
Dichloroethane[1,1-]	80	4	2	10.1 to [396]	50-603063 (228 ft)	48.5	5750
Dichloroethane[1,2-]	80	4	3	[32.8] to [396]	50-603471 (unknown)	93	242
Dichloroethene[1,1-]	80	21	7	10.7 to 1310	50-603061 (228 ft)	1310	7490
Dichloroethene[cis-1,2-]	80	47	13	11.9 to 634	50-24813 (241 ft)	634	11,700
Dichloropropane[1,2-]	80	18	8	8.77 to [453]	50-603383 (244 ft)	351	580

Table 3.2-13 (continued)

Analyte	Number of Analyses	Number of Detects	Number of Detected Locations	Concentration Range	Location and Depth of Maximum Detection	Maximum Detected Result	Tier 1 SL[a]
Isooctane	80	2	2	25.2 to [458]	50-603064 (113 ft)	65.4	na
Methylene Chloride	80	40	13	12.2 to 1110	50-603471 (288 ft)	**1110**	665
Propanol[2-]	80	1	1	7.37 to [958]	50-603064 (500 ft)	7.37	136
Tetrachloroethylene	80	73	18	12.9 to 1900	50-24784 (155 ft)	1900	3630
Trichloro-1,2,2-trifluoroethane[1,1,2-]	80	51	12	22.2 to 23,000	50-603061 (228 ft)	23,000	1,190,000,000
Trichloroethane[1,1,1-]	80	33	11	13.6 to 3110	50-603061 (228 ft)	3110	141,000
Trichloroethane[1,1,2-]	80	6	4	19.6 to [534]	50-24813 (150 ft)	164	169
Trichloroethylene	80	80	18	46.2 to 75,200	50-24813 (241 ft)	**75,200**	2020
Trichlorofluoromethane	80	34	14	8.42 to [550]	50-603063 (228 ft)	51.7	4,540,000

Notes: Units in $\mu g/m^3$. Brackets indicate nondetected result. Bold indicates maximum concentration greater than Tier 1 screening level.

[a] Tier 1 screening levels from Table 3.2-1.

[b] na = Not available.

Table 3.2-14
Summary of VOC Detection Status and Tier 1 Screening Results for January 2020–February 2020 Sampling Event

Analyte	Number of Analyses	Number of Detects	Number of Detected Locations	Concentration Range	Location and Depth of Maximum Detection	Maximum Detected Result	Tier 1 SL[a]
Acetone	59	15	7	18 to [140]	50-603471 (450)	70	20,300
Benzene	59	17	4	6.7 to [45]	50-603471 (288)	17	1140
Carbon Disulfide	59	3	2	14 to [200]	50-603471 (unknown)	53	478,000
Carbon Tetrachloride	59	55	15	20 to 1400	50-24813 (241 ft)	1400	5650
Chloroform	59	49	15	10 to 2400	50-24813 (150 ft)	2400	12,000
Dichlorodifluoromethane	59	57	15	21 to 840	50-24813 (241 ft)	840	2,780,000
Dichloroethane[1,2-]	59	13	6	9.7 to 97	50-24813 (150 ft) 50-603471 (unknown)	97	242

Table 3.2-14 (continued)

Analyte	Number of Analyses	Number of Detects	Number of Detected Locations	Concentration Range	Location and Depth of Maximum Detection	Maximum Detected Result	Tier 1 SL[a]
Dichloroethene[1,1-]	59	18	6	10 to 670	50-603064 (214 ft)	670	7490
Dichloroethene[cis-1,2-]	59	35	11	17 to 550	50-24813 (241 ft)	550	11,700
Dichloropropane[1,2-]	59	17	6	17 to 79	50-603472 (146)	79	580
Ethanol	59	5	4	16 to 110	50-603471 (450)	110	na[b]
Methyl tert-Butyl Ether	59	1	1	7.2 to [50]	50-24813 (450 ft)	7.2	336
Methylene Chloride	59	32	9	28 to 1500	50-603471 (288 ft)	**1500**	665
Propanol[2-]	59	4	3	19 to 470	50-603067 (143 ft)	**470**	136
Tetrachloroethylene	59	50	15	43 to 1400	50-24784 (362 ft)	1400	3630
Toluene	59	1	1	10 to [53]	50-603063 (228 ft)	10	272,000
Trichloro-1,2,2-trifluoroethane[1,1,2-]	59	35	10	16 to 11,000	50-603064 (214 ft)	11,000	1,190,000,000
Trichloroethane[1,1,1-]	59	33	11	11 to 1700	50-603064 (214 ft)	1700	141,000
Trichloroethane[1,1,2-]	59	10	3	11 to 170	50-24813 (150 ft)	**170**	169
Trichloroethylene	59	59	15	64 to 75,000	50-24813 (241 ft)	**75,000**	2020
Trichlorofluoromethane	59	36	13	11 to [79]	50-603064 (332 ft)	55	4,540,000
Trimethylbenzene[1,2,4-]	59	2	1	16 to [69]	50-603503 (133 ft)	24	14,100

Notes: Units in µg/m^3. Brackets indicate nondetected result. Bold indicates maximum concentration greater than Tier 1 screening level.

[a] Tier 1 screening levels from Table 3.2-1.

[b] na = Not available.

Table 3.2-15
Summary of Data Used to Calculate Tier 2 Screening Levels[a]

Parameters	Symbol	Unit	Pore-Water Transport	Vapor Transport				
				2-Hexanone	Methylene Chloride	2-Propanol	1,1,2-TCA	TCE
Source length along the regional groundwater flow direction	L	m	1.07[b]	107	107	107	107	107
Hydraulic conductivity in the regional aquifer	K	m/d	2.3	2.3	2.3	2.3	2.3	2.3
Hydraulic gradient in the regional aquifer[c]	I	m/m	0.014	0.014	0.014	0.014	0.014	0.014
Considered aquifer thickness (e.g., screen length of a monitoring well)	D_a	m	3	3	3	3	3	3
Infiltration rate through the vadose zone[d]	R	m/yr	0.1[e]	0.001	0.001	0.001	0.001	0.001
Porosity	N	—[f]	na[g]	0.3	0.3	0.3	0.3	0.3
Volumetric moisture content in the vadose zone	Θ	—	na	0.1	0.1	0.1	0.1	0.1
Diffusion coefficient of contaminants in air	D_a	m^2/d	na	0.608[c]	0.873[f]	0.89[c]	0.674[d]	0.683[d]
Diffusion coefficient of contaminants in water	D_w	m^2/d	na	7.29E-05[c]	1.01E-04[d]	9.68E-05[c]	7.6E-05[d]	7.85E-05[d]

[a] Values from LANL (2012, 209658, Table F-2.2-1), except as noted.

[b] Length set to 1% of vapor plume source length to represent flow through fracture.

[c] Value from EPA regional screening tables (https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables) converted from cm^2/s to m^2/day.

[d] Value from NMED (2019, 700550, Appendix B), converted from cm^2/s to m^2/day.

[e] Infiltration rate set to 100 mm/yr to represent flow through fracture.

[f] — = Dimensionless.

[g] na = Not available.

Table 3.2-16
Tier 2 Screening Levels

Chemical	Maximum Pore Gas Concentration (μg/m^3)	Tier 2 Pore Water Transport Screening Level (μg/m^3)	Minimum Tier 2 Vapor-Phase Transport Screening Level (μg/m^3)
2-Hexanone	696	2100	1550
Methylene Chloride	1840	9640	1920
2-Propanol	470	1970	8380
1,1,2-TCA	213	2450	660
TCE	85,900	29,300	6390

Table 3.2-17
Tier 2 Screening of TCE Vapor Data at MDA C

Location ID	Depth (ft bgs)	Tier 2 Screening Level		October–November 2012		March–April 2013		November–December 2013		April–May 2014		October–November 2014	
		Porous Media Flow	Fracture Flow	Sample ID	Result	Sample ID	Result	Sample ID	Result	Sample ID	Result	Sample ID	Result
50-24784	155	53,511	27,841	MD50-13-24032	3706	MD50-13-28927	3437	MD50-14-45789	3330	MD50-14-75350	3545	MD50-14-87677	3061
50-24784	244	50,053	24,396	MD50-13-24033	3974	MD50-13-28928	3115	MD50-14-45788	3061	MD50-14-75349	3222	MD50-14-87678	3115
50-24784	362	45,489	19,819	MD50-13-24034	2793	MD50-13-28929	2632	MD50-14-45787	1933	MD50-14-75348	2524	MD50-14-87679	2256
50-24784	450	42,069	16,412	MD50-13-24035	967	MD50-13-28930	1020	MD50-14-45786	752	MD50-14-75347	1020	MD50-14-87680	859
50-24813	25	57,809	32,139	MD50-13-24038	13,426	MD50-13-28931	12,889	MD50-14-45795	11,815	MD50-14-75356	12,889	MD50-14-87681	9130
50-24813	150	52,964	27,295	MD50-13-24040	26,852	MD50-13-28932	**44,038**	MD50-14-45794	**42,427**	MD50-14-75355	**41,353**	MD50-14-87682	**37,056**
50-24813	241	49,430	23,773	MD50-13-24041	**69,816**	MD50-13-28933	**85,928**	MD50-14-45793	**64,446**	MD50-14-75354	**80,557**	MD50-14-87683	**75,187**
50-24813	358	44,904	19,234	MD50-13-24036	**26,315**	MD50-13-28934	**52,094**	MD50-14-45792	**52,094**	MD50-14-75353	**51,020**	MD50-14-87684	**48,334**
50-24813	450	41,331	15,674	MD50-13-24037	**26,315**	MD50-13-28935	**27,927**	MD50-14-45791	**26,852**	MD50-14-75352	**25,778**	MD50-14-87685	**19,871**
50-24813	600	35,521	9864	MD50-13-24039	3330	MD50-13-28936	3276	MD50-14-45790	1074	MD50-14-75351	3383	MD50-14-87686	2632
50-24822	25	56,677	31,020	MD50-13-24042	6982	MD50-13-28937	7519	MD50-14-45800	8056	MD50-14-75361	5908	MD50-14-87687	6445
50-24822	142	52,151	26,481	MD50-13-24046	24,704	MD50-13-28938	23,093	MD50-14-45796	**29,001**	MD50-14-75357	22,556	MD50-14-87688	22,556
50-24822	235	48,540	22,883	MD50-13-24044	**36,519**	MD50-13-28939	**36,519**	MD50-14-45797	**31,686**	MD50-14-75358	**29,001**	MD50-14-87689	**30,612**
50-24822	351	44,052	18,382	MD50-13-24045	11,815	MD50-13-28940	**22,019**	MD50-14-45798	**24,704**	MD50-14-75359	**19,334**	MD50-14-87690	**19,871**
50-24822	450	40,212	14,555	MD50-13-24043	9130	MD50-13-28941	10,741	MD50-14-45799	11,815	MD50-14-75360	9667	MD50-14-87691	9130
50-603061	25	56,677	31,020	MD50-13-24051	462	MD50-13-28942	537	MD50-14-45801	473	MD50-14-75362	440	MD50-14-87692	371
50-603061	128	52,698	27,028	MD50-13-24047	2739	MD50-13-28943	2846	MD50-14-45802	2685	MD50-14-75363	2363	MD50-14-87693	1987
50-603061	228	48,820	23,150	MD50-13-24048	3437	MD50-13-28944	3598	MD50-14-45803	1719	MD50-14-75364	3169	MD50-14-87694	1880
50-603061	347	44,204	18,535	MD50-13-24049	1182	MD50-13-28945	1289	MD50-14-45804	177	MD50-14-75365	1343	MD50-14-87695	1182
50-603061	450	40,212	14,555	MD50-13-24050	532	MD50-13-28946	451	MD50-14-45805	344	MD50-14-75366	446	MD50-14-87696	408
50-603062	122	51,490	25,820	MD50-13-24052	6445	MD50-13-28947	6982	MD50-14-45806	7519	MD50-14-75367	6445	MD50-14-87697	5263
50-603062	217	47,803	22,146	MD50-13-24053	6982	MD50-13-28948	8593	MD50-14-45807	9130	MD50-14-75368	6982	MD50-14-87698	6445
50-603062	337	43,162	17,492	MD50-13-24054	2041	MD50-13-28949	2041	MD50-14-45809	2041	MD50-14-75370	2309	MD50-14-87699	1826
50-603062	450	38,776	13,119	MD50-13-24055	591	MD50-13-28950	698	MD50-14-45808	698	MD50-14-75369	644	MD50-14-87700	591
50-603063	25	56,715	31,058	MD50-13-24060	1396	MD50-13-28951	1504	MD50-14-45814	1396	MD50-14-75375	1343	MD50-14-87701	1289
50-603063	128	52,736	27,066	MD50-13-24056	6982	MD50-13-28952	9667	MD50-14-45813	9667	MD50-14-75374	9130	MD50-14-87702	7519
50-603063	228	48,858	23,188	MD50-13-24057	22,556	MD50-13-28953	22,556	MD50-14-45812	**23,630**	MD50-14-75373	**23,630**	MD50-14-87703	22,556
50-603063	347	44,243	18,586	MD50-13-24058	11,278	MD50-13-28954	13,426	MD50-14-45811	12,352	MD50-14-75372	12,352	MD50-14-87704	13,426
50-603063	450	40,250	14,593	MD50-13-24059	7519	MD50-13-28955	8593	MD50-14-45810	8056	MD50-14-75371	8056	MD50-14-87705	8056
50-603064	113	52,418	26,761	MD50-13-24061	**28,463**	MD50-13-28956	**29,538**	MD50-14-45815	21,482	MD50-14-75376	25,241	MD50-14-87706	22,556
50-603064	214	48,502	22,845	MD50-13-24062	**29,537**	MD50-13-28957	**40,816**	MD50-14-45816	**25,241**	MD50-14-75377	**35,445**	MD50-14-87707	**33,834**
50-603064	332	43,938	18,268	MD50-13-24063	13,963	MD50-13-28958	13,426	MD50-14-45817	13,426	MD50-14-75378	13,426	MD50-14-87708	13,426
50-603064	500	37,428	11,758	MD50-13-24064	1504	MD50-13-28959	1665	MD50-14-45818	1611	MD50-14-75379	1504	MD50-14-87709	1343
50-603383	26	57,885	32,215	MD50-13-24157	752	MD50-13-28960	3061	MD50-14-45819	2524	MD50-14-75380	591	MD50-14-87710	1611
50-603383	139	53,511	27,841	MD50-13-24153	4296	MD50-13-28961	4780	MD50-14-45820	3759	MD50-14-75381	5102	MD50-14-87711	4189

Table 3.2-17 (continued)

Location ID	Depth (ft bgs)	Tier 2 Screening Level		October–November 2012		March–April 2013		November–December 2013		April–May 2014		October–November 2014	
		Porous Media Flow	Fracture Flow	Sample ID	Result	Sample ID	Result	Sample ID	Result	Sample ID	Result	Sample ID	Result
50-603383	244	49,430	23,773	MD50-13-24154	5370	MD50-13-28962	5370	MD50-14-45821	5908	MD50-14-75382	5908	MD50-14-87712	5908
50-603383	359	44,980	19,310	MD50-13-24155	1450	MD50-13-28963	1557	MD50-14-45822	1826	MD50-14-75383	1987	MD50-14-87713	1880
50-603383	450	41,458	15,789	MD50-13-24156	1343	MD50-13-28964	1396	MD50-14-45823	52.6 (U)	MD50-14-75384	1396	MD50-14-87714	1074
50-603467	143	53,003	27,333	MD50-13-24066	10,741	MD50-13-28965	12,889	MD50-14-45824	15,574	MD50-14-75385	12,889	MD50-14-87715	14,500
50-603467	244	49,087	23,430	MD50-13-24070	**30,075**	MD50-13-28966	**27,927**	MD50-14-45825	**24,167**	MD50-14-75386	21,482	MD50-14-87716	**24,167**
50-603467	360	44,586	18,929	MD50-13-24068	**29,000**	MD50-13-28967	**24,167**	MD50-14-45826	**20,408**	MD50-14-75387	**21,482**	MD50-14-87717	**22,019**
50-603467	500	39,170	13,500	MD50-13-24069	8593	MD50-13-28968	8056	MD50-14-45827	9667	MD50-14-75388	7519	MD50-14-87718	8593
50-603467	600	35,292	9622	MD50-13-24067	3652	MD50-13-28969	3974	MD50-14-45828	1020	MD50-14-75389	3974	MD50-14-87719	4135
50-603468	142	52,380	26,723	MD50-13-24159	24,167	MD50-13-28970	8593	MD50-14-45831	18,797	MD50-14-75392	21,482	MD50-14-87720	13,426
50-603468	233	48,858	23,188	MD50-13-24158	**29,537**	MD50-13-28971	**23,630**	MD50-14-45830	**26,852**	MD50-14-75391	**30,075**	MD50-14-87721	**25,241**
50-603468	354	44,166	18,497	MD50-13-24160	**20,408**	MD50-13-28972	**27,927**	MD50-14-45829	**29,001**	MD50-14-75390	**29,538**	MD50-14-87722	**25,778**
50-603468	403	42,272	16,602	MD50-13-24161	**22,556**	MD50-13-28973	**23,630**	MD50-14-45832	**22,019**	MD50-14-75393	**25,241**	MD50-14-87723	**22,556**
50-603470	83	54,783	29,126	MD50-13-24077	25,778	MD50-13-28977	15,574	MD50-14-45847	13,426	MD50-14-75403	13,963	MD50-14-87727	12,352
50-603470	203	50,129	24,472	MD50-13-24078	**40,278**	MD50-13-28978	**42,427**	MD50-14-45846	**32,760**	MD50-14-75402	**45,112**	MD50-14-87728	**43,501**
50-603470	278	47,230	21,561	MD50-13-24079	**45,112**	MD50-13-28979	**59,075**	MD50-14-45845	**51,020**	MD50-14-75401	**50,483**	MD50-14-87729	**53,705**
50-603470	351	44,395	18,738	MD50-13-24080	**22,556**	MD50-13-28980	**37,056**	MD50-14-45844	**37,056**	MD50-14-75400	**38,668**	MD50-14-87730	**39,742**
50-603470	450	40,556	14,899	MD50-13-24081	**19,334**	MD50-13-28981	**15,574**	MD50-14-45843	**16,112**	MD50-14-75399	**18,797**	MD50-14-87731	**17,723**
50-603470	600	34,745	9088	MD50-13-24075	1557	MD50-13-28982	1826	MD50-14-45842	1772	MD50-14-75398	1611	—*	—
50-603470	650	32,813	7143	MD50-13-24076	85.9	MD50-13-28983	50.5	MD50-14-45841	40.8	MD50-14-75397	49.9	MD50-14-87733	91.3
50-603471	90	54,706	29,037	MD50-13-24082	19,871	MD50-13-28984	18,260	MD50-14-45852	20,945	MD50-14-75408	10,204	MD50-14-87734	5908
50-603471	209	50,091	24,434	MD50-13-24083	**35,445**	MD50-13-28985	**41,890**	MD50-14-45851	**45,112**	MD50-14-75407	**39,742**	MD50-14-87735	**34,371**
50-603471	288	47,027	21,370	MD50-13-24084	**53,167**	MD50-13-28986	**64,446**	MD50-14-45850	**48,334**	MD50-14-75406	**53,705**	MD50-14-87736	**59,075**
50-603471	360	44,243	18,586	MD50-13-24085	**44,575**	MD50-13-28987	**49,409**	MD50-14-45849	**51,557**	MD50-14-75405	**45,649**	MD50-14-87737	**42,964**
50-603471	450	40,759	15,089	MD50-13-24086	**38,667**	MD50-13-28988	**34,908**	MD50-14-45848	**27,390**	MD50-14-75404	**26,315**	MD50-14-87738	**24,167**
50-603471	—	—	—	—	—	—	—	—	—	MD50-14-75754	17,723	MD50-14-90318	13,963
50-603472	27	57,618	31,948	MD50-13-24143	2685	MD50-13-28991	263	MD50-14-45859	2363	MD50-14-75415	2739	MD50-14-87741	2094
50-603472	146	53,003	27,333	MD50-13-24144	13,426	MD50-13-28992	13,426	MD50-14-45855	12,889	MD50-14-75411	12,889	MD50-14-87742	9667
50-603472	292	47,345	21,675	MD50-13-24147	**31,149**	MD50-13-28993	**27,390**	MD50-14-45856	**26,315**	MD50-14-75412	**29,538**	MD50-14-87743	15,037
50-603472	364	44,548	18,891	MD50-13-24145	17,185	MD50-13-28994	16,649	MD50-14-45857	7519	MD50-14-75413	18,260	MD50-14-87744	18,260
50-603472	450	41,217	15,560	MD50-13-24146	11,815	MD50-13-28995	12,352	MD50-14-45858	8056	MD50-14-75414	10,741	MD50-14-87745	5048
50-603503	133	53,702	28,032	MD50-13-24094	2148	MD50-13-28998	2417	MD50-14-45862	2148	MD50-14-75418	2041	MD50-14-87748	1450
50-603503	237	49,672	24,002	MD50-13-24093	4887	MD50-13-28999	5370	MD50-14-45863	4995	MD50-14-75419	4296	MD50-14-87749	4511
50-603503	347	45,400	19,743	MD50-13-24092	2900	MD50-13-29000	3222	MD50-14-45864	3491	MD50-14-75420	3437	MD50-14-87750	1504
50-603503	450	41,420	15,750	MD50-13-24091	2954	MD50-13-29001	3115	MD50-14-45865	2954	MD50-14-75421	2846	MD50-14-87751	2578
50-613182	550	37,339	11,682	MD50-13-24089	3222	MD50-13-28996	3115	MD50-14-45860	2900	MD50-14-75416	1933	MD50-14-87746	1343
50-613182	632.5	34,148	8478	MD50-13-24090	7.52 (U)	MD50-13-28997	14	MD50-14-45861	10.7	MD50-14-75417	33.3	MD50-14-87747	53.7 (U)
50-613183	550	36,957	11,288	MD50-13-24087	3813	MD50-13-28989	3813	MD50-14-45853	3545	MD50-14-75409	3813	MD50-14-87739	3330

Table 3.2-17 (continued)

Location ID	Depth (ft bgs)	Tier 2 Screening Level		October–November 2012		March–April 2013		November–December 2013		April–May 2014		October–November 2014	
		Porous Media Flow	Fracture Flow	Sample ID	Result	Sample ID	Result	Sample ID	Result	Sample ID	Result	Sample ID	Result
50-613183	642.5	33,372	7715	MD50-13-24088	75.2	MD50-13-28990	80.6	MD50-14-45854	64.4	MD50-14-75410	80.6	MD50-14-87740	75.2
50-613184	500	38,470	12,801	MD50-13-24074	4135	MD50-13-28974	4135	MD50-14-45833	4404	MD50-14-75394	4780	MD50-14-87724	3652
50-613184	600	34,593	8936	MD50-13-24073	698	MD50-13-28975	752	MD50-14-45834	752	MD50-14-75395	859	MD50-14-87725	698
50-613184	664.5	32,088	6431	MD50-13-24072	107	MD50-13-28976	80.6	MD50-14-45835	134	MD50-14-75396	166	MD50-14-87726	113
50-613185	145	51,998	26,328	MD50-13-24099	4619	MD50-13-29002	4619	MD50-14-45870	4296	MD50-14-75426	3867	MD50-14-87752	3759
50-613185	235	48,502	22,845	MD50-13-24098	7519	MD50-13-29003	8056	MD50-14-45869	7519	MD50-14-75425	6982	MD50-14-87753	6982
50-613185	350	44,052	18,382	MD50-13-24095	4082	MD50-13-29004	3974	MD50-14-45868	3759	MD50-14-75424	3813	MD50-14-87754	3652
50-613185	450	40,174	14,504	MD50-13-24096	1557	MD50-13-29005	1772	MD50-14-45867	1772	MD50-14-75423	1557	MD50-14-87755	1235
50-613185	600	34,364	8694	MD50-13-24097	96.7	MD50-13-29006	145	MD50-14-45866	113	MD50-14-75422	150	MD50-14-87756	156

Table 3.2-17 (continued)

Location ID	Depth (ft bgs)	Tier 2 Screening Level		March–April 2015		October 2015		April 2016		October 2016		April 2017	
		Porous Media Flow	Fracture Flow	Sample ID	Result	Sample ID	Result	Sample ID	Result	Sample ID	Result	Sample ID	Result
50-24784	155	53,511	27,841	MD50-15-92946	2900	MD50-15-105183	3652	MD50-16-115112	3598	MD50-16-126487	3330	MD50-17-131652	3974
50-24784	244	50,053	24,396	MD50-15-92947	3169	MD50-15-105184	3276	MD50-16-115113	2202	MD50-16-126488	2363	MD50-17-131653	4672
50-24784	362	45,489	19,819	MD50-15-92948	2256	MD50-15-105185	2846	MD50-16-115114	2900	MD50-16-126489	2363	MD50-17-131654	3276
50-24784	450	42,069	16,412	MD50-15-92949	967	MD50-15-105186	1343	MD50-16-115115	1074	MD50-16-126490	1128	MD50-17-131655	1343
50-24813	25	57,809	32,139	MD50-15-92950	10,204	MD50-15-105187	11,815	MD50-16-115116	10,741	MD50-16-126491	7519	MD50-17-131656	11,278
50-24813	150	52,964	27,295	MD50-15-92951	**35,445**	MD50-15-105188	**42,427**	MD50-16-115117	**40,816**	MD50-16-126492	**29,001**	MD50-17-131657	**41,890**
50-24813	241	49,430	23,773	MD50-15-92952	**69,816**	MD50-15-105189	**59,075**	MD50-16-115118	**80,557**	MD50-16-126493	**64,446**	MD50-17-131658	**85,928**
50-24813	358	44,904	19,234	MD50-15-92953	**48,871**	MD50-15-105190	**45,649**	MD50-16-115119	**59,075**	MD50-16-126494	**46,723**	MD50-17-131659	**59,075**
50-24813	450	41,331	15,674	MD50-15-92954	**24,167**	MD50-15-105191	**31,149**	MD50-16-115120	15,574	MD50-16-126495	**25,778**	MD50-17-131660	**31,686**
50-24813	600	35,521	9864	MD50-15-92955	2900	MD50-15-105192	4082	MD50-16-115121	3867	MD50-16-126496	3437	MD50-17-131661	4404
50-24822	25	56,677	31,020	MD50-15-92956	4028	MD50-15-105193	5908	MD50-16-115122	6445	MD50-16-126497	5908	MD50-17-131662	2793
50-24822	142	52,151	26,481	MD50-15-92957	18,797	MD50-15-105194	20,945	MD50-16-115123	23,630	MD50-16-126498	22,019	MD50-17-131663	8593
50-24822	235	48,540	22,883	MD50-15-92958	**29,001**	MD50-15-105195	**30,075**	MD50-16-115124	**33,297**	MD50-16-126499	**40,816**	MD50-17-131664	9667
50-24822	351	44,052	18,382	MD50-15-92959	18,260	MD50-15-105196	19,334	MD50-16-115125	**20,408**	MD50-16-126500	**22,019**	MD50-17-131665	11,815
50-24822	450	40,212	14,555	MD50-15-92960	6445	MD50-15-105197	9130	MD50-16-115126	9667	MD50-16-126501	3115	MD50-17-131666	6982
50-603061	25	56,677	31,020	MD50-15-92961	532	MD50-15-105198	537	MD50-16-115127	537	MD50-16-126502	451	MD50-17-131667	644
50-603061	128	52,698	27,028	MD50-15-92962	2632	MD50-15-105199	2846	MD50-16-115128	2793	MD50-16-126503	2524	MD50-17-131668	3061
50-603061	228	48,820	23,150	MD50-15-92963	3545	MD50-15-105200	4511	MD50-16-115129	3437	MD50-16-126504	4082	MD50-17-131669	3706
50-603061	347	44,204	18,535	MD50-15-92964	1504	MD50-15-105201	1880	MD50-16-115130	1450	MD50-16-126505	1826	MD50-17-131670	2041
50-603061	450	40,212	14,555	MD50-15-92965	698	MD50-15-105202	806	MD50-16-115131	806	MD50-16-126506	430	MD50-17-131671	913
50-603062	122	51,490	25,820	MD50-15-92966	5048	MD50-15-105203	5263	MD50-16-115132	6445	MD50-16-126507	6445	MD50-17-131672	5908
50-603062	217	47,803	22,146	MD50-15-92967	6445	MD50-15-105204	5908	MD50-16-115133	7519	MD50-16-126508	6982	MD50-17-131673	7519
50-603062	337	43,162	17,492	MD50-15-92968	1987	MD50-15-105205	2041	MD50-16-115134	2309	MD50-16-126509	2846	MD50-17-131674	2094
50-603062	450	38,776	13,119	MD50-15-92969	591	MD50-15-105206	644	MD50-16-115135	698	MD50-16-126510	913	MD50-17-131675	752
50-603063	25	56,715	31,058	MD50-15-92970	967	MD50-15-105207	1182	MD50-16-115136	1182	MD50-16-126511	1235	MD50-17-131676	1289
50-603063	128	52,736	27,066	MD50-15-92971	8056	MD50-15-105208	7519	MD50-16-115137	9667	MD50-16-126512	10741	MD50-17-131677	10,204
50-603063	228	48,858	23,188	MD50-15-92972	**24,704**	MD50-15-105209	21,482	MD50-16-115138	**25,778**	MD50-16-126513	**32,223**	MD50-17-131678	**26,852**
50-603063	347	44,243	18,586	MD50-15-92973	10,741	MD50-15-105210	12,889	MD50-16-115139	16,649	MD50-16-126514	18,797	MD50-17-131679	18,797
50-603063	450	40,250	14,593	MD50-15-92974	7519	MD50-15-105211	7519	MD50-16-115140	9667	MD50-16-126515	8593	MD50-17-131680	10,741
50-603064	113	52,418	26,761	MD50-15-92975	22,556	MD50-15-105212	23,630	MD50-16-115141	23,093	MD50-16-126516	19,871	MD50-17-131681	**26,852**
50-603064	214	48,502	22,845	MD50-15-92976	**33,297**	MD50-15-105213	**37,056**	MD50-16-115142	**34,371**	MD50-16-126517	**37,593**	MD50-17-131682	**40,279**
50-603064	332	43,938	18,268	MD50-15-92977	11,815	MD50-15-105214	12,352	MD50-16-115143	13,963	MD50-16-126518	17,186	MD50-17-131683	17,186
50-603064	500	37,428	11,758	MD50-15-92978	1396	MD50-15-105215	1933	MD50-16-115144	1772	MD50-16-126519	2470	MD50-17-131684	2094
50-603383	26	57,885	32,215	MD50-15-92979	387	MD50-15-105216	1987	MD50-16-115145	1450	MD50-16-126520	2900	MD50-17-131685	392
50-603383	139	53,511	27,841	MD50-15-92980	4135	MD50-15-105217	4458	MD50-16-116404	5370	MD50-16-126521	5263	MD50-17-131686	5370

Table 3.2-17 (continued)

Location ID	Depth (ft bgs)	Tier 2 Screening Level		March–April 2015		October 2015		April 2016		October 2016		April 2017	
		Porous Media Flow	Fracture Flow	Sample ID	Result	Sample ID	Result	Sample ID	Result	Sample ID	Result	Sample ID	Result
50-603383	244	49,430	23,773	MD50-15-92981	5908	MD50-15-105218	6445	MD50-16-115147	6982	MD50-16-126522	7519	MD50-17-131687	8056
50-603383	359	44,980	19,310	MD50-15-92982	2148	MD50-15-105219	2524	MD50-16-115148	3222	MD50-16-126523	1826	MD50-17-131688	3276
50-603383	450	41,458	15,789	MD50-15-92983	1289	MD50-15-105220	1396	MD50-16-115149	1772	MD50-16-126524	2041	MD50-17-131689	1987
50-603467	143	53,003	27,333	MD50-15-92984	17,186	MD50-15-105221	16,649	MD50-16-115150	12,889	MD50-16-126525	11,278	MD50-17-131690	11,278
50-603467	244	49,087	23,430	MD50-15-92985	**24,167**	MD50-15-105222	22,556	MD50-16-115151	**24,704**	MD50-16-126526	22,556	MD50-17-131691	**24,704**
50-603467	360	44,586	18,929	MD50-15-92986	**20,408**	MD50-15-105223	**19,871**	MD50-16-115152	**21,482**	MD50-16-126527	**25,778**	MD50-17-131692	**23,630**
50-603467	500	39,170	13,500	MD50-15-92987	8056	MD50-15-105224	7519	MD50-16-115153	6982	MD50-16-126528	9667	MD50-17-131693	8056
50-603467	600	35,292	9622	MD50-15-92988	3813	MD50-15-105225	3867	MD50-16-115154	2524	MD50-16-126529	4726	MD50-17-131694	4619
50-603468	142	52,380	26,723	MD50-15-92989	20,408	MD50-15-105226	19,334	MD50-16-115155	13,426	MD50-16-126530	9667	MD50-17-131695	10,741
50-603468	233	48,858	23,188	MD50-15-92990	**24,704**	MD50-15-105227	**25,778**	MD50-16-115156	**25,778**	MD50-16-126531	**30,075**	MD50-17-131696	**26,315**
50-603468	354	44,166	18,497	MD50-15-92991	**25,241**	MD50-15-105228	**26,852**	MD50-16-115157	**26,315**	MD50-16-126532	**31,686**	MD50-17-131697	**27,927**
50-603468	403	42,272	16,602	MD50-15-92992	**22,019**	MD50-15-105229	**22,019**	MD50-16-115158	**23,630**	MD50-16-126533	**32,223**	MD50-17-131698	**23,093**
50-603470	83	54,783	29,126	MD50-15-92996	8,593	MD50-15-105233	14,500	MD50-16-115162	10,204	MD50-16-126537	11,815	MD50-17-131702	10,741
50-603470	203	50,129	24,472	MD50-15-92997	**31,149**	MD50-15-105234	**37,593**	MD50-16-115163	**41,890**	MD50-16-126538	**34,371**	MD50-17-131703	**45,649**
50-603470	278	47,230	21,561	MD50-15-92998	**40,816**	MD50-15-105235	**44,575**	MD50-16-115164	**53,705**	MD50-16-126539	**48,871**	MD50-17-131704	**53,705**
50-603470	351	44,395	18,738	MD50-15-92999	**31,686**	MD50-15-105236	**33,834**	MD50-16-115165	**36,519**	MD50-16-126540	**38,131**	MD50-17-131705	**40,816**
50-603470	450	40,556	14,899	MD50-15-93000	**17,186**	MD50-15-105237	**23,093**	MD50-16-115166	14,500	MD50-16-126541	**19,871**	MD50-17-131706	13,426
50-603470	600	34,745	9088	—	—	—	—	—	—	—	—	—	—
50-603470	650	32,813	7143	MD50-15-93002	52.6	MD50-15-105239	102	MD50-16-115168	91.3	MD50-16-126542	145	MD50-17-131707	91.3
50-603471	90	54,706	29,037	MD50-15-93003	10,741	MD50-15-105240	6,982	MD50-16-115169	2739	MD50-16-126543	6982	MD50-17-131708	10,741
50-603471	209	50,091	24,434	MD50-15-93004	**45,112**	MD50-15-105241	**43,501**	MD50-16-115170	18,797	MD50-16-126544	**41,353**	MD50-17-131709	**38,668**
50-603471	288	47,027	21,370	MD50-15-93005	**34,371**	MD50-15-105242	**51,557**	MD50-16-115171	**52,631**	MD50-16-126545	**52,094**	MD50-17-131710	**64,446**
50-603471	360	44,243	18,586	MD50-15-93006	**42,427**	MD50-15-105243	**42,427**	MD50-16-115172	**44,038**	MD50-16-126546	**46,186**	MD50-17-131711	**50,483**
50-603471	450	40,759	15,089	MD50-15-93007	**24,167**	MD50-15-105244	**36,519**	MD50-16-115173	**29,538**	MD50-16-126547	**26,852**	MD50-17-131712	**31,686**
50-603471	—	—	—	MD50-15-93331	17,186	MD50-15-105398	16,649	MD50-16-115192	9667	MD50-16-126582	17,186	MD50-17-131731	19,871
50-603472	27	57,618	31,948	MD50-15-93010	1826	MD50-15-105247	2470	MD50-16-115176	2524	MD50-16-126550	2470	MD50-17-131715	2739
50-603472	146	53,003	27,333	MD50-15-93011	10,204	MD50-15-105248	11,815	MD50-16-115177	10,741	MD50-16-126551	11,815	MD50-17-131716	15,574
50-603472	292	47,345	21,675	MD50-15-93012	18,260	MD50-15-105249	**31,149**	MD50-16-115178	**28,464**	MD50-16-126552	**33,297**	MD50-17-131717	**35,982**
50-603472	364	44,548	18,891	MD50-15-93013	17,186	MD50-15-105250	**22,019**	MD50-16-115179	18,797	MD50-16-126553	**25,241**	MD50-17-131718	**24,704**
50-603472	450	41,217	15,560	MD50-15-93014	5908	MD50-15-105251	13,426	MD50-16-115180	11,815	MD50-16-126554	7519	MD50-17-131719	10,741
50-603503	133	53,702	28,032	MD50-15-93017	1826	MD50-15-105254	1826	MD50-16-115183	1933	MD50-16-126557	2094	MD50-17-131722	1987
50-603503	237	49,672	24,002	MD50-15-93018	4296	MD50-15-105255	4350	MD50-16-115184	4780	MD50-16-126558	5263	MD50-17-131723	4780
50-603503	347	45,400	19,743	MD50-15-93019	3222	MD50-15-105256	3061	MD50-16-115185	4028	MD50-16-126559	4726	MD50-17-131724	4296
50-603503	450	41,420	15,750	MD50-15-93020	2309	MD50-15-105257	2470	MD50-16-115186	2846	MD50-16-126560	3061	MD50-17-131725	2900
50-613182	550	37,339	11,682	MD50-15-93015	2578	MD50-15-105252	3652	MD50-16-115181	3330	MD50-16-126555	3920	MD50-17-131720	2846
50-613182	632.5	34,148	8478	MD50-15-93016	59.1 (U)	MD50-15-105253	53.2	MD50-16-115182	64.4	MD50-16-126556	64.4	MD50-17-131721	64.4
50-613183	550	36,957	11,288	MD50-15-93008	3706	MD50-15-105245	4887	MD50-16-115174	3867	MD50-16-126548	4619	MD50-17-131713	5156

Table 3.2-17 (continued)

Location ID	Depth (ft bgs)	Tier 2 Screening Level		March–April 2015		October 2015		April 2016		October 2016		April 2017	
		Porous Media Flow	Fracture Flow	Sample ID	Result	Sample ID	Result	Sample ID	Result	Sample ID	Result	Sample ID	Result
50-613183	642.5	33,372	7715	MD50-15-93009	85.9	MD50-15-105246	118	MD50-16-115175	107	MD50-16-126549	113	MD50-17-131714	118
50-613184	500	38,470	12,801	MD50-15-92993	4135	MD50-15-105230	4404	MD50-16-115159	4780	MD50-16-126534	5908	MD50-17-131699	5156
50-613184	600	34,593	8936	MD50-15-92994	537	MD50-15-105231	859	MD50-16-115160	859	MD50-16-126535	1128	MD50-17-131700	1020
50-613184	664.5	32,088	6431	MD50-15-92995	129	MD50-15-105232	145	MD50-16-115161	113	MD50-16-126536	172	MD50-17-131701	69.8
50-613185	145	51,998	26,328	MD50-15-93021	3598	MD50-15-105258	3652	MD50-16-115187	3974	MD50-16-126561	3759	MD50-17-131726	4082
50-613185	235	48,502	22,845	MD50-15-93022	5908	MD50-15-105259	6445	MD50-16-115188	6445	MD50-16-126562	6982	MD50-17-131727	7519
50-613185	350	44,052	18,382	MD50-15-93023	3491	MD50-15-105260	3491	MD50-16-115189	3813	MD50-16-126563	3115	MD50-17-131728	3974
50-613185	450	40,174	14,504	MD50-15-93024	1504	MD50-15-105261	1611	MD50-16-115190	1826	MD50-16-126564	1772	MD50-17-131729	1933
50-613185	600	34,364	8694	MD50-15-93025	129	MD50-15-105262	145	MD50-16-115191	177	MD50-16-126565	102	MD50-17-131730	177

Table 3.2-17 (continued)

Location ID	Depth (ft bgs)	Tier 2 Screening Level		October 2017		January–February 2019		January–February 2020	
		Porous Media Flow	Fracture Flow	Sample ID	Result	Sample ID	Result	Sample ID	Result
50-24784	155	53,511	27,841	MD50-17-146521	2202	MD50-19-166032	2954	MD50-20-191444	140
50-24784	244	50,053	24,396	MD50-17-146522	2578	MD50-19-166033	1665	—	—
50-24784	362	45,489	19,819	MD50-17-146523	3545	MD50-19-166034	2739	MD50-20-191446	3100
50-24784	450	42,069	16,412	MD50-17-146524	1504	MD50-19-166035	1235	MD50-20-191447	1300
50-24813	25	57,809	32,139	MD50-17-146525	4780	MD50-19-166036	8593	MD50-20-191452	8100
50-24813	150	52,964	27,295	MD50-17-146526	**41,890**	MD50-19-166037	**30,075**	MD50-20-191453	**33,000**
50-24813	241	49,430	23,773	MD50-17-146527	**75,187**	MD50-19-166038	**75,187**	MD50-20-191454	**75,000**
50-24813	358	44,904	19,234	MD50-17-146528	**64,446**	MD50-19-166039	**43,501**	—	—
50-24813	450	41,331	15,674	MD50-17-146529	**33,297**	MD50-19-166040	**25,241**	MD50-20-191456	**27,000**
50-24813	600	35,521	9864	MD50-17-146530	4780	MD50-19-166041	4082	—	—
50-24822	25	56,677	31,020	MD50-17-146531	6445	MD50-19-166042	5317	—	—
50-24822	142	52,151	26,481	MD50-17-146532	20,408	MD50-19-166043	20,408	—	—
50-24822	235	48,540	22,883	MD50-17-146533	**33,834**	MD50-19-166044	**30,612**	MD50-20-191466	**33,000**
50-24822	351	44,052	18,382	MD50-17-146534	**53,705**	MD50-19-166045	**21,482**	MD50-20-191467	**24,000**
50-24822	450	40,212	14,555	MD50-17-146535	**15,574**	MD50-19-166046	10,204	MD50-20-191468	11,000
50-603061	25	56,677	31,020	MD50-17-146536	591	MD50-19-166047	537	—	—
50-603061	128	52,698	27,028	MD50-17-146537	2954	MD50-19-166048	2470	—	—
50-603061	228	48,820	23,150	MD50-17-146538	3545	MD50-19-166049	4404	—	—
50-603061	347	44,204	18,535	MD50-17-146539	2148	MD50-19-166050	1880	—	—
50-603061	450	40,212	14,555	MD50-17-146540	967	MD50-19-166051	859	—	—
50-603062	122	51,490	25,820	MD50-17-146541	6445	MD50-19-166052	6445	—	—
50-603062	217	47,803	22,146	MD50-17-146542	8593	MD50-19-166053	8056	MD50-20-191579	8600
50-603062	337	43,162	17,492	MD50-17-146543	3007	MD50-19-166054	2524	MD50-20-191580	3000
50-603062	450	38,776	13,119	MD50-17-146544	913	MD50-19-166055	913	MD50-20-191581	1000
50-603063	25	56,715	31,058	MD50-17-146545	53.7 (U)	MD50-19-166056	806	—	—
50-603063	128	52,736	27,066	MD50-17-146546	913	MD50-19-166057	8593	—	—
50-603063	228	48,858	23,188	MD50-17-146547	9667	MD50-19-166058	22,556	—	—
50-603063	347	44,243	18,586	MD50-17-146548	**29,538**	MD50-19-166059	10,204	—	—
50-603063	450	40,250	14,593	MD50-17-146549	**21482**	MD50-19-166060	9130	—	—
50-603064	113	52,418	26,761	MD50-17-146550	**26,852**	MD50-19-166061	18,260	MD50-20-191484	23,000
50-603064	214	48,502	22,845	MD50-17-146551	**41,353**	MD50-19-166062	**31,149**	MD50-20-191485	**32,000**
50-603064	332	43,938	18,268	MD50-17-146552	17,186	MD50-19-166063	15,037	MD50-20-191486	17,000
50-603064	500	37,428	11,758	MD50-17-146553	2202	MD50-19-166064	1719	MD50-20-191487	2600
50-603383	26	57,885	32,215	MD50-17-146554	392	MD50-19-166065	2954	—	—
50-603383	139	53,511	27,841	MD50-17-146555	4565	MD50-19-166066	5370	—	—

Table 3.2-17 (continued)

Location ID	Depth (ft bgs)	Tier 2 Screening Level		October 2017		January–February 2019		January–February 2020	
		Porous Media Flow	Fracture Flow	Sample ID	Result	Sample ID	Result	Sample ID	Result
50-603383	244	49,430	23,773	MD50-17-146556	6982	MD50-19-166067	6445	—	—
50-603383	359	44,980	19,310	MD50-17-146557	3383	MD50-19-166068	2900	—	—
50-603383	450	41,458	15,789	MD50-17-146558	1719	MD50-19-166069	1611	—	—
50-603467	143	53,003	27,333	MD50-17-146559	14,500	MD50-19-166070	15,037	MD50-20-191502	10,000
50-603467	244	49,087	23,430	MD50-17-146560	**26,315**	MD50-19-166071	20,408	MD50-20-191503	5300
50-603467	360	44,586	18,929	MD50-17-146561	**24,704**	MD50-19-166072	17,723	MD50-20-191504	3000
50-603467	500	39,170	13,500	MD50-17-146562	10,204	MD50-19-166073	8056	MD50-20-191505	2800
50-603467	600	35,292	9622	MD50-17-146563	5102	MD50-19-166074	4404	MD50-20-191506	2000
50-603468	142	52,380	26,723	MD50-17-146564	15,574	MD50-19-166075	12,352	MD50-20-191512	15,000
50-603468	233	48,858	23,188	MD50-17-146565	**34,371**	MD50-19-166076	23,093	MD50-20-191513	**26,000**
50-603468	354	44,166	18,497	MD50-17-146566	**35,445**	MD50-19-166077	**21,482**	MD50-20-191514	**28,000**
50-603468	403	42,272	16,602	MD50-17-146567	**32,760**	MD50-19-166078	**19,871**	MD50-20-191515	**18,000**
50-603470	83	54,783	29,126	MD50-17-146571	10,741	MD50-19-166082	9667	MD50-20-191526	9700
50-603470	203	50,129	24,472	MD50-17-146572	**47,260**	MD50-19-166083	**32,760**	MD50-20-191527	**33,000**
50-603470	278	47,230	21,561	MD50-17-146573	**49,409**	MD50-19-166084	**40,816**	MD50-20-191528	**49,000**
50-603470	351	44,395	18,738	MD50-17-146574	**41,890**	MD50-19-166085	**26,852**	MD50-20-191529	**40,000**
50-603470	450	40,556	14,899	MD50-17-146575	**22,556**	MD50-19-166086	**18,797**	MD50-20-191530	**20,000**
50-603470	600	34,745	9088	—	—	—	—	—	—
50-603470	650	32,813	7143	MD50-17-146576	75.2	MD50-19-166087	102	MD50-20-191531	91
50-603471	90	54,706	29,037	MD50-17-146577	3813	MD50-19-166088	9667	MD50-20-191539	12,000
50-603471	209	50,091	24,434	MD50-17-146578	**39,742**	MD50-19-166089	**44,038**	MD50-20-191540	**44,000**
50-603471	288	47,027	21,370	MD50-17-146579	**35,982**	MD50-19-166090	**48,334**	MD50-20-191541	**53,000**
50-603471	360	44,243	18,586	MD50-17-146580	**45,649**	MD50-19-166091	**39,742**	MD50-20-191542	**45,000**
50-603471	450	40,759	15,089	MD50-17-146581	**19,871**	MD50-19-166092	**26,852**	MD50-20-191543	11,000
50-603471	—	—	—	MD50-17-147715	9130	MD50-19-166130	13,426	MD50-20-191538	17,000
50-603472	27	57,618	31,948	MD50-17-146585	1772	MD50-19-166098	1987	MD50-20-191554	2300
50-603472	146	53,003	27,333	MD50-17-146586	10,741	MD50-19-166099	10,741	MD50-20-191555	11,000
50-603472	292	47,345	21,675	MD50-17-146587	20,945	MD50-19-166100	**26,852**	MD50-20-191556	7500
50-603472	364	44,548	18,891	MD50-17-146588	17,186	MD50-19-166101	**20,408**	MD50-20-191557	**24,000**
50-603472	450	41,217	15,560	MD50-17-146589	8056	MD50-19-166102	12,352	MD50-20-191558	5200
50-603503	133	53,702	28,032	MD50-17-146592	1987	MD50-19-166105	2578	MD50-20-191586	2300
50-603503	237	49,672	24,002	MD50-17-146593	4887	MD50-19-166106	5156	MD50-20-191587	5200
50-603503	347	45,400	19,743	MD50-17-146594	4404	MD50-19-166107	4780	MD50-20-191588	5300
50-603503	450	41,420	15,750	MD50-17-146595	3115	MD50-19-166108	3115	MD50-20-191589	3500
50-613182	550	37,339	11,682	MD50-17-146590	4135	MD50-19-166103	4028	MD50-20-191564	4600
50-613182	632.5	34,148	8478	MD50-17-146591	51.6 (U)	MD50-19-166104	46.2 (J)	MD50-20-191565	64 (J)
50-613183	550	36,957	11,288	MD50-17-146583	4511	MD50-19-166093	4672	MD50-20-191550	5000

Table 3.2-17 (continued)

Location ID	Depth (ft bgs)	Tier 2 Screening Level		October 2017		January–February 2019		January–February 2020	
		Porous Media Flow	Fracture Flow	Sample ID	Result	Sample ID	Result	Sample ID	Result
50-613183	642.5	33,372	7715	MD50-17-146584	113	MD50-19-166094	124	MD50-20-191551	200
50-613184	500	38,470	12,801	MD50-17-146568	6982	MD50-19-166079	5048	MD50-20-191520	5900
50-613184	600	34,593	8936	MD50-17-146569	1343	MD50-19-166080	1128	MD50-20-191521	1400
50-613184	664.5	32,088	6431	MD50-17-146570	247	MD50-19-166081	193	MD50-20-191522	220
50-613185	145	51,998	26,328	MD50-17-146596	4458	MD50-19-166109	3706	MD50-20-191594	4000
50-613185	235	48,502	22,845	MD50-17-146597	8056	MD50-19-166110	6982	MD50-20-191595	7500
50-613185	350	44,052	18,382	MD50-17-146598	4726	MD50-19-166111	4189	MD50-20-191596	5000
50-613185	450	40,174	14,504	MD50-17-146599	2256	MD50-19-166112	1933	MD50-20-191597	2400
50-613185	600	34,364	8694	MD50-17-146600	226	MD50-19-166113	226	MD50-20-191598	300

Note: Units are μg/m^3. Data qualifiers are defined in Appendix A. Bold indicates result exceeds Tier 2 screening level for fracture flow. Shading indicates value exceeds Tier 2 screening level for porous media flow.

* — = Not sampled or no valid data.

Table 3.2-18
Regional Wells in the MDA C Monitoring Group

Well	Screen	Depth (ft bgs)	Hydro-stratigraphic Unit	Total No. of Sampling Events[a]	Earliest Sampling Event	Most Recent Sampling Event	Sampling System	Chronology of Events Relevant to Groundwater Sampling
R-14	Screen 1 MP1A	1204	Puye Formation	11	9-Feb-04	8-Nov-07	Westbay system	Multiple-screened regional well was completed on 19-Dec-02. Westbay multiport sampling system was installed on 20-Feb-03. Westbay system was removed 10-Feb-08. Screen 2 was plugged and abandoned 20-Feb-08. Redeveloped and completed as single screen well 12-May-08. Dedicated pump installed 14-May-08.
	Screen 2 MP2A	1286.5	Puye Formation	12	11-Feb-04	8-Nov-07	Westbay system	
	Single	1201	Puye Formation	21	14-May-08	18-Nov-20	Dedicated Grundfos pump	
R-46	Single	1340	Puye Formation	17	13-May-09	17-Nov-20	Dedicated Grundfos pump	Single-screen regional well was completed on 26-Feb-09. Dedicated submersible pump installed on 13-May-09.
R-60	Single	1330	Puye Formation	9	16-Dec-10	16-Nov-20	Dedicated Grundfos pump	Single-screen regional well was completed on 18-Oct-10. Dedicated submersible pump installed on 4-Dec-10.
R-17[b]	Screen 1	1057	Puye Formation	22	19-Oct-06	30-Oct-20	Baski dual-valve system	Multiple screened regional well was completed on 4-Jan-06. Baski dual valve sampling system was installed on 12-Dec-06
	Screen 2	1124	Puye Formation	22	17-Oct-06	30-Oct-20	Baski dual-valve system	

Sources: Well completion reports for R-14 (LANL 2003, 076062); R-17 (Kleinfelder 2006, 092493); R-46 (LANL 2009, 105592); and R-60 (LANL 2011, 111798). Well rehabilitation and conversion summary report for R-14 (LANL 2008, 101462). Well Screen Analysis Report, Revision 2 (LANL 2007, 096330).

[a] Sampling events for analyses by off-site laboratories. This total includes samples submitted for limited analytical suites.

[b] R-17 is included here for comparison as a nearby background well. It is assigned to the General Surveillance monitoring group (N3B 2020, 700927).

Table 3.2-19
Statistical Summary of Organic Chemicals Detected in Groundwater Samples from MDA C Groundwater Monitoring Network Wells for the Period Extending from November 2012 to November 2020

Chemical	Well	Port Name	Port Depth (ft)	Number of Analyses	Number of Detects	Average Detected Concentration (µg/L)	Maximum Detected Concentration (µg/L)	PQL (µg/L)	Standard Used for Screening[a] (µg/L)	Standard Source[b]	Value > Standard	1/2 Standard	Value >1/2 Standard	Comment
Acetone	R-14	S1	1200.6	14	1	2.16	2.16	10	14,100	NMED Tap SL	0	7050	0	Detected once below the PQL
	R-17	S1	1057	8	2	7.2	10.9	10	14,100	NMED Tap SL	0	7050	0	Maximum detection in September 2020
	R-46	Single	1340	14	3	2.46	2.84	10	14,100	NMED Tap SL	0	7050	0	All detections below the PQL
	R-60	Single	1330	14	1	2.21	2.21	10	14,100	NMED Tap SL	0	7050	0	Detected once below the PQL
Benzoic acid	R-17	S1	1057	8	1	13.5	13.5	10–22	75,000	EPA Tap SL	0	37,500	0	Detected once below the PQL
	R-46	Single	1340	13	2	13.8	14.4	10.4–23.3	75,000	EPA Tap SL	0	37,500	0	Detected twice below the PQL
Bis(2-ethylhexyl)phthalate	R-17	S1	1057	8	1	3.16	3.16	1–11	6	EPA MCL	0	3	1	Detected once below the PQL
	R-46	Single	1340	13	2	1.93	3.51	1–11.6	6	EPA MCL	0	3	1	Detected twice below the PQL
Di-n-butylphthalate	R-46	Single	1340	13	1	4.01	4.01	5.21–11.6	900	EPA Tap SL	0	450	0	Detected once below the PQL
Diethylphthalate	R-46	Single	1340	13	1	3.82	3.82	5.21–11.6	15,000	EPA Tap SL	0	7500	0	Detected once below the PQL
Nitrosodiethylamine[N-]	R-60	Single	1330	16	1	0.000183	0.000183	0.0005–11.2	0.00167	NMED Tap SL	0	0.000835	0	Detected once below the PQL
Nitrosodimethylamine[N-]	R-46	Single	1330	16	1	0.000621	0.000621	0.0005–11.6	0.00491	NMED Tap SL	0	0.002455	0	Detected once
Phenol	R-17	S1	1057	8	1	3.62	3.62	5–11	5,760	NMED Tap SL	0	2880	0	Detected once below the PQL

Source: Environmental Information Management (EIM) database.

[a] Lowest applicable regulatory standard or other type of screening level.

[b] Reference for standard used for screening:

EPA MCL = EPA maximum contaminant level (40 Code of Federal Regulations Part 141).

EPA Tap SL = EPA regional screening level for tap water (https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables).

NMED Tap SL = NMED screening level for tap water (NMED 2019, 700550).

Table 3.2-20
Number of Sampling Events for Organic COPCs
Detected at Least Twice in the Same Screened Interval

Suite	Analyte	Well			
		R-14 S1	R-17 S1	R-46	R-60
SVOC	Benzoic acid	—*	—	13	—
	Bis(2-ethylhexyl)phthalate	—	—	13	—
VOC	Acetone	—	8	14	—

Source: Environmental Information Management (EIM) database.
* — = Not detected or only detected once.

Table 3.2-21
Nondetected Organic Analytes with MDLs Greater Than Applicable Regulatory Standards

Analyte	Units	Standard Used for Screening[a]	Standard Source[b]	Minimum MDL	Maximum MDL
SVOCs					
Atrazine	µg/L	3	NM GW Std	0.2	4.2
Azobenzene	µg/L	1.2	EPA Tap SL	0.16	3.49
Benzidine	µg/L	0.00109	NMED Tap SL	0.25	9.4
Benzo(a)anthracene	µg/L	0.12	NMED Tap SL	0.0163	0.349
Benzo(a)pyrene	µg/L	0.2	NM GW Std	0.0163	0.489
Bis(2-chloroethyl)ether	µg/L	0.137	NMED Tap SL	0.03	3.49
Dibenz(a,h)anthracene	µg/L	0.0343	NMED Tap SL	0.0163	0.349
Dichlorobenzidine[3,3'-]	µg/L	1.25	NMED Tap SL	0.039	5.9
Dinitro-2-methylphenol[4,6-]	µg/L	1.52	NMED Tap SL	1	3.49
Dinitrotoluene[2,4-]	µg/L	2.37	NMED Tap SL	0.0769	3.49
Dinitrotoluene[2,6-]	µg/L	0.485	NMED Tap SL	0.0769	3.49
Hexachlorobenzene	µg/L	1	EPA MCL	0.00638	3.49
Hexachlorobutadiene	µg/L	1.39	NMED Tap SL	0.3	3.49
Nitrobenzene	µg/L	1.4	NMED Tap SL	0.0769	3.49
Nitrosodiethylamine[N-]	µg/L	0.00167	NMED Tap SL	0.00018	3.49
Nitrosodimethylamine[N-]	µg/L	0.00491	NMED Tap SL	0.00036	3.49
Nitroso-di-n-butylamine[N-]	µg/L	0.0273	NMED Tap SL	0.00047	3.49
Nitroso-di-n-propylamine[N-]	µg/L	0.11	EPA Tap SL	0.00047	3.49
Nitrosopyrrolidine[N-]	µg/L	0.37	NMED Tap SL	0.00047	3.49
Pentachlorophenol	µg/L	1	NM GW Std	0.0505	3.49

Table 3.2-21 (continued)

Analyte	Units	Standard Used for Screening[a]	Standard Source[b]	Minimum MDL	Maximum MDL
Tetrachlorobenzene[1,2,4,5-]	µg/L	1.66	NMED Tap SL	1.5	3.49
VOCs					
Acrolein	µg/L	0.0415	NMED Tap SL	0.5	14
Acrylonitrile	µg/L	0.523	NMED Tap SL	0.5	2.8
Chloro-1,3-butadiene[2-]	µg/L	0.187	NMED Tap SL	0.1	0.3
Dibromo-3-Chloropropane[1,2-]	µg/L	0.2	EPA MCL	0.00571	0.5
Dibromoethane[1,2-]	µg/L	0.05	NM GW Std	0.00571	0.5
Trichloropropane[1,2,3-]	µg/L	0.00835	NMED Tap SL	0.0183	1.7

Source: Environmental Information Management (EIM) database.

[a] Lowest applicable regulatory standard or other type of screening level.

[b] Reference for standard used for screening:
EPA MCL = EPA maximum contaminant level (Title 40 Code of Federal Regulations Part 141).
EPA Tap SL = EPA regional screening level for tap water (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).
NM GW Std = New Mexico Groundwater Human Health Standards (New Mexico Administrative Code 20.6.2).

Table 3.2-22
Screening of Metals and General Chemistry Parameter Results Detected in Groundwater Samples from November 2012 to November 2020

Chemical	Units	Background Concentrations[a]				Standard Used for Screening	Standard Source[b]	Maximum Detected Concentration[c]
		Minimum	Maximum	Average	UTL			
Metals								
Aluminum	µg/L	68.1	283	124	na[d]	5000	NM GW Std	—[e]
Antimony	µg/L	0.56	5.26	2.74	na	6	NM GW Std	5.26
Arsenic	µg/L	1.67	3.86	2.35	na	10	NM GW Std	3.77
Barium	µg/L	4.67	66.9	24.7	38.1	2000	NM GW Std	**39.8**
Beryllium	µg/L	2.36	2.36	2.36	na	4	NM GW Std	—
Boron	µg/L	15	25.4	17.6	na	750	NM GW Std	19.4
Cadmium	µg/L	0.378	0.378	0.378	na	5	NM GW Std	0.378
Calcium	mg/L	2.08	20.8	11.8	17.03	na	na	14.2
Chromium	µg/L	2.01	9.83	4.16	7.48	50	NM GW Std	6.61
Cobalt	µg/L	1.03	1.62	1.28	na	50	NM GW Std	1.39
Copper	µg/L	3.74	11.3	6.53	na	1000	NM GW Std	11.3
Iron	µg/L	30.3	184	61	na	1000	NM GW Std	**353**
Lead	µg/L	0.933	1.56	1.24	na	15	NM GW Std	2
Magnesium	mg/L	0.27	4.61	3.24	4.18	na	na	3.94
Manganese	µg/L	2.03	38.7	8.44	na	200	NM GW Std	25.4
Molybdenum	µg/L	0.648	3.14	1.4	2.5	1000	NM GW Std	1.75
Nickel	µg/L	0.503	7.23	1.27	2.9	200	NM GW Std	**59.7**
Potassium	mg/L	0.352	2.97	1.65	2.39	na	na	**2.49**
Selenium	µg/L	1.02	1.83	1.51	na	50	NM GW Std	—
Silver	µg/L	0.225	0.225	0.225	na	50	NM GW Std	0.225
Sodium	mg/L	8.01	18	11.3	16	na	na	12.2
Strontium	µg/L	8.58	203	56.9	157	11800	NMED Tap SL	51.9
Tin	µg/L	3.42	27.1	8.267	na	12000	EPA Tap SL	5.91
Thallium	µg/L	0.338	0.687	0.507	na	2	NM GW Std	**1.16**

Table 3.2-22 (continued)

Chemical	Units	Background Concentrations[a]				Standard Used for Screening	Standard Source[b]	Maximum Detected Concentration[c]
		Minimum	Maximum	Average	UTL			
Uranium	µg/L	0.131	1.4	0.516	1.19	30	NM GW Std	0.93
Vanadium	µg/L	1.37	13.9	6.2	11.4	63.1	NMED Tap SL	9.04
Zinc	µg/L	3.3	65	9.02	na	5960	NMED Tap SL	29.2
General Chemistry Parameters								
Alkalinity-CO_3+HCO_3	mg/L	47.6	81.3	60.4	72.9	na	na	62.8
Ammonia as N	mg/L	0.016	0.331	0.0652	na	na	na	0.311
Bromide	mg/L	0.0668	0.116	0.0813	na	na	na	0.118
Chloride	mg/L	1.46	3.28	2.08	2.7	250	NM GW Std	3.82
Cyanide (Total)	mg/L	0.00246	0.00246	0.00246	na	0.2	NM GW Std	0.0025
Fluoride	mg/L	0.0769	0.507	0.249	0.377	1.6	NM GW Std	0.398
Hardness	mg/L	30.8	56.8	43	67.1	na	na	49.8
Nitrate-Nitrite as N	mg/L	0.0254	0.955	0.446	0.769	10	EPA MCL	0.548
Perchlorate	µg/L	0.123	0.455	0.315	0.414	13.8	NMED Tap SL	0.374
Silicon Dioxide	mg/L	37.8	92.5	70.4	81.9	na	na	**86.3**
Sulfate	mg/L	1.29	6.96	2.7	4.59	600	NM GW Std	**5.77**
Total Dissolved Solids	mg/L	74.3	187	131	161	1000	NM GW Std	244
Total Kjeldahl Nitrogen	mg/L	0.0339	0.193	0.0769	na	na	na	0.317
Total Organic Carbon	mg/L	0.33	1.37	0.625	1.08	na	na	2.44
Total Phosphate as P	mg/L	0.015	0.211	0.0593	na	na	na	0.084

Note: Bolded value indicates maximum concentration greater than UTL. Shaded cell indicates maximum concentration greater than background maximum.

[a] Source: LANL (2016, 601920).

[b] Reference for standard used for screening:
EPA MCL = EPA maximum contaminant level (Title 40 Code of Federal Regulations Part 141).
EPA Tap SL = EPA regional screening level for tap water (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).
NM GW Std = New Mexico Groundwater Human Health Standards (New Mexico Administrative Code 20.6.2).
NMED Tap SL = NMED screening level for tap water (NMED 2019, 700550, Table A-1).

[c] Source: Environmental Information Management (EIM) database.

[d] na = Not available.

[e] — = Not detected.

Table 7.0-1
Summary of Potential Remedial Action Technologies

Area	No Action	Containment Technologies	In Situ Treatment	Excavation	Ex Situ Treatment
Pits and Shafts Exposure pathways of concern include • direct exposure to waste via erosion, biointrusion, waste subsidence, or excavation • exposure to contaminated surface and/or subsurface soils via excavation or biointrusion • creation of contaminated leachate from infiltration of water into the waste • volatilization of VOCs from waste or contaminated subsurface soils with vapor transport through pore gas to groundwater	Alternative 1 No action	Alternative 2 – Soil barrier Alternative 3A – Multilayer cover Alternative 3B – ET cover	n/a*	Alternative 4 – Excavation of pits and shafts with off-site disposal	Alternative 4 – Elementary neutralization of corrosive liquids
Vadose Zone Exposure pathway includes • volatilization of VOCs from waste or volatilization/vapor diffusion from contaminated subsurface soils with vapor transport through pore gas to groundwater	Alternative 1 No action	n/a	Alternative 2 – Natural attenuation of SVE plume Alternative 3A – Plume Area SVE Alternative 3B – Plume Area SVE Alternative 4 – Plume Monitoring	n/a	n/a

Note: Groundwater and vapor monitoring and institutional controls will be implemented in conjunction with all technologies other than the no-action technology.
* n/a = Not applicable.

Table 7.1-1
Screening of Alternatives against the Threshold-Screening Criteria

Alternative	Description	Threshold-Screening Criteria			
		Protective of HH&E*	Attains Media Cleanup Standards	Controls Source and Releases	Complies with Waste Management Standards
Alternative 1 No action	This technology includes no groundwater or vapor monitoring, no maintenance, and no institutional controls.	No Potential remains for exposure through erosion, direct contact, and biointrusion.	No Does not comply with the EPA guidance for attaining media cleanup standards when waste is left in place.	No No source removal or control. No monitoring of VOC releases.	Yes No waste will be generated.
Alternative 2 Soil barrier, natural attenuation, and institutional controls	Existing soil cover will be maintained and repaired as needed. Groundwater and vapor monitoring will be conducted for 100 yr. Institutional controls will be implemented for 100 yr.	Yes Existing soil cover provides protection against erosion, direct contact, and moisture infiltration. Monitoring and institutional controls will provide protection for biointrusion and vapor migration. Current conditions pose no unacceptable risk and will be maintained.	Yes Complies with the EPA guidance for attaining media cleanup standards when waste is left in place. Media cleanup standards are not currently exceeded.	Yes Existing soil cover controls moisture infiltration and provides protection from exposure to waste and soils. Natural attenuation and properties of stratigraphic units control vapor migration to groundwater.	Yes No waste will be generated.

Table 7.1-1 (continued)

Alternative	Description	Threshold-Screening Criteria			
		Protective of HH&E*	Attains Media Cleanup Standards	Controls Source and Releases	Complies with Waste Management Standards
Alternative 3A Multilayer cover, SVE, and institutional controls	• A multilayer cover will be constructed over the pits/ shafts/impoundments. • A SVE system will be installed and operated to remove VOC vapors from the vadose zone • Groundwater and vapor monitoring will be conducted for 100 yr. • Institutional controls will be implemented for 100 yr.	Yes The multilayer cover provides protection against erosion, direct contact, biointrusion, and moisture infiltration. SVE prevents potential future migration of vapors to groundwater. Institutional controls restrict site access.	Yes Complies with the EPA guidance for attaining media cleanup standards when waste is left in place. SVE will ensure media cleanup standards are not exceeded in the future.	Yes The cover will minimize/ eliminate moisture infiltration. The cover will provide protection from exposure to waste and soils and reduce erosion. SVE will remove potential source of groundwater contamination.	Yes Any waste generated under this technology will comply with all applicable regulatory requirements.
Alternative 3B ET cover, SVE, and institutional controls	• An ET cover will be constructed over the pit/shafts/impoundments. • A SVE system will be installed and operated to remove VOC vapors from the vadose zone • Groundwater and vapor monitoring will be conducted for 100 yr. • Institutional controls will be implemented for 100 yr.	Yes The ET cover provides protection against erosion, direct contact, biointrusion, and moisture infiltration. SVE prevents potential future migration of vapors to groundwater. Institutional controls restrict site access.	Yes Complies with the EPA guidance for attaining media cleanup standards when waste is left in place. SVE will ensure media cleanup standards are not exceeded in the future.	Yes The cover will minimize/eliminat e moisture infiltration. The cover will provide protection from exposure to waste, soils, and reduce erosion. SVE will remove potential source of groundwater contamination.	Yes Any waste generated under this technology will comply with all applicable regulatory requirements.

Table 7.1-1 (continued)

Alternative	Description	Threshold-Screening Criteria			
		Protective of HH&E*	Attains Media Cleanup Standards	Controls Source and Releases	Complies with Waste Management Standards
Alternative 4 Waste excavation, plume monitoring, and institutional controls	• Waste from the pits and shafts will be excavated and sent off-site for treatment and/or off-site disposal. • The excavated areas will be backfilled with clean fill material. Some treated waste may be returned to the unit if it meets the media cleanup standards. • VOCs in the subsurface will continue to be monitored semi-annually to determine if the vadose plume beneath the excavated pits and shafts is releasing contaminants to the groundwater.. Field tests will be conducted to determine if the existing boreholes outside the excavated and backfilled area can be upgraded for passive venting, if required A trigger mechanism will be proposed to determine if a passive or active SVE system will need to be installed and operated to remove VOC vapors from the vadose zone. • Institutional controls will be implemented for 100 yr.	Yes Removal of the waste will be protective of HH&E by eliminating the source.	Yes The pits and shafts will be excavated. Plume monitoring will ensure media cleanup standards are not exceeded in the future.	Yes Excavation will remove the source material in the pits and shafts and prevent future releases. The plume beneath the source area will be monitored. Passive and/or active SVE, if required, will remove potential source of groundwater contamination.	Yes Any waste generated and disposed under this technology will comply with all applicable regulatory requirements. This includes complying with WAC for off-site disposal of excavated wastes.

*HH&E = Human health and the environment.

Table 7.1-2
Performance Objectives and Regulatory Criteria for MDA Covers

No.	Performance Objectives	Regulatory Criteria	Guidance
1	Minimize risk to ALARA[a]	DOE Order 458.1	
2	Long-term effectiveness with design life of 1000 yr, but not less than 200 yr	40 CFR 192.02	DOE Technical Approach Document (1989, 099296) Dwyer et al. (1997, 096232)
3	Provide reasonable assurance that releases of radon-222 from residual radioactive material to the atmosphere will not exceed an average release rate of 20 pCi/m2/s.	40 CFR 192.02	RAECOM code
4	All plans for the management and disposal of wastes must provide for institutional controls and long-term stewardship of the disposal facility necessary to ensure continued performance.	DOE Order 458.1	
5	The Consent Order specifies the factors that are to be considered in evaluating corrective measure alternatives. All alternatives must be able to meet the following four threshold criteria: • Be protective of human health and the environment; • Attain media cleanup standards; • Control the source or sources of releases so as to reduce or eliminate, to the extent possible, further releases of contaminants that may pose a threat to human health and the environment; and • Comply with applicable standards for management of wastes. Alternatives that meet these four criteria are then given a comparative evaluation against the following five balancing criteria to recommend a preferred alternative: • long-term reliability and effectiveness; • reduction of contaminant toxicity, mobility, or volume; • short-term effectiveness; • implementability; and • cost.	Consent Order	All listed
6	Covers shall be designed to minimize to the extent practicable water infiltration, to direct percolating or surface water away from the disposed waste, and to resist degradation by surface geologic processes and biotic activity	20.3.13.1313 NMAC 10 CFR 61.51	DOE Technical Approach Document (1989, 099296) Dwyer et al. (1997, 096232)
7	Surface features shall direct surface water drainage away from disposal units at velocities and gradients which will not result in erosion that will require ongoing active maintenance in the future.	20.3.13.1313 NMAC 10 CFR 61.51	DOE Technical Approach Document (1989, 099296) Dwyer et al. (1997, 096232)

Table 7.1-2 (continued)

No.	Performance Objectives	Regulatory Criteria	Guidance
8	The disposal site shall be designed to complement and improve, where appropriate, the ability of the disposal site's natural characteristics to assure that the performance objectives will be met.	20.3.13.1313 NMAC 1 0 CFR 61.51	DOE Technical Approach Document (1989, 099296) Dwyer et al. (1997, 096232)
9	Surface features shall direct surface water drainage away from disposal units at velocities and gradients which will not result in erosion that will require ongoing active maintenance in the future	20.3.13.1313 NMAC 10 CFR 61.51	DOE Technical Approach Document (1989, 099296) Dwyer et al. (1997, 096232)
10	The disposal site shall be designed to minimize to the extent practicable the contact of water with waste during storage, the contact of standing waste with water during disposal and the contact of percolating or standing water with wastes after disposal	20.3.13.1313 NMAC 10 CFR 61.51	DOE Technical Approach Document (1989, 099296) Dwyer et al. (1997, 096232)
11	The cover shall have soil/gravel admixture designed to minimize erosion	ALARA & NUREG[b] 1623	DOE Technical Approach Document (1989, 099296) Dwyer et al. (1997, 096232)
12	Soil loss less than 2 tons/acre/yr		"Design and Construction of RCRA/CERCLA[c] Final Covers" (EPA 1991, 097899).
13	1000-yr performance period	DOE Order 435.1	
14	100-yr institutional control	DOE Order 435.1	
15	100-yr maintenance period – assumed under 100-yr institutional control	DOE Order 435.1	
16	100-yr monitoring period - assumed under 100-yr institutional control	DOE Order 435.1	

[a] ALARA = As low as reasonably achievable.

[b] NUREG = Nuclear Regulatory Commission.

[c] CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act.

Table 8.2-1
Alternative 2 Cost Estimate–Soil Barrier

	WBS	Item Description	Labor Cost	Material Cost	Equipment Cost	Subcontractor Cost	Other Costs	Gross Costs
Alternative 2 – Soil Barrier, Natural Attenuation, and Institutional Controls								
Direct Costs	**Surface Preparation**							
	1.1.7	Review Preparedness Documentation for Completeness	$3,561	—[a]	—	—	—	$3,561
	1.1.8	Subcontract development and prep for PSP[b] execution (assume MSA[c] available)	$132,797	—	—	—	—	$132,797
	1.1.9	Preparedness Review for Site Prep	$28,161	—	—	—	—	$28,161
	1.1.10	Subcontractor Mobilization & Site prep	$55,402	$121,385	$74,299	$95,547	—	$346,633
	1.1.11	Site Prep & Surface Material Application	—	$175,485	$690,990	$1,203,151	—	$2,069,626
	1.1.12	Demobilize Surface Application Equipment	—	—	$18,604	$18,050	—	$36,654
	1.1.13	Demobilize all Equipment from Site (including equipment decontamination and hydroseeding)	$9,493	—	$35,256	$225,351	—	$270,100
	1.1.15	Develop and Submit a Subccontractor Report	—	—	—	$24,834	—	$24,834
	1.1.16	Field Summary Report	$5,094	—	—	$11,440	—	$16,534
							Surface Preparation Total	**$2,928,900**
	O&M							
	1.2.2	Well Monitoring for 10 yr	—	—	—	$2,145,190	—	$2,145,190
	1.2.3	Cover Maintenance for 100 yr	$234,509	$296,870	$849,011	$3,221,481	—	$4,601,871
							O&M Total	**$6,747,061**

Table 8.2-1 (continued)

WBS		Item Description	Labor Cost	Material Cost	Equipment Cost	Subcontractor Cost	Other Costs	Gross Costs
Indirect Costs	**Indirect Capital Costs**							
	1.1.4	Project Management	$318,173	—	—	—	—	$318,173
	1.1.5	Project Support	$836,084	$57,661	—	—	—	$893,745
	1.1.6	Project Controls	$18,602	—	—	—	—	$18,602
							Indirect Capital Costs Total	**$1,230,520**
	Indirect O&M							
	1.2.1	Project Management	$1,364,475	$57,661	—	—	—	$1,422,136
							Indirect O&M Total	**$1,422,136**
	Total Unburdened Direct & Indirect Costs							$12,328,618
		Management Reserve						
		Management Reserve at 30%	—	—	—	—	$3,698,585	$3,698,585
							Alternative 2 – Soil Barrier, Natural Attenuation, and Institutional Controls	**$16,027,203**

[a]— = Not applicable.

[b] PSP = Project scope and planning.

[c] MSA = Master services agreement.

Table 8.2-2
MDA C Alternative 3A – Multi-Layer Cover Unburdened Cost Estimate

	Item Description	Labor Cost	Material Cost	Equipment Cost	Subcontractor Cost	Other Costs	Gross Cost
Alternative 3A – Multilayer (RCRA) Cover, Passive SVE, Institutional Controls							
Direct Costs	**Excavation**						
	Site Prep	$201,199	$ 251,957	$97,572	—	—	$550,728
	Cover Prep	$402,137	$3,768,953	$ 414,589	—	—	$4,585,679
	Extension and Retrofitting 24 Boreholes	—	—	—	$360,000	—	$360,000
	Retaining Wall	$708,689	$ 455,040	$60,749	—	—	$1,224,477
	Compacted Clay (2 ft)	$721,472	$2,661,227	$1,219,083	—	—	$4,601,782
	Geomembrane (40-mil HDPE[a])	$138,739	$ 592,554	$53,915	—	—	$785,209
	Drainage Layer (1 ft)	$116,136	$ 652,020	$119,496	—	—	$887,652
	Cover Soil/Surface Treatment (2 ft)	$327,775	$1,337,305	$379,039	—	—	$2,044,118
	Cover Armoring	$46,719	$19,274	$1,412	—	—	$67,405
	Vegetation	$115,467	$24,743	$24,743	—	—	$164,954
	TDR[b] Moisture Monitor	$4,846	$56,234	—	—	—	$61,080
						RCRA Cover Total	**$15,333,083**
	Craft Distributables						
	Craft Distributables	$717,121	$108,350	—	—	—	$825,471
	O&M						
	Passive SVE Operation (1-yr monitoring for 10 yr)	$76,173	—	—	—	—	$76,173
	Annual Passive SVE Report for 10 yr	$55,740	—	—	—	—	$55,740
	Well Monitoring for 10 yr	—	—		$2,145,190	—	$2,145,190
	ET Cover Maintenance for 100 yr	—	—	$29,862	$1,643,108	—	$1,672,971
						O&M Total	**$3,950,074**

Table 8.2-2 (continued)

	Item Description	Labor Cost	Material Cost	Equipment Cost	Subcontractor Cost	Other Costs	Gross Cost
Indirect Costs	**Indirect Capital Costs**						
	Design	—	—	—	$1,420,227	—	$1,420,227
	Project Management	$2,145,276	—	—	—	—	$2,145,276
	Construction Management	$2,165,847	—	—	—	—	$2,165,847
	Indirect Total	—	—	—	—	—	$5,731,350
	Indirect O&M						
	Project Management	$191,616	—	—	—	—	$191,616
	Construction Management	$36,203	—	—	—	—	$36,203
						Indirect O&M Total	**$227,819**
						Total Unburdened Costs	**$26,067,797**
	Management Reserve						
	Management Reserve (50.9%)	—	—	—	—	$13,201,365	$13,268,509
						Total Costs 3A – Multilayer (RCRA) Cover, SVE, Institutional Controls	**$39,336,306**

Notes: Labor costs are RS Mean's determination of the proper craft mix and productivity rate to complete the specific task in the detailed cost estimate in Appendix H. Material costs are products necessary to complete the specific tasks in the detailed cost estimate. Equipment costs are the mechanized and/or hand tools needed to complete the specific tasks in the detailed cost estimate. Subcontract costs are a lump-sum costs, usually based on past history, to complete the specific tasks in the detailed cost estimate. This includes material, labor, and equipment to perform the task. Craft distributables include a $7 per direct job hour cost to account for the nonlabor costs associated with temporary utilities/services, small tools, consumables, construction equipment not specifically identified in direct work line items, and training costs. Costs included in the above table are not burdened. Management Reserve costs are calculated at 50.9% of all other costs. Assume the vapor wells will be monitored for 10 yr. Assume the cover will be maintained for 100 yr with re-seeding performed every 10 yr.

[a] — = Not applicable.

[b] HDPE = High-density polyethylene.

[c] TDR = Time-domain reflectometer.

Table 8.2-3
Alternative 3B ET Cover Unburdened Cost Estimate

	WBS	Item Description	Labor Cost	Material Cost	Equipment Cost	Subcontractor Cost	Other Costs	Gross Costs
Alternative 3B - ET Cover, SVE, Institutional Controls								
Direct Costs	**ET Cover**							
	1.1.7	Review Preparedness Documentation for Completeness	$3,561	—	—	—	—	$3,561
	1.1.8	Subcontract development and prep for PSP execution (assume MSA available)	$132,797	—	—	—	—	$132,797
	1.1.9	Preparedness Review for ET Cover Installation	$28,161	—	—	—	—	$28,161
	1.1.10	Subcontractor Mobilization & Site prep	$55,402	$121,385	$74,299	$95,547	—	$346,633
	1.1.11	Cover Installation	—	$1,177,265	$889,768	$1,427,982	—	$3,495,015
	1.1.11.1	Retrofit Open Boreholes for Passive SVE	—	—	—	$360,000	—	$360,000
	1.1.11.2	Transport & Apply Aggregate to the Site	—	$1,177,265	$889,768	$1,067,982	—	$3,135,015
	1.1.12	Demobilize Cover Application Equipment	—	—	$18,604	$18,050	—	$36,654
	1.1.13	Demobilize all Equipment from Site (including equipment decontamination and hydroseeding)	$9,493	—	$35,256	$225,351	—	$270,100
	1.1.15	Develop and Submit a Subccontractor Report		—	—	$24,834	—	$24,834
	1.1.16	Field Summary Report	$7,617	—	—	$17,106	—	$24,723
							ET Cover Total	**$4,362,479**
	O&M							
	1.2.2	Vapor Monitoring for 10 yr	—	—	—	$2,145,190	—	$2,145,190
	1.2.3	Passive SVE Monitoring for 10 yr	$76,173	—	—	—	—	$76,173
	1.2.4	Annual Passive SVE Report for 10 yr	$55,740	—	—	—	—	$55,740
	1.2.5	ET Cover Maintenance for 100 yr	—	—	$29,862	$1,643,108	—	$1,672,971
							O&M Total	**$3,950,074**

Table 8.2-3 (continued)

	WBS	Item Description	Labor Cost	Material Cost	Equipment Cost	Subcontractor Cost	Other Costs	Gross Costs
Indirect Costs	**Indirect Capital Costs**							
	1.1.4	Project Management	$409,820	—	—	—	—	$409,820
	1.1.5	Project Support	$1,076,912	$72,960	—	—	—	$1,149,872
	1.1.6	Project Controls	$23,961	—	—	—	—	$23,961
							Indirect Capital Costs Total	**$1,583,653**
	Indirect O&M							
	1.2.1	Project Management	$191,616	—	—	—	—	$191,616
							Indirect O&M Total	**$191,616**
							Total Unburdened Direct & Indirect Costs	$10,087,822
	Management Reserve							
		Management Reserve at 20%	—	—	—	—	$1,991,182	$2,017,564
							Total Costs 3B – ET Cover, SVE, Institutional Controls	**$12,105,386**

[a] — = Not applicable.

[b] PSP = Project scope and planning.

[c] MSA = Master services agreement.

Table 8.2-4
MDA C Alternative 4 – Clean Closure Unburdened Cost Estimate

	Item Description	Labor Cost	Material Cost	Equipment Cost	Subcontractor Cost	Other Costs	Gross Cost
Alternative 4 – Excavation, Monitoring and Institutional Controls							
Direct Costs	**Excavation**						
	Site Prep	$4,631,737	$7,496,936	$2,676,173	—*	—	$14,804,846
	Site Excavation	$3,135,225	$2,541,786	$2,127,096	—	—	$7,804,107
	Site backfill	$2,698,644	$7,140,062	$2,939,977	—	—	$12,778,683
	Drill and Case 7 Boreholes	—	—	—	$78,750	—	$78,750
	Disposal of Waste	$55,748,451	—	$1,568	$319,263,562	—	$375,013,581
	Confirmatory Sampling	$70,924	—	$ 270	$2,618,552	—	$2,689,745
	Equipment Decontamination	$373,480	$2,834,204	—	—	—	$3,207,684
	Vegetation	$115,467	$24,743	$24,743	—	—	$164,954
						Excavation Total	**$416,542,350**
	Craft Distributables						
	Craft Distributables	$3,473,750	$876,504	—	—	—	$4,350,254
	O&M						
	Vapor Monitoring for 10 yr	—	—	—	$2,145,190	—	$2,145,190
						O&M Total	**$2,145,190**

Table 8.2-4 (continued)

	Item Description	Labor Cost	Material Cost	Equipment Cost	Subcontractor Cost	Other Costs	Gross Cost
Alternative 4 – Excavation, Monitoring and Institutional Controls							
Indirect Costs	**Indirect Capital Costs**						
	Design	—	—	—	$15,928,226	—	$15,928,226
	Project Management	$46,337,791	—	—	—	—	$46,337,791
	Construction Management	$48,299,752	—	—	—	—	$48,299,752
						Indirect Total	**$110,565,770**
	Indirect O&M						
	Project Management	$17,442	—	—	—	—	$17,442
	Construction Management	$17,442	—	—	—	—	$17,442
	Indirect O&M Total	—	—	—	—	—	$34,884
						Total Unburdened Costs	**$533,638,447**
	Management Reserve						
	Management Reserve (50.9%)	—	—	—	—	$271,581,886	$271,621,970
						Total Costs 4 – Excavation, SVE, Institutional Controls	**$805,260,417**

*— = Not applicable.

Table 9.1-1
Explanation of Rating System Used for Evaluating Remedial Alternative Evaluation Criteria

Balancing Criteria	Rating				
	1	2	3	4	5
Long-Term Reliability and Effectiveness	Not demonstrated as effective; potential for remedy failure.	→	→	→	Reduces risk with little long-term management and has proven effective under similar conditions.
Reduction of Toxicity, Mobility, or Volume	No reduction of toxicity, mobility, or volume of contaminants.	→	→	→	Completely and permanently reduces the toxicity, mobility, and volume of contaminants.
Short-Term Effectiveness	Provides no short-term risk reduction and may create significant additional risks to the community, workers, and the environment.	→	→	→	Quickly reduces short-term risk without creating significant additional risks.
Implementability	Difficult to implement. Significant amount of time needed for implementation.	→	→	→	Can be implemented quickly and easily and poses few difficulties.
Cost	Highest costs.	→	→	→	Less costly and does not sacrifice protection of human health and the environment.

Table 9.1-2
Screening of Alternatives against the Balancing Criteria

Alternative	Balancing Criteria	Rating Justification	Rating
Alternative 1 No Action	Long-Term Reliability and Effectiveness	This alternative is rated lowest in long-term reliability and effectiveness since there is high long-term risk, high uncertainty with leaving waste in place, potentially high amount of long-term management and monitoring, and high potential for remedy failure.	1
	Reduction of Toxicity, Mobility, or Volume	This alternative is rated lowest in reduction of toxicity, mobility, or volume since there is no reduction.	1
	Short-Term Effectiveness	This alternative is mid-rated for short-term effectiveness because no additional risk is generated, although no risk reduction is obtained.	2
	Implementability	This alternative is rated highest in implementability because it easiest to implement, as no remedy is required.	5
	Cost	This alternative is rated highest in the cost criteria because it has no associated costs.	5
		Total	**14**

Table 9.1-2 (continued)

Alternative	Balancing Criteria	Rating Justification	Rating
Alternative 2 Soil Barrier, Natural Attenuation, and Institutional Controls	Long-Term Reliability and Effectiveness	This alternative is rated next to lowest in long-term reliability and effectiveness since there is high uncertainty and potential for remedy failure in not having engineered controls and relying on institutional controls.	2
	Reduction of Toxicity, Mobility, or Volume	The existing soil cover reduces infiltration, therefore reducing mobility. This alternative is rated lower than Alternatives 3A and 3B because it does not include an engineered cover and does not include SVE to reduce contaminant volume.	2
	Short-Term Effectiveness	This alternative is mid-rated for short-term effectiveness because no additional risk is generated, although no risk reduction is obtained.	2
	Implementability	This alternative is more complicated that Alternative 1, but consists of easily implementable activities.	4
	Cost	This alternative has the lowest cost of the action alternatives.	4
		Total	**14**
Alternative 3A Multilayer cover, SVE, and institutional controls	Long-Term Reliability and Effectiveness	A multilayer cover with SVE is more reliable in the long-term compared with Alternatives 1 or 2. However, because of the potential for desiccation in the clay layers, it is rated as less reliable than Alternative 3B and Alternative 4, which includes excavation.	3
	Reduction of Toxicity, Mobility, or Volume	SVE will reduce volume and downward mobility of VOCs. The multilayer cover reduces infiltration, therefore reducing mobility. This alternative is comparable to Alternative 3B, except it will not last for the performance period and is rated lower than Alternative 4, which includes excavation.	3
	Short-Term Effectiveness	This alternative is comparable to Alternative 3B but is rated higher than Alternative 4, which includes excavation because of the risks associated with excavation and waste handling.	4
	Implementability	This alternative uses standard construction techniques. This alternative is comparable to Alternative 3B but is rated higher than Alternative 4, which includes excavation because of the additional difficulty with performing excavation and waste handling.	3
	Cost	This alternative is higher in cost then Alternative 3B but is rated higher than Alternative 4, which includes excavation because of its additional costs for excavation and waste handling.	2
		Total	**15**

Table 9.1-2 (continued)

Alternative	Balancing Criteria	Rating Justification	Rating
Alternative 3B ET cover, SVE, and institutional controls	Long-Term Reliability and Effectiveness	This alternative is more reliable in the long-term compared with Alternatives 1 and 2. This alternative is also rated higher than Alternative 3A because it does not have the desiccation issue associated with the clay layer. Excavation provides more long-term reliability; therefore, Alternative 4 is rated higher.	4
	Reduction of Toxicity, Mobility, or Volume	SVE will reduce volume and downward mobility of VOCs. The ET cover reduces infiltration, therefore reducing mobility. This alternative is rated higher than Alternative 3A, because the multilayer cover will not last for the performance period and is rated lower than Alternative 4, which includes excavation.	4
	Short-Term Effectiveness	This alternative is comparable to Alternative 3A but is rated higher than Alternative 4, which includes excavation because of the risks associated with excavation and waste handling.	4
	Implementability	This alternative uses standard construction techniques. This alternative is comparable with Alternative 3A but is rated higher than Alternative 4, which includes excavation because of the additional difficulty with performing excavation and waste handling.	3
	Cost	This alternative is lower in cost then Alternative 3A but is rated higher than Alternative 4, which includes excavation because of its additional costs for excavation and waste handling.	4
		Total	**19**
Alternative 4 Waste excavation, VOC plume monitoring, and institutional controls	Long-Term Reliability and Effectiveness	Excavation with plume monitoring provides the most reliable long-term effectiveness because all wastes are removed. This alternative is rated higher than all other alternatives.	5
	Reduction of Toxicity, Mobility, or Volume	Excavation reduces volume of waste at the site. Plume monitoring will determine if contaminant releases from the plume may effect groundwater. This alternative provides the greatest reduction in toxicity, mobility, or volume because all waste is removed; therefore, this alternative is rated higher than all other alternatives.	5
	Short-Term Effectiveness	This alternative is rated lower than all other alternatives because of the increased short-term risks associated with excavation and waste handling.	1
	Implementability	This alternative is rated lower than all other alternatives because of the additional difficulty with performing excavation.	2
	Cost	This alternative is rated lower than all other alternatives because of the additional costs for excavation to depths required to retrieve wastes from the shafts and for waste handling.	1
		Total	**14**

Appendix A

Acronyms and Abbreviations,
Metric Conversion Table, and Data Qualifier Definitions

A-1.0 ACRONYMS AND ABBREVIATIONS

3-D	three-dimensional
ACZ	acceptable compaction zone
AD	Associate Director
AEA	Atomic Energy Act
AOC	area of concern
ALARA	as low as reasonably achievable
amsl	above mean sea level
ASTM	American Society for Testing and Materials
bgs	below ground surface
BV	background value
CAMU	corrective action management unit
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
cfs	cubic feet per second
CME	corrective measures evaluation
CMI	corrective measures implementation
Consent Order	Compliance Order on Consent
COPC	chemical of potential concern
CSM	conceptual site model
CV	coefficient of variation
DO	dissolved oxygen
DOE	Department of Energy (U.S.)
DSA	documented safety analysis
DU	depleted uranium
EIM	Environmental Information Management database
EPA	Environmental Protection Agency (U.S.)
ET	evapotranspiration
FAMSL	feet above mean sea level
FD	field duplicate
FHC	Final Hazard Categorization
FLUTe	Flexible Liner Underground Technology
FSP	facility safety plan
FV	fallout value
FY	fiscal year
G&A	general and administrative
GAC	granular activated carbon

GBIR	groundwater background investigation report
GPR	ground-penetrating radar
HC	hazard category
HDPE	high-density polyethylene
HH&E	human health and the environment
HI	hazard index
hp	horsepower
HPIC	high-pressure ion chamber
IFGMP	Interim Facility-Wide Groundwater Monitoring Plan
LANL	Los Alamos National Laboratory
LASL	Los Alamos Scientific Laboratory
LDR	land disposal restriction
LLW	low-level waste
MAR	material at risk
MASW	multichannel analysis of surface waves
MCL	maximum contaminant level
MDA	material disposal area
MDD	maximum dry density
MDL	method detection limit
MLLW	mixed LLW
MSA	master services agreement
MTR	minimum technology requirement
MY	monitoring year
N3B	Newport News Nuclear BWXT-Los Alamos, LLC
NMAC	New Mexico Administrative Code
NMED	New Mexico Environment Department
NMGRT	New Mexico gross receipts tax
NMWQCC	New Mexico Water Quality Control Commission
NPDES	National Pollutant Discharge Elimination System
NRX	Navy reactor experiment
NTU	nephelometric turbidity unit
NUREG	Nuclear Regulatory Commission
O&M	operations and maintenance
ORP	oxidation-reduction potential
OU	operable unit
PCB	polychlorinated biphenyl
PCE	tetrachloroethene
PET	potential evapotranspiration

PFAS	per- and polyfluoroalkyl substances
PFHxS	perfluorohexane sulfonic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctane sulfate
PID	photoionization detector
PLS	pure live seed
PQL	practical quantitation limit
PSP	project scope and planning
PV	present value
PVC	polyvinyl chloride
Q	quarter
RAO	remedial action objective
RCRA	Resource Conservation and Recovery Act
RDX	Royal Demolition Explosive
RESRAD	residual radioactivity
RFI	RCRA facility investigation
RLWTF	radioactive liquid waste treatment facility
ROI	radius of influence
RPF	Records Processing Facility
SAL	screening action level
scfm	standard cubic foot per minute
SL	screening level
SOP	standard operating procedure
SS	stainless steel
SSD	saturated dry surface
SSL	soil screening level
SVE	soil vapor extraction
SVOC	semivolatile organic compound
SWMU	solid waste management unit
TA	technical area
TAL	target analyte list
TCA	trichloroethane
TCE	trichloroethene
TD	total depth
TDR	time-domain reflectometer
TDS	total dissolved solids
TIC	tentatively identified compound
TKN	total Kjeldahl nitrogen

TLD	thermoluminescent dosimeter
TNT	trinitrotoluene
TOC	total organic carbon
TRU	transuranic
TWF	Transuranic Waste Facility
USGS	United States Geological Survey
UTL	upper tolerance limit
VOC	volatile organic compound
WAC	waste acceptance criteria
WIPP	Waste Isolation Pilot Plant

A-2.0 METRIC CONVERSION TABLE

Multiply SI (Metric) Unit	by	To Obtain U.S. 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 (µg/g)	1	parts per million (ppm)
liters (L)	0.26	gallons (gal.)
milligrams per liter (mg/L)	1	parts per million (ppm)
degrees Celsius (°C)	9/5 + 32	degrees Fahrenheit (°F)

A-3.0 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.
NQ	Best data
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 parameters.

Appendix B

Reinvestigation of Vadose-Zone Water Contents at Material Disposal Area C

B-1.0 INTRODUCTION

As part of the site investigation, the vadose zone hydrology of Material Disposal Area (MDA) C at Los Alamos National Laboratory (LANL or the Laboratory) was analyzed based on volumetric water content and chloride data (LANL 2006, 094688, Appendix L). These data were primarily from boreholes drilled in the shallower parts of the mesa into the Tshirege Member of the Bandelier Tuff from the surface to depths ranging from approximately 160 ft to 270 ft below ground surface (bgs). For the Phase II investigation of MDA C (LANL 2009, 107389), new or extended boreholes were drilled at 14 locations to provide additional contaminant data from deeper parts of the mesa to depths ranging from 300 ft to 653 ft bgs. These Phase II boreholes extended into the Cerro Toledo interval and the Otowi Member of the Bandelier Tuff; one extended into the top of the Tschicoma dacite. Phase II borehole locations are shown in Figure B-1.0-1, and the details are summarized in Table B-1.0-1. Borehole logs can be found in Appendix C of the Phase II investigation report (LANL 2009, 107389). As part of characterization efforts, laboratory gravimetric water content measurements were made on selected core samples from the boreholes, but the data were not included in the Phase II report. The objective of this appendix is to present these MDA C water content data and discuss their implications for flow and transport in the vadose zone beneath the site.

B-2.0 METHODS AND RESULTS

A total of 103 core samples collected in the field were sealed to prevent changes in moisture content and analyzed in the laboratory using the standard oven-drying method for gravimetric water content. To make these results more useful for understanding vadose-zone flow conditions and to compare them with previous MDA C results described in Appendix L of the MDA C investigation report (LANL 2006, 094688), gravimetric water content values were converted to volumetric water content values using bulk density values from Rogers and Gallaher (1995, 097569) for the various rock units. Because no bulk density data were available for the Tschicoma dacite in the Rogers and Gallaher study, the average bulk density of this unit, based on the geophysical density log from regional well R-46, was used (LANL 2009, 105592, Appendix E). Gravimetric and volumetric water content results for each borehole sample are included in Table B-2.0-1.

B-3.0 DISCUSSION

The average volumetric water content for the entire 103 sample data set was 10%, and the minimum and maximum water contents were 2% and 24%, respectively. Only 3 samples had water contents over 20% (2 in the Cerro Toledo interval and 1 in the Tschicoma dacite). The distribution of water contents is shown in Figure B-3.0-1 and is dominated by water contents near the average value.

Boreholes 50-603061 and 50-603064 have two of the most complete moisture content profiles of the 14 Phase II boreholes and are good examples of how MDA C water contents vary with depth and stratigraphy (Figure B-3.0-2). Borehole 50-603061 is slightly wetter than 50-603064, but both profiles show that the water contents over much of the upper 500 ft are relatively low (less than approximately 15%). Borehole 603062 is near buildings that could impact the infiltration while 50-603064 is on open ground.

The spike in water content in the Qct unit of borehole 50-603061 is the highest measured of all the samples (24%) but is quite far from saturated conditions. A water-content spike in the Qct unit was also observed in borehole 50-24817 (Table B-2.0-1). As the data from borehole 50-603064 show, water contents in the Qct unit are not always elevated and, as discussed later, the average water content in the

Qct unit is not much higher than in the Bandelier Tuff units. The variation in Qct water content is probably related to the fact that Qct is a heterogeneous unit composed of volcanoclastic sediments and buried soils with fine pore structure that can hold moisture without indicating a higher water flux. This characteristic is quite different from the ash flow Bandelier Tuff units, and the water contents measured in the more homogeneous Bandelier Tuff units are considered to be a better measure of average moisture flux.

The MDA C water contents indicate relatively dry mesa conditions and can also be used to examine how close the vadose zone is to saturation. The porosity of the Bandelier Tuff is around 40%, and the volumetric water content data can be divided by porosity to estimate the percent saturation in the mesa. The data indicate the MDA C vadose zone is well below saturation, with most of the mesa having saturations of 25% or lower. These results suggest downward fluxes are likely to be relatively low. As discussed in Appendix L of the MDA C investigation report (LANL 2006, 094688), downward fluxes estimated using chloride mass balance were less than 0.12 in./yr (0.32 cm/yr) and about half of the profiles examined had fluxes below 0.04 in./yr (0.1 cm/yr). Table B-3.0-1 compares average volumetric water contents for each geologic unit measured during the Phase I (2004–2007) and Phase II investigations, and the differences are small. Given the similarity of the water content data between the two investigations, it is likely that fluxes predicted for the Phase II boreholes would be similar to those calculated in Phase I.

B-4.0 SUMMARY

Water content data from deeper boreholes drilled as part of the MDA C Phase II investigation are consistent with those reported in Phase I and show that the vadose zone beneath MDA C has low water contents that are quite far from saturation. These water contents suggest downward fluxes of water (and dissolved contaminants) are likely to be low. The low flux interpretation is supported by the chloride mass balance results presented in the MDA C investigation report (LANL 2006, 094688), which indicate downwater fluxes are less than 0.32 cm/yr, and vadose zone transport times are estimated to be on the order of 1000 yr or longer. These results are consistent with Birdsell et al. 2005 and Kwicklis et al. 2005, which summarize the conceptual model and infiltration estimates for vadose zone transport on the dry mesas of the Pajarito Plateau.

B-5.0 REFERENCES

The following reference list includes documents cited in this appendix. Parenthetical information following each reference provides the author(s), publication date, and ERID, ESHID, or EMID. This information is also included in text citations. ERIDs were assigned by the Laboratory's Associate Directorate for Environmental Management (IDs through 599999); ESHIDs were assigned by the Laboratory's Associate Directorate for Environment, Safety, and Health (IDs 600000 through 699999); and EMIDs are assigned by Newport News Nuclear BWXT-Los Alamos, LLC (N3B) (IDs 700000 and above). IDs are used to locate documents in N3B's Records Management System and in the Master Reference Set. The New Mexico Environment Department (NMED) Hazardous Waste Bureau and N3B maintain copies of the Master Reference Set. The set ensures that NMED has the references to review documents. The set is updated when new references are cited in documents.

Birdsell, K.H., B.D. Newman, D.E. Broxton, and B.A. Robinson, 2005. "Conceptual Models of Vadose Zone Flow and Transport beneath the Pajarito Plateau, Los Alamos, New Mexico," *Vadose Zone Journal,* Vol. 4, pp. 620–636. (Birdsell et al. 2005, 092048)

Kwicklis, E., M. Witkowski, K. Birdsell, B. Newman, and D. Walther, August 2005. "Development of an Infiltration Map for the Los Alamos Area, New Mexico," *Vadose Zone Journal,* Vol. 4, pp. 672–693. (Kwicklis et al. 2005, 090069)

LANL (Los Alamos National Laboratory), December 2006. "Investigation Report for Material Disposal Area C, Solid Waste Management Unit 50-009, at Technical Area 50," Los Alamos National Laboratory document LA-UR-06-8096, Los Alamos, New Mexico. (LANL 2006, 094688)

LANL (Los Alamos National Laboratory), March 2009. "Completion Report for Regional Aquifer Well R-46," Los Alamos National Laboratory document LA-UR-09-1338, Los Alamos, New Mexico. (LANL 2009, 105592)

LANL (Los Alamos National Laboratory), October 2009. "Phase II Investigation Report for Material Disposal Area C, Solid Waste Management Unit 50-009, at Technical Area 50, Revision 1," Los Alamos National Laboratory document LA-UR-09-6266, Los Alamos, New Mexico. (LANL 2009, 107389)

Rogers, D.B., and B.M. Gallaher, September 1995. "The Unsaturated Hydraulic Characteristics of the Bandelier Tuff," Los Alamos National Laboratory report LA-12968-MS, Los Alamos, New Mexico. (Rogers and Gallaher 1995, 097569)

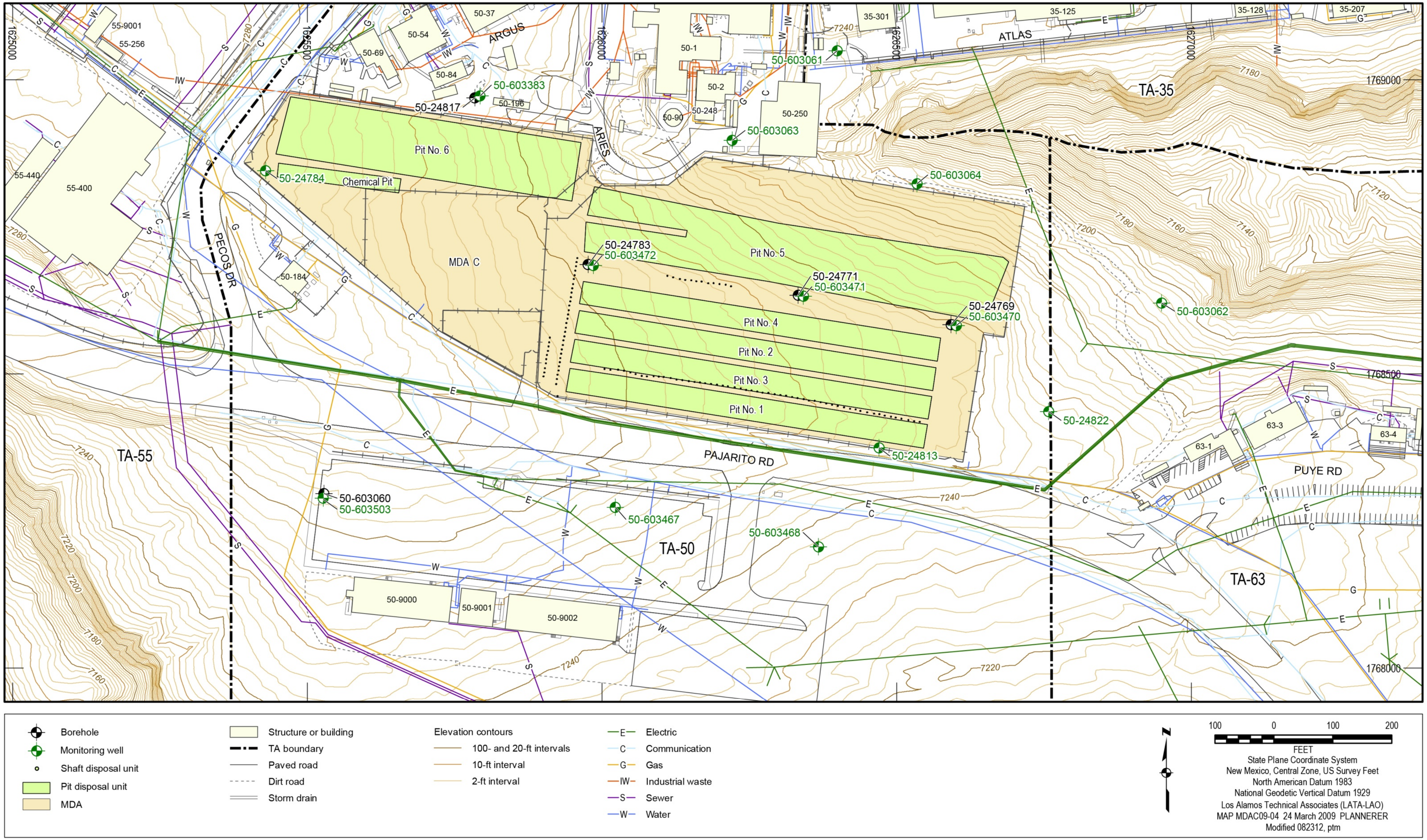


Figure B-1.0-1 Locations of Phase II boreholes and vapor-monitoring wells

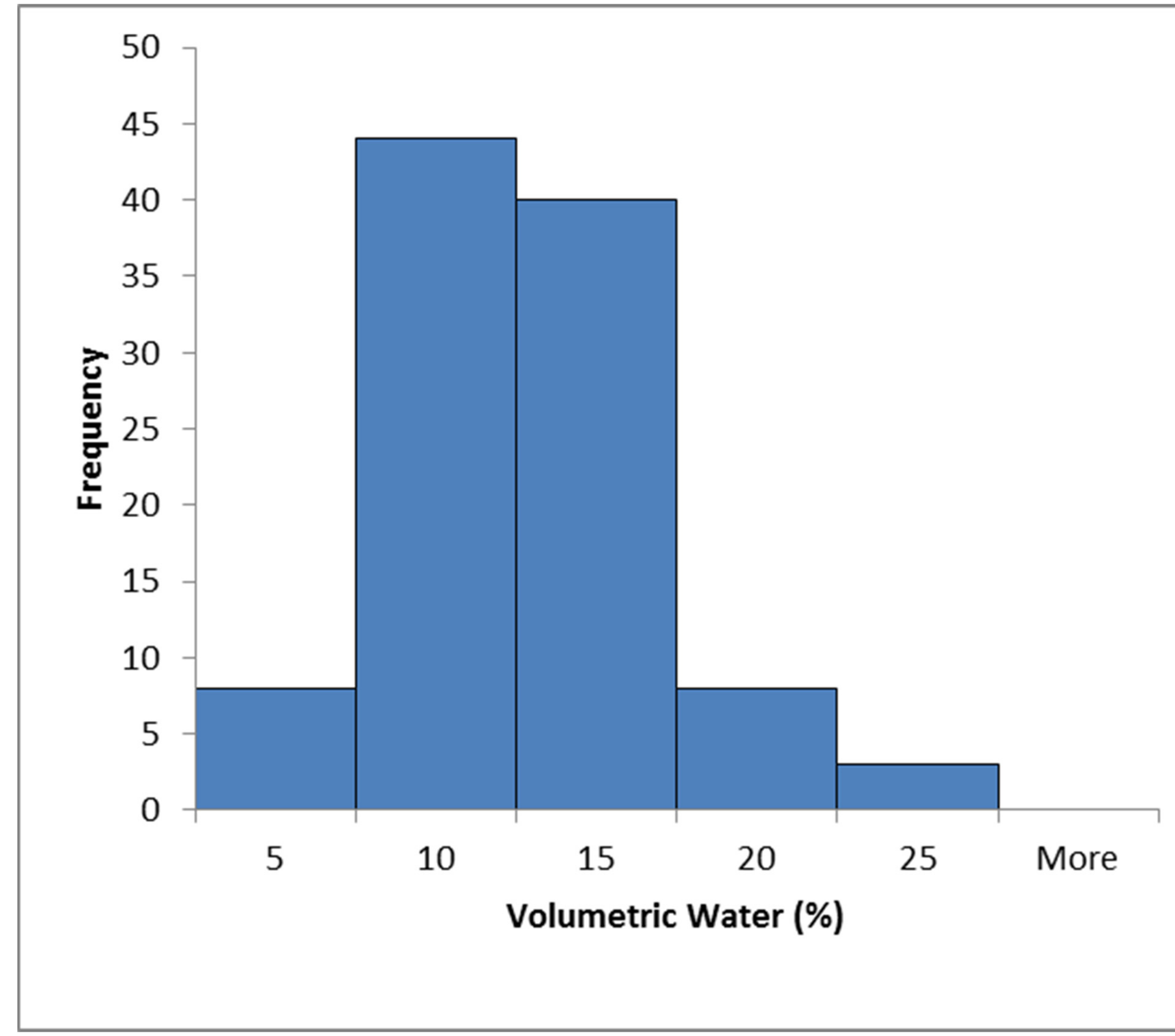
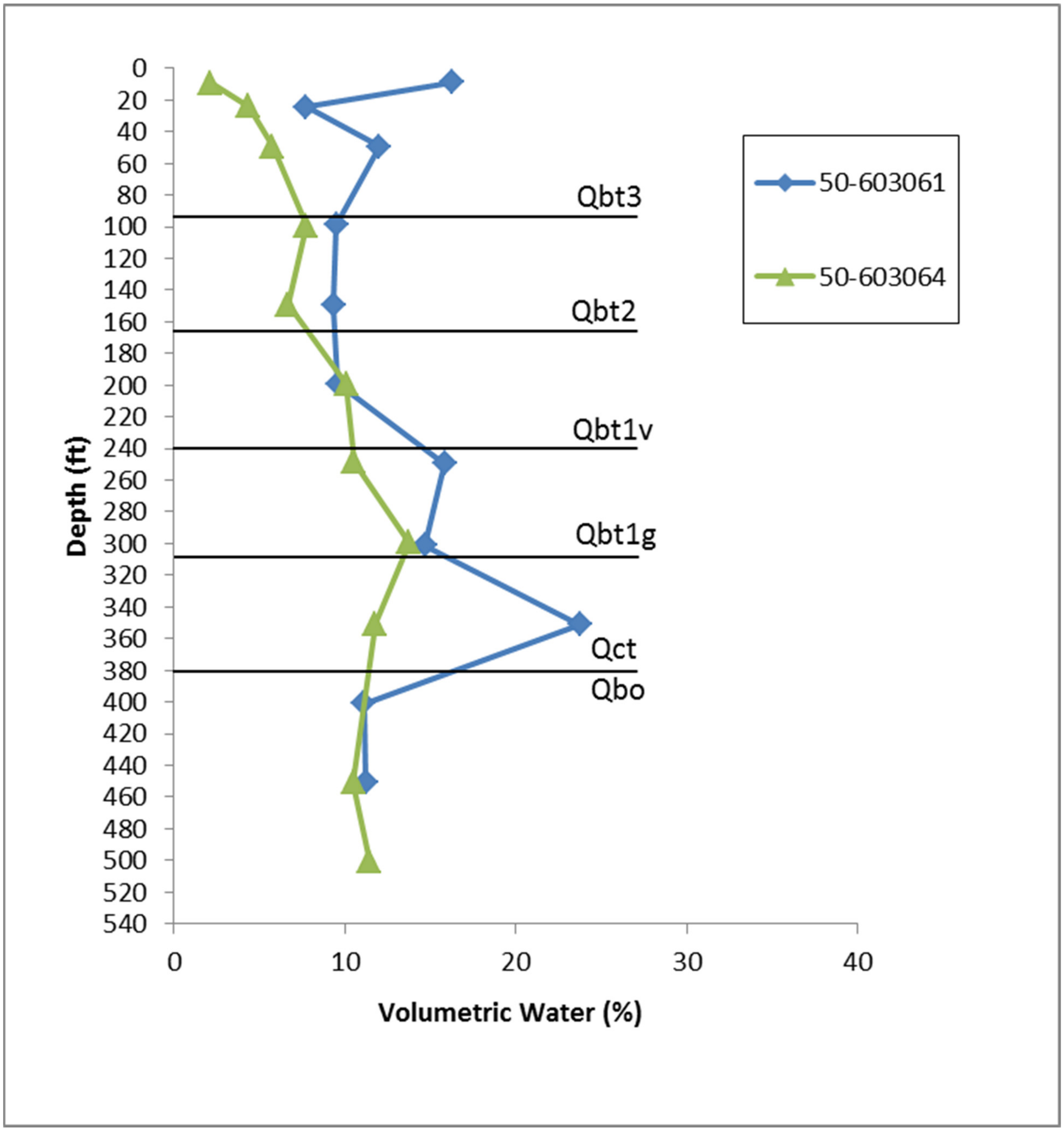


Figure B-3.0-1 Histogram of MDA C water contents from Phase II boreholes



Notes: Depths of stratigraphic contacts are approximate because of differences in contact depths for the two boreholes. Actual borehole stratigraphy is presented in the Phase II investigation report (LANL 2009, 107389).

Figure B-3.0-1 Volumetric water content profiles for boreholes 50-603061 and 50-603064

Table B-1.0-1
Summary of Phase II Investigation Boreholes

Borehole or Grouped Boreholes	Location ID	Year Drilled	Final Total Depth (ft)	Core Samples Depth Range (ft)	Vapor Samples Depth Range (ft)	Vapor-Sampling System
1	50-24769	2006; extended in 2008	300	18.1–300	20–300	Packer (2006)
	50-603470	2008	653	360–653	351–650	SS[a] Tubing (2008)
2	50-24771	2006; extended in 2008	300	15.9–300	17–300	Packer (2006, 2008)
	50-603471	2008	460	350–452	360–450	FLUTe[b] (2008)
3	50-24783	2006; extended in 2008	300	17.5–300	20–300	Packer (2006)
	50-603472	2008	460	350–452	364–450	SS Tubing (2008)
4	50-24784	2006; extended in 2009	460	8–452	10–450	Packer (2006); SS Tubing (2009)
5	50-24813	2006; extended in 2008 and 2009	635	18.2–602	20–600	Packer (2006); SS Tubing (2008)
6	50-24817	2005; extended in 2008	460	18.4–452.5	20–250	Packer (2005, 2008)
	50-603383	2008	460	n/a[c]	286–450	FLUTe (2008)
7	50-24820	2005; extended in 2008	602.5	17.5–602.5	20–250	Packer (2005)
	50-603467	2008	600	n/a	287–600	FLUTe (2008)
8	50-24821	2005	250	18.6–250	20–250	Packer (2005)
	50-603373	2008	300	n/a	30–260	Packer and SS Tubing (2008)
	50-603468	2008	460	300–451.5	300–450	FLUTe (2008)
9	50-24822	2005; extended in 2008	452.5	18.6–452.5	20–450	Packer (2005); SS Tubing (2008)
10	50-603060	2008	451.5	48–451.5	50–450	None
	50-603503	2008	460	n/a	347–450	SS Tubing (2008)
11	50-603061	2008	460	8–452	13–450	SS Tubing (2008)
12	50-603062	2008	460	48.5–452	50–450	SS Tubing (2008)
13	50-603063	2008	460	8–452	10–450	SS Tubing (2008)
14	50-603064	2008	510	8.5–502	25–500	SS Tubing (2008)

[a] SS = Stainless steel.

[b] FLUTe = Flexible Liner Underground Technology.

[c] n/a = Not applicable; no core collected.

Table B-2.0-1
MDA C Phase II Water Content Data

Sample ID	Depth (ft)	Unit	Gravimetric Water Content (%)	Bulk Density (g/cm^3)	Volumetric Water Content (%)
Borehole 50-24769[a]					
MD50-08-7442	198–200	Qbt 1v	1.5	1.26	2
MD50-08-7443	248–250	Qbt 1v-c	8.6	1.26	11
MD50-08-7444	298–300	Qbt 1g	8.3	1.13	9
Borehole 50-24771[b]					
MD50-08-7616	198–200	Qbt 1v	2.2	1.26	3
MD50-08-7617	248.5–250	Qbt 1v-c	8.9	1.26	11
MD50-08-7618	297.5–300	Qbt 1g	9	1.13	10
Borehole 50-24783[c]					
MD50-08-7646	198–200	Qbt 1v	2.9	1.26	4
MD50-08-7647	248.5–250	Qbt 1v-c	8.7	1.26	11
MD50-08-7648	298.5–300	Qbt 1g	10	1.13	11
Borehole 50-24784					
MD50-08-7676	350–352	Qct	8.8	1.25	11
MD50-08-7677	400–402	Qbo	8.2	1.18	10
MD50-08-7678	450–452	Qbo	6.8	1.18	8
Borehole 50-24813					
MD50-08-7706	198.5–200	Qbt 1v	7.7	1.26	10
MD50-08-7707	248.5–250	Qbt 1g	11	1.13	12
MD50-08-7708	298–300	Qbt 1g	8.5	1.13	10
MD50-08-7709	350–352	Qct	10	1.25	13
MD50-08-7710	400–402	Qbo	6.2	1.18	7
MD50-08-7711	450–452	Qbo	7.9	1.18	9
MD50-08-7712	500–502	Qbo	7.1	1.18	8
MD50-08-7713	550–552	Qbo	7.8	1.18	9
MD50-08-7714	600–602	Qbo	9.1	1.18	11
Borehole 50-24817[d]					
MD50-08-7739	300–302.5	Qbt 1g	9	1.13	10
MD50-08-7743	350–352	Qct	18	1.25	23
MD50-08-7741	450–452.5	Qbo	9.6	1.18	11
Borehole 50-24820[e]					
MD50-08-7829	300–303	Qbt 1g	7.9	1.13	9
MD50-08-7830	350–351.5	Qct	9.9	1.25	12
MD50-08-7831	400–401.5	Qbo	6.3	1.18	7
MD50-08-7832	450–452	Qbo	7.2	1.18	8
MD50-08-7833	500–502.5	Qbo	8	1.18	9
MD50-08-7834	550–552.5	Qbo	8.6	1.18	10
MD50-08-7828	600–602.5	Qbo	11	1.18	13

Table B-2.0-1 (continued)

Sample ID	Depth (ft)	Unit	Gravimetric Water Content (%)	Bulk Density (g/cm^3)	Volumetric Water Content (%)
Borehole 50-24822					
MD50-08-7940	300–302	Qbt 1g	7.6	1.13	9
MD50-08-7941	350–352.5	Qct	10	1.25	13
MD50-08-7942	400–402	Qbo	6.6	1.18	8
MD50-08-7943	450–452.5	Qbo	8.9	1.18	11
Borehole 50-603060[f]					
MD50-08-8148	48–50	Qbt 3	4.1	1.25	5
MD50-08-8149	99–100	Qbt 3	2	1.25	3
MD50-08-8150	149–150	Qbt 2	2	1.46	3
MD50-08-8151	199–200	Qbt 1v	2.7	1.26	3
MD50-08-8152	248.5–250	Qbt 1v-c	15	1.26	19
MD50-08-8153	298.5–300	Qbt 1g	9.4	1.13	11
MD50-08-8154	360–362	Qct	7.1	1.25	9
MD50-08-8156	410–412.5	Qbo	6.2	1.18	7
MD50-08-8182	450–451.5	Qbo	6.5	1.18	8
Borehole 50-603061					
MD50-08-8192	8–10	Fill/Qbt 3	13	1.25	16
MD50-08-8193	24–25	Qbt 3	6.2	1.25	8
MD50-08-8194	49–50	Qbt 3	9.6	1.25	12
MD50-08-8195	97.5–100	Qbt 2	6.5	1.46	9
MD50-08-8196	149–150	Qbt 2	6.4	1.46	9
MD50-08-8197	198.5–200	Qbt 1v	7.6	1.26	10
MD50-08-8198	249–250	Qbt 1g	14	1.13	16
MD50-08-8199	300–302	Qbt 1g	13	1.13	15
MD50-08-8200	350–352	Qct	19	1.25	24
MD50-08-8221	400–402	Qbo	9.4	1.18	11
MD50-08-8222	450–452	Qbo	9.5	1.18	11
Borehole 50-603062					
MD50-08-8238	48.5–50	Qbt 3	5.9	1.25	7
MD50-08-8239	98.5–100	Qbt 2	6.4	1.46	9
MD50-08-8240	148.5–150	Qbt 2	7.1	1.46	10
MD50-08-8241	198.5–200	Qbt 1v	4.4	1.26	6
MD50-08-8242	248.5–250	Qbt 1g	8.2	1.13	9
MD50-08-8243	298.5–300	Qbt 1g	11	1.13	12
MD50-08-8244	350–352	Qct	6.7	1.25	8
MD50-08-8245	400–402	Qbo	8.5	1.18	10
MD50-08-8246	450–452	Qbo	8.5	1.18	10

Table B-2.0-1 (continued)

Sample ID	Depth (ft)	Unit	Gravimetric Water Content (%)	Bulk Density (g/cm³)	Volumetric Water Content (%)
Borehole 50-603063					
MD50-08-8282	8–10	Qbt 3	10	1.25	13
MD50-08-8283	23.5–25	Qbt 3	6.5	1.25	8
MD50-08-8284	48.5–50	Qbt 3	7	1.25	9
MD50-08-8285	97.5–99	Qbt 3	6.3	1.25	8
MD50-08-8286	148–150	Qbt 2	6.3	1.46	9
MD50-08-8287	198–200	Qbt 1v	7.3	1.26	9
MD50-08-8288	248–250	Qbt 1g	15	1.13	17
MD50-08-8311	300–302.5	Qbt 1g	14	1.13	16
MD50-08-8290	400–402.5	Qbo	14	1.18	17
MD50-08-8312	450–452	Qbo	13	1.18	15
Borehole 50-603064					
MD50-08-8328	8.5–10	Qbt 3	1.7	1.25	2
MD50-08-8329	23–25	Qbt 3	3.5	1.25	4
MD50-08-8330	48.5–50	Qbt 3	4.6	1.25	6
MD50-08-8331	98.5–100	Qbt 2	5.3	1.46	8
MD50-08-8332	148.5–150	Qbt 1v	5.3	1.26	7
MD50-08-8333	198.5–200	Qbt 1v	8	1.26	10
MD50-08-8334	247.5–250	Qbt 1g	9.3	1.13	11
MD50-08-8335	298.5–300	Qct	11	1.25	14
MD50-08-8336	350–351.5	Qct	9.4	1.25	12
MD50-08-8357	400–401.5	Qbo	8.1	1.18	10
MD50-08-8358	450–451.5	Qbo	8.9	1.18	11
MD50-08-8359	500–502	Qbo	9.7	1.18	11
Borehole 50-603468[g]					
MD50-08-7888	300–301.5	Qbt 1g	9.2	1.13	10
MD50-08-7889	350–351	Qct	5.7	1.25	7
MD50-08-7890	400–401.5	Qbo	7.5	1.18	9
MD50-08-7891	450–451.5	Qbo	8.5	1.18	10
Borehole 50-603470					
MD50-08-7445	360–362	Qct	7	1.25	9
MD50-08-7446	400–402	Qbo	7	1.18	8
MD50-08-7447	450–452.5	Qbo	8.8	1.18	10
MD50-08-7448	500–502	Qbo	9.5	1.18	11
MD50-08-7449	550.5–552.5	Qbo	9	1.18	11
MD50-08-7450	600–602	Qbo	9.4	1.18	11
MD50-08-7441	650–653	Tvt 2	9.8	2.25	22

Table B-2.0-1 (continued)

Sample ID	Depth (ft)	Unit	Gravimetric Water Content (%)	Bulk Density (g/cm^3)	Volumetric Water Content (%)
Borehole 50-603471					
MD50-08-7620	350–351.5	Qct	14	1.25	18
MD50-08-7619	400–402	Qbo	7.4	1.18	9
MD50-08-7621	450–452	Qbo	8.7	1.18	10
Borehole 50-603472					
MD50-08-7649	350–354	Qct	6.8	1.25	9
MD50-08-7650	400–402.5	Qbo	7.6	1.18	9
MD50-08-7651	450–452	Qbo	8.9	1.18	11

[a] Collocated with Phase II borehole 50-603470.

[b] Collocated with Phase II borehole 50-603471.

[c] Collocated with Phase II borehole 50-603472.

[d] Collocated with Phase II borehole 50-603383.

[e] Collocated with Phase II borehole 50-603467.

[f] Collocated with Phase II borehole 50-603503.

[g] Collocated with Phase I borehole 50-24821 and Phase II borehole 50-603373.

Table B-3.0-1
Comparison of Average Volumetric Water Contents by Geologic Unit from MDA C Phase I and Phase II Investigations

Unit	Phase I (%)[a]	Phase II (%)[b]	Number of Phase II Samples
Qbt 3	8	7	12
Qbt 2	8	8	7
Qbt 1g	12	12	17
Qbt 1v	6	8	14
Qct	—[c]	13	14
Qbo	—	10	37

[a] Phase I value is average of multiple neutron probe measurements.

[b] Phase II value is average of results of core sample analysis.

[c] — = No measurements made in this unit.

Appendix C

Compliance Order on Consent
Investigation Results for Material Disposal Area C

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C-1.0 INTRODUCTION

This appendix provides a summary of the scope of investigations conducted at Material Disposal Area (MDA) C under the Compliance Order on Consent (the Consent Order) and presents the results of these investigations. Information on other historical investigations at MDA C before the Consent Order are summarized in the MDA C historical investigation report (LANL 2005, 091493, Appendix B).

C-2.0 2004–2007 SITE INVESTIGATION

Field investigations conducted from 2004 through 2007 at MDA C under the Consent Order are reported in the MDA C investigation report (LANL 2006, 094688) and a supplemental data report (LANL 2007, 097285). Under this investigation, a radiological survey was conducted and surface fill samples were collected at 6 locations and analyzed for radionuclides to supplement the surface sample data from the previous Phase I Resource Conservation and Recovery Act facility investigation (RFI). Geophysical and seismic surveys were performed to better define disposal pit boundaries and to map the walls between Pits 1–4. Thirty-three boreholes were drilled, and 209 core samples were collected and analyzed for inorganic and organic chemicals and radionuclides to characterize the nature and extent of subsurface contamination. Core samples for geotechnical characterization were also collected from 1 of the boreholes. A total of 378 vapor samples were collected from these boreholes and 2 existing boreholes in two sampling rounds and analyzed for volatile organic compounds (VOCs) and tritium to characterize subsurface vapor contamination. To determine the relationship between VOCs and tritium concentrations in solid and vapor phases, 3 additional boreholes were drilled and 40 pairs of core and vapor samples were collected. To characterize potential contamination beneath the pits, 4 additional boreholes were drilled between Pits 2 and 3, and 25 core and 25 vapor samples were collected.

C-2.1 Radiological Survey and Surface Fill Sampling

A radiological survey was conducted east of the MDA C boundary and outside the fenceline in May 2004 to identify potential surface or near-surface radiological contamination and select biased surface sampling locations. The survey was performed with a portable gamma spectroscopy instrument with an integrated multichannel analyzer that used 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-ft by 15-ft spacing.

Six surface sampling locations were selected based on the gamma spectroscopy survey conducted at the site. A discrete grab sample was collected from 0 ft to 0.5 ft below ground surface (bgs) at each of the six locations. The six surface fill samples were analyzed at an off-site analytical laboratory for americium-241, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, and strontium-90. Table C-2.1-1 summarizes the samples collected and analyses requested. Locations of these samples are included in Figure C-2.1-1.

The radionuclides detected or detected above background values (BVs) or fallout values (FVs) in surface fill samples are presented in Table C-2.1-2.

C-2.2 Geophysical and Seismic Surveys

In April 2006, a geophysical investigation was performed to delineate the lateral boundaries of Pits 1-4 and to locate any anomalies that could be attributed to the disposal shafts (ARM 2006, 094164). Four geophysical techniques were used: high-sensitivity metal detector (EM61), cesium vapor magnetometer, terrain conductivity (EM31), and ground-penetrating radar. A seismic survey was also performed in

April 2006. The survey used the multichannel analysis of surface waves (MASW) method to identify and map the walls between Pits 1–4 (Lee 2006, 094163).

The results of the geophysical survey provided clearer delineation of the boundaries of Pits 1–4 than had been previously available. The interpreted pit boundaries based on these data showed a significant variance in some cases with respect to historical information. Although the shapes and sizes of the pits were generally consistent with engineering drawings and other historical information, the interpreted locations were offset by as much as 25 ft from the historical data. The disposal shafts along the western side of Pits 1–4 were shown as anomaly locations that varied by less than 3 ft in comparison with historical data. The shafts located between Pits 1 and 3 that are shown in historical drawings were not observed in the geophysical data. The shafts 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, 094164).

Pits 1–4 were assumed to be separated from one another by walls of intact tuff bedrock. However, the seismic survey could not confirm this assumption (Lee 2006, 094163). The seismic survey results noted the wall between Pit 2 and Pit 3 was the most prominent, the wall between Pit 1 and Pit 3 was less prominent or well defined, and no wall between Pit 2 and Pit 4 was observed (Lee 2006, 091463).

C-2.3 Borehole Sampling

C-2.3.1 Core Sampling and Analysis

A total of 33 boreholes were drilled in 2005–2006 at MDA C to collect samples to define the vertical and lateral extent of site contamination. An additional 3 boreholes were drilled to collect paired core and vapor samples for the purpose of correlating VOC concentrations in tuff (core) samples with VOC concentrations in vapor samples. One borehole 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. The remaining boreholes ranged in depth from 90 ft to 300 ft bgs. Core samples were collected from a minimum of 5 depths in each borehole. Additional samples were collected at fracture zones, with samples collected above, within, and beneath those fractures that were large enough to make up 80% of the required sample volume. Five major fractures in four boreholes were sampled during the 2005–2006 borehole investigation.

All core samples were 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, polychlorinated biphenyls (PCBs), dioxins and furans, explosive compounds, VOCs, and semivolatile organic compounds (SVOCs). Table C-2.3-1 summarizes the samples collected and analyses requested. These sample locations are included in Figure C-2.3-1.

After the submission of the MDA C investigation report in December 2006 (LANL 2006, 094688), four additional boreholes were drilled between Pits 2 and 3 in February 2007, as requested by the New Mexico Environment Department (NMED) (2007, 095437). A total of 25 fill and tuff samples were collected and submitted to off-site contract laboratories for analysis of TAL metals, cyanide (total), nitrate, perchlorate, dioxins and furans, explosive compounds, PCBs, SVOCs, VOCs, americium-241, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, and strontium-90. Table C-2.3-2 summarizes the samples collected and analyses requested. These sampling locations are included in Figure C-2.3-1.

Inorganic chemicals detected above BVs, detected organic chemicals, and radionuclides detected or detected above BVs in core samples collected in 2005–2006 are presented in Tables C-2.3-3 through C-2.3-5, respectively. Inorganic chemicals detected above BVs, detected organic chemicals, and radionuclides detected or detected above BVs in samples collected from the borehole drilling between Pits 2 and 3 in 2007 are presented in Tables C-2.3-6 through C-2.3-8, respectively. The results of the fracture investigation are summarized in Table C-2.3-9.

The core sample results indicated a number of inorganic and organic chemicals were detected at low concentrations beneath the former disposal units and were consistent with the results obtained during the Phase I RFI. All inorganic chemicals detected above BVs during the 2005–2006 sampling campaign were generally less than 5 times the BV. The interpretation of these results indicates little if any migration of metals and other inorganic chemicals from the disposal units. Although several inorganic chemicals were detected above BV or the maximum background concentration in samples collected at the total depth (TD) of the borehole, the detections above background in TD samples were generally only slightly above background and were generally not accompanied by detections above background in higher lithologic units. The results appeared to indicate the detections above background in TD samples were associated with natural variability of the tuff rather than indicative of unbounded releases.

Forty-two organic compounds were detected in core samples. These compounds consisted of 8 VOCs, 18 SVOCs (primarily polycyclic aromatic hydrocarbons), 3 PCBs, 9 dioxin or furan congeners, and 4 explosive compounds or degradation products. All detected concentrations were low (i.e., less than 1 mg/kg), and many were less than estimated quantitation limits. Detections were generally sporadic with no discernible spatial pattern indicative of a release.

Uranium isotopes were detected above BVs in core samples, and five fallout radionuclides (americium-241, cesium-137, plutonium-238, plutonium-239, and strontium-90) were detected in core samples. Uranium-235 was detected most frequently above BV, but all results were less than 4 times BV. All fallout radionuclides were detected at low activities (less than 1 pCi/g). Detections were generally sporadic, with no discernible spatial pattern indicative of a release.

C-2.3.2 Vapor Sampling and Analysis

Subsurface vapor samples were collected from each of 34 boreholes between August 2005 and August 2006. A total of 210 first-round vapor samples were collected and analyzed for VOCs and tritium. A second round of vapor samples was collected from some of the boreholes to measure the concentrations of VOCs in vapor after drilling was completed to allow borehole conditions to equilibrate. Second-round samples were collected at least 30 days after the initial vapor samples were taken using the same collection methods. A total of 168 second-round vapor samples were collected and analyzed for VOCs and tritium. An additional 3 boreholes were drilled to collect paired core and vapor samples to correlate VOC concentrations in tuff (core) samples with VOC concentrations in vapor samples. Vapor samples were collected for VOCs and tritium, and corresponding core samples were collected for VOCs. Table C-2.3-10 summarizes the samples collected and analyses requested for the two rounds of vapor sampling performed during 2005 and 2006. The locations of boreholes where these vapor samples were collected are included in Figure C-2.3-1. Vapor samples were collected from discrete 1-ft sampling intervals using a straddle-packer system. Samples for VOCs were collected in SUMMA canisters, and samples for tritium were collected in silica gel sample tubes.

Vapor samples were also collected from the 4 boreholes drilled between Pits 2 and 3 in 2007. A total of 25 vapor samples were collected and submitted to off-site contract laboratories for analysis of VOCs and tritium. Table C-2.3-2 summarizes the samples collected and analyses requested.

Results for VOCs and tritium in vapor samples collected in 2005–2006 are presented in Tables C-2.3-11 through C-2.3-13. Results for VOCs and tritium in vapor samples collected between Pits 2 and 3 in 2007 are presented in Tables C-2.3-14 and C-2.3-15, respectively.

Forty-two VOCs were detected in vapor samples collected during the first round of sampling. The VOCs with the highest frequency of detection were chloroform (209 of 210 samples), dichlorodifluoromethane (208 of 210 samples), tetrachloroethene (PCE) (209 of 210 samples), and trichloroethene (TCE) (210 of 210 samples). The VOCs with the highest detected concentrations were PCE (maximum concentration 24,000 µg/m3) and TCE (54,000 µg/m3). All other VOCs had maximum concentrations less than 10,000 µg/m3. Similar results were obtained from the second round of vapor sampling and the vapor sampling between Pits 2 and 3. The vapor-phase VOC results are indicative of a release from the MDA C disposal units and migration of VOCs by vapor-phase diffusion.

Collocated core and vapor samples were collected at three borehole locations (50-26823, 50-26824, and 50-26825) to determine the relationship between the concentrations of VOCs in vapor and in core samples. Concentrations of VOCs in vapor samples and the corresponding collocated core samples are presented in Table C-2.3-16. 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. The correlations between concentrations of individual analytes in core and in vapor samples were found to be 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.

Tritium was not analyzed in core samples but was detected in vapor samples. Tritium was detected in 197 of 210 samples during the first round of pore gas sampling, 162 of 168 samples during the second round, and 25 of 25 samples collected between Pits 2 and 3. The highest activities were detected near the southwest corner of Pit 5 and southeast corner of Pit 6, indicating a release in this area.

C-2.3.3 Geotechnical Characterization

Samples for geotechnical characterization were also collected from the 620-ft-deep borehole to determine the geotechnical properties of the bedrock underlying MDA C. Eight geotechnical samples were collected at depths ranging from 71.5 ft to 329 ft bgs. Geotechnical samples were analyzed for moisture content, bulk density, porosity, saturated hydraulic conductivity, and pH. Volumetric water-content profiles were also collected in 19 boreholes across MDA C using neutron thermalization (neutron probe). One-time measurements were taken at 0.5-ft increments over the entire depth of each borehole. Core samples from 20 boreholes were also analyzed for anions using a deionized water leaching procedure to collect data to perform a chloride mass balance.

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

The volumetric water-content profiles collected using neutron probes showed the water contents to be low, with the average 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% to 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 estimated using a chloride mass-balance approach. This approach involves measuring chloride concentrations in vadose zone pore water with depth. The relatively low chloride contents indicate a high downward flux because water can 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 moisture 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 were 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.

C-3.0 2008–2009 PHASE II INVESTIGATION

Phase II field investigations conducted in 2008 and 2009 at MDA C under the Consent Order are reported in the Phase II MDA C investigation report (LANL 2009, 107389). The specific objectives for the Phase II investigation were (1) to define the nature and extent of inorganic chemicals (TAL metals) at the surface at MDA C and (2) to characterize subsurface vapor concentrations of VOCs and tritium (LANL 2007, 098425). Under this phase of investigation, 59 surface and near-surface samples were collected at 30 locations to define the extent of inorganic chemical contamination and conduct risk-screening assessments. Subsurface investigation activities included installing 5 new boreholes at locations without existing boreholes, extending 8 existing boreholes, installing 7 new deep boreholes next to existing shallow boreholes, and installing 1 new pilot-test borehole. Fourteen vapor-monitoring wells were constructed in the new boreholes and associated existing boreholes. A total of 104 core and 91 vapor samples were collected from these boreholes and vapor-monitoring wells to better define the vertical and lateral extent of contamination in subsurface tuff and vapor.

C-3.1 Surface and Near-Surface Sampling

Fifty-nine surface and near-surface soil samples were collected from 2 depths (generally 0 ft to 0.5 ft and 1.0 ft to 1.5 ft bgs) at 30 locations in 2008. The samples were analyzed at an off-site analytical laboratory for TAL metals. Table C-3.1-1 summarizes the samples collected and analyses requested. Locations of these samples are included in Figure C-2.1-1.

Inorganic chemicals detected above BVs in surface and near-surface samples collected during 2008 are presented in Table C-3.1-2.

The surface and near-surface samples showed 6 inorganic chemicals detected above BVs in 1 to 15 samples each. Detected concentrations above BVs were low, with maximum concentrations less than 5 times BV. The low concentrations and low frequency of detection above BVs are not indicative of releases from the site. The vertical and lateral extent of contamination were defined for all inorganic chemicals in surface and near-surface soil at MDA C.

C-3.2 Core Sampling

Core samples were collected from the new and extended boreholes. A summary of the Phase II boreholes is presented in Table C-3.2-1. The Phase II boreholes consist of 22 boreholes installed at 14 locations (Figure C-3.2-1). The Phase II investigation work plan (LANL 2007, 098425) specified advancing the boreholes at each location until concentrations of PCE and TCE in vapor samples were less than target concentrations (2100 $\mu g/m^3$ for TCE and 3800 $\mu g/m^3$ for PCE). Vapor-screening samples to determine if target levels had been met were collected during drilling and submitted to an off-site laboratory for 24-hr screening-level analysis of TCE and PCE by standard gas chromatographic methods. Drilling continued until TCE and PCE concentrations in vapor-screening samples were less than target levels.

A total of 104 core samples were collected during the Phase II borehole investigation and submitted for laboratory analysis of TAL metals, total cyanide, nitrate, perchlorate, SVOCs, PCBs, americium-241, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, and strontium-90. Figure C-3.2-1 shows the sampling locations, and Table C-3.2-2 summarizes the samples collected and analyses requested.

Inorganic chemicals detected above BVs, detected organic chemicals, and radionuclides detected or detected above BVs in core samples collected during the Phase II investigation are presented in Tables C-3.2-3 through C-2.3-5, respectively.

The core sample results for inorganic chemicals were consistent with the results obtained during the 2004–2006 investigation. With the exception of chromium, detections of inorganic chemicals above BV were generally sporadic and not indicative of a release. Chromium was generally detected above BV in only the deeper tuff units (Qbt 1g, Qct, and Qbo). The detections were only slightly above BVs and appeared to be associated with natural variability. With the possible exception of borehole 50-603470, vertical and lateral extent of contamination were defined for all inorganic chemicals in tuff at MDA C. Borehole 50-603470 penetrated the Tschicoma dacite (Tvt 2), and the TD sample was collected in the dacite. Concentrations of inorganic chemicals in this sample were generally higher than in overlying samples, but it was not possible to determine whether the concentrations were above BV since no background data for dacite are available.

The core sample results for organic chemicals showed organic chemicals were not detected or were detected infrequently (i.e., in one to eight samples each) and at low concentrations. All detected concentrations were less than 1 mg/kg, and most results were less than estimated quantitation limits. The vertical and lateral extent of contamination were defined for all organic chemicals in tuff at MDA C.

With the exception of uranium-235/236, radionuclides were not detected in core samples or were detected in only 1 or 2 samples at low activities (less than 1 pCi/g for fallout radionuclides). Uranium-234 and uranium-238 were not detected above BV in any samples but were detected in the dacite sample from borehole 50-603470. Uranium-235/236 was detected above BV in 35 samples, but all results were less than 2 times BV. The vertical and lateral extent of contamination were defined for all radionuclides in tuff at MDA C.

C-3.3 Vapor Sampling

After drilling was completed at a borehole location, vapor-monitoring wells were constructed using stainless-steel or Flexible Liner Underground Technology (FLUTe) membrane systems. Vapor samples were then collected using the stainless-steel or FLUTe systems. A total of 91 vapor samples were collected during the Phase II investigation. Figure C-3.2-1 shows the sampling locations, and Table C-3.2-2 summarizes the samples collected and analyses requested. Samples for VOCs were collected in SUMMA canisters and samples for tritium were collected in silica gel sample tubes.

Results for VOCs and tritium in vapor samples collected in the Phase II investigation are presented in Tables C-3.3-1 and C-3.3-2, respectively.

The results of the pore-gas sampling for VOCs were similar to the results from the 2004–2006 investigation in terms of the VOCs detected and the frequency of detection. The samples from the new boreholes showed that concentrations of VOCs decreased with depth and decreased with distance away from the disposal units. Therefore, the lateral and vertical extent of VOCs were defined by decreasing trends. Concentrations of PCE and TCE in the deepest samples at several locations were, however, above screening levels based on protection of groundwater. Extent was, therefore, not defined to screening levels, which was one of the objectives of the Phase II investigation.

Tritium vapor samples from the new boreholes installed for the Phase II investigation indicated tritium activities decreased with depth and with distance from disposal units. The lateral and vertical extent of tritium in subsurface vapor were defined at MDA C.

During the Phase II investigation, NMED requested that the Laboratory conduct a pilot test to evaluate and compare three different vapor-sampling systems because of possible adsorption of contaminants to sampling tubing. A pilot test work plan was submitted to NMED in March 2008 (LANL 2008, 101653) and was subsequently approved with modification (NMED 2008, 101113). Eight pilot test boreholes, located as four sets of paired boreholes inside and outside the boundary of MDA C (LANL 2008, 102651, Figure 2.1-1), were systematically installed with the packer system, the FLUTe system, and/or the stainless-steel tubing system. Vapor samples were collected and analyzed for VOCs and tritium. The pilot test results were submitted to NMED in a report in July 2008 (LANL 2008, 102651), and the report was approved in September 2008 (NMED 2008, 102903). The pilot test concluded that either a FLUTe or a stainless-steel system is appropriate to use as a vapor-monitoring system. Table C-3.2-1 summarizes the vapor-sampling system installed for each Phase II borehole as well as the depth ranges for core and pore-gas sampling.

C-4.0 2010–2011 PHASE III INVESTIGATION

Phase III field investigations conducted in 2010 and 2011 at MDA C under the Consent Order are reported in the Phase III MDA C investigation report (LANL 2011, 204370). Based on the results of the Phase II investigation, NMED directed a Phase III investigation to define the vertical extent of vapor-phase VOCs, evaluate concentrations of metals in Tschicoma dacite, and determine whether contaminants had migrated to groundwater (NMED 2009, 107361). Four new boreholes were advanced into the top of the Tschicoma dacite. Dacite samples were collected at two depths from each of the two boreholes located outside the MDA C boundary and analyzed for TAL metals. Because the lateral and vertical extent of inorganic chemicals, organic chemicals, and radionuclides in tuff had previously been defined, no samples were collected from the overlying tuff in any of the new boreholes. The four new boreholes were completed as vapor-monitoring wells. Six quarterly rounds of vapor sampling were performed during 2010 and 2011. The first 4 rounds were performed using the 14 existing Phase II vapor-monitoring wells, and final 2 rounds were performed using the Phase II wells and the 4 new Phase III wells. To evaluate potential groundwater contamination, a new regional well, well R-60, was installed approximately 100 ft east of MDA C. Two quarterly rounds of groundwater samples were collected from well R-60.

C-4.1 Vapor Sampling

Four new vapor-monitoring wells were installed during the Phase III investigation. Three of these wells were installed next to existing Phase II vapor-monitoring wells to provide deeper sampling ports below the TD of the existing wells. The remaining well was installed at a location without an existing well. Before these 4 new wells were installed, 4 rounds of vapor samples (January 2010–April 2010, April 2010–July 2010, July 2010–September 2010, and October 2010–January 2011) were collected using the vapor-monitoring well network installed during the 2008–2009 Phase II investigation. Following installation of the 4 new wells, 2 additional rounds of vapor samples (January 2011–March 2011 and March 2011–May 2011) were collected from the existing and new wells. The total number of vapor samples collected during these 6 events was 132, 127, 126, 127, 154, and 154, respectively, for a total of 820 samples. The vapor samples were submitted for analysis of VOCs and tritium. Figure C-4.1-1 shows the sampling locations, and Table C-4.1-1 shows the sampling port depths and geologic units monitored at each location. Tables C-4.1-2 through C-4.1-7 summarize the samples collected and analyses requested during each of the 6 events. Samples for VOCs were collected in SUMMA canisters, and samples for tritium were collected in silica gel sample tubes.

Results for VOCs and tritium in vapor samples collected in the Phase II investigation are presented in Tables C-4.1-8 through C-4.1-13 and Tables C-4.1-14 through C-4.1-19, respectively.

The results of pore-gas samples collected from the deep Phase III monitoring wells showed VOC concentrations to decrease with depth to concentrations below screening levels. The lateral and vertical extent of vapor-phase VOC contamination at MDA C were defined.

C-4.2 Tschicoma Dacite Sampling

Two of the four deep boreholes installed during the 2010–2011 Phase III investigation were installed outside the footprint of MDA C to the south of Pajarito Road (locations 50-613184 and 50-613185 in Figure C-4.1-1). These boreholes were advanced approximately 20 ft into the top of the dacite and two samples were collected from each borehole and analyzed for TAL metals. The boreholes outside the MDA C footprint were sampled because these locations were judged to be most likely to be representative of background conditions. Table C-4-2-1 summarizes the samples collected and analyses requested.

TAL metals detected in the dacite samples are presented in Table C-4.2-2.

No background concentration data are available for metals in the Tschicoma dacite. The concentrations of most metals detected in the Phase III dacite samples were much lower than the concentrations previously detected in the Phase II sample from borehole 50-603470. The concentrations of metals in the sample from borehole 50-603470 appeared more representative of soil, which, along with a soil horizon video-logged at the top of the dacite in nearby well R-60, indicated that the metals detected in dacite at borehole 50-603470 were not associated with a contaminant release.

C-4.3 Groundwater Sampling

Regional well R-60 was completed during the 2010–2011 Phase III investigation. Data from the first two sampling events (December 16, 2010, and January 24, 2011) were evaluated as part of the Phase III investigation report. Based on the results of the core and vapor sampling, VOCs and tritium were the only contaminants that had migrated any significant distance from the MDA C disposal units toward the regional aquifer. Groundwater samples collected from well R-60 showed one VOC (acetone) detected in the first sample but no VOCs detected in the second sample. Tritium was not detected in either sample. These results indicate vapor-phase migration of VOCs and tritium from MDA C to the regional aquifer is not occurring.

C-5.0 POST-INVESTIGATION VAPOR SAMPLING

Following submittal of the Phase III investigation report for MDA C, vapor monitoring was performed in accordance with the frequencies and locations recommended in the report (LANL 2011, 204370, pp. 96–97). The report recommended quarterly sampling from 46 ports at 10 locations and annual sampling from 108 ports at 13 locations. The ports recommended for quarterly sampling were sampled in August 2011 and the ports recommended for annual sampling were sampled in October and November 2011. The Phase III investigation report was approved by NMED with modifications in December 2011 (NMED 2011, 208797). NMED's approval with modifications specified a revised monitoring program consisting of semiannual sampling from 80 ports at 18 locations. Locations of the 18 vapor-monitoring boreholes are shown in Figure C-5.0-1.The first semiannual sampling event was conducted in March and April 2012. The semiannual sampling events continued through October 2017 and then restarted in 2019 (N3B 2021, 701220).

VOCs detected in vapor samples collected during the August 2011 and October–November 2011 sampling events are presented in Tables C-5.0-1 and C-5.0-2, respectively. Table C-5.0-3 presents the samples collected and analyses requested for the March–April 2012 sampling event, and Table C-5.0-4 presents the VOCs detected in the vapor samples from this sampling event. VOCs detected from the March 2012–October 2017 yearly sampling events and from the two 2019 sampling events are shown in Tables C-5.0-5 through C-5.0-12.

Tables C-5.0-13 and C-5.0-14 present tritium detected in vapor samples during the August 2011 and October–November 2011 sampling events. Table C-5.0-15 presents tritium detected in vapor samples from the March 2012–October 2017 yearly sampling events, and Table C-5.0-16 presents tritium detected in vapor samples from the two 2019 sampling events.

C-6.0 REFERENCES

The following reference list includes documents cited in this appendix. Parenthetical information following each reference provides the author(s), publication date, and ERID, ESHID, or EMID. This information is also included in text citations. ERIDs were assigned by Los Alamos National Laboratory's (LANL's or the Laboratory's Associate Directorate for Environmental Management (IDs through 599999); ESHIDs were assigned by the Laboratory's Associate Directorate for Environment, Safety, and Health (IDs 600000 through 699999); and EMIDs are assigned by Newport News Nuclear BWXT-Los Alamos, LLC (N3B) (IDs 700000 and above). IDs are used to locate documents in N3B's Records Management System and in the Master Reference Set. The NMED Hazardous Waste Bureau and N3B maintain copies of the Master Reference Set. The set ensures that NMED has the references to review documents. The set is updated when new references are cited in documents.

ARM (ARM Group, Inc.), May 1, 2006. "Geophysical Investigation of Material Disposal Area C, Los Alamos National Laboratory, Los Alamos, New Mexico," ARM Project No. 06195, Hershey, Pennsylvania. (ARM 2006, 094164)

LANL (Los Alamos National Laboratory), September 22, 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, 059730)

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, 091493)

LANL (Los Alamos National Laboratory), December 2006. "Investigation Report for Material Disposal Area C, Solid Waste Management Unit 50-009, at Technical Area 50," Los Alamos National Laboratory document LA-UR-06-8096, Los Alamos, New Mexico. (LANL 2006, 094688)

LANL (Los Alamos National Laboratory), April 19, 2007. "Submittal of Drilling and Sampling Results from Boreholes Between Pit 2 and Pit 3 at Material Disposal Area C, Solid Waste Management Unit 50-009," Los Alamos National Laboratory letter (EP2007-0231) to J.P. Bearzi (NMED-HWB) from C.A. Mangeng (LANL) and G.J. Rael (DOE-LASO), Los Alamos, New Mexico. (LANL 2007, 097285)

LANL (Los Alamos National Laboratory), July 2007. "Phase II Investigation Work Plan for Material Disposal Area C, Solid Waste Management Unit 50-009, at Technical Area 50, Revision 1," Los Alamos National Laboratory document LA-UR-07-5083, Los Alamos, New Mexico. (LANL 2007, 098425)

LANL (Los Alamos National Laboratory), March 2008. "Pilot Test Work Plan for Evaluating Vapor-Sampling Systems at Material Disposal Area C," Los Alamos National Laboratory document LA-UR-08-1614, Los Alamos, New Mexico. (LANL 2008, 101653)

LANL (Los Alamos National Laboratory), July 2008. "Pilot Test Investigation Report for Evaluating Vapor-Sampling Systems at Material Disposal Area C, Solid Waste Management Unit 50-009, at Technical Area 50," Los Alamos National Laboratory document LA-UR-08-4814, Los Alamos, New Mexico. (LANL 2008, 102651)

LANL (Los Alamos National Laboratory), October 2009. "Phase II Investigation Report for Material Disposal Area C, Solid Waste Management Unit 50-009, at Technical Area 50, Revision 1," Los Alamos National Laboratory document LA-UR-09-6266, Los Alamos, New Mexico. (LANL 2009, 107389)

LANL (Los Alamos National Laboratory), December 2009. "Radionuclide Screening Action Levels (SALs) from RESRAD, Version 6.5," Los Alamos National Laboratory document LA-UR-09-8111, Los Alamos, New Mexico. (LANL 2009, 107655)

LANL (Los Alamos National Laboratory), June 2011. "Phase III Investigation Report for Material Disposal Area C, Solid Waste Management Unit 50-009, at Technical Area 50," Los Alamos National Laboratory document LA-UR-11-3429, Los Alamos, New Mexico. (LANL 2011, 204370)

Lee, R.K., June 16, 2006. "Report, MASW Survey, MDA C, Los Alamos, New Mexico," Quantum Geophysics, Inc., letter to J. Sena (LATA) from R.K. Lee (Quantum Geophysics, Inc.), Phoenixville, Pennsylvania. (Lee 2006, 094163)

N3B (Newport News Nuclear BWXT-Los Alamos, LLC), February 2021. "Periodic Monitoring Report for 2019 Vapor-Sampling Activities at Material Disposal Area C, Solid Waste Management Unit 50-009, at Technical Area 50, Revision 1," Newport News Nuclear BWXT-Los Alamos, LLC, document EM2021-0041, Los Alamos, New Mexico. (N3B 2021, 701220)

NMED (New Mexico Environment Department), February 19, 2007. “Notice of Disapproval (NOD) for Material Disposal Area (MDA) C, Solid Waste Management Unit 50-009, at Technical Area 50,” New Mexico Environment Department letter to D. Gregory (DOE LASO) and D. McInroy (LANL) from J.P. Bearzi (NMED-HWB), Santa Fe, New Mexico. (NMED 2007, 095437)

NMED (New Mexico Environment Department), March 28, 2008. “Approval with Modification, Pilot Test Work Plan for Evaluating Vapor-Sampling Systems at Material Disposal Area C,” New Mexico Environment Department letter to D. Gregory (DOE-LASO) and D. McInroy (LANL) from J.P. Bearzi (NMED-HWB), Santa Fe, New Mexico. (NMED 2008, 101113)

NMED (New Mexico Environment Department), September 10, 2008. “Approval, Pilot Test Investigation Report for Evaluating Vapor-Sampling Systems at Material Disposal Area C,” New Mexico Environment Department letter to D. Gregory (DOE-LASO) and D. McInroy (LANL) from J.P. Bearzi (NMED-HWB), Santa Fe, New Mexico. (NMED 2008, 102903)

NMED (New Mexico Environment Department), October 15, 2009. “Second Notice of Disapproval, Phase II Investigation Report for Material Disposal Area C, Solid Waste Management Unit 50-009, at Technical Area 50,” New Mexico Environment Department letter to D. Gregory (DOE-LASO) and D. McInroy (LANL) from J.P. Bearzi (NMED-HWB), Santa Fe, New Mexico. (NMED 2009, 107361)

NMED (New Mexico Environment Department), December 8, 2011. “Approval, Phase III Investigation Report for Material Disposal Area C, Solid Waste Management Unit 50-009, at Technical Area 50,” New Mexico Environment Department letter to G.J. Rael (DOE-LASO) and M.J. Graham (LANL) from J.E. Kieling (NMED-HWB), Santa Fe, New Mexico. (NMED 2011, 208797)

NMED (New Mexico Environment Department), February 2012 (updated June 2012). “Risk Assessment Guidance for Site Investigations and Remediation,” Hazardous Waste Bureau and Ground Water Quality Bureau Voluntary Remediation Program, Santa Fe, New Mexico. (NMED 2012, 219971)

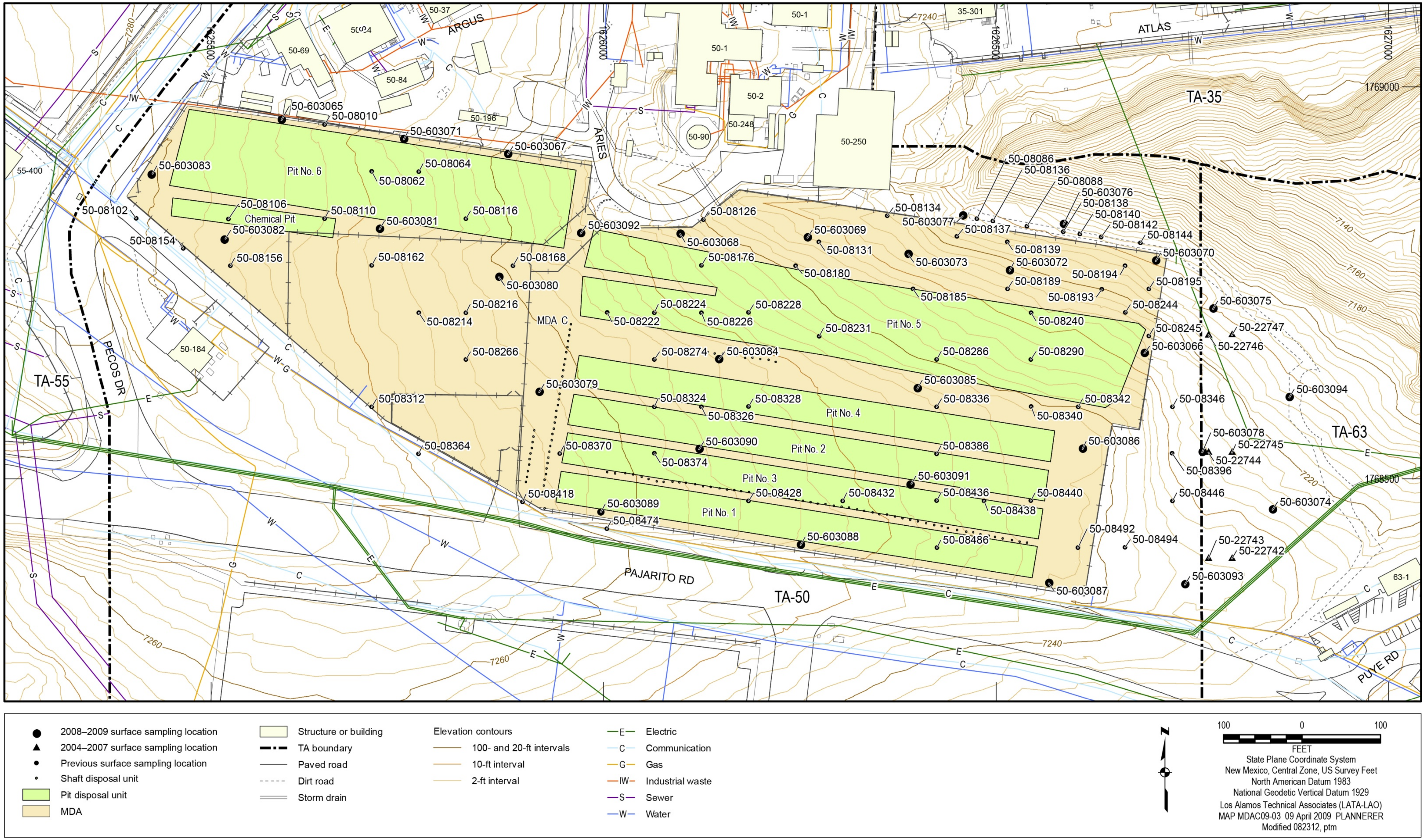


Figure C-2.1-1 All surface and near-surface sampling locations at MDA C

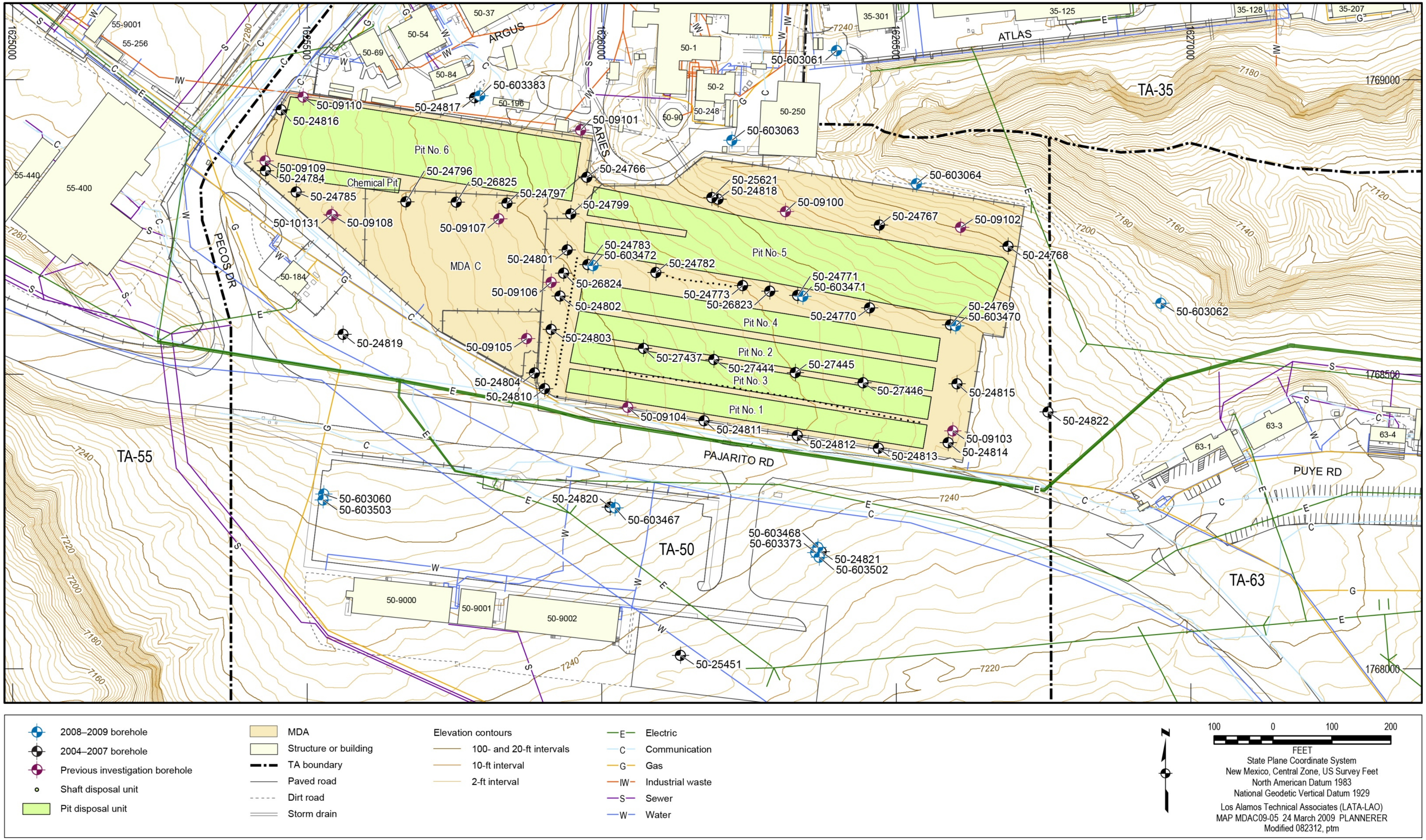


Figure C-2.3-1 Locations of boreholes used to collect core samples at MDA C

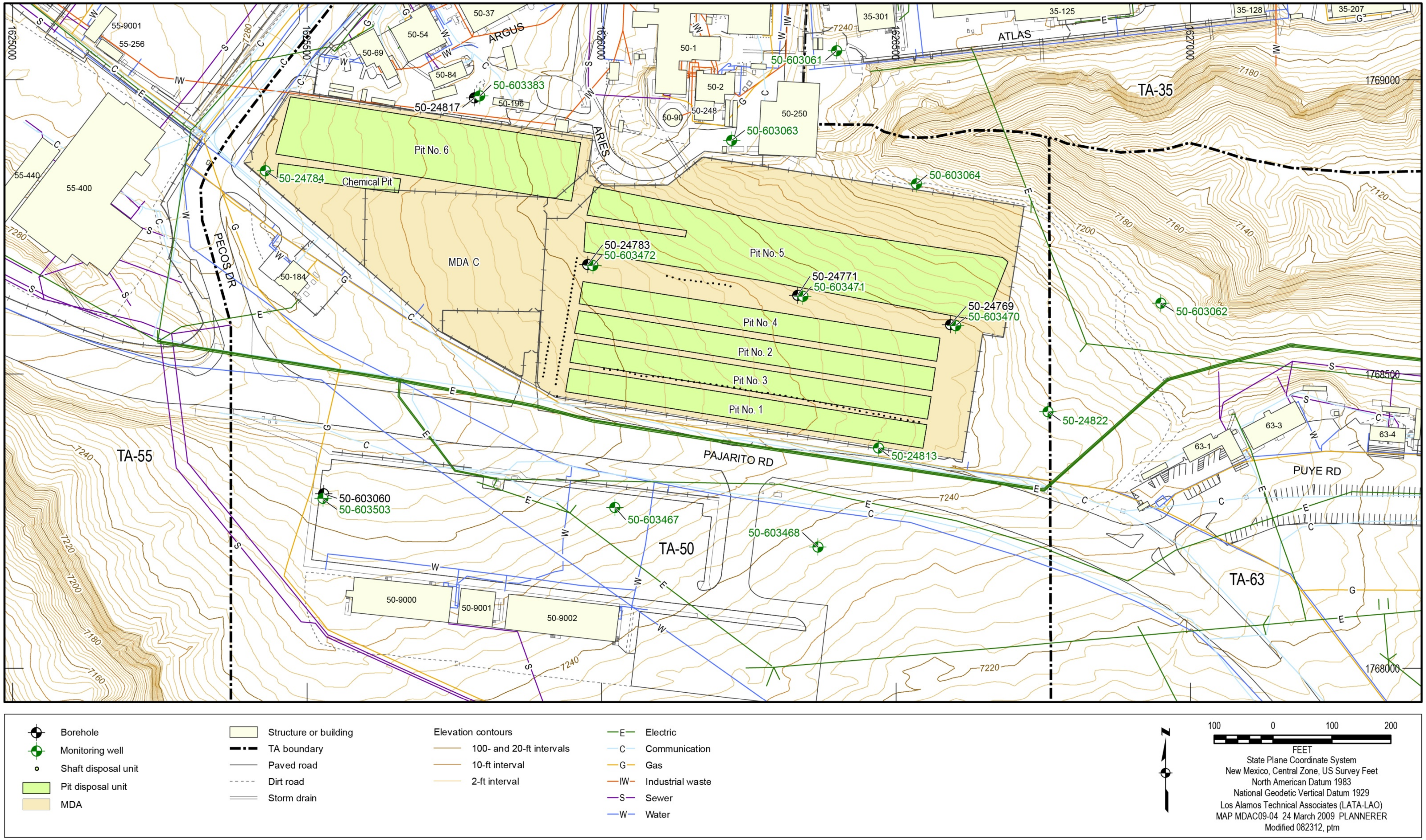


Figure C-3.2-1 Phase II boreholes and vapor-sampling locations

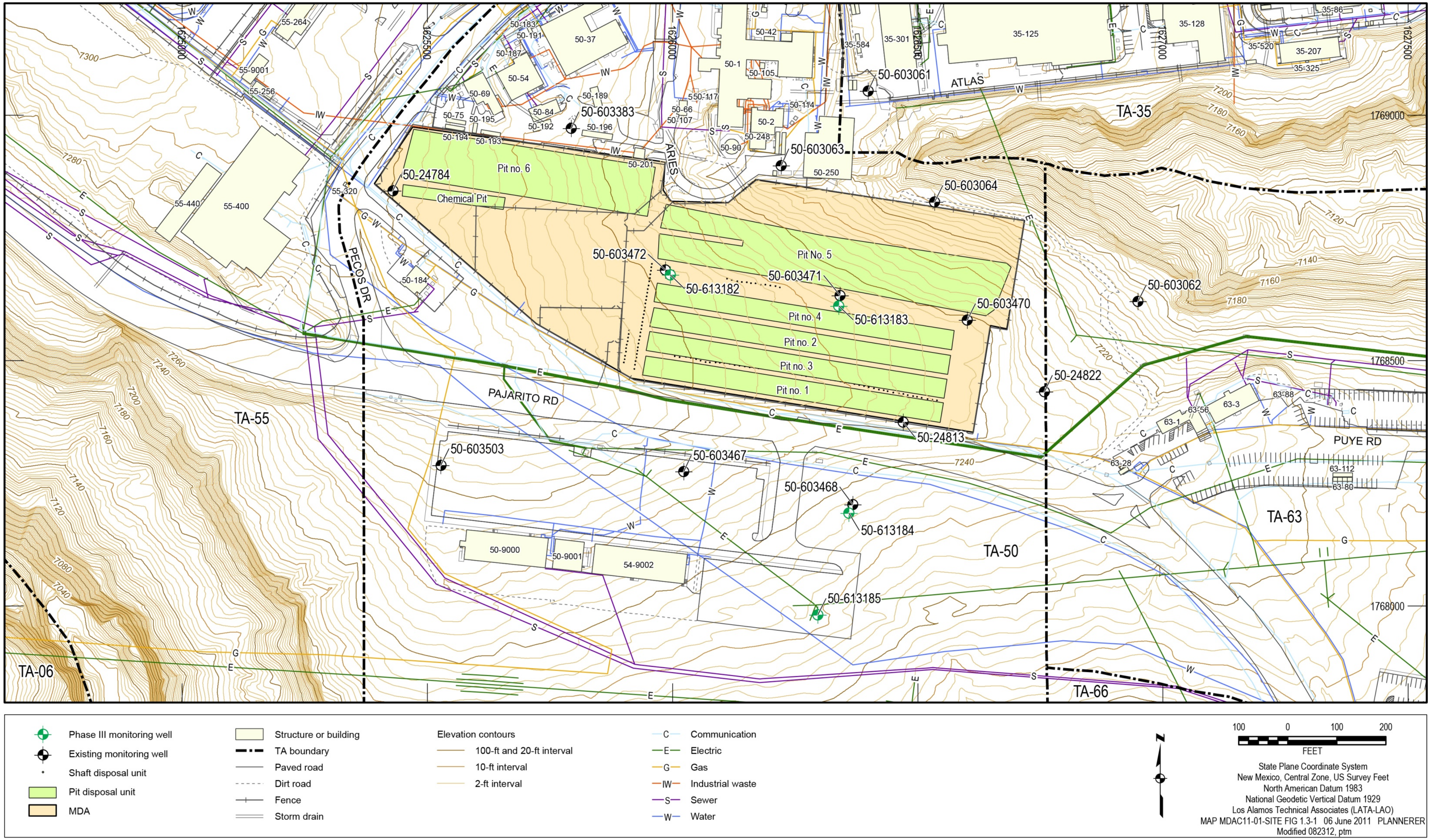


Figure C-4.1-1 Locations of vapor-monitoring boreholes sampled during Phase III investigation at MDA C

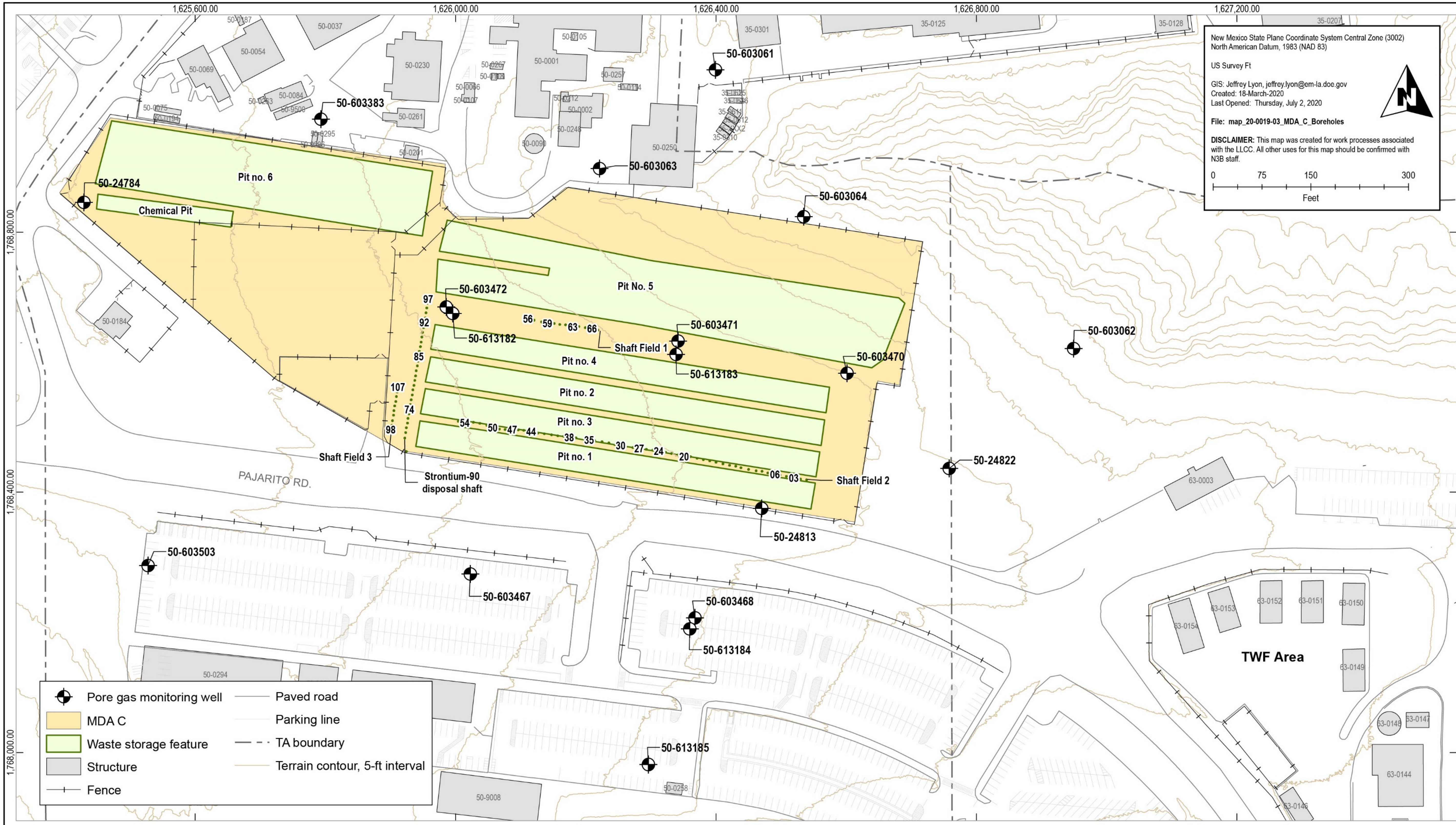


Figure C-5.0-1 Location of 18 vapor-monitoring boreholes sampled based on NMED's approval with modifications

Table C-2.1-1
Summary of Surface Soil Samples Collected at MDA C during 2004–2007 Investigation

Location ID	Sample ID	Depth (ft)	Media	Americium-241	Gamma-Emitting Radionuclides	Isotopic Plutonium	Isotopic Uranium	Strontium-90
50-22742	MD50-04-53250	0–0.5	Soil	2149S*	2149S	2149S	2149S	2149S
50-22743	MD50-04-53251	0–0.5	Soil	2149S	2149S	2149S	2149S	2149S
50-22744	MD50-04-53252	0–0.5	Soil	2149S	2149S	2149S	2149S	2149S
50-22745	MD50-04-53253	0–0.5	Soil	2149S	2149S	2149S	2149S	2149S
50-22746	MD50-04-53254	0–0.5	Soil	2149S	2149S	2149S	2149S	2149S
50-22747	MD50-04-53255	0–0.5	Soil	2149S	2149S	2149S	2149S	2149S

* Analytical request number.

Table C-2.1-2
Radionuclides Detected or Detected Above BVs/FVs in Surface Soil Samples at MDA C during 2004–2007 Investigation

Location ID	Sample ID	Depth (ft)	Media	Americium-241	Cesium-134	Plutonium-238	Plutonium-239
Soil/Fill BV/FV[a]				**0.013**	**na**[b]	**0.023**	**0.054**
Industrial SAL[c]				**180**	**9.7**	**240**	**210**
Residential SAL[c]				**30**	**2.4**	**37**	**33**
50-22742	MD50-04-53250	0.0–0.5	Soil	—[d]	0.08	—	0.36
50-22743	MD50-04-53251	0.0–0.5	Soil	0.05	—	0.04	1.12
50-22744	MD50-04-53252	0.0–0.5	Soil	—	0.08	—	0.74
50-22745	MD50-04-53253	0.0–0.5	Soil	0.08	0.08	0.07	0.62
50-22746	MD50-04-53254	0.0–0.5	Soil	—	—	—	1.84
50-22747	MD50-04-53255	0.0–0.5	Soil	0.1	—	0.03	3

Note: Units are pCi/g.

[a] BVs and FVs are from LANL (1998, 059730).

[b] na = Not available.

[c] Screening action levels (SALs) are from LANL (2009, 107655).

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

Table C-2.3-1
Summary of Subsurface Tuff Samples Collected at MDA C during 2004–2007 Investigation

Location ID	Sample ID	Depth (ft)	Media	Americium-241	Anions	Cyanide	Dioxins and Furans	Gamma-Emitting Radionuclides	Explosive Compounds	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs
50-24766	MD50-06-64603	15.6–17.1	Qbt 3	5069S[a]	5068S	5068S	5066S	5069S	5067S	5069S	5069S	5068S	5067S	5067S	5069S	5067S	—[b]
50-24766	MD50-06-64604	27.5–29.2	Qbt 3	5069S	5068S	5068S	5066S	5069S	5067S	5069S	5069S	5068S	5067S	5067S	5069S	5067S	—
50-24766	MD50-06-64586	97.5–99.9	Qbt 2	5073S	5072S	5072S	—	5073S	—	5073S	5073S	5072S	5071S	5071S	5073S	5071S	—
50-24766	MD50-06-64587	122.5–124.6	Qbt 2	5073S	5072S	5072S	—	5073S	—	5073S	5073S	5072S	5071S	5071S	5073S	5071S	—
50-24766	MD50-06-64605	148.1–149.5	Qbt 2	5082S	5082S	5082S	5080S	5082S	—	5082S	5082S	5082S	5081S	5081S	5082S	5081S	—
50-24767	MD50-06-64635	8–10	Qbt 3	4737S	4737S	4737S	4735S	4737S	4736S	4737S	4737S	4737S	4736S	4736S	4737S	4736S	—
50-24767	MD50-06-64636	28.1–30	Qbt 3	4754S	4754S	4754S	4752S	4754S	4753S	4754S	4754S	4754S	4753S	4753S	4754S	4753S	—
50-24767	MD50-06-66770	29.5–30	Qbt 3	—	—	—	—	—	—	—	—	—	—	—	—	—	4741S
50-24767	MD50-06-64618	58.3–59.8	Qbt 3	4768S	4767S	4767S	—	4768S	—	4768S	4768S	4767S	4766S	4766S	4768S	4766S	—
50-24767	MD50-06-66772	59.9–60	Qbt 3	—	—	—	—	—	—	—	—	—	—	—	—	—	4764S
50-24767	MD50-06-64619	123.2–125	Qbt 2	4768S	4767S	4767S	—	4768S	—	4768S	4768S	4767S	4766S	4766S	4768S	4766S	—
50-24767	MD50-06-64637	148.3–149.8	Qbt 2	4768S	4767S	4767S	4765S	4768S	—	4768S	4768S	4767S	4766S	4766S	4768S	4766S	—
50-24768	MD50-06-64667	12.5–15	Qbt 3	4782S	4781S	4781S	4779S	4782S	4780S	4782S	4782S	4781S	4780S	4780S	4782S	4780S	—
50-24768	MD50-06-64668	27.5–29.5	Qbt 3	4782S	4781S	4781S	4779S	4782S	4780S	4782S	4782S	4781S	4780S	4780S	4782S	4780S	—
50-24768	MD50-06-64650	96.7–99.5	Qbt 2	4807S	4806S	4806S	—	4807S	—	4807S	4807S	4806S	4805S	4805S	4807S	4805S	—
50-24768	MD50-06-64651	123.2–125	Qbt 2	4807S	4806S	4806S	—	4807S	—	4807S	4807S	4806S	4805S	4805S	4807S	4805S	—
50-24768	MD50-06-64669	148.6–151.5	Qbt 2	4807S	4806S	4806S	4804S	4807S	—	4807S	4807S	4806S	4805S	4805S	4807S	4805S	—
50-24769	MD50-06-64699	18.1–20	Qbt 3	4815S	4814S	4814S	4812S	4815S	4813S	4815S	4815S	4814S	4813S	4813S	4815S	4813S	—
50-24769	MD50-06-64700	37.5–39.9	Qbt 3	4815S	4814S	4814S	4812S	4815S	4813S	4815S	4815S	4814S	4813S	4813S	4815S	4813S	—
50-24769	MD50-06-64682	97.5–99.3	Qbt 3	4839S	4838S	4838S	—	4839S	—	4839S	4839S	4838S	4837S	4837S	4839S	4837S	—
50-24769	MD50-06-64683	122.5–124.5	Qbt 2	4839S	4838S	4838S	—	4839S	—	4839S	4839S	4838S	4837S	4837S	4839S	4837S	—
50-24769	MD50-06-64701	147.9–149.8	Qbt 2	4839S	4838S	4838S	4841S	4839S	—	4839S	4839S	4838S	4837S	4837S	4839S	4837S	—
50-24770	MD50-06-64731	18.1–22.5	Qbt 3	4909S	4908S	4908S	4906S	4909S	4907S	4909S	4909S	4908S	4907S	4907S	4909S	4907S	—
50-24770	MD50-06-64717	24.6–25	Qbt 3	4909S	4908S	4908S	—	4909S	—	4909S	4909S	4908S	4907S	4907S	4909S	4907S	—
50-24770	MD50-06-64732	38.2–39.9	Qbt 3	4909S	4908S	4908S	4906S	4909S	4907S	4909S	4909S	4908S	4907S	4907S	4909S	4907S	—
50-24770	MD50-06-64714	98.7–100	Qbt 3	4931S	4931S	4931S	—	4931S	—	4931S	4931S	4931S	4930S	4930S	4931S	4930S	—
50-24770	MD50-06-64715	123.2–124.6	Qbt 3	4939S	4938S	4938S	—	4939S	—	4939S	4939S	4938S	4937S	4937S	4939S	4937S	—
50-24770	MD50-06-64733	147.5–150	Qbt 2	4939S	4938S	4938S	4936S	4939S	—	4939S	4939S	4938S	4937S	4937S	4939S	4937S	—
50-24771	MD50-06-64756	15.9–17.5	Qbt 3	4853S	4853S	4853S	4851S	4853S	4852S	4853S	4853S	4853S	4852S	4852S	4853S	4852S	—
50-24771	MD50-06-64757	38–40	Qbt 3	4884S	4883S	4883S	4881S	4884S	4882S	4884S	4884S	4883S	4882S	4882S	4884S	4882S	—
50-24771	MD50-06-64739	98.8–100	Qbt 2	4884S	4883S	4883S	—	4884S	—	4884S	4884S	4883S	4882S	4882S	4884S	4882S	—
50-24771	MD50-06-64740	123.6–125	Qbt 2	4884S	4883S	4883S	—	4884S	—	4884S	4884S	4883S	4882S	4882S	4884S	4882S	—
50-24771	MD50-06-64758	148.2–150	Qbt 2	4884S	4883S	4883S	4881S	4884S	—	4884S	4884S	4883S	4882S	4882S	4884S	4882S	—
50-24773	MD50-06-64781	20–22.5	Qbt 3	4819S	4818S	4818S	4816S	4819S	4817S	4819S	4819S	4818S	4817S	4817S	4819S	4817S	—
50-24773	MD50-06-64782	38–40	Qbt 3	4836S	4836S	4836S	4840S	4836S	4835S	4836S	4836S	4836S	4835S	4835S	4836S	4835S	—

Table C-2.3-1 (continued)

Location ID	Sample ID	Depth (ft)	Media	Americium-241	Anions	Cyanide	Dioxins and Furans	Gamma-Emitting Radionuclides	Explosive Compounds	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs
50-24773	MD50-06-64764	98.5–100	Qbt 2	4850S	4849S	4849S	—	4850S	—	4850S	4850S	4849S	4848S	4848S	4850S	4848S	—
50-24773	MD50-06-64765	123.7–124.8	Qbt 2	4850S	4849S	4849S	—	4850S	—	4850S	4850S	4849S	4848S	4848S	4850S	4848S	—
50-24773	MD50-06-64783	150–152.8	Qbt 2	4850S	4849S	4849S	4847S	4850S	—	4850S	4850S	4849S	4848S	4848S	4850S	4848S	—
50-24782	MD50-06-64813	20.9–22.5	Qbt 3	4763S	4762S	4762S	4760S	4763S	4761S	4763S	4763S	4762S	4761S	4761S	4763S	4761S	—
50-24782	MD50-06-64814	35.3–37.1	Qbt 3	4763S	4762S	4762S	4760S	4763S	4761S	4763S	4763S	4762S	4761S	4761S	4763S	4761S	—
50-24782	MD50-06-64796	98.5–100	Qbt 3	4784S	4784S	4784S	—	4784S	—	4784S	4784S	4784S	4783S	4783S	4784S	4783S	—
50-24782	MD50-06-64797	123.5–125	Qbt 3	4803S	4802S	4802S	—	4803S	—	4803S	4803S	4802S	4801S	4801S	4803S	4801S	—
50-24782	MD50-06-64815	156–157.5	Qbt 3	4803S	4802S	4802S	4800S	4803S	—	4803S	4803S	4802S	4801S	4801S	4803S	4801S	—
50-24783	MD50-06-64838	17.5–20	Qbt 3	4725S	4724S	4724S	4730S	4725S	4723S	4725S	4725S	4724S	4723S	4723S	4725S	4723S	—
50-24783	MD50-06-64839	35.4–37.5	Qbt 3	4725S	4724S	4724S	4730S	4725S	4723S	4725S	4725S	4724S	4723S	4723S	4725S	4723S	—
50-24783	MD50-06-64821	98.6–100	Qbt 3	4739S	4739S	4739S	—	4739S	—	4739S	4739S	4739S	4738S	4738S	4739S	4738S	—
50-24783	MD50-06-64822	123.3–125	Qbt 2	4751S	4750S	4750S	—	4751S	—	4751S	4751S	4750S	4749S	4749S	4751S	4749S	—
50-24783	MD50-06-64840	150.3–152.5	Qbt 2	4751S	4750S	4750S	4748S	4751S	—	4751S	4751S	4750S	4749S	4749S	4751S	4749S	—
50-24784	MD50-06-64380	8–10	Qbt 3	4579S	4579S	4579S	4577S	4579S	4578S	4579S	4579S	4579S	4578S	4578S	4579S	4578S	—
50-24784	MD50-06-64381	18–20	Qbt 3	4598S	4597S	4597S	4595S	4598S	4596S	4598S	4598S	4597S	4596S	4596S	4598S	4596S	—
50-24784	MD50-06-64363	46.1–47.5	Qbt 3	4598S	4597S	4597S	—	4598S	—	4598S	4598S	4597S	4596S	4596S	4598S	4596S	—
50-24784	MD50-06-64364	48.7–50	Qbt 3	4598S	4597S	4597S	—	4598S	—	4598S	4598S	4597S	4596S	4596S	4598S	4596S	—
50-24784	MD50-06-64365	51–55	Qbt 3	4626S	4625S	4625S	—	4626S	—	4626S	4626S	4625S	4624S	4624S	4626S	4624S	—
50-24784	MD50-06-64367	98.5–100	Qbt 3	4626S	4625S	4625S	—	4626S	—	4626S	4626S	4625S	4624S	4624S	4626S	4624S	—
50-24784	MD50-06-64366	167.5–169	Qbt 2	4661S	4660S	4660S	—	4661S	—	4661S	4661S	4660S	4659S	4659S	4661S	4659S	—
50-24784	MD50-06-64369	197.9–199.2	Qbt 1v	4672S	4671S	4671S	—	4672S	—	4672S	4672S	4671S	4670S	4670S	4672S	4670S	—
50-24784	MD50-06-64368	248–250	Qbt 1v	4672S	4671S	4671S	—	4672S	—	4672S	4672S	4671S	4670S	4670S	4672S	4670S	—
50-24784	MD50-06-65526	273.5–275	Qbt 1g	4681S	4681S	4681S	—	4681S	—	4681S	4681S	4681S	4680S	4680S	4681S	4680S	—
50-24784	MD50-06-64382	298.3–299.8	Qbt 1g	4679S	4679S	4679S	4678S	4679S	—	4679S	4679S	4679S	4677S	4677S	4679S	4677S	—
50-24785	MD50-06-64412	8.5–10	Qbt 3	4425S	4424S	4424S	4422S	4425S	4423S	4425S	4425S	4424S	4423S	4423S	4425S	4423S	—
50-24785	MD50-06-64413	17.5–19	Qbt 3	4438S	4437S	4437S	4435S	4438S	4436S	4438S	4438S	4437S	4436S	4436S	4438S	4436S	—
50-24785	MD50-06-64395	57.5–60	Qbt 3	4468S	4467S	4467S	—	4468S	—	4468S	4468S	4467S	4466S	4466S	4468S	4466S	—
50-24785	MD50-06-64396	117.5–120	Qbt 2	4484S	4483S	4483S	—	4484S	—	4484S	4484S	4483S	4482S	4482S	4484S	4482S	—
50-24785	MD50-06-64397	198.7–200	Qbt 1v	4499S	4498S	4498S	—	4499S	—	4499S	4499S	4498S	4497S	4497S	4499S	4497S	—
50-24785	MD50-06-64398	248.5–250	Qbt 1g	4539S	4539S	4539S	—	4539S	—	4539S	4539S	4539S	4538S	4538S	4539S	4538S	—
50-24785	MD50-06-64414	273.8–275	Qbt 1g	4544S	4544S	4544S	4545S	4544S	—	4544S	4544S	4544S	4544S	4544S	4544S	4544S	—
50-24796	MD50-06-64457	8–10	Qbt 3	4250S	4250S	4250S	4250S	4250S	4250S	4250S	4250S	4250S	4250S	—	4250S	4250S	—
50-24796	MD50-06-64458	17.5–19.3	Qbt 3	4250S	4250S	4250S	4250S	4250S	4250S	4250S	4250S	4250S	4250S	—	4250S	4250S	—
50-24796	MD50-06-64440	37.5–39.3	Qbt 3	4271S	4270S	4270S	—	4271S	—	4271S	4271S	4270S	4269S	—	4271S	4269S	—
50-24796	MD50-06-64441	97.5–100	Qbt 3	4271S	4270S	4270S	—	4271S	—	4271S	4271S	4270S	4269S	—	4271S	4269S	—
50-24796	MD50-06-64442	118.7–120	Qbt 2	4281S	4280S	4280S	—	4281S	—	4281S	4281S	4280S	4278S	—	4281S	4278S	—
50-24796	MD50-06-64459	147.5–149.4	Qbt 2	4281S	4280S	4280S	4279S	4281S	—	4281S	4281S	4280S	4278S	—	4281S	4278S	—

Table C-2.3-1 (continued)

Location ID	Sample ID	Depth (ft)	Media	Americium-241	Anions	Cyanide	Dioxins and Furans	Gamma-Emitting Radionuclides	Explosive Compounds	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs
50-24797	MD50-06-64506	17.5–18.3	Qbt 3	4311S	4311S	4311S	4304S	4311S	4311S	4311S	4311S	4311S	4311S	4311S	4311S	4311S	—
50-24797	MD50-06-64509	37–38	Qbt 3	4320S	4320S	4320S	4319S	4320S	4320S	4320S	4320S	4320S	4320S	4320S	4320S	4320S	—
50-24797	MD50-06-64489	58–60	Qbt 3	4335S	4334S	4334S	—	4335S	—	4335S	4335S	4334S	4333S	4333S	4335S	4333S	—
50-24797	MD50-06-64490	117–120	Qbt 2	4335S	4334S	4334S	—	4335S	—	4335S	4335S	4334S	4333S	4333S	4335S	4333S	—
50-24797	MD50-06-64508	157.5–159	Qbt 2	4380S	4380S	4380S	4378S	4380S	—	4380S	4380S	4380S	4379S	4379S	4380S	4379S	—
50-24799	MD50-06-64516	13.1–15	Qbt 3	4298S	4298S	4298S	—	4298S	—	4298S	4298S	4298S	4298S	4298S	4298S	4298S	—
50-24799	MD50-06-64517	15–16.5	Qbt 3	4298S	4298S	4298S	—	4298S	—	4298S	4298S	4298S	4298S	4298S	4298S	4298S	—
50-24799	MD50-06-64531	18–20	Qbt 3	4298S	4298S	4298S	4297S	4298S	4298S	4298S	4298S	4298S	4298S	4298S	4298S	4298S	—
50-24799	MD50-06-64532	30.6–32.5	Qbt 3	4310S	4310S	4310S	4301S	4310S	4309S	4310S	4310S	4310S	4309S	4309S	4310S	4309S	—
50-24799	MD50-06-64518	34.5–36	Qbt 3	4310S	4310S	4310S	—	4310S	—	4310S	4310S	4310S	4309S	4309S	4310S	4309S	—
50-24799	MD50-06-64519	38.5–40	Qbt 3	4310S	4310S	4310S	—	4310S	—	4310S	4310S	4310S	4309S	4309S	4310S	4309S	—
50-24799	MD50-06-64514	98.3–100	Qbt 3	4337S	4337S	4337S	—	4337S	—	4337S	4337S	4337S	4336S	4336S	4337S	4336S	—
50-24799	MD50-06-64515	118.4–120	Qbt 2	4374S	4373S	4373S	—	4374S	—	4374S	4374S	4373S	4371S	4371S	4374S	4371S	—
50-24799	MD50-06-64533	158.5–160	Qbt 2	4374S	4373S	4373S	4372S	4374S	—	4374S	4374S	4373S	4371S	4371S	4374S	4371S	—
50-24801	MD50-06-64863	16.8–20	Qbt 3	4504S	4504S	4504S	4504S	4504S	4504S	4504S	4504S	4504S	4504S	4504S	4504S	4504S	—
50-24801	MD50-06-64864	33–35	Qbt 3	4504S	4504S	4504S	4504S	4504S	4504S	4504S	4504S	4504S	4504S	4504S	4504S	4504S	—
50-24801	MD50-06-64846	78–80	Qbt 3	4541S	4541S	4541S	—	4541S	—	4541S	4541S	4541S	4540S	4540S	4541S	4540S	—
50-24801	MD50-06-64847	118–120	Qbt 2	4542S	4542S	4542S	—	4542S	—	4542S	4542S	4542S	4542S	4542S	4542S	4542S	—
50-24801	MD50-06-64865	148.3–150	Qbt 2	4542S	4542S	4542S	4543S	4542S	—	4542S	4542S	4542S	4542S	4542S	4542S	4542S	—
50-24802	MD50-06-64888	12.5–16.1	Qbt 3	4686S	4686S	4686S	4695S	4686S	4687S	4686S	4686S	4686S	4687S	4687S	4686S	4687S	—
50-24802	MD50-06-64889	40.6–42.5	Qbt 3	4686S	4686S	4686S	4695S	4686S	4687S	4686S	4686S	4686S	4687S	4687S	4686S	4687S	—
50-24802	MD50-06-64871	98.2–100	Qbt 3	4694S	4693S	4693S	—	4694S	—	4694S	4694S	4693S	4691S	4691S	4694S	4691S	—
50-24802	MD50-06-64872	123.1–125	Qbt 2	4694S	4693S	4693S	—	4694S	—	4694S	4694S	4693S	4691S	4691S	4694S	4691S	—
50-24802	MD50-06-64890	157.5–159.1	Qbt 2	4694S	4693S	4693S	4692S	4694S	—	4694S	4694S	4693S	4691S	4691S	4694S	4691S	—
50-24803	MD50-06-64913	15.4–17.5	Qbt 3	4707S	4707S	4707S	4705S	4707S	4706S	4707S	4707S	4707S	4706S	4706S	4707S	4706S	—
50-24803	MD50-06-64914	36–37.5	Qbt 3	4711S	4710S	4710S	4708S	4711S	4709S	4711S	4711S	4710S	4709S	4709S	4711S	4709S	—
50-24803	MD50-06-64896	98.7–99.8	Qbt 3	4711S	4710S	4710S	—	4711S	—	4711S	4711S	4710S	4709S	4709S	4711S	4709S	—
50-24803	MD50-06-64897	123.3–124.8	Qbt 2	4711S	4710S	4710S	—	4711S	—	4711S	4711S	4710S	4709S	4709S	4711S	4709S	—
50-24803	MD50-06-64915	150–153.9	Qbt 2	4711S	4710S	4710S	4708S	4711S	—	4711S	4711S	4710S	4709S	4709S	4711S	4709S	—
50-24804	MD50-06-64965	8.6–9.8	Qbt 3	5091S	5090S	5090S	—	5091S	—	5091S	5091S	5090S	5089S	5089S	5091S	5089S	—
50-24804	MD50-06-64966	10–11.4	Qbt 3	5091S	5090S	5090S	—	5091S	—	5091S	5091S	5090S	5089S	5089S	5091S	5089S	—
50-24804	MD50-06-64980	15.4–17.1	Qbt 3	5091S	5090S	5090S	5088S	5091S	5089S	5091S	5091S	5090S	5089S	5089S	5091S	5089S	—
50-24804	MD50-06-64981	32.5–34.2	Qbt 3	5114S	5113S	5113S	5111S	5114S	5112S	5114S	5114S	5113S	5112S	5112S	5114S	5112S	—
50-24804	MD50-06-64963	97.8–99.2	Qbt 3	5114S	5113S	5113S	—	5114S	—	5114S	5114S	5113S	5112S	5112S	5114S	5112S	—
50-24804	MD50-06-64964	122.5–124.1	Qbt 3	5114S	5113S	5113S	—	5114S	—	5114S	5114S	5113S	5112S	5112S	5114S	5112S	—
50-24804	MD50-06-64982	147.5–149.8	Qbt 2	5114S	5113S	5113S	5111S	5114S	—	5114S	5114S	5113S	5112S	5112S	5114S	5112S	—
50-24810	MD50-06-65005	17.5–19	Qbt 3	5038S	5037S	5037S	5035S	5038S	5036S	5038S	5038S	5037S	5036S	5036S	5038S	5036S	—

Table C-2.3-1 (continued)

Location ID	Sample ID	Depth (ft)	Media	Americium-241	Anions	Cyanide	Dioxins and Furans	Gamma-Emitting Radionuclides	Explosive Compounds	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs
50-24810	MD50-06-65006	35.5–37.1	Qbt 3	5038S	5037S	5037S	5035S	5038S	5036S	5038S	5038S	5037S	5036S	5036S	5038S	5036S	—
50-24810	MD50-06-64988	97.5–99	Qbt 3	5038S	5037S	5037S	—	5038S	—	5038S	5038S	5037S	5036S	5036S	5038S	5036S	—
50-24810	MD50-06-64989	122.5–123.9	Qbt 2	5038S	5037S	5037S	—	5038S	—	5038S	5038S	5037S	5036S	5036S	5038S	5036S	—
50-24810	MD50-06-65007	148.3–151.6	Qbt 2	5042S	5041S	5041S	5039S	5042S	—	5042S	5042S	5041S	5040S	5040S	5042S	5040S	—
50-24811	MD50-06-65075	18.5–20	Qbt 3	5004S	5003S	5003S	5001S	5004S	5002S	5004S	5004S	5003S	5002S	5002S	5004S	5002S	—
50-24811	MD50-06-65076	38.5–40	Qbt 3	5004S	5003S	5003S	5001S	5004S	5002S	5004S	5004S	5003S	5002S	5002S	5004S	5002S	—
50-24811	MD50-06-65058	97.5–98.7	Qbt 3	5010S	5009S	5009S	—	5010S	—	5010S	5010S	5009S	5008S	5008S	5010S	5008S	—
50-24811	MD50-06-65059	123.2–125	Qbt 2	5010S	5009S	5009S	—	5010S	—	5010S	5010S	5009S	5008S	5008S	5010S	5008S	—
50-24811	MD50-06-65077	147.5–150.6	Qbt 2	5025S	5025S	5025S	5023S	5025S	—	5025S	5025S	5025S	5024S	5024S	5025S	5024S	—
50-24812	MD50-06-65100	8.4–10	Qbt 3	4970S	4970S	4970S	4969S	4970S	4970S	4970S	4970S	4970S	4970S	4970S	4970S	4970S	—
50-24812	MD50-06-65101	33.5–35	Qbt 3	4970S	4970S	4970S	4969S	4970S	4970S	4970S	4970S	4970S	4970S	4970S	4970S	4970S	—
50-24812	MD50-06-65083	97.5–98.9	Qbt 3	4968S	4968S	4968S	—	4968S	—	4968S	4968S	4968S	4968S	4968S	4968S	4968S	—
50-24812	MD50-06-65084	122.5–123.7	Qbt 2	4968S	4968S	4968S	—	4968S	—	4968S	4968S	4968S	4968S	4968S	4968S	4968S	—
50-24812	MD50-06-65102	146–150	Qbt 2	4975S	4975S	4975S	4974S	4975S	—	4975S	4975S	4975S	4975S	4975S	4975S	4975S	—
50-24813	MD50-06-65132	18.2–20	Qbt 3	4935S	4934S	4934S	4932S	4935S	4933S	4935S	4935S	4934S	4933S	4933S	4935S	4933S	—
50-24813	MD50-06-65133	30–31.9	Qbt 3	4935S	4934S	4934S	4932S	4935S	4933S	4935S	4935S	4934S	4933S	4933S	4935S	4933S	—
50-24813	MD50-06-65115	98.2–99.7	Qbt 3	4949S	4948S	4948S	—	4949S	—	4949S	4949S	4948S	4947S	4947S	4949S	4947S	—
50-24813	MD50-06-65116	123.5–125	Qbt 2	4949S	4948S	4948S	—	4949S	—	4949S	4949S	4948S	4947S	4947S	4949S	4947S	—
50-24813	MD50-06-65134	148–150	Qbt 2	4949S	4948S	4948S	4946S	4949S	—	4949S	4949S	4948S	4947S	4947S	4949S	4947S	—
50-24814	MD50-06-65157	7.5–9.1	Qbt 3	4880S	4880S	4880S	4878S	4880S	4879S	4880S	4880S	4880S	4879S	4879S	4880S	4879S	—
50-24814	MD50-06-65158	30–31.6	Qbt 3	4913S	4912S	4912S	4910S	4913S	4911S	4913S	4913S	4912S	4911S	4912S	4913S	4911S	—
50-24814	MD50-06-65140	96.8–99.9	Qbt 3	4913S	4912S	4912S	—	4913S	—	4913S	4913S	4912S	4911S	4911S	4913S	4911S	—
50-24814	MD50-06-65141	123.5–124.8	Qbt 2	4913S	4912S	4912S	—	4913S	—	4913S	4913S	4912S	4911S	4911S	4913S	4911S	—
50-24814	MD50-06-65159	147.5–149.5	Qbt 2	4913S	4912S	4912S	4910S	4913S	—	4913S	4913S	4912S	4911S	4911S	4913S	4911S	—
50-24815	MD50-06-65189	17.5–20	Qbt 3	4846S	4845S	4845S	4843S	4846S	4844S	4846S	4846S	4845S	4844S	4844S	4846S	4844S	—
50-24815	MD50-06-65190	37.8–41.5	Qbt 3	4846S	4845S	4845S	4843S	4846S	4844S	4846S	4846S	4845S	4844S	4844S	4846S	4844S	—
50-24815	MD50-06-65172	98.8–100	Qbt 3	4857S	4856S	4856S	—	4857S	—	4857S	4857S	4856S	4855S	4855S	4857S	4855S	—
50-24815	MD50-06-65173	123.4–125	Qbt 2	4857S	4856S	4856S	—	4857S	—	4857S	4857S	4856S	4855S	4855S	4857S	4855S	—
50-24815	MD50-06-65191	147.8–149.7	Qbt 2	4857S	4856S	4856S	4854S	4857S	—	4857S	4857S	4856S	4855S	4855S	4857S	4855S	—
50-24816	MD50-06-65214	23.1–24.7	Qbt 3	4415S	4414S	4414S	4412S	4415S	4413S	4415S	4415S	4414S	4413S	4413S	4415S	4413S	—
50-24816	MD50-06-65215	32.2–34	Qbt 3	4415S	4414S	4414S	4412S	4415S	4413S	4415S	4415S	4414S	4413S	4413S	4415S	4413S	—
50-24816	MD50-06-65197	63.8–65	Qbt 3	4441S	4440S	4440S	—	4441S	—	4441S	4441S	4440S	4439S	4439S	4441S	4439S	—
50-24816	MD50-06-65198	118.7–120	Qbt 2	4441S	4440S	4440S	—	4441S	—	4441S	4441S	4440S	4439S	4439S	4441S	4439S	—
50-24816	MD50-06-65199	198.8–200	Qbt 2	4465S	4464S	4464S	—	4465S	—	4465S	4465S	4464S	4463S	4463S	4465S	4463S	—
50-24816	MD50-06-65216	223.4–225	Qbt 2	4465S	4464S	4464S	4462S	4465S	—	4465S	4465S	4464S	4463S	4463S	4465S	4463S	—
50-24817	MD50-05-63837	18.4–20	Qbt 3	4015S	4014S	4014S	4012S	4015S	—	4015S	4015S	4014S	4013S	—	4015S	4013S	—
50-24817	RE50-05-63807	18.4–20	Qbt 3	—	—	—	—	—	3983S	—	—	—	—	—	—	—	—

Table C-2.3-1 (continued)

Location ID	Sample ID	Depth (ft)	Media	Americium-241	Anions	Cyanide	Dioxins and Furans	Gamma-Emitting Radionuclides	Explosive Compounds	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs
50-24817	MD50-05-63838	37–40	Qbt 3	4015S	4014S	4014S	4012S	4015S	—	4015S	4015S	4014S	4013S	—	4015S	4013S	—
50-24817	RE50-05-63808	37–40	Qbt 3	—	—	—	—	—	3994S	—	—	—	—	—	—	—	—
50-24817	RE50-05-63810	98.8–100	Qbt 3	4016S	4016S	4016S	—	4016S	—	4016S	4016S	4016S	4016S	—	4016S	4016S	—
50-24817	RE50-05-63811	138–140	Qbt 2	4034S	4033S	4033S	—	4034S	—	4034S	4034S	4033S	4032S	—	4034S	4032S	—
50-24817	RE50-05-63812	198.4–200	Qbt 1v	4034S	4033S	4033S	—	4034S	—	4034S	4034S	4033S	4032S	—	4034S	4032S	—
50-24817	MD50-05-63839	248.1–250	Qbt 1g	4055S	4055S	4055S	4056S	4055S	—	4055S	4055S	4055S	4055S	—	4055S	4055S	—
50-24818	MD50-06-65229	8.5–10	Qbt 3	4556S	4556S	4556S	4554S	4556S	4555S	4556S	4556S	4556S	4555S	4555S	4556S	4555S	—
50-24818	MD50-06-65230	22.1–25	Qbt 3	4571S	4570S	4570S	4569S	4571S	4568S	4571S	4571S	4570S	4568S	4568S	4571S	4568S	—
50-24818	MD50-06-65261	98.5–100	Qbt 2	4588S	4587S	4587S	—	4588S	—	4588S	4588S	4587S	4586S	4586S	4588S	4586S	—
50-24818	MD50-06-66758	100.4–100.5	Qbt 2	—	—	—	—	—	—	—	—	—	—	—	—	—	4602S
50-24818	MD50-06-65262	147.5–149.2	Qbt 2	4623S	4623S	4623S	—	4623S	—	4623S	4623S	4623S	4622S	4622S	4623S	4622S	—
50-24818	MD50-06-65263	189.9–190	Qbt 1v	4648S	4649S	4649S	—	4648S	—	4648S	4648S	4649S	4647S	4647S	4648S	4647S	—
50-24818	MD50-06-66759	190	Qbt 1v	—	—	—	—	—	—	—	—	—	—	—	—	—	4632S
50-24818	MD50-06-65264	247.7–249.2	Qbt 1g	4658S	4657S	4657S	—	4658S	—	4658S	4658S	4657S	4656S	4656S	4658S	4656S	—
50-24818	MD50-06-65265	280–282.5	Qbt 1g	4675S	4674S	4674S	—	4675S	—	4675S	4675S	4674S	4673S	4673S	4675S	4673S	—
50-24818	MD50-06-66760	312.9–313	Qbt 1g	—	—	—	—	—	—	—	—	—	—	—	—	—	4666S
50-24818	MD50-06-65266	313.5–315	Qbt 1g	4683S	4683S	4683S	—	4683S	—	4683S	4683S	4683S	4682S	4682S	4683S	4682S	—
50-24818	MD50-06-65267	396–402	Qbo	5110S	5110S	5110S	—	5110S	—	5110S	5110S	5110S	5109S	5109S	5110S	5109S	—
50-24818	MD50-06-66761	397.9–398	Qbo	—	—	—	—	—	—	—	—	—	—	—	—	—	5108S
50-24818	MD50-06-65268	449–452	Qbo	5345S	5345S	5345S	—	5345S	—	5345S	5345S	5345S	5344S	5344S	5345S	5344S	—
50-24818	MD50-06-65269	497–500.5	Qbo	5366S	5366S	5366S	—	5366S	—	5366S	5366S	5366S	5365S	5365S	5366S	5365S	—
50-24818	MD50-06-66762	498.4–498.5	Qbo	—	—	—	—	—	—	—	—	—	—	—	—	—	5328S
50-24818	MD50-06-65270	547–551.5	Qbo	5369S	5368S	5368S	—	5369S	—	5369S	5369S	5368S	5367S	5367S	5369S	5367S	—
50-24818	MD50-06-65271	597–600.4	Qbo	5369S	5368S	5368S	—	5369S	—	5369S	5369S	5368S	5367S	5367S	5369S	5367S	—
50-24818	MD50-06-66763	600.4–600.5	Qbo	—	—	—	—	—	—	—	—	—	—	—	—	—	5334S
50-24819	RE50-05-61422	18.5–20	Qbt 3	3676S	3675S	3675S	—	3676S	—	3676S	3676S	3675S	3674S	—	3676S	3674S	—
50-24819	RE50-05-61423	48–50	Qbt 3	3689S	3688S	3688S	3840S	3689S	—	3689S	3689S	3688S	3687S	—	3689S	3687S	—
50-24819	RE50-05-61424	97.5–100	Qbt 3	3707S	3706S	3706S	—	3707S	—	3707S	3707S	3706S	3705S	—	3707S	3705S	—
50-24819	RE50-05-61425	138.5–140	Qbt 2	3707S	3706S	3706S	—	3707S	—	3707S	3707S	3706S	3705S	—	3707S	3705S	—
50-24819	RE50-05-61426	198.1–200	Qbt 1v	3737S	3737S	3737S	—	3737S	—	3737S	3737S	3737S	3737S	—	3737S	3737S	—
50-24819	RE50-05-61427	246.5–250	Qbt 1v	3734S	3734S	3734S	—	3734S	—	3734S	3734S	3734S	3734S	—	3734S	3734S	—
50-24819	RE50-05-61428	273–275	Qbt 1g	3757S	3756S	3756S	3755S	3757S	—	3757S	3757S	3756S	3754S	—	3757S	3754S	—
50-24820	RE50-05-61438	17.5–20	Qbt 3	3788S	3788S	3788S	—	3788S	—	3788S	3788S	3788S	3788S	3788S	3788S	—	—
50-24820	RE50-05-61439	48.4–50	Qbt 3	3794S	3794S	3794S	3793S	3794S	—	3794S	3794S	3794S	3794S	3794S	3794S	—	—
50-24820	RE50-05-63429	48.4–50	Qbt 3	—	—	—	—	—	3792S	—	—	—	—	—	—	—	—
50-24820	RE50-05-61440	97.5–100	Qbt 3	3806S	3805S	3805S	—	3806S	—	3806S	3806S	3805S	3804S	3806S	3804S	—	—
50-24820	RE50-05-61441	138.7–140	Qbt 2	3826S	3826S	3826S	—	3826S	—	3826S	3826S	3826S	3826S	3826S	3826S	—	—

Table C-2.3-1 (continued)

Location ID	Sample ID	Depth (ft)	Media	Americium-241	Anions	Cyanide	Dioxins and Furans	Gamma-Emitting Radionuclides	Explosive Compounds	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs
50-24820	RE50-05-61442	198.2–200	Qbt 1v	3833S	3832S	3832S	—	3833S	—	3833S	3833S	3832S	3831S	3833S	3831S	—	—
50-24820	RE50-05-61443	248.3–250	Qbt 1g	3833S	3832S	3832S	—	3833S	—	3833S	3833S	3832S	3831S	3833S	3831S	—	—
50-24821	RE50-05-61456	18.6–20	Qbt 3	3841S	3841S	3841S	—	3841S	—	3841S	3841S	3841S	3841S	3841S	3841S	—	—
50-24821	RE50-05-63430	18.6–20	Qbt 3	—	—	—	—	—	3866S	—	—	—	—	—	—	—	—
50-24821	RE50-05-61457	48.6–50	Qbt 3	3841S	3841S	3841S	3840S	3841S	—	3841S	3841S	3841S	3841S	3841S	3841S	—	—
50-24821	RE50-05-63535	48.6–50	Qbt 3	—	—	—	—	—	3856S	—	—	—	—	—	—	—	—
50-24821	RE50-05-61458	98.4–100	Qbt 3	3859S	3859S	3859S	—	3859S	—	3859S	3859S	3859S	3859S	3859S	3859S	—	—
50-24821	RE50-05-61460	137.5–140	Qbt 2	3870S	3870S	3870S	—	3870S	—	3870S	3870S	3870S	3870S	3870S	3870S	—	—
50-24821	RE50-05-61459	157.5–160	Qbt 2	3881S	3881S	3881S	—	3881S	—	3881S	3881S	3881S	3881S	3881S	3881S	—	—
50-24821	RE50-05-61461	248.6–250	Qbt 1g	3893S	3893S	3893S	—	3893S	—	3893S	3893S	3893S	3893S	3893S	3893S	—	—
50-24822	RE50-05-61474	18.6–20	Qbt 3	3902S	3902S	3902S	—	3902S	—	3902S	3902S	3902S	3902S	—	3902S	3902S	—
50-24822	RE50-05-61475	47.5–49.1	Qbt 3	3924S	3924S	3924S	3925S	3924S	—	3924S	3924S	3924S	3924S	—	3924S	3924S	—
50-24822	RE50-05-63431	47.5–49.1	Qbt 3	—	—	—	—	—	3920S	—	—	—	—	—	—	—	—
50-24822	RE50-05-61476	98.6–100	Qbt 3	3924S	3924S	3924S	—	3924S	—	3924S	3924S	3924S	3924S	—	3924S	3924S	—
50-24822	RE50-05-61477	137.5–139.2	Qbt 2	3946S	3946S	3946S	—	3946S	—	3946S	3946S	3946S	3946S	—	3946S	3946S	—
50-24822	RE50-05-61478	198.5–200	Qbt 1v	3951S	3951S	3951S	—	3951S	—	3951S	3951S	3951S	3951S	—	3951S	3951S	—
50-24822	RE50-05-61479	248.7–250	Qbt 1g	3961S	3961S	3961S	—	3961S	—	3961S	3961S	3961S	3960S	—	3961S	3960S	—
50-25451	MD50-06-66697	18.7–19.9	Qbt 3	4967S	4967S	4967S	4966S	4967S	4967S	4967S	4967S	4967S	4967S	4967S	4967S	4967S	—
50-25451	MD50-06-66698	48.1–49.9	Qbt 3	4967S	4967S	4967S	4966S	4967S	4967S	4967S	4967S	4967S	4967S	4967S	4967S	4967S	—
50-25451	MD50-06-66671	96–100	Qbt 2	5000S	4999S	4999S	—	5000S	—	5000S	5000S	4999S	4998S	4998S	5000S	4998S	—
50-25451	MD50-06-66672	146–147.5	Qbt 2	5000S	4999S	4999S	—	5000S	—	5000S	5000S	4999S	4998S	4998S	5000S	4998S	—
50-25451	MD50-06-66673	198.9–200	Qbt 2	5000S	4999S	4999S	—	5000S	—	5000S	5000S	4999S	4998S	4998S	5000S	4998S	—
50-25451	MD50-06-66674	251.2–252.5	Qbt 1g	5012S	5012S	5012S	—	5012S	—	5012S	5012S	5012S	5011S	5011S	5012S	5011S	—
50-25451	MD50-06-66699	298.5–300	Qbt 1g	5028S	5028S	5028S	5026S	5028S	—	5028S	5028S	5028S	5027S	5027S	5028S	5027S	—
50-25621	MD50-06-68034	29.7–30	Qbt 3	—	—	—	—	—	—	—	—	—	—	—	—	—	4861S
50-25621	MD50-06-68035	59.7–60	Qbt 3	—	—	—	—	—	—	—	—	—	—	—	—	—	4861S

[a] Analytical request number.

[b] — = Analysis not requested.

Table C-2.3-2
Samples Collected and Analyses Requested in Boreholes between Pits 2 and 3 during 2004–2007 Investigation

Sample ID	Location ID	Depth (ft)	Media	Anions	Cyanide (total)	TAL metals	Perchlorate	Dioxins and furans	Explosive compounds	PCBs	SVOCs	VOCs	Americium-241	Gamma-Emitting Radionuclides	Tritium	Isotopic plutonium	Isotopic uranium	Strontium-90
MD50-07-75313	50-27437	4–5	Fill	6660S	6660S	6660S	6660S	—*	—	6659S	6659S	6659S	6661S	6661S	—	6661S	6661S	6661S
MD50-07-75329	50-27437	10	Vapor	—	—	—	—	—	—	—	—	6718S	—	—	6719S	—	—	—
MD50-07-75328	50-27437	20	Vapor	—	—	—	—	—	—	—	—	6718S	—	—	6719S	—	—	—
MD50-07-75314	50-27437	20.5–22.5	Qbt 3	6666S	6666S	6666S	6666S	—	—	6665S	6665S	6665S	6667S	6667S	—	6667S	6667S	6667S
MD50-07-75327	50-27437	32	Vapor	—	—	—	—	—	—	—	—	6718S	—	—	6719S	—	—	—
MD50-07-75317	50-27437	32.5–35	Qbt 3	6666S	6666S	6666S	6666S	6664S	6665S	6665S	6665S	6665S	6667S	6667S	—	6667S	6667S	6667S
MD50-07-75315	50-27437	60—62.5	Qbt 3	6666S	6666S	6666S	6666S	—	—	6665S	6665S	6665S	6667S	6667S	—	6667S	6667S	6667S
MD50-07-75326	50-27437	60	Vapor	—	—	—	—	—	—	—	—	6702S	—	—	6703S	—	—	—
MD50-07-75318	50-27437	80–82	Qbt 3	6666S	6666S	6666S	6666S	6664S	6665S	6665S	6665S	6665S	6667S	6667S	—	6667S	6667S	6667S
MD50-07-75325	50-27437	80	Vapor	—	—	—	—	—	—	—	—	6702S	—	—	6703S	—	—	—
MD50-07-75351	50-27444	20–22.5	Qbt 3	6713S	6713S	6713S	6713S	—	—	6712S	6712S	6712S	6714S	6714S	—	6714S	6714S	6714S
MD50-07-75367	50-27444	20	Vapor	—	—	—	—	—	—	—	—	6794S	—	—	6793S	—	—	—
MD50-07-75355	50-27444	35–37.5	Qbt 3	6713S	6713S	6713S	6713S	6710S	6711S	6712S	6712S	6712S	6714S	6714S	—	6714S	6714S	6714S
MD50-07-75366	50-27444	35	Vapor	—	—	—	—	—	—	—	—	6794S	—	—	6793S	—	—	—
MD50-07-75352	50-27444	60–65	Qbt 3	6721S	6721S	6721S	6721S	—	—	6720S	6720S	6720S	6722S	6722S	—	6722S	6722S	6722S
MD50-07-75365	50-27444	60	Vapor	—	—	—	—	—	—	—	—	6794S	—	—	6793S	—	—	—
MD50-07-75354	50-27444	80–82.5	Qbt 3	6721S	6721S	6721S	6721S	—	—	6720S	6720S	6720S	6722S	6722S	—	6722S	6722S	6722S
MD50-07-75364	50-27444	80	Vapor	—	—	—	—	—	—	—	—	6782S	—	—	6790S	—	—	—
MD50-07-75363	50-27444	97	Vapor	—	—	—	—	—	—	—	—	6782S	—	—	6790S	—	—	—
MD50-07-75357	50-27444	97.5–100	Qbt 3	6735S	6735S	6735S	6735S	—	—	6734S	6734S	6734S	6736S	6736S	—	6736S	6736S	6736S
MD50-07-75362	50-27444	140	Vapor	—	—	—	—	—	—	—	—	6782S	—	—	6790S	—	—	—
MD50-07-75368	50-27444	140–153	Qbt 2	6735S	6735S	6735S	6735S	—	—	6734S	6734S	6734S	6736S	6736S	—	6736S	6736S	6736S
MD50-07-75361	50-27444	197	Vapor	—	—	—	—	—	—	—	—	6776S	—	—	6777S	—	—	—
MD50-07-76314	50-27444	197.5–200	Qbt 1v	6750S	6750S	6750S	6750S	—	—	6749S	6749S	6749S	6750S	6750S	—	6750S	6750S	6750S
MD50-07-75360	50-27444	247	Vapor	—	—	—	—	—	—	—	—	6776S	—	—	6777S	—	—	—
MD50-07-76315	50-27444	247.5–250	Qbt 1v	6764S	6764S	6764S	6764S	—	—	6763S	6763S	6763S	6765S	6765S	—	6765S	6765S	6765S
MD50-07-75359	50-27444	296	Vapor	—	—	—	—	—	—	—	—	6776S	—	—	6777S	—	—	—
MD50-07-76316	50-27444	296–300	Qbt 1g	6764S	6764S	6764S	6764S	—	—	6763S	6763S	6763S	6765S	6765S	—	6765S	6765S	6765S
MD50-07-75356	50-27444	332.5–335	Qct	6762S	6762S	6762S	6762S	6759S	6760S	6761S	6761S	6761S	6762S	6762S	—	6762S	6762S	6762S

Table C-2.3-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Anions	Cyanide (total)	TAL metals	Perchlorate	Dioxins and furans	Explosive compounds	PCBs	SVOCs	VOCs	Americium-241	Gamma-Emitting Radionuclides	Tritium	Isotopic plutonium	Isotopic uranium	Strontium-90
MD50-07-75358	50-27444	335	Vapor	—	—	—	—	—	—	—	—	6756S	—	—	6758S	—	—	—
MD50-07-75374	50-27445	2.5–5	Fill	6679S	6679S	6679S	6679S	—	—	6678S	6678S	6678S	6680S	6680S	—	6680S	6680S	6680S
MD50-07-75386	50-27445	10	Vapor	—	—	—	—	—	—	—	—	6742S	—	—	6743S	—	—	—
MD50-07-75375	50-27445	20–22.5	Qbt 3	6679S	6679S	6679S	6679S	—	—	6678S	6678S	6678S	6680S	6680S	—	6680S	6680S	6680S
MD50-07-75385	50-27445	20	Vapor	—	—	—	—	—	—	—	—	6742S	—	—	6743S	—	—	—
MD50-07-75379	50-27445	35–37.5	Qbt 3	6679S	6679S	6679S	6679S	6678S	6678S	6678S	6678S	6678S	6680S	6680S	—	6680S	6680S	6680S
MD50-07-75384	50-27445	35	Vapor	—	—	—	—	—	—	—	—	6731S	—	—	6732S	—	—	—
MD50-07-75383	50-27445	62	Vapor	—	—	—	—	—	—	—	—	6731S	—	—	6732S	—	—	—
MD50-07-75376	50-27445	62.5–65	Qbt 3	6688S	6688S	6688S	6688S	—	—	6686S	6686S	6686S	6689S	6689S	—	6689S	6689S	6689S
MD50-07-75380	50-27445	80–82.5	Qbt 3	6688S	6688S	6688S	6688S	6684S	6687S	6686S	6686S	6686S	6689S	6689S	—	6689S	6689S	6689S
MD50-07-75382	50-27445	80	Vapor	—	—	—	—	—	—	—	—	6730S	—	—	6732S	—	—	—
MD50-07-75398	50-27446	2.5–5	Fill	6697S	6697S	6697S	6697S	—	—	6696S	6696S	6696S	6698S	6698S	—	6698S	6698S	6698S
MD50-07-75410	50-27446	10	Vapor	—	—	—	—	—	—	—	—	6755S	—	—	6757S	—	—	—
MD50-07-75399	50-27446	20–22.5	Qbt 3	6697S	6697S	6697S	6697S	—	—	6696S	6696S	6696S	6698S	6698S	—	6698S	6698S	6698S
MD50-07-75409	50-27446	20	Vapor	—	—	—	—	—	—	—	—	6755S	—	—	6757S	—	—	—
MD50-07-75408	50-27446	32	Vapor	—	—	—	—	—	—	—	—	6751S	—	—	6752S	—	—	—
MD50-07-75403	50-27446	35–37.5	Qbt 3	6697S	6697S	6697S	6697S	6704S	6705S	6696S	6696S	6696S	6698S	6698S	—	6698S	6698S	6698S
MD50-07-75400	50-27446	61–65	Qbt 3	6700S	6700S	6700S	6700S	—	—	6699S	6699S	6699S	6701S	6701S	—	6701S	6701S	6701S
MD50-07-75407	50-27446	61	Vapor	—	—	—	—	—	—	—	—	6751S	—	—	6752S	—	—	—
MD50-07-75404	50-27446	80–82.5	Qbt 3	6700S	6700S	6700S	6700S	6706S	6707S	6699S	6699S	6699S	6701S	6701S	—	6701S	6701S	6701S
MD50-07-75406	50-27446	80	Vapor	—	—	—	—	—	—	—	—	6751S	—	—	6752S	—	—	—

Note: Numbers in analyte columns are request numbers.

* — = Analysis not requested.

Table C-2.3-3
Summary of Inorganic Chemicals Detected or Detected above Background Values in Tuff at MDA C during 2005–2006 Sampling

Location ID	Sample ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron
Qbt 2,3,4 BV[a]				**7340**	**0.5**	**2.79**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**14,500**
Qbt 1v BV[a]				**8170**	**0.5**	**1.81**	**26.5**	**1.7**	**0.4**	**3700**	**2.24**	**1.78**	**3.26**	**9900**
Qbt 1g, Qct, Qbo BV[a]				**3560**	**0.5**	**0.56**	**25.7**	**1.44**	**0.4**	**1900**	**2.6**	**8.89**	**3.96**	**3700**
Industrial SSL[b]				**11,30,000**	**454**	**17.7**	**223,000**	**2260**	**897**	**na[c]**	**1,700,000[d]**	**302[e]**	**45,400**	**795,000**
Residential SSL[b]				**78,000**	**31.3**	**3.9**	**15,600**	**156**	**70.3**	**na**	**117,000[d]**	**23[e]**	**31,300**	**54,800**
50-24766	MD50-06-64604	27.5–29.2	Qbt 3	—[f]	—	—	—	—	—	—	—	—	—	—
50-24766	MD50-06-64586	97.5–99.9	Qbt 2	—	—	—	—	—	—	—	—	—	—	—
50-24766	MD50-06-64587	122.5–124.6	Qbt 2	—	—	—	—	—	—	—	—	—	—	—
50-24766	MD50-06-64605	148.1–149.5	Qbt 2	—	—	—	—	—	—	—	—	—	—	—
50-24767	MD50-06-64635	8–10	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24767	MD50-06-64636	28.1–30	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24767	MD50-06-64618	58.3–59.8	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24767	MD50-06-64619	123.2–125	Qbt 2	16,300 (J+)	—	2.93	56.3	3.4	—	—	—	—	4.73	—
50-24767	MD50-06-64637	148.3–149.8	Qbt 2	—	—	—	—	—	—	—	—	—	—	—
50-24768	MD50-06-64667	12.5–15	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24768	MD50-06-64668	27.5–29.5	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24768	MD50-06-64650	96.7–99.5	Qbt 2	—	—	—	—	—	—	—	—	—	—	—
50-24768	MD50-06-64651	123.2–125	Qbt 2	—	—	—	—	—	—	—	—	—	—	—
50-24768	MD50-06-64669	148.6–151.5	Qbt 2	7580 (J+)	—	—	—	1.5	—	—	—	—	—	—
50-24769	MD50-06-64699	18.1–20	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24769	MD50-06-64700	37.5–39.9	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24769	MD50-06-64682	97.5–99.3	Qbt 3	25,400	—	4.76	87.2 (J+)	—	—	3970	14.8	3.63	9.25	15,600
50-24769	MD50-06-64683	122.5–124.5	Qbt 2	—	—	—	—	—	—	—	—	—	—	—
50-24769	MD50-06-64701	147.9–149.8	Qbt 2	—	—	—	—	—	—	—	—	—	—	—
50-24770	MD50-06-64731	18.1–22.5	Qbt 3	15,200 (J+)	—	3.45	96.2	—	—	2540 (J+)	7.84	—	7.49	—
50-24770	MD50-06-64717	24.6–25	Qbt 3	—	—	—	217	—	—	3400 (J+)	—	—	—	—
50-24770	MD50-06-64732	38.2–39.9	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24770	MD50-06-64714	98.7–100	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24770	MD50-06-64715	123.2–124.6	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24770	MD50-06-64733	147.5–150	Qbt 2	—	—	—	—	—	—	—	—	—	—	—
50-24771	MD50-06-64756	15.9–17.5	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24771	MD50-06-64757	38–40	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24771	MD50-06-64739	98.8–100	Qbt 2	—	—	—	—	—	—	—	—	—	—	—
50-24771	MD50-06-64740	123.6–125	Qbt 2	—	—	—	—	—	—	—	—	—	—	—
50-24771	MD50-06-64758	148.2–150	Qbt 2	—	—	—	—	—	—	—	—	—	—	—

Table C-2.3-3 (continued)

Location ID	Sample ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron
Qbt 2,3,4 BV[a]				**7340**	**0.5**	**2.79**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**14,500**
Qbt 1v BV[a]				**8170**	**0.5**	**1.81**	**26.5**	**1.7**	**0.4**	**3700**	**2.24**	**1.78**	**3.26**	**9900**
Qbt 1g, Qct, Qbo BV[a]				**3560**	**0.5**	**0.56**	**25.7**	**1.44**	**0.4**	**1900**	**2.6**	**8.89**	**3.96**	**3700**
Industrial SSL[b]				**1,130,000**	**454**	**17.7**	**223,000**	**2260**	**897**	**na[c]**	**1,700,000[d]**	**300[e]**	**45,400**	**795,000**
Residential SSL[b]				**78,000**	**31.3**	**3.9**	**15,600**	**156**	**70.3**	**na**	**117,000[d]**	**23[e]**	**3130**	**54,800**
50-24773	MD50-06-64781	20–22.5	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24773	MD50-06-64782	38–40	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24773	MD50-06-64764	98.5–100	Qbt 2	—	—	—	—	—	—	—	—	—	—	—
50-24773	MD50-06-64765	123.7–124.8	Qbt 2	—	—	—	—	—	—	—	—	—	—	—
50-24773	MD50-06-64783	150–152.8	Qbt 2	—	—	—	—	—	—	—	—	—	—	—
50-24782	MD50-06-64813	20.9–22.5	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24782	MD50-06-64814	35.3–37.1	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24782	MD50-06-64796	98.5–100	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24782	MD50-06-64797	123.5–125	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24782	MD50-06-64815	156–157.5	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24783	MD50-06-64838	17.5–20	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24783	MD50-06-64839	35.4–37.5	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24783	MD50-06-64821	98.6–100	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24783	MD50-06-64822	123.3–125	Qbt 2	—	—	—	—	—	—	—	—	—	—	—
50-24783	MD50-06-64840	150.3–152.5	Qbt 2	—	—	—	—	—	—	—	—	—	—	—
50-24784	MD50-06-64380	8–10	Qbt 3	—	—	—	—	—	—	—	7.89	—	—	—
50-24784	MD50-06-64381	18–20	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24784	MD50-06-64363	46.1–47.5	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24784	MD50-06-64364	48.7–50	Qbt 3	51,100 (J+)	0.557 (U)	7.06	258	6.67	—	6040	23.4	5.79	20.7	26,500
50-24784	MD50-06-64365	51–55	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24784	MD50-06-64367	98.5–100	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24784	MD50-06-64366	167.5–169	Qbt 2	—	—	—	—	—	—	—	—	—	—	—
50-24784	MD50-06-64369	197.9–199.2	Qbt 1v	—	—	1.84	—	—	0.506 (U)	—	—	—	—	—
50-24784	MD50-06-64368	248–250	Qbt 1v	—	—	2.94	—	—	0.52 (U)	—	2.29	—	—	—
50-24784	MD50-06-65526	273.5–275	Qbt 1g	—	—	1.57 (U)	—	—	0.524 (U)	—	—	—	—	—
50-24784	MD50-06-64382	298.3–299.8	Qbt 1g	—	—	1.62 (U)	—	—	0.541 (U)	—	19.4	—	—	—
50-24785	MD50-06-64412	8.5–10	Qbt 3	11,800 (J+)	—	—	65.2	—	—	—	9.36 (J)	—	—	—
50-24785	MD50-06-64413	17.5–19	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24785	MD50-06-64395	57.5–60	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24785	MD50-06-64396	117.5–120	Qbt 2	—	—	—	—	1.39	—	—	—	—	—	—
50-24785	MD50-06-64397	198.7–200	Qbt 1v	—	—	—	—	—	0.502 (U)	—	—	—	—	—
50-24785	MD50-06-64398	248.5–250	Qbt 1g	—	—	2.93	—	—	0.575 (U)	—	4.67 (J)	—	—	7640

Table C-2.3-3 (continued)

Location ID	Sample ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron
Qbt 2,3,4 BV[a]				**7340**	**0.5**	**2.79**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**14,500**
Qbt 1v BV[a]				**8170**	**0.5**	**1.81**	**26.5**	**1.7**	**0.4**	**3700**	**2.24**	**1.78**	**3.26**	**9900**
Qbt 1g, Qct, Qbo BV[a]				**3560**	**0.5**	**0.56**	**25.7**	**1.44**	**0.4**	**1900**	**2.6**	**8.89**	**3.96**	**3700**
Industrial SSL[b]				**1,130,000**	**454**	**17.7**	**223,000**	**2260**	**897**	**na[c]**	**1,700,000[d]**	**300[e]**	**45,400**	**795,000**
Residential SSL[b]				**78,000**	**31.3**	**3.9**	**15,600**	**156**	**70.3**	**na**	**117,000[d]**	**23[e]**	**3130**	**54,800**
50-24785	MD50-06-64414	273.8–275	Qbt 1g	—	—	0.668 (J)	—	—	0.541 (U)	—	—	—	—	—
50-24796	MD50-06-64457	8–10	Qbt 3	15,100 (J+)	—	—	—	—	—	—	29	—	6.69	—
50-24796	MD50-06-64458	17.5–19.3	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24796	MD50-06-64440	37.5–39.3	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24796	MD50-06-64441	97.5–100	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24796	MD50-06-64442	118.7–120	Qbt 2	—	—	—	—	—	—	—	—	—	—	—
50-24796	MD50-06-64459	147.5–149.4	Qbt 2	—	—	—	—	—	—	—	—	—	—	—
50-24797	MD50-06-64506	17.5–18.3	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24797	MD50-06-64509	37–38	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24797	MD50-06-64489	58–60	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24797	MD50-06-64490	117–120	Qbt 2	—	—	—	—	—	—	—	—	—	—	—
50-24797	MD50-06-64508	157.5–159	Qbt 2	—	—	—	—	—	—	—	—	—	—	—
50-24799	MD50-06-64516	13.1–15	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24799	MD50-06-64517	15–16.5	Qbt 3	9940 (J+)	—	2.82	51.2	—	—	—	7.69	—	—	—
50-24799	MD50-06-64531	18–20	Qbt 3	18,000 (J+)	—	2.99	58	—	—	2330	11.5	—	5.82	—
50-24799	MD50-06-64532	30.6–32.5	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24799	MD50-06-64518	34.5–36	Qbt 3	22,600 (J+)	—	2.96	84.1 (J+)	2.32 (J)	—	3560 (J)	11.8	—	6.19	17,200
50-24799	MD50-06-64519	38.5–40	Qbt 3	—	—	—	—	—	—	—	10.4	—	—	—
50-24799	MD50-06-64514	98.3–100	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24799	MD50-06-64515	118.4–120	Qbt 2	—	—	—	—	—	—	—	—	—	—	—
50-24799	MD50-06-64533	158.5–160	Qbt 2	—	—	—	—	2.67	—	—	—	—	—	—
50-24801	MD50-06-64863	16.8–20	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24801	MD50-06-64864	33–35	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24801	MD50-06-64846	78–80	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24801	MD50-06-64847	118–120	Qbt 2	—	—	—	—	—	—	—	—	—	—	—
50-24801	MD50-06-64865	148.3–150	Qbt 2	—	—	—	—	—	—	—	—	—	—	—
50-24802	MD50-06-64888	12.5–16.1	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24802	MD50-06-64889	40.6–42.5	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24802	MD50-06-64871	98.2–100	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24802	MD50-06-64872	123.1–125	Qbt 2	—	—	—	—	—	—	—	—	—	—	—
50-24802	MD50-06-64890	157.5–159.1	Qbt 2	—	—	—	—	—	—	—	—	—	—	—
50-24803	MD50-06-64913	15.4–17.5	Qbt 3	—	—	—	—	—	—	—	—	—	—	—

Table C-2.3-3 (continued)

Location ID	Sample ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron
Qbt 2,3,4 BV[a]				**7340**	**0.5**	**2.79**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**14,500**
Qbt 1v BV[a]				**8170**	**0.5**	**1.81**	**26.5**	**1.7**	**0.4**	**3700**	**2.24**	**1.78**	**3.26**	**9900**
Qbt 1g, Qct, Qbo BV[a]				**3560**	**0.5**	**0.56**	**25.7**	**1.44**	**0.4**	**1900**	**2.6**	**8.89**	**3.96**	**3700**
Industrial SSL[b]				**1,130,000**	**454**	**17.7**	**223,000**	**2260**	**897**	**na[c]**	**1,700,000[d]**	**300[e]**	**45,400**	**795,000**
Residential SSL[b]				**78,000**	**31.3**	**3.9**	**15,600**	**156**	**70.3**	**na**	**117,000[d]**	**23[e]**	**3130**	**54,800**
50-24803	MD50-06-64914	36–37.5	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24803	MD50-06-64896	98.7–99.8	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24803	MD50-06-64897	123.3–124.8	Qbt 2	—	—	—	—	—	—	—	—	—	—	—
50-24803	MD50-06-64915	150–153.9	Qbt 2	—	—	—	—	—	—	—	—	—	—	—
50-24804	MD50-06-64965	8.6–9.8	Qbt 3	—	—	3.63	—	—	—	—	—	—	5.16	—
50-24804	MD50-06-64966	10–11.4	Qbt 3	12,700 (J+)	—	3.82	47.8	—	—	—	—	—	4.95	—
50-24804	MD50-06-64980	15.4–17.1	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24804	MD50-06-64981	32.5–34.2	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24804	MD50-06-64963	97.8–99.2	Qbt 3	—	1.08	—	—	—	—	—	—	—	—	—
50-24804	MD50-06-64964	122.5–124.1	Qbt 3	—	1.01	—	—	—	—	—	—	—	—	—
50-24804	MD50-06-64982	147.5–149.8	Qbt 2	—	—	—	—	—	—	—	—	—	—	—
50-24810	MD50-06-65005	17.5–19	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24810	MD50-06-65006	35.5–37.1	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24810	MD50-06-64988	97.5–99	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24810	MD50-06-64989	122.5–123.9	Qbt 2	—	—	—	—	—	—	—	—	—	—	—
50-24810	MD50-06-65007	148.3–151.6	Qbt 2	—	—	—	—	—	—	—	—	—	—	—
50-24811	MD50-06-65075	18.5–20	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24811	MD50-06-65076	38.5–40	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24811	MD50-06-65058	97.5–98.7	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24811	MD50-06-65059	123.2–125	Qbt 2	—	—	—	—	—	—	—	—	—	—	—
50-24811	MD50-06-65077	147.5–150.6	Qbt 2	—	—	—	—	—	—	—	—	—	—	—
50-24812	MD50-06-65100	8.4–10	Qbt 3	—	—	7.11	—	—	—	4850 (J)	8.08 (J)	3.56	11.4 (J)	—
50-24812	MD50-06-65101	33.5–35	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24812	MD50-06-65083	97.5–98.9	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24812	MD50-06-65084	122.5–123.7	Qbt 2	—	—	—	—	—	—	—	—	—	—	—
50-24812	MD50-06-65102	146–150	Qbt 2	24,300 (J+)	—	4.56	—	5.62 (J)	—	2560 (J)	9.95 (J)	—	7.75 (J)	—
50-24813	MD50-06-65132	18.2–20	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24813	MD50-06-65133	30–31.9	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24813	MD50-06-65115	98.2–99.7	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24813	MD50-06-65116	123.5–125	Qbt 2	—	—	—	—	—	—	—	—	—	—	—
50-24813	MD50-06-65134	148–150	Qbt 2	—	—	—	—	—	—	—	—	—	—	—
50-24814	MD50-06-65157	7.5–9.1	Qbt 3	—	—	—	—	—	—	—	—	—	—	—

Table C-2.3-3 (continued)

Location ID	Sample ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron
Qbt 2,3,4 BV[a]				**7340**	**0.5**	**2.79**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**14,500**
Qbt 1v BV[a]				**8170**	**0.5**	**1.81**	**26.5**	**1.7**	**0.4**	**3700**	**2.24**	**1.78**	**3.26**	**9900**
Qbt 1g, Qct, Qbo BV[a]				**3560**	**0.5**	**0.56**	**25.7**	**1.44**	**0.4**	**1900**	**2.6**	**8.89**	**3.96**	**3700**
Industrial SSL[b]				**1,130,000**	**454**	**17.7**	**223,000**	**2260**	**897**	**na[c]**	**1,700,000[d]**	**300[e]**	**45,400**	**795,000**
Residential SSL[b]				**78,000**	**31.3**	**3.9**	**15,600**	**156**	**70.3**	**na**	**117,000[d]**	**23[e]**	**3130**	**54,800**
50-24814	MD50-06-65158	30–31.6	Qbt 3	—	—	—	—	1.26	—	—	—	—	—	—
50-24814	MD50-06-65140	96.8–99.9	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24814	MD50-06-65141	123.5–124.8	Qbt 2	—	—	—	—	—	—	—	—	—	—	—
50-24814	MD50-06-65159	147.5–149.5	Qbt 2	—	—	—	—	—	—	—	—	—	—	—
50-24815	MD50-06-65189	17.5–20	Qbt 3	9660 (J+)	—	—	—	—	—	—	—	—	—	—
50-24815	MD50-06-65190	37.8–41.5	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24815	MD50-06-65172	98.8–100	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24815	MD50-06-65173	123.4–125	Qbt 2	—	—	—	—	—	—	—	—	—	—	—
50-24815	MD50-06-65191	147.8–149.7	Qbt 2	—	—	—	—	—	—	—	—	—	—	—
50-24816	MD50-06-65214	23.1–24.7	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24816	MD50-06-65215	32.2–34	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24816	MD50-06-65197	63.8–65	Qbt 3	—	—	—	—	1.69	—	—	—	—	—	—
50-24816	MD50-06-65198	118.7–120	Qbt 2	—	—	—	—	—	—	—	—	—	—	—
50-24816	MD50-06-65199	198.8–200	Qbt 2	—	—	—	—	—	—	—	8.14 (J)	—	—	—
50-24816	MD50-06-65216	223.4–225	Qbt 2	—	—	—	—	—	—	—	—	—	—	—
50-24817	MD50-05-63837	18.4–20	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24817	MD50-05-63838	37–40	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24817	RE50-05-63810	98.8–100	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24817	RE50-05-63811	138–140	Qbt 2	—	—	—	—	—	—	—	—	—	—	—
50-24817	RE50-05-63812	198.4–200	Qbt 1v	—	—	—	—	—	0.525 (U)	—	—	—	—	—
50-24817	MD50-05-63839	248.1–250	Qbt 1g	7870	—	2.88	31.2	2.07	0.576 (U)	—	—	—	—	5740
50-24818	MD50-06-65229	8.5–10	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24818	MD50-06-65230	22.1–25	Qbt 3	—	—	2.86	—	—	—	—	—	—	—	—
50-24818	MD50-06-65261	98.5–100	Qbt 2	—	—	—	—	—	—	—	—	—	—	—
50-24818	MD50-06-65262	147.5–149.2	Qbt 2	—	—	—	—	—	—	—	—	—	—	—
50-24818	MD50-06-65263	189.9–190	Qbt 1v	—	—	—	—	—	0.515 (U)	—	5.7	—	—	—
50-24818	MD50-06-65264	247.7–249.2	Qbt 1g	—	—	0.762 (J)	—	—	0.531 (U)	—	—	—	—	3760
50-24818	MD50-06-65265	280–282.5	Qbt 1g	—	—	1.61 (U)	—	—	0.537 (U)	—	7.63	—	—	—
50-24818	MD50-06-65266	313.5–315	Qbt 1g	—	—	1.71 (U)	—	—	0.571 (U)	—	—	—	—	—
50-24818	MD50-06-65267	396–402	Qbo	—	—	0.75 (J)	—	—	0.534 (U)	—	4.33	—	18.2 (J)	5600
50-24818	MD50-06-65268	449–452	Qbo	—	—	13.3	29.9	—	11.1 (U)	—	998	17.4	446	184,000
50-24818	MD50-06-65269	497–500.5	Qbo	—	—	1.61 (U)	27 (J+)	—	0.538 (U)	—	3.56 (J)	—	14.3	5150

Table C-2.3-3 (continued)

Location ID	Sample ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron
Qbt 2,3,4 BV[a]				**7340**	**0.5**	**2.79**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**14,500**
Qbt 1v BV[a]				**8170**	**0.5**	**1.81**	**26.5**	**1.7**	**0.4**	**3700**	**2.24**	**1.78**	**3.26**	**9900**
Qbt 1g, Qct, Qbo BV[a]				**3560**	**0.5**	**0.56**	**25.7**	**1.44**	**0.4**	**1900**	**2.6**	**8.89**	**3.96**	**3700**
Industrial SSL[b]				**1,130,000**	**454**	**17.7**	**223,000**	**2260**	**897**	**na**[c]	**1,700,000**[d]	**300**[e]	**45,400**	**795,000**
Residential SSL[b]				**78,000**	**31.3**	**3.9**	**15,600**	**156**	**70.3**	**na**	**117,000**[d]	**23**[e]	**3130**	**54,800**
50-24818	MD50-06-65270	547–551.5	Qbo	—	—	1.63 (U)	—	—	0.545 (U)	—	2.66 (J)	—	127	—
50-24818	MD50-06-65271	597–600.4	Qbo	—	—	1.72 (U)	—	—	0.572 (U)	—	—	—	11.3	—
50-24819	RE50-05-61422	18.5–20	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24819	RE50-05-61423	48–50	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24819	RE50-05-61424	97.5–100	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24819	RE50-05-61425	138.5–140	Qbt 2	—	—	—	—	—	—	—	—	—	—	—
50-24819	RE50-05-61426	198.1–200	Qbt 1v	—	—	—	—	—	0.502 (U)	—	2.68 (J)	—	—	—
50-24819	RE50-05-61427	246.5–250	Qbt 1v	—	—	—	—	—	0.541 (U)	—	—	—	—	—
50-24819	RE50-05-61428	273–275	Qbt 1g	—	—	1.6 (U)	—	—	0.534 (U)	—	—	—	—	—
50-24820	RE50-05-61438	17.5–20	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24820	RE50-05-61439	48.4–50	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24820	RE50-05-61440	97.5–100	Qbt 3	10,600 (J+)	—	—	108	—	—	2410	—	—	—	—
50-24820	RE50-05-61441	138.7–140	Qbt 2	—	—	—	—	—	—	—	—	—	—	—
50-24820	RE50-05-61442	198.2–200	Qbt 1v	—	—	—	—	—	0.498 (U)	—	—	—	—	—
50-24820	RE50-05-61443	248.3–250	Qbt 1g	—	—	1.84	33.5	—	0.536 (U)	—	—	—	—	4660
50-24821	RE50-05-61456	18.6–20	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24821	RE50-05-61457	48.6–50	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24821	RE50-05-61458	98.4–100	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24821	RE50-05-61460	137.5–140	Qbt 2	—	—	—	—	—	—	—	—	—	—	—
50-24821	RE50-05-61459	157.5–160	Qbt 2	—	—	4.21	—	—	—	—	14.9 (J)	—	—	—
50-24821	RE50-05-61461	248.6–250	Qbt 1g	—	—	1.56 (U)	—	—	0.519 (U)	—	3.8 (J)	—	—	5260
50-24822	RE50-05-61474	18.6–20	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24822	RE50-05-61475	47.5–49.1	Qbt 3	—	—	—	—	1.36	—	—	—	—	—	—
50-24822	RE50-05-61476	98.6–100	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-24822	RE50-05-61477	137.5–139.2	Qbt 2	—	—	—	—	—	—	—	—	—	—	—
50-24822	RE50-05-61478	198.5–200	Qbt 1v	—	—	—	—	—	0.499 (U)	—	—	—	—	—
50-24822	RE50-05-61479	248.7–250	Qbt 1g	—	—	0.643 (J)	—	—	0.519 (U)	—	2.76	—	—	4520
50-25451	MD50-06-66697	18.7–19.9	Qbt 3	—	—	—	—	—	—	—	—	—	—	—
50-25451	MD50-06-66698	48.1–49.9	Qbt 3	—	—	—	—	2.07 (J)	—	—	—	—	—	—

Table C-2.3-3 (continued)

Location ID	Sample ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron
Qbt 2,3,4 BV[a]				**7340**	**0.5**	**2.79**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**14,500**
Qbt 1v BV[a]				**8170**	**0.5**	**1.81**	**26.5**	**1.7**	**0.4**	**3700**	**2.24**	**1.78**	**3.26**	**9900**
Qbt 1g, Qct, Qbo BV[a]				**3560**	**0.5**	**0.56**	**25.7**	**1.44**	**0.4**	**1900**	**2.6**	**8.89**	**3.96**	**3700**
Industrial SSL[b]				**1,130,000**	**454**	**17.7**	**223,000**	**2260**	**897**	**na[c]**	**1,700,000[d]**	**300[e]**	**45,400**	**795,000**
Residential SSL[b]				**78,000**	**31.3**	**3.9**	**15,600**	**156**	**70.3**	**na**	**117,000[d]**	**23[e]**	**3130**	**54,800**
50-25451	MD50-06-66671	96–100	Qbt 2	—	—	—	—	—	—	—	—	—	—	—
50-25451	MD50-06-66672	146–147.5	Qbt 2	—	—	—	—	—	—	—	—	—	—	—
50-25451	MD50-06-66673	198.9–200	Qbt 2	—	—	—	—	—	—	—		—	—	—
50-25451	MD50-06-66674	251.2–252.5	Qbt 1g	—	—	1.56 (U)	—	—	0.519 (U)	—	—	—	—	—
50-25451	MD50-06-66699	298.5–300	Qbt 1g	—	—	1.61 (U)	—	—	0.538 (U)	—	2.99	—	—	—

Table C-2.3-3 (continued)

Location ID	Sample ID	Depth (ft)	Media	Lead	Magnesium	Manganese	Nickel	Nitrate	Perchlorate	Potassium	Selenium	Silver	Vanadium	Zinc
Qbt 2,3,4 BV[a]				**11.2**	**1690**	**482**	**6.58**	**na**	**na**	**3500**	**0.3**	**1**	**17**	**63.5**
Qbt 1v BV[a]				**18.4**	**780**	**408**	**2**	**na**	**na**	**6670**	**0.3**	**1**	**4.48**	**84.6**
Qbt 1g, Qct, Qbo BV[a]				**13.5**	**739**	**189**	**2**	**na**	**na**	**2390**	**0.3**	**1**	**4.59**	**40**
Industrial SSL[b]				**800**	**na**	**26,700**	**22,500**	**1,820,000**	**795**	**na**	**5680**	**5680**	**5680**	**341,000**
Residential SSL[b]				**400**	**na**	**1860**	**1560**	**125,000**	**54.8**	**na**	**391**	**391**	**391**	**23,500**
50-24766	MD50-06-64604	27.5–29.2	Qbt 3	—	—	—	—	1.76	—	—	—	—	—	—
50-24766	MD50-06-64586	97.5–99.9	Qbt 2	—	—	—	—	1.19	0.00101 (J)	—	0.772 (J)	—	—	—
50-24766	MD50-06-64587	122.5–124.6	Qbt 2	—	—	—	—	1.24	0.00728	—	0.667 (J)	—	—	—
50-24766	MD50-06-64605	148.1–149.5	Qbt 2	—	—	—	—	1.1	—	—	1.57 (U)	—	—	—
50-24767	MD50-06-64635	8.0–10.0	Qbt 3	17.1	—	—	—	1.32	—	—	1.56 (U)	—	—	—
50-24767	MD50-06-64636	28.1–30.0	Qbt 3	18.6	—	—	—	2.36	—	—	1.53 (U)	—	—	—
50-24767	MD50-06-64618	58.3–59.8	Qbt 3	19.9	—	—	—	1.1	—	—	1.56 (U)	—	—	—
50-24767	MD50-06-64619	123.2–125.0	Qbt 2	—	1730 (J+)	—	—	—	—	—	1.65 (U)	—	—	—
50-24767	MD50-06-64637	148.3–149.8	Qbt 2	—	—	—	—	—	—	—	1.53 (U)	—	—	—
50-24768	MD50-06-64667	12.5–15.0	Qbt 3	—	—	—	—	—	—	—	1.47 (U)	—	—	—
50-24768	MD50-06-64668	27.5–29.5	Qbt 3	—	—	—	—	—	—	—	1.5 (U)	—	—	—
50-24768	MD50-06-64650	96.7–99.5	Qbt 2	—	—	—	—	—	—	—	1.49 (U)	—	—	—
50-24768	MD50-06-64651	123.2–125.0	Qbt 2	14.6	—	—	—	—	—	—	1.45 (U)	—	—	—
50-24768	MD50-06-64669	148.6–151.5	Qbt 2	19.7	—	—	—	—	—	—	1.57 (U)	—	—	—
50-24769	MD50-06-64699	18.1–20.0	Qbt 3	—	—	—	—	6.99	0.00085 (J)	—	9.09	—	—	—
50-24769	MD50-06-64700	37.5–39.9	Qbt 3	—	—	—	—	2.9	0.000893 (J)	—	8.4	—	—	—
50-24769	MD50-06-64682	97.5–99.3	Qbt 3	12.6	4000 (J+)	—	—	—	0.00118 (J)	—	1.49 (U)	—	27.1	—
50-24769	MD50-06-64683	122.5–124.5	Qbt 2	—	—	—	—	1.22	0.00174 (J)	—	1.5 (U)	—	—	—
50-24769	MD50-06-64701	147.9–149.8	Qbt 2	—	—	—	—	—	—	—	1.5 (U)	—	—	—
50-24770	MD50-06-64731	18.1–22.5	Qbt 3	24.6	2400	—	—	0.771 (J-)	0.00823	—	1.62 (U)	—	—	—
50-24770	MD50-06-64717	24.6–25.0	Qbt 3	14.1	—	—	—	0.741 (J-)	0.0209	—	1.54 (U)	—	—	—
50-24770	MD50-06-64732	38.2–39.9	Qbt 3	—	—	—	—	0.754 (J-)	0.00348	—	1.49 (U)	—	—	—
50-24770	MD50-06-64714	98.7–100.0	Qbt 3	—	—	—	—	0.786 (J)	—	—	1.51 (U)	—	—	—
50-24770	MD50-06-64715	123.2–124.6	Qbt 3	—	—	—	—	0.751 (J)	—	—	1.48 (U)	—	—	—
50-24770	MD50-06-64733	147.5–150.0	Qbt 2	—	—	—	—	0.795 (J)	—	—	1.5 (U)	—	—	—
50-24771	MD50-06-64756	15.9–17.5	Qbt 3	—	—	—	—	2.9	—	—	1.55 (U)	—	—	—
50-24771	MD50-06-64757	38.0–40.0	Qbt 3	—	—	—	—	0.828 (J)	0.000538 (J)	—	11	—	—	—
50-24771	MD50-06-64739	98.8–100.0	Qbt 2	—	—	—	—	2.06	0.00507	—	10.1	—	—	—
50-24771	MD50-06-64740	123.6–125.0	Qbt 2	—	—	—	—	0.919 (J)	0.00318	—	11.4	—	—	—
50-24771	MD50-06-64758	148.2–150.0	Qbt 2	—	—	—	—	0.694 (J)	—	—	12	—	—	—

Table C-2.3-3 (continued)

Location ID	Sample ID	Depth (ft)	Media	Lead	Magnesium	Manganese	Nickel	Nitrate	Perchlorate	Potassium	Selenium	Silver	Vanadium	Zinc
Qbt 2,3,4 BV[a]				**11.2**	**1690**	**482**	**6.58**	**na**	**na**	**3500**	**0.3**	**1**	**17**	**63.5**
Qbt 1v BV[a]				**18.4**	**780**	**408**	**2**	**na**	**na**	**6670**	**0.3**	**1**	**4.48**	**84.6**
Qbt 1g, Qct, Qbo BV[a]				**13.5**	**739**	**189**	**2**	**na**	**na**	**2390**	**0.3**	**1**	**4.59**	**40**
Industrial SSL[b]				**800**	**na**	**26,700**	**22,500**	**1,820,000**	**795**	**na**	**5680**	**5680**	**5680**	**341,000**
Residential SSL[b]				**400**	**na**	**1860**	**1560**	**125,000**	**54.8**	**na**	**391**	**391**	**391**	**23,500**
50-24773	MD50-06-64781	20.0–22.5	Qbt 3	—	—	—	—	1.03 (J-)	0.00118 (J)	—	1.52 (U)	—	—	—
50-24773	MD50-06-64782	38.0–40.0	Qbt 3	—	—	—	—	1.13	—	—	1.54 (U)	—	—	—
50-24773	MD50-06-64764	98.5–100.0	Qbt 2	—	—	—	—	0.795 (J)	—	—	1.48 (U)	—	—	—
50-24773	MD50-06-64765	123.7–124.8	Qbt 2	—	—	—	—	0.693 (J)	—	—	1.45 (U)	—	—	—
50-24773	MD50-06-64783	150.0–152.8	Qbt 2	—	—	—	—	0.707 (J)	—	—	1.49 (U)	—	—	—
50-24782	MD50-06-64813	20.9–22.5	Qbt 3	—	—	—	—	1.51	0.00647	—	1.48 (U)	—	—	—
50-24782	MD50-06-64814	35.3–37.1	Qbt 3	—	—	—	—	2.43	0.0211	—	1.54 (U)	—	—	—
50-24782	MD50-06-64796	98.5–100.0	Qbt 3	—	—	—	—	—	—	—	1.46 (U)	—	—	—
50-24782	MD50-06-64797	123.5–125.0	Qbt 3	—	—	—	—	—	—	—	1.46 (U)	—	—	—
50-24782	MD50-06-64815	156.0–157.5	Qbt 3	—	—	—	—	—	—	—	1.51 (U)	—	—	—
50-24783	MD50-06-64838	17.5–20.0	Qbt 3	—	—	—	—	1.96	0.000591 (J)	—	1.52 (U)	—	—	—
50-24783	MD50-06-64839	35.4–37.5	Qbt 3	—	—	—	—	1.2	—	—	1.52 (U)	—	—	—
50-24783	MD50-06-64821	98.6–100.0	Qbt 3	14.2	—	—	—	—	—	—	1.5 (U)	—	—	—
50-24783	MD50-06-64822	123.3–125.0	Qbt 2	—	—	—	—	—	—	—	1.47 (U)	—	—	—
50-24783	MD50-06-64840	150.3–152.5	Qbt 2	—	—	—	—	—	—	—	1.5 (U)	—	—	—
50-24784	MD50-06-64380	8.0–10.0	Qbt 3	—	—	—	—	2.18 (J-)	—	—	15	—	—	—
50-24784	MD50-06-64381	18.0–20.0	Qbt 3	—	—	—	—	2.31	0.000758 (J)	—	6.12	—	—	—
50-24784	MD50-06-64363	46.1–47.5	Qbt 3	—	—	—	—	—	—	—	6.79	—	—	—
50-24784	MD50-06-64364	48.7–50.0	Qbt 3	25.8	7720	—	20.3	2.48	0.00123 (J)	6770 (J+)	20	—	39.3	103
50-24784	MD50-06-64365	51.0–55.0	Qbt 3	—	—	—	—	0.652 (J)	—	—	1.54 (U)	—	—	—
50-24784	MD50-06-64367	98.5–100.0	Qbt 3	—	—	—	—	0.51 (J)	—	—	1.55 (U)	—	—	—
50-24784	MD50-06-64366	167.5–169.0	Qbt 2	—	—	—	—	0.498 (J-)	—	—	1.48 (U)	—	—	—
50-24784	MD50-06-64369	197.9–199.2	Qbt 1v	—	—	—	—	0.53 (J-)	—	—	1.52 (U)	—	—	—
50-24784	MD50-06-64368	248.0–250.0	Qbt 1v	—	—	—	—	0.879 (J-)	0.00201 (J)	—	1.56 (U)	—	—	—
50-24784	MD50-06-65526	273.5–275.0	Qbt 1g	—	—	—	—	0.658 (J)	—	—	1.57 (U)	—	—	—
50-24784	MD50-06-64382	298.3–299.8	Qbt 1g	—	—	—	—	0.625 (J)	—	—	1.62 (U)	—	—	—
50-24785	MD50-06-64412	8.5–10.0	Qbt 3	—	—	—	—	—	0.00145 (J)	—	1.76 (U)	—	—	—
50-24785	MD50-06-64413	17.5–19.0	Qbt 3	—	—	—	—	—	—	—	1.52 (U)	—	—	—
50-24785	MD50-06-64395	57.5–60.0	Qbt 3	—	—	—	—	0.893	—	—	1.54 (U)	—	—	—
50-24785	MD50-06-64396	117.5–120.0	Qbt 2	—	—	—	—	—	—	—	1.54 (U)	—	—	—
50-24785	MD50-06-64397	198.7–200.0	Qbt 1v	—	—	—	—	1.12 (J-)	—	—	1.51 (U)	—	—	—
50-24785	MD50-06-64398	248.5–250.0	Qbt 1g	25.6	—	275	—	1.67	0.000926	—	3.14	—	—	62

Table C-2.3-3 (continued)

Location ID	Sample ID	Depth (ft)	Media	Lead	Magnesium	Manganese	Nickel	Nitrate	Perchlorate	Potassium	Selenium	Silver	Vanadium	Zinc
Qbt 2,3,4 BV[a]				**11.2**	**1690**	**482**	**6.58**	**na**	**na**	**3500**	**0.3**	**1**	**17**	**63.5**
Qbt 1v BV[a]				**18.4**	**780**	**408**	**2**	**na**	**na**	**6670**	**0.3**	**1**	**4.48**	**84.6**
Qbt 1g, Qct, Qbo BV[a]				**13.5**	**739**	**189**	**2**	**na**	**na**	**2390**	**0.3**	**1**	**4.59**	**40**
Industrial SSL[b]				**800**	**na**	**26,700**	**22,500**	**1,820,000**	**795**	**na**	**5680**	**5680**	**5680**	**341,000**
Residential SSL[b]				**400**	**na**	**1860**	**1560**	**125,000**	**54.8**	**na**	**391**	**391**	**391**	**23,500**
50-24785	MD50-06-64414	273.8–275.0	Qbt 1g	81.5	—	—	—	—	—	—	1.75	—	—	81.7 (J)
50-24796	MD50-06-64457	8.0–10.0	Qbt 3	60.9 (J)	2530	—	—	4.54	0.00412	—	1.55 (U)	—	—	—
50-24796	MD50-06-64458	17.5–19.3	Qbt 3	17.3 (J)	—	—	—	1.89	0.000583 (J)	—	1.54 (U)	—	—	—
50-24796	MD50-06-64440	37.5–39.3	Qbt 3	—	—	—	—	0.659 (J)	—	—	1.5 (U)	—	—	—
50-24796	MD50-06-64441	97.5–100.0	Qbt 3	—	—	—	—	0.54 (J)	—	—	1.5 (U)	—	—	—
50-24796	MD50-06-64442	118.7–120.0	Qbt 2	—	—	—	—	0.555 (J-)	—	—	1.46 (U)	—	—	—
50-24796	MD50-06-64459	147.5–149.4	Qbt 2	—	—	—	—	0.629 (J-)	—	—	1.49 (U)	—	—	—
50-24797	MD50-06-64506	17.5–18.3	Qbt 3	—	—	—	—	1.17	—	—	1.54 (U)	—	—	—
50-24797	MD50-06-64509	37.0–38.0	Qbt 3	—	—	—	—	0.991 (J)	—	—	1.54 (U)	—	—	—
50-24797	MD50-06-64489	58.0–60.0	Qbt 3	—	—	—	—	—	—	—	1.49 (U)	—	—	—
50-24797	MD50-06-64490	117.0–120.0	Qbt 2	—	—	—	—	0.532 (J)	—	—	1.51 (U)	—	—	—
50-24797	MD50-06-64508	157.5–159.0	Qbt 2	—	—	—	—	—	—	—	1.54 (U)	—	—	—
50-24799	MD50-06-64516	13.1–15.0	Qbt 3	—	—	—	—	1.79	—	—	1.59 (U)	—	—	—
50-24799	MD50-06-64517	15.0–16.5	Qbt 3	—	—	—	—	1.73	—	—	1.56 (U)	—	—	—
50-24799	MD50-06-64531	18.0–20.0	Qbt 3	—	2550	—	—	1.7	—	—	1.59 (U)	—	—	—
50-24799	MD50-06-64532	30.6–32.5	Qbt 3	—	—	—	—	1.42	—	—	1.53 (U)	—	—	—
50-24799	MD50-06-64518	34.5–36.0	Qbt 3	16	3000	—	—	2.16	—	—	1.67 (U)	—	20.3	65
50-24799	MD50-06-64519	38.5–40.0	Qbt 3	—	—	—	—	1.35	0.000942 (J)	—	1.56 (U)	—	—	—
50-24799	MD50-06-64514	98.3–100.0	Qbt 3	—	—	—	—	3.32 (J-)	0.00069 (J)	—	1.54 (U)	—	—	—
50-24799	MD50-06-64515	118.4–120.0	Qbt 2	—	—	—	—	—	—	—	1.5 (U)	—	—	—
50-24799	MD50-06-64533	158.5–160.0	Qbt 2	—	—	—	—	—	—	—	1.58 (U)	—	—	—
50-24801	MD50-06-64863	16.8–20.0	Qbt 3	—	—	—	—	2	—	—	1.56 (U)	—	—	—
50-24801	MD50-06-64864	33.0–35.0	Qbt 3	—	—	—	—	0.974 (J)	—	—	1.61 (U)	—	—	—
50-24801	MD50-06-64846	78.0–80.0	Qbt 3	—	—	—	—	—	—	—	1.53 (U)	—	—	—
50-24801	MD50-06-64847	118.0–120.0	Qbt 2	—	—	—	—	—	—	—	1.07 (J)	—	—	—
50-24801	MD50-06-64865	148.3–150.0	Qbt 2	—	—	—	—	—	—	—	1.42 (J)	—	—	—
50-24802	MD50-06-64888	12.5–16.1	Qbt 3	—	—	—	—	—	—	—	1.5 (U)	—	—	—
50-24802	MD50-06-64889	40.6–42.5	Qbt 3	—	—	—	—	1.27	—	—	1.56 (U)	—	—	—
50-24802	MD50-06-64871	98.2–100.0	Qbt 3	—	—	—	—	0.708 (J)	—	—	1.55 (U)	—	—	—
50-24802	MD50-06-64872	123.1–125.0	Qbt 2	—	—	—	—	0.795 (J)	—	—	1.51 (U)	—	—	—
50-24802	MD50-06-64890	157.5–159.1	Qbt 2	—	—	—	—	0.664 (J)	—	—	1.46 (U)	—	—	—
50-24803	MD50-06-64913	15.4–17.5	Qbt 3	—	—	—	—	1.23	0.000538 (J)	—	1.67 (U)	—	—	—

Table C-2.3-3 (continued)

Location ID	Sample ID	Depth (ft)	Media	Lead	Magnesium	Manganese	Nickel	Nitrate	Perchlorate	Potassium	Selenium	Silver	Vanadium	Zinc
Qbt 2,3,4 BV[a]				**11.2**	**1690**	**482**	**6.58**	**na**	**na**	**3500**	**0.3**	**1**	**17**	**63.5**
Qbt 1v BV[a]				**18.4**	**780**	**408**	**2**	**na**	**na**	**6670**	**0.3**	**1**	**4.48**	**84.6**
Qbt 1g, Qct, Qbo BV[a]				**13.5**	**739**	**189**	**2**	**na**	**na**	**2390**	**0.3**	**1**	**4.59**	**40**
Industrial SSL[b]				**800**	**na**	**26,700**	**22,500**	**1,820,000**	**795**	**na**	**5680**	**5680**	**5680**	**341,000**
Residential SSL[b]				**400**	**na**	**1860**	**1560**	**125,000**	**54.8**	**na**	**391**	**391**	**391**	**23,500**
50-24803	MD50-06-64914	36.0–37.5	Qbt 3	42.8	—	—	—	0.709 (J)	—	—	1.56 (U)	—	—	—
50-24803	MD50-06-64896	98.7–99.8	Qbt 3	—	—	—	—	1.18	—	—	1.56 (U)	—	—	—
50-24803	MD50-06-64897	123.3–124.8	Qbt 2	—	—	—	—	0.619 (J)	—	—	1.51 (U)	—	—	—
50-24803	MD50-06-64915	150.0–153.9	Qbt 2	—	—	—	—	0.641 (J)	—	—	1.54 (U)	—	—	—
50-24804	MD50-06-64965	8.6–9.8	Qbt 3	51.9	—	—	—	—	—	—	1.19 (J)	—	—	101
50-24804	MD50-06-64966	10.0–11.4	Qbt 3	32.4	2060	—	—	—	—	—	2.49	—	—	—
50-24804	MD50-06-64980	15.4–17.1	Qbt 3	68.6	—	—	—	1.14	—	—	0.75 (J)	—	—	—
50-24804	MD50-06-64981	32.5–34.2	Qbt 3	34.9	—	—	—	1.05	—	—	1 (J)	—	—	—
50-24804	MD50-06-64963	97.8–99.2	Qbt 3	—	—	—	—	1.13	—	—	0.695 (J)	1.53	—	—
50-24804	MD50-06-64964	122.5–124.1	Qbt 3	36	—	—	—	1.06	0.00735	—	1.58 (U)	1.43	—	—
50-24804	MD50-06-64982	147.5–149.8	Qbt 2	47.8	—	—	—	1 (J)	0.00668	—	1.52 (U)	—	—	—
50-24810	MD50-06-65005	17.5–19.0	Qbt 3	—	—	—	—	—	—	—	1.6 (U)	—	—	—
50-24810	MD50-06-65006	35.5–37.1	Qbt 3	—	—	—	—	—	—	—	1.59 (U)	—	—	—
50-24810	MD50-06-64988	97.5–99.0	Qbt 3	—	—	—	—	—	0.000538 (J)	—	1.58 (U)	—	—	—
50-24810	MD50-06-64989	122.5–123.9	Qbt 2	—	—	—	—	0.847 (J)	—	—	1.59 (U)	—	—	—
50-24810	MD50-06-65007	148.3–151.6	Qbt 2	—	—	—	—	0.787 (J-)	—	—	1.57 (U)	—	—	—
50-24811	MD50-06-65075	18.5–20.0	Qbt 3	—	—	—	—	0.788 (J)	—	—	1.58 (U)	—	—	—
50-24811	MD50-06-65076	38.5–40.0	Qbt 3	—	—	—	—	0.805 (J)	0.000666 (J)	—	1.56 (U)	—	—	—
50-24811	MD50-06-65058	97.5–98.7	Qbt 3	—	—	—	—	0.722 (J)	—	—	1.56 (U)	—	—	—
50-24811	MD50-06-65059	123.2–125.0	Qbt 2	—	—	—	—	0.703 (J)	—	—	1.51 (U)	—	—	—
50-24811	MD50-06-65077	147.5–150.6	Qbt 2	—	—	—	—	1.25	0.000989 (J)	—	1.5 (U)	—	—	—
50-24812	MD50-06-65100	8.4–10.0	Qbt 3	29.8	—	—	—	—	—	—	0.919 (J)	—	—	78.7 (J-)
50-24812	MD50-06-65101	33.5–35.0	Qbt 3	17.7	—	—	—	—	—	—	1.44 (J)	—	—	—
50-24812	MD50-06-65083	97.5–98.9	Qbt 3	—	—	—	—	0.978 (J)	—	—	1.59 (U)	—	—	—
50-24812	MD50-06-65084	122.5–123.7	Qbt 2	—	—	—	—	0.814 (J)	—	—	1.2 (J)	—	—	—
50-24812	MD50-06-65102	146.0–150.0	Qbt 2	11.3	3420 (J)	—	—	—	—	—	3.33	—	—	69.7 (J-)
50-24813	MD50-06-65132	18.2–20.0	Qbt 3	—	—	—	—	0.785 (J-)	—	—	1.55 (U)	—	—	—
50-24813	MD50-06-65133	30.0–31.9	Qbt 3	—	—	—	—	0.798 (J-)	—	—	1.54 (U)	—	—	—
50-24813	MD50-06-65115	98.2–99.7	Qbt 3	—	—	—	—	0.769 (J)	—	—	1.59 (U)	—	—	—
50-24813	MD50-06-65116	123.5–125.0	Qbt 2	—	—	—	—	0.775 (J)	0.000558 (J)	—	1.52 (U)	—	—	—
50-24813	MD50-06-65134	148.0–150.0	Qbt 2	—	—	—	—	0.768 (J)	0.048	—	1.59 (U)	—	—	—
50-24814	MD50-06-65157	7.5–9.1	Qbt 3	—	—	—	—	0.86 (J)	0.00142 (J)	—	1.52 (U)	—	—	—

Table C-2.3-3 (continued)

Location ID	Sample ID	Depth (ft)	Media	Lead	Magnesium	Manganese	Nickel	Nitrate	Perchlorate	Potassium	Selenium	Silver	Vanadium	Zinc
Qbt 2,3,4 BV[a]				**11.2**	**1690**	**482**	**6.58**	**na**	**na**	**3500**	**0.3**	**1**	**17**	**63.5**
Qbt 1v BV[a]				**18.4**	**780**	**408**	**2**	**na**	**na**	**6670**	**0.3**	**1**	**4.48**	**84.6**
Qbt 1g, Qct, Qbo BV[a]				**13.5**	**739**	**189**	**2**	**na**	**na**	**2390**	**0.3**	**1**	**4.59**	**40**
Industrial SSL[b]				**800**	**na**	**26,700**	**22,500**	**1,820,000**	**795**	**na**	**5680**	**5680**	**5680**	**341,000**
Residential SSL[b]				**400**	**na**	**1860**	**1560**	**125,000**	**54.8**	**na**	**391**	**391**	**391**	**23,500**
50-24814	MD50-06-65158	30.0–31.6	Qbt 3	—	—	—	—	0.805 (J)	—	—	1.55 (U)	—	—	—
50-24814	MD50-06-65140	96.8–99.9	Qbt 3	—	—	—	—	0.686 (J)	—	—	1.56 (U)	—	—	—
50-24814	MD50-06-65141	123.5–124.8	Qbt 2	—	—	—	—	0.807 (J)	—	—	1.5 (U)	—	—	—
50-24814	MD50-06-65159	147.5–149.5	Qbt 2	—	—	—	—	0.668 (J)	—	—	1.56 (U)	—	—	—
50-24815	MD50-06-65189	17.5–20.0	Qbt 3	23.1	—	—	—	1.57	—	—	1.57 (U)	—	—	—
50-24815	MD50-06-65190	37.8–41.5	Qbt 3	—	—	—	—	1.1	—	—	1.56 (U)	—	—	—
50-24815	MD50-06-65172	98.8–100.0	Qbt 3	—	—	—	—	0.871 (J)	—	—	1.54 (U)	—	—	—
50-24815	MD50-06-65173	123.4–125.0	Qbt 2	—	—	—	—	0.757 (J)	0.00059 (J)	—	1.55 (U)	—	—	—
50-24815	MD50-06-65191	147.8–149.7	Qbt 2	—	—	—	—	0.767 (J)	0.00272	—	1.58 (U)	—	—	—
50-24816	MD50-06-65214	23.1–24.7	Qbt 3	15.4	—	—	—	—	—	—	1.69 (U)	—	—	—
50-24816	MD50-06-65215	32.2–34.0	Qbt 3	28.6	—	—	—	—	—	—	1.66 (U)	—	—	—
50-24816	MD50-06-65197	63.8–65.0	Qbt 3	—	—	—	—	—	—	—	1.58 (U)	—	—	—
50-24816	MD50-06-65198	118.7–120.0	Qbt 2	—	—	—	—	—	—	—	1.5 (U)	—	—	—
50-24816	MD50-06-65199	198.8–200.0	Qbt 2	—	—	—	—	—	—	—	1.46 (U)	—	—	—
50-24816	MD50-06-65216	223.4–225.0	Qbt 2	—	—	—	—	—	—	—	1.51 (U)	—	—	—
50-24817	MD50-05-63837	18.4–20.0	Qbt 3	—	—	—	—	—	—	—	1.53 (U)	—	—	—
50-24817	MD50-05-63838	37.0–40.0	Qbt 3	—	—	—	—	0.77 (J)	—	—	1.54 (U)	—	—	—
50-24817	RE50-05-63810	98.8–100.0	Qbt 3	—	—	—	—	0.945 (J)	0.000739 (J)	—	1.57 (U)	—	—	—
50-24817	RE50-05-63811	138.0–140.0	Qbt 2	—	—	—	—	0.846 (J)	—	—	1.57 (U)	—	—	—
50-24817	RE50-05-63812	198.4–200.0	Qbt 1v	—	—	—	—	0.932 (J)	—	—	1.57 (U)	—	—	—
50-24817	MD50-05-63839	248.1–250.0	Qbt 1g	—	—	243	—	1.38	0.000975 (J)	—	1.73 (U)	—	—	44.8
50-24818	MD50-06-65229	8.5–10.0	Qbt 3	—	—	—	—	4.9 (J-)	—	—	1.53 (U)	—	—	—
50-24818	MD50-06-65230	22.1–25.0	Qbt 3	—	—	—	—	2.48 (J-)	0.00056 (J)	—	1.57 (U)	—	—	—
50-24818	MD50-06-65261	98.5–100.0	Qbt 2	—	—	—	—	0.354 (J-)	—	—	5.57	—	—	—
50-24818	MD50-06-65262	147.5–149.2	Qbt 2	—	—	—	—	0.424 (J)	—	—	1.54 (U)	—	—	—
50-24818	MD50-06-65263	189.9–190.0	Qbt 1v	—	—	—	—	0.399 (J)	0.00095 (J)	—	1.55 (U)	—	—	—
50-24818	MD50-06-65264	247.7–249.2	Qbt 1g	—	—	—	—	0.658 (J-)	—	—	1.59 (U)	—	—	—
50-24818	MD50-06-65265	280.0–282.5	Qbt 1g	—	—	—	—	0.468 (J-)	—	—	1.61 (U)	—	—	—
50-24818	MD50-06-65266	313.5–315.0	Qbt 1g	13.8 (J+)	—	—	—	0.584 (J)	—	—	1.71 (U)	—	—	93.1
50-24818	MD50-06-65267	396.0–402.0	Qbo	—	—	—	2.87	1.02 (J)	—	—	2.13	—	—	—
50-24818	MD50-06-65268	449.0–452.0	Qbo	22.1 (U)	—	1900	—	0.74 (J-)	—	—	33.2 (U)	—	55.2	—
50-24818	MD50-06-65269	497.0–500.5	Qbo	—	1180 (J+)	—	4.11 (J)	—	—	—	1.61 (U)	—	6.36 (J)	—

Table C-2.3-3 (continued)

Location ID	Sample ID	Depth (ft)	Media	Lead	Magnesium	Manganese	Nickel	Nitrate	Perchlorate	Potassium	Selenium	Silver	Vanadium	Zinc
Qbt 2,3,4 BV[a]				**11.2**	**1690**	**482**	**6.58**	**na**	**na**	**3500**	**0.3**	**1**	**17**	**63.5**
Qbt 1v BV[a]				**18.4**	**780**	**408**	**2**	**na**	**na**	**6670**	**0.3**	**1**	**4.48**	**84.6**
Qbt 1g, Qct, Qbo BV[a]				**13.5**	**739**	**189**	**2**	**na**	**na**	**2390**	**0.3**	**1**	**4.59**	**40**
Industrial SSL[b]				**800**	**na**	**26,700**	**22,500**	**1,820,000**	**795**	**na**	**5680**	**5680**	**5680**	**341,000**
Residential SSL[b]				**400**	**na**	**1860**	**1560**	**125,000**	**54.8**	**na**	**391**	**391**	**391**	**23,500**
50-24818	MD50-06-65270	547.0–551.5	Qbo	—	872 (J+)	—	—	—	—	—	1.63 (U)	—	—	54.2
50-24818	MD50-06-65271	597.0–600.4	Qbo	—	—	—	—	—	—	—	1.72 (U)	—	—	—
50-24819	RE50-05-61422	18.5–20.0	Qbt 3	—	—	—	—	1.18	—	—	1.6 (U)	—	—	—
50-24819	RE50-05-61423	48.0–50.0	Qbt 3	—	—	—	—	0.942 (J+)	—	—	1.53 (U)	—	—	—
50-24819	RE50-05-61424	97.5–100.0	Qbt 3	—	—	—	—	0.889 (J)	0.00128 (J)	—	1.53 (U)	—	—	—
50-24819	RE50-05-61425	138.5–140.0	Qbt 2	—	—	—	—	1.11	—	—	1.5 (U)	—	—	—
50-24819	RE50-05-61426	198.1–200.0	Qbt 1v	—	—	—	—	0.809 (J)	0.000663 (J-)	—	1.51 (U)	—	—	—
50-24819	RE50-05-61427	246.5–250.0	Qbt 1v	—	—	—	—	0.909 (J)	0.000784 (J-)	—	1.62 (U)	—	—	—
50-24819	RE50-05-61428	273.0–275.0	Qbt 1g	—	—	—	—	0.876 (J)	0.000589 (J-)	—	1.6 (U)	—	—	—
50-24820	RE50-05-61438	17.5–20.0	Qbt 3	—	—	—	—	0.898 (J)	0.000635 (J-)	—	1.52 (U)	—	—	—
50-24820	RE50-05-61439	48.4–50.0	Qbt 3	—	—	—	—	0.98 (J)	0.00126 (J-)	—	1.49 (U)	—	—	—
50-24820	RE50-05-61440	97.5–100.0	Qbt 3	—	—	—	—	0.948 (J)	—	—	1.53 (U)	—	—	—
50-24820	RE50-05-61441	138.7–140.0	Qbt 2	—	—	—	—	0.687 (J)	—	—	1.5 (U)	—	—	—
50-24820	RE50-05-61442	198.2–200.0	Qbt 1v	—	—	—	—	0.687 (J)	—	—	1.49 (U)	—	—	—
50-24820	RE50-05-61443	248.3–250.0	Qbt 1g	—	—	225	—	0.797 (J)	—	—	1.61 (U)	—	—	—
50-24821	RE50-05-61456	18.6–20.0	Qbt 3	—	—	—	—	0.692 (J)	—	—	1.54 (U)	—	—	—
50-24821	RE50-05-61457	48.6–50.0	Qbt 3	—	—	—	—	0.685 (J)	—	—	1.55 (U)	—	—	—
50-24821	RE50-05-61458	98.4–100.0	Qbt 3	—	—	—	—	—	—	—	1.58 (U)	—	—	—
50-24821	RE50-05-61460	137.5–140.0	Qbt 2	—	—	—	—	1.07 (J)	—	—	1.61 (U)	—	—	—
50-24821	RE50-05-61459	157.5–160.0	Qbt 2	—	—	—	—	0.862 (J)	—	—	1.6 (U)	—	—	—
50-24821	RE50-05-61461	248.6–250.0	Qbt 1g	—	—	264	—	0.708 (J)	0.00062 (J)	—	1.56 (U)	—	—	—
50-24822	RE50-05-61474	18.6–20.0	Qbt 3	17.8	—	—	—	—	0.000658 (J)	—	1.5 (U)	—	—	—
50-24822	RE50-05-61475	47.5–49.1	Qbt 3	20.3	—	—	—	—	0.00504	—	1.53 (U)	—	—	—
50-24822	RE50-05-61476	98.6–100.0	Qbt 3	50.9	—	—	—	—	—	—	1.51 (U)	—	—	—
50-24822	RE50-05-61477	137.5–139.2	Qbt 2	—	—	—	—	0.726 (J)	—	—	1.58 (U)	—	—	—
50-24822	RE50-05-61478	198.5–200.0	Qbt 1v	—	—	—	—	—	—	—	1.5 (U)	—	—	—
50-24822	RE50-05-61479	248.7–250.0	Qbt 1g	—	—	257 (J)	—	—	—	—	1.56 (U)	—	—	—
50-25451	MD50-06-66697	18.7–19.9	Qbt 3	—	—	—	—	—	—	—	2.17	—	—	—
50-25451	MD50-06-66698	48.1–49.9	Qbt 3	—	—	—	—	—	—	—	2.38	—	—	—

Table C-2.3-3 (continued)

Location ID	Sample ID	Depth (ft)	Media	Lead	Magnesium	Manganese	Nickel	Nitrate	Perchlorate	Potassium	Selenium	Silver	Vanadium	Zinc
Qbt 2,3,4 BV[a]				**11.2**	**1690**	**482**	**6.58**	**na**	**na**	**3500**	**0.3**	**1**	**17**	**63.5**
Qbt 1v BV[a]				**18.4**	**780**	**408**	**2**	**na**	**na**	**6670**	**0.3**	**1**	**4.48**	**84.6**
Qbt 1g, Qct, Qbo BV[a]				**13.5**	**739**	**189**	**2**	**na**	**na**	**2390**	**0.3**	**1**	**4.59**	**40**
Industrial SSL[b]				**800**	**na**	**26,700**	**22,500**	**1,820,000**	**795**	**na**	**5680**	**5680**	**5680**	**341,000**
Residential SSL[b]				**400**	**na**	**1860**	**1560**	**125,000**	**54.8**	**na**	**391**	**391**	**391**	**23,500**
50-25451	MD50-06-66671	96.0–100.0	Qbt 2	—	—	—	—	—	—	—	1.45 (U)	—	—	—
50-25451	MD50-06-66672	146.0–147.5	Qbt 2	—	—	—	—	—	—	—	1.51 (U)	—	—	—
50-25451	MD50-06-66673	198.9–200.0	Qbt 2	—	—	—	—	—	—	—	1.48 (U)	—	—	—
50-25451	MD50-06-66674	251.2–252.5	Qbt 1g	—	—	—	—	—	—	—	1.56 (U)	—	—	—
50-25451	MD50-06-66699	298.5–300.0	Qbt 1g	—	—	—	—	—	—	—	1.61 (U)	—	—	—

Note: Units are mg/kg. See Appendix A for data qualifier definitions.

[a] BVs are from LANL (1998, 059730).

[b] Soil screening levels (SSLs) are from NMED (2012, 219971) unless otherwise indicated.

[c] na = Not available.

[d] SSL is for trivalent chromium.

[e] SSL from U.S. Environmental Protection Agency (EPA) regional screening tables (https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables).

[f] — = Not detected above BV or not detected.

Table C-2.3-4
Summary of Organic Chemicals Detected in Tuff at MDA C during 2005–2006 Sampling

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	Benzoic acid	Bis(2-ethylhexyl)phthalate	Chloronaphthalene[2-]	Chrysene	Di-n-butylphthalate
Industrial SSL[a]				**36,700**	**18,300[b]**	**868,000**	**183,000**	**8.26**	**8.26**	**8.26**	**2.34**	**23.4**	**234**	**2,500,000[c]**	**1370**	**90,800**	**2340**	**68,400**
Residential SSL[a]				**3440**	**1720[b]**	**66,600**	**1720**	**2.22**	**1.12**	**2.22**	**0.148**	**1.48**	**14.8**	**240,000[c]**	**347**	**6260**	**148**	**6110**
50-24766	MD50-06-64603	15.6–17.1	Qbt 3	—[d]	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24766	MD50-06-64604	27.5–29.2	Qbt 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24766	MD50-06-64586	97.5–99.9	Qbt 2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24767	MD50-06-66770	29.5–30.0	Qbt 3	—	—	0.00887	—	—	—	—	—	—	—	—	—	—	—	—
50-24768	MD50-06-64651	123.2–125.0	Qbt 2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24769	MD50-06-64699	18.1–20.0	Qbt 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24769	MD50-06-64700	37.5–39.9	Qbt 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24769	MD50-06-64701	147.9–149.8	Qbt 2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24770	MD50-06-64731	18.1–22.5	Qbt 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24770	MD50-06-64733	147.5–150.0	Qbt 2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24773	MD50-06-64782	38.0–40.0	Qbt 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24773	MD50-06-64783	150.0–152.8	Qbt 2	—	—	—	—	0.02	0.0055	0.0032 (J)	—	—	—	—	—	—	—	—
50-24783	MD50-06-64838	17.5–20.0	Qbt 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24783	MD50-06-64839	35.4–37.5	Qbt 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24783	MD50-06-64821	98.6–100.0	Qbt 3	—	—	—	—	—	0.00091 (J)	—	—	—	—	—	—	—	—	—
50-24784	MD50-06-64381	18.0–20.0	Qbt 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24784	MD50-06-64382	298.3–299.8	Qbt 1g	—	—	—	—	—	—	—	—	—	—	—	0.366	—	—	0.106 (J)
50-24785	MD50-06-64413	17.5–19.0	Qbt 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24796	MD50-06-64457	8.0–10.0	Qbt 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24796	MD50-06-64458	17.5–19.3	Qbt 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24796	MD50-06-64442	118.7–120.0	Qbt 2	—	—	—	—	—	—	—	—	—	—	0.541 (J)	—	—	—	—
50-24796	MD50-06-64459	147.5–149.4	Qbt 2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24797	MD50-06-64509	37.0–38.0	Qbt 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24799	MD50-06-64516	13.1–15.0	Qbt 3	—	—	—	—	—	—	—	—	—	—	0.58 (J)	—	—	—	—
50-24799	MD50-06-64517	15.0–16.5	Qbt 3	—	—	—	—	—	0.0021 (J)	—	—	—	—	—	—	—	—	—
50-24802	MD50-06-64888	12.5–16.1	Qbt 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24802	MD50-06-64889	40.6–42.5	Qbt 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24802	MD50-06-64872	123.1–125.0	Qbt 2	—	—	—	—	—	0.0022 (J)	—	—	—	—	—	—	—	—	—
50-24802	MD50-06-64890	157.5–159.1	Qbt 2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24803	MD50-06-64913	15.4–17.5	Qbt 3	—	—	—	—	0.0134	0.0098 (J)	0.0065	—	—	—	—	—	—	—	—

Table C-2.3-4 (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	Benzoic acid	Bis(2-ethylhexyl)phthalate	Chloronaphthalene[2-]	Chrysene	Di-n-butylphthalate
Industrial SSL[a]				**36,700**	**18,300[b]**	**868,000**	**183,000**	**8.26**	**8.26**	**8.26**	**2.34**	**23.4**	**234**	**2,500,000[c]**	**1370**	**90,800**	**2340**	**68,400**
Residential SSL[a]				**3440**	**1720[b]**	**66,600**	**1720**	**2.22**	**1.12**	**2.22**	**0.148**	**1.48**	**14.8**	**240,000[c]**	**347**	**6260**	**148**	**6110**
50-24804	MD50-06-64980	15.4–17.1	Qbt 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24804	MD50-06-64982	147.5–149.8	Qbt 2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24810	MD50-06-65005	17.5–19.0	Qbt 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24812	MD50-06-65100	8.4–10.0	Qbt 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24812	MD50-06-65102	146.0–150.0	Qbt 2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24813	MD50-06-65116	123.5–125.0	Qbt 2	—	—	—	—	—	0.007	0.0031 (J)	—	—	—	—	—	—	—	—
50-24814	MD50-06-65157	7.5–9.1	Qbt 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24814	MD50-06-65158	30.0–31.6	Qbt 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24815	MD50-06-65191	147.8–149.7	Qbt 2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24816	MD50-06-65214	23.1–24.7	Qbt 3	—	—	—	0.00945 (J)	—	—	—	—	—	—	—	0.0868 (J)	—	0.0114 (J)	—
50-24816	MD50-06-65198	118.7–120.0	Qbt 2	—	—	—	—	—	0.369	0.129	—	—	—	—	—	—	—	—
50-24816	MD50-06-65216	223.40–225.0	Qbt 2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24817	MD50-05-63838	37.0–40.0	Qbt 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24818	MD50-06-65229	8.5–10.0	Qbt 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24818	MD50-06-65230	22.1–25.0	Qbt 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24818	MD50-06-65264	247.7–249.2	Qbt 1g	—	—	—	—	0.0028 (J)	0.0023 (J)	—	—	—	—	—	—	—	—	—
50-24818	MD50-06-66760	312.90–313.0	Qbt 1g	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24818	MD50-06-66761	397.90–398.0	Qbo	—	—	0.0098	—	—	—	—	—	—	—	—	—	—	—	—
50-24818	MD50-06-66762	498.40–498.5	Qbo	—	—	0.00374 (J)	—	—	—	—	—	—	—	—	—	—	—	—
50-24820	RE50-05-61441	138.7–140.0	Qbt 2	—	—	—	—	—	—	—	—	0.113	—	—	0.11 (J)	—	—	—
50-24820	RE50-05-61442	198.2–200.0	Qbt 1v	—	—	—	0.0078 (J)	—	—	—	0.103	0.112	—	—	0.114 (J)	—	—	—
50-24820	RE50-05-61443	248.3–250.0	Qbt 1g	—	—	—	0.0076 (J)	—	—	—	0.113	0.122	—	0.605 (J)	0.128 (J)	—	—	—
50-24821	RE50-05-61458	98.4–100.0	Qbt 3	0.0143 (J)	0.0109 (J)	—	0.0142 (J)	—	—	—	—	0.0117 (J)	0.0126 (J)	—	—	0.0134 (J)	0.0188 (J-)	—
50-24822	RE50-05-61475	47.5–49.1	Qbt 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24822	RE50-05-61477	137.5–139.2	Qbt 2	—	—	—	—	—	—	0.0118	—	—	—	—	—	—	—	—
50-25451	MD50-06-66697	18.7–19.9	Qbt 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Table C-2.3-4 (continued)

Location ID	Sample ID	Depth (ft)	Media	Di-n-octylphthalate	Fluoranthene	Fluorene	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	Methylnaphthalene[2-]	Nitrotoluene[2-]
Industrial SSL[a]				**68,400**[e]	**24,400**	**24,400**	**na**[f]	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**23.4**	**2200**[c]	**1020**
Residential SSL[a]				**6110**[e]	**2290**	**2290**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**1.48**	**230**[c]	**29.1**
50-24766	MD50-06-64603	15.6–17.1	Qbt 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24766	MD50-06-64604	27.5–29.2	Qbt 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24766	MD50-06-64586	97.5–99.9	Qbt 2	0.308 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24767	MD50-06-66770	29.5–30.0	Qbt 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24768	MD50-06-64651	123.2–125.0	Qbt 2	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24769	MD50-06-64699	18.1–20.0	Qbt 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24769	MD50-06-64700	37.5–39.9	Qbt 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24769	MD50-06-64701	147.9–149.8	Qbt 2	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24770	MD50-06-64731	18.1–22.5	Qbt 3	—	—	—	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	147.5–150.0	Qbt 2	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24773	MD50-06-64782	38.0–40.0	Qbt 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24773	MD50-06-64783	150.0–152.8	Qbt 2	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24783	MD50-06-64838	17.5–20.0	Qbt 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24783	MD50-06-64839	35.4–37.5	Qbt 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24783	MD50-06-64821	98.6–100.0	Qbt 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24784	MD50-06-64381	18.0–20.0	Qbt 3	—	—	—	4.49E-07 (J)	4.49E-07	—	—	8.97E-07	—	—	1.39E-07	—	—	—
50-24784	MD50-06-64382	298.3–299.8	Qbt 1g	—	0.0228 (J)	—	5.85E-07 (J)	1.01E-06	—	—	—	—	—	7.52E-08	—	—	—
50-24785	MD50-06-64413	17.5–19.0	Qbt 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24796	MD50-06-64457	8.0–10.0	Qbt 3	—	—	—	1.3E-07 (J)	1.3E-07	—	—	—	—	—	—	—	—	—
50-24796	MD50-06-64458	17.5–19.3	Qbt 3	—	—	—	3.4E-07 (J)	6.46E-07	—	—	—	—	—	—	—	—	—
50-24796	MD50-06-64442	118.7–120.0	Qbt 2	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24796	MD50-06-64459	147.5–149.4	Qbt 2	—	—	—	7.66E-07 (J)	0.0000017	—	—	—	—	—	—	—	—	—
50-24797	MD50-06-64509	37.0–38.0	Qbt 3	—	—	—	3.01E-07 (J)	5.7E-07	—	—	—	—	—	—	—	—	—
50-24799	MD50-06-64516	13.1–15.0	Qbt 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24799	MD50-06-64517	15.0–16.5	Qbt 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24802	MD50-06-64888	12.5–16.1	Qbt 3	—	—	—	5.03E-07 (J)	5.03E-07	—	3.26E-07	—	—	—	5.62E-08	—	—	—
50-24802	MD50-06-64889	40.6–42.5	Qbt 3	—	—	—	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	123.1–125.0	Qbt 2	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24802	MD50-06-64890	157.5–159.1	Qbt 2	—	—	—	1.92E-07 (J)	1.92E-07	—	—	—	—	—	—	—	—	—
50-24803	MD50-06-64913	15.4–17.5	Qbt 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Table C-2.3-4 (continued)

Location ID	Sample ID	Depth (ft)	Media	Di-n-octylphthalate	Fluoranthene	Fluorene	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	Methylnaphthalene[2-]	Nitrotoluene[2-]
Industrial SSL[a]				**68,400[e]**	**24,400**	**24,400**	**na[f]**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**23.4**	**2200[c]**	**1020**
Residential SSL[a]				**6110[e]**	**2290**	**2290**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**1.48**	**230[c]**	**29.1**
50-24804	MD50-06-64980	15.4–17.1	Qbt 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24804	MD50-06-64982	147.5–149.8	Qbt 2	—	—	—	1.02E-07 (J)	1.02E-07	—	—	—	—	—	—	—	—	—
50-24810	MD50-06-65005	17.5–19.0	Qbt 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24812	MD50-06-65100	8.4–10.0	Qbt 3	—	—	—	—	—	6.41E-07 (J)	6.41E-07	—	—	—	—	—	—	—
50-24812	MD50-06-65102	146.0–150.0	Qbt 2	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24813	MD50-06-65116	123.5–125.0	Qbt 2	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24814	MD50-06-65157	7.5–9.1	Qbt 3	—	—	—	8.67E-07 (J)	1.86E-06	—	—	—	—	—	—	—	—	—
50-24814	MD50-06-65158	30.0–31.6	Qbt 3	—	—	—	2.2E-07 (J)	2.2E-07	—	—	—	—	—	—	—	—	—
50-24815	MD50-06-65191	147.8–149.7	Qbt 2	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24816	MD50-06-65214	23.1–24.7	Qbt 3	—	—	—	—	—	—	—	—	—	—	—	—	0.00903 (J)	—
50-24816	MD50-06-65198	118.7–120.0	Qbt 2	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24816	MD50-06-65216	223.4–225.0	Qbt 2	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24817	MD50-05-63838	37.0–40.0	Qbt 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24818	MD50-06-65229	8.5–10.0	Qbt 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24818	MD50-06-65230	22.1–25.0	Qbt 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24818	MD50-06-65264	247.7–249.2	Qbt 1g	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24818	MD50-06-66760	312.9–313.0	Qbt 1g	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24818	MD50-06-66761	397.9–398.0	Qbo	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24818	MD50-06-66762	498.4–498.5	Qbo	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24820	RE50-05-61441	138.7–140.0	Qbt 2	—	0.0167 (J)	—	—	—	—	—	—	—	—	—	—	—	—
50-24820	RE50-05-61442	198.2–200.0	Qbt 1v	0.178 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24820	RE50-05-61443	248.3–250.0	Qbt 1g	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24821	RE50-05-61458	98.4–100.0	Qbt 3	—	0.0138 (J)	0.0136 (J)	—	—	—	—	—	—	—	—	0.149	0.014 (J)	—
50-24822	RE50-05-61475	47.5–49.1	Qbt 3	—	—	—	3.58E-07 (J)	6.46E-07	—	—	4.88E-07	3.97E-08 (J)	—	3.97E-08	—	—	—
50-24822	RE50-05-61477	137.5–139.2	Qbt 2	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-25451	MD50-06-66697	18.7–19.9	Qbt 3	—	—	—	—	—	—	—	—	—	—	—	—	—	0.135 (J)

Table C-2.3-4 (continued)

Location ID	Sample ID	Depth (ft)	Media	Nitrotoluene[3-]	Nitrotoluene[4-]	Octachlorodibenzodioxin [1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran [1,2,3,4,6,7,8,9-]	Pentachlorodibenzodioxins (total)	Pentachlorodibenzofuran [1,2,3,7,8-]	Pentachlorodibenzofuran [2,3,4,7,8-]	Pentachlorodibenzofurans (total)	Phenanthrene	Pyrene	RDX[g]	Tetrachlorodibenzofuran [2,3,7,8-]	Tetrachlorodibenzofurans (total)	Trichloroethylene
Industrial SSL[a]				**114**	**2740**	**na**	**na**	**na**	**na**	**na**	**na**	**20,500**	**18,300**	**3410**	**na**	**na**	**41.3**
Residential SSL[a]				**7.82**	**244**	**na**	**na**	**na**	**na**	**na**	**na**	**1830**	**1720**	**58.2**	**na**	**na**	**8.77**
50-24766	MD50-06-64603	15.6–17.1	Qbt 3	—	0.389 (J)	2.65E-07 (J)	1.35E-07 (J)	—	—	—	—	—	—	—	—	—	—
50-24766	MD50-06-64604	27.5–29.2	Qbt 3	—	—	4.27E-07 (J)	—	—	—	—	—	—	—	0.165 (J)	—	—	—
50-24766	MD50-06-64586	97.5–99.9	Qbt 2	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24767	MD50-06-66770	29.5–30.0	Qbt 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24768	MD50-06-64651	123.2–125.0	Qbt 2	—	—	—	—	—	—	—	—	—	0.0119 (J)	—	—	—	—
50-24769	MD50-06-64699	18.1–20.0	Qbt 3	—	—	6.98E-07 (J)	—	—	—	—	—	—	—	—	—	—	—
50-24769	MD50-06-64700	37.5–39.9	Qbt 3	—	—	3.68E-07 (J)	—	—	—	—	—	—	—	—	—	—	—
50-24769	MD50-06-64701	147.9–149.8	Qbt 2	—	—	3.52E-07 (J)	—	—	—	—	—	—	—	—	—	—	—
50-24770	MD50-06-64731	18.1–22.5	Qbt 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24770	MD50-06-64733	147.5–150.0	Qbt 2	—	—	8.17E-07 (J)	—	—	—	—	—	—	—	—	—	—	—
50-24773	MD50-06-64782	38.0–40.0	Qbt 3	—	—	2.07E-07 (J)	—	—	—	—	—	—	—	—	—	—	—
50-24773	MD50-06-64783	150.0–152.8	Qbt 2	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24783	MD50-06-64838	17.5–20.0	Qbt 3	—	—	4.49E-07 (J)	—	—	—	—	—	—	—	—	—	—	—
50-24783	MD50-06-64839	35.4–37.5	Qbt 3	—	—	6.12E-07 (J)	—	—	—	—	—	—	—	—	—	—	—
50-24783	MD50-06-64821	98.6–100.0	Qbt 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24784	MD50-06-64381	18.0–20.0	Qbt 3	—	—	6.78E-07 (J)	—	—	—	—	—	—	—	—	—	2.04E-07	—
50-24784	MD50-06-64382	298.3–299.8	Qbt 1g	—	—	0.0000113	5.32E-07 (J)	—	—	—	—	—	0.0317 (J)	—	—	—	—
50-24785	MD50-06-64413	17.5–19.0	Qbt 3	—	—	5.37E-07 (J)	—	—	—	—	—	—	—	—	1.05E-07 (J)	1.05E-07	—
50-24796	MD50-06-64457	8.0–10.0	Qbt 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24796	MD50-06-64458	17.5–19.3	Qbt 3	—	—	2.45E-06 (J)	4.65E-07 (J)	—	—	—	—	—	—	—	—	—	—
50-24796	MD50-06-64442	118.7–120.0	Qbt 2	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24796	MD50-06-64459	147.5–149.4	Qbt 2	—	—	4.52E-06 (J)	—	—	—	—	—	—	—	—	—	—	—
50-24797	MD50-06-64509	37.0–38.0	Qbt 3	—	—	—	1.69E-07 (J)	—	—	—	—	—	—	—	—	—	—
50-24799	MD50-06-64516	13.1–15.0	Qbt 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24799	MD50-06-64517	15.0–16.5	Qbt 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24802	MD50-06-64888	12.5–16.1	Qbt 3	—	—	5.29E-06	4.76E-07 (J)	—	—	—	—	—	—	—	—	—	—
50-24802	MD50-06-64889	40.6–42.5	Qbt 3	—	—	6.35E-07 (J)	4.01E-07 (J)	—	1.21E-07 (J)	1.11E-07 (J)	7.17E-07	—	—	—	—	—	—
50-24802	MD50-06-64872	123.1–125.0	Qbt 2	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24802	MD50-06-64890	157.5–159.1	Qbt 2	—	—	3.44E-06 (J)	2.51E-07 (J)	—	—	—	—	—	—	—	—	—	—
50-24803	MD50-06-64913	15.4–17.5	Qbt 3	—	—	3.77E-07 (J)	—	—	—	—	—	—	—	—	—	—	—

Table C-2.3-4 (continued)

Location ID	Sample ID	Depth (ft)	Media	Nitrotoluene[3-]	Nitrotoluene[4-]	Octachlorodibenzodioxin [1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran [1,2,3,4,6,7,8,9-]	Pentachlorodibenzodioxins (total)	Pentachlorodibenzofuran [1,2,3,7,8-]	Pentachlorodibenzofuran [2,3,4,7,8-]	Pentachlorodibenzofurans (total)	Phenanthrene	Pyrene	RDX[g]	Tetrachlorodibenzofuran [2,3,7,8-]	Tetrachlorodibenzofurans (total)	Trichloroethylene
Industrial SSL[a]				**114**	**2740**	**na**	**na**	**na**	**na**	**na**	**na**	**20,500**	**18,300**	**3410**	**na**	**na**	**41.3**
Residential SSL[a]				**7.82**	**244**	**na**	**na**	**na**	**na**	**na**	**na**	**1830**	**1720**	**58.2**	**na**	**na**	**8.77**
50-24804	MD50-06-64980	15.4–17.1	Qbt 3	—	—	3.03E-07 (J)	—	—	—	—	—	—	—	—	—	—	—
50-24804	MD50-06-64982	147.5–149.8	Qbt 2	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24810	MD50-06-65005	17.5–19.0	Qbt 3	0.346 (J+)	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24812	MD50-06-65100	8.4–10.0	Qbt 3	—	—	1.53E-06 (J)	—	—	—	—	—	—	—	—	—	—	—
50-24812	MD50-06-65102	146.0–150.0	Qbt 2	—	—	—	—	—	3.13E-07 (J)	—	3.13E-07	—	—	—	—	—	—
50-24813	MD50-06-65116	123.5–125.0	Qbt 2	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24814	MD50-06-65157	7.5–9.1	Qbt 3	—	—	0.0000117 (J)	7.88E-07 (J)	—	—	—	—	—	—	—	—	—	—
50-24814	MD50-06-65158	30.0–31.6	Qbt 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24815	MD50-06-65191	147.8–149.7	Qbt 2	—	—	3.36E-07 (J)	—	—	—	—	—	—	—	—	—	—	—
50-24816	MD50-06-65214	23.1–24.7	Qbt 3	—	—	4.58E-07 (J)	—	—	—	—	—	—	—	—	—	—	—
50-24816	MD50-06-65198	118.7–120.0	Qbt 2	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24816	MD50-06-65216	223.4–225.0	Qbt 2	—	—	6.95E-07 (J)	—	—	—	—	—	—	—	—	—	—	—
50-24817	MD50-05-63838	37.0–40.0	Qbt 3	—	—	1.12E-06 (J)	—	—	—	—	—	—	—	—	—	—	—
50-24818	MD50-06-65229	8.5–10.0	Qbt 3	—	—	5.85E-07 (J)	—	—	—	—	—	—	—	—	—	—	—
50-24818	MD50-06-65230	22.1–25.0	Qbt 3	—	—	—	—	—	—	—	—	—	0.0148 (J)	—	—	—	—
50-24818	MD50-06-65264	247.7–249.2	Qbt 1g	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24818	MD50-06-66760	312.9–313.0	Qbt 1g	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00199
50-24818	MD50-06-66761	397.9–398.0	Qbo	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24818	MD50-06-66762	498.4–498.5	Qbo	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24820	RE50-05-61441	138.7–140.0	Qbt 2	—	—	—	—	—	—	—	—	0.0113 (J)	0.0118 (J)	—	—	—	—
50-24820	RE50-05-61442	198.2–200.0	Qbt 1v	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24820	RE50-05-61443	248.3–250.0	Qbt 1g	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-24821	RE50-05-61458	98.4–100.0	Qbt 3	—	—	—	—	—	—	—	—	0.0169 (J)	0.0148 (J)	—	—	—	—
50-24822	RE50-05-61475	47.5–49.1	Qbt 3	—	—	0.0000129	2.65E-07 (J)	7.64E-08	—	—	—	—	—	—	—	—	—
50-24822	RE50-05-61477	137.5–139.2	Qbt 2	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-25451	MD50-06-66697	18.7–19.9	Qbt 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Note: Units are mg/kg.

[a] Soil screening levels (SSLs) are from NMED (2012, 219971) unless otherwise indicated.

[b] Pyrene used as a surrogate based on structural similarity.

[c] SSL from U.S. Environmental Protection Agency (EPA) regional screening tables (https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables).

[d] — = Not detected.

[e] Di-n-butylphthalate used a surrogate based on structural similarity.

[f] na = Not available.

[g] RDX = Royal Demolition Explosive.

Table C-2.3-5
Summary of Radionuclides Detected or Detected above BVs in Tuff at MDA C during 2005–2006 Sampling

Location ID	Sample ID	Depth (ft)	Media	Americium-241	Cesium-137	Plutonium-238	Plutonium-239	Strontium-90	Uranium-234	Uranium-235	Uranium-238
Qbt 2,3 BV[a]				**na[b]**	**na**	**na**	**na**	**na**	**1.98**	**0.09**	**1.93**
Qbt 1v BV[a]				**na**	**na**	**na**	**na**	**na**	**3.12**	**0.14**	**3.05**
Qbt 1g, Qbo BV[a]				**na**	**na**	**na**	**na**	**na**	**4**	**0.18**	**3.9**
Industrial SAL[c]				**180**	**23**	**240**	**210**	**1900**	**1500**	**87**	**430**
Residential SAL[c]				**30**	**5.6**	**37**	**33**	**5.7**	**170**	**17**	**87**
50-24766	MD50-06-64587	122.5–124.6	Qbt 2	—[d]	—	—	—	0.0688	—	—	—
50-24767	MD50-06-64636	28.1–30.0	Qbt 3	—	—	—	0.278	—	—	—	—
50-24767	MD50-06-64619	123.2–125.0	Qbt 2	—	—	—	0.0682	—	—	—	—
50-24768	MD50-06-64668	27.5–29.5	Qbt 3	—	—	—	—	—	—	0.118	—
50-24768	MD50-06-64669	148.6–151.5	Qbt 2	0.0872	—	—	—	—	—	—	—
50-24769	MD50-06-64699	18.1–20.0	Qbt 3	—	—	—	—	—	—	0.0957	—
50-24771	MD50-06-64756	15.90–17.5	Qbt 3	—	—	—	—	—	—	0.0945	—
50-24771	MD50-06-64757	38.0–40.0	Qbt 3	—	—	—	—	—	—	0.162	—
50-24771	MD50-06-64740	123.6–125.0	Qbt 2	—	—	—	—	—	—	0.137	—
50-24771	MD50-06-64758	148.2–150.0	Qbt 2	—	—	—	—	—	—	0.105	—
50-24773	MD50-06-64782	38.0–40.0	Qbt 3	—	0.131	—	—	—	—	—	—
50-24782	MD50-06-64813	20.90–22.5	Qbt 3	—	—	—	0.029	—	—	—	—
50-24782	MD50-06-64797	123.5–125.0	Qbt 3	—	—	0.302	0.684	—	—	—	—
50-24782	MD50-06-64815	156.0–157.5	Qbt 3	—	—	0.0883	0.0478	—	—	—	—
50-24783	MD50-06-64840	150.3–152.5	Qbt 2	0.423	—	0.248	0.106	—	—	—	—
50-24784	MD50-06-64368	248.0–250.0	Qbt 1v	—	—	—	—	—	—	0.151	—
50-24784	MD50-06-64382	298.3–299.8	Qbt 1g	—	—	—	—	—	—	0.211	—
50-24785	MD50-06-64412	8.5–10.0	Qbt 3	—	—	—	—	—	—	0.101	—

Table C-2.3-5 (continued)

Location ID	Sample ID	Depth (ft)	Media	Americium-241	Cesium-137	Plutonium-238	Plutonium-239	Strontium-90	Uranium-234	Uranium-235	Uranium-238
Qbt2, 3 BV[a]				**na**	**na**	**na**	**na**	**na**	**1.98**	**0.09**	**1.93**
Qbt1v BV[a]				**na**	**na**	**na**	**na**	**na**	**3.12**	**0.14**	**3.05**
Qbt1g, Qbo BV[a]				**na**	**na**	**na**	**na**	**na**	**4**	**0.18**	**3.9**
Industrial SAL[c]				**180**	**23**	**240**	**210**	**1900**	**1500**	**87**	**430**
Residential SAL[c]				**30**	**5.6**	**37**	**33**	**5.7**	**170**	**17**	**87**
50-24785	MD50-06-64413	17.5–19.0	Qbt 3	—	—	—	—	—	—	0.148	—
50-24785	MD50-06-64398	248.5–250.0	Qbt 1g	—	—	—	—	—	—	0.357	—
50-24785	MD50-06-64414	273.8–275.0	Qbt 1g	—	—	—	—	—	—	0.236	—
50-24796	MD50-06-64458	17.5–19.3	Qbt 3	—	—	—	—	—	—	0.0903	—
50-24796	MD50-06-64440	37.5–39.3	Qbt 3	—	—	—	—	—	—	0.116	—
50-24799	MD50-06-64515	118.4–120.0	Qbt 2	—	—	—	—	—	—	0.145	—
50-24799	MD50-06-64533	158.5–160.0	Qbt 2	—	—	—	—	—	—	0.158	—
50-24801	MD50-06-64847	118.0–120.0	Qbt 2	—	—	—	—	—	—	0.105	—
50-24811	MD50-06-65075	18.5–20.0	Qbt 3	—	—	—	0.0463	—	—	—	—
50-24811	MD50-06-65076	38.5–40.0	Qbt 3	—	—	—	0.252	—	—	—	—
50-24811	MD50-06-65058	97.5–98.7	Qbt 3	—	—	—	0.132	—	—	—	—
50-24811	MD50-06-65059	123.2–125.0	Qbt 2	—	—	—	0.0651	—	—	—	—
50-24812	MD50-06-65083	97.5–98.9	Qbt 3	—	—	—	—	—	—	0.0913	—
50-24814	MD50-06-65157	7.5–9.1	Qbt 3	—	—	—	0.241	—	—	—	—
50-24816	MD50-06-65214	23.1–24.7	Qbt 3	—	—	—	—	—	—	0.115	—
50-24816	MD50-06-65198	118.7–120.0	Qbt 2	—	—	—	—	—	—	0.113	—
50-24816	MD50-06-65199	198.8–200.0	Qbt 2	—	—	—	—	—	2.15	—	2.43
50-24817	RE50-05-63810	98.8–100.0	Qbt 3	—	—	—	—	—	—	0.15	—
50-24817	RE50-05-63811	138.0–140.0	Qbt 2	—	—	—	—	—	—	0.0984	—

Table C-2.3-5 (continued)

Location ID	Sample ID	Depth (ft)	Media	Americium-241	Cesium-137	Plutonium-238	Plutonium-239	Strontium-90	Uranium-234	Uranium-235	Uranium-238
Qbt2, 3 BV[a]				**na**	**na**	**na**	**na**	**na**	**1.98**	**0.09**	**1.93**
Qbt1v BV[a]				**na**	**na**	**na**	**na**	**na**	**3.12**	**0.14**	**3.05**
Qbt1g, Qbo BV[a]				**na**	**na**	**na**	**na**	**na**	**4**	**0.18**	**3.9**
Industrial SAL[c]				**180**	**23**	**240**	**210**	**1900**	**1500**	**87**	**430**
Residential SAL[c]				**30**	**5.6**	**37**	**33**	**5.7**	**170**	**17**	**87**
50-24817	MD50-05-63839	248.1–250.0	Qbt 1g	—	—	—	—	—	—	0.233	—
50-24818	MD50-06-65265	280.0–282.5	Qbt 1g	—	—	—	—	—	—	0.209	—
50-24818	MD50-06-65266	313.5–315.0	Qbt 1g	—	—	—	—	—	—	0.244	—
50-24819	RE50-05-61424	97.5–100.0	Qbt 3	—	—	—	—	—	—	0.119	—
50-24819	RE50-05-61426	198.1–200.0	Qbt 1v	—	—	—	—	—	3.18	0.216	3.52
50-24819	RE50-05-61427	246.5–250.0	Qbt 1v	—	—	—	—	—	—	0.201	—
50-24819	RE50-05-61428	273.0–275.0	Qbt 1g	—	—	—	—	—	—	0.272	—
50-24820	RE50-05-61443	248.3–250.0	Qbt 1g	—	—	—	—	—	—	0.245	—
50-24821	RE50-05-61461	248.6–250.0	Qbt 1g	—	—	—	—	—	—	0.272	—
50-24822	RE50-05-61478	198.5–200.0	Qbt 1v	—	—	—	—	—	—	0.238	—
50-24822	RE50-05-61479	248.7–250.0	Qbt 1g	—	—	—	—	—	—	0.312	—
50-25451	MD50-06-66672	146.0–147.5	Qbt 2	—	—	—	0.0269	—	—	—	—

Note: Units are pCi/g.

[a] BVs from LANL (1998, 059730).

[b] na = Not available.

[c] Screening action levels (SALs) from LANL (2009, 107655).

[d] — = Not detected greater than BV or not detected.

Table C-2.3-6
Inorganic Chemicals above BVs in Tuff in Boreholes between Pits 2 and 3 during 2007 Sampling

Sample ID	Location ID	Depth (ft)	Media	Cyanide (total)	Iron	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Vanadium
Soil BV[a]				**0.5**	**21,500**	**0.1**	**15.4**	**na[b]**	**na**	**1.52**	**39.6**
Qbt 2,3,4 BV[a]				**0.5**	**14,500**	**0.1**	**6.58**	**na**	**na**	**0.3**	**17**
Qbt 1v BV[a]				**0.5**	**9900**	**0.1**	**2**	**na**	**na**	**0.3**	**4.48**
Qbt 1g, Qct, Qbo BV[a]				**0.5**	**3700**	**0.1**	**2**	**na**	**na**	**0.3**	**4.59**
Industrial SSL[c]				**681**	**795,000**	**341[d]**	**22,500**	**1,820,000**	**795**	**5680**	**5680**
Residential SSL[c]				**46.9**	**54,800**	**23.5[d]**	**1560**	**125,000**	**54.8**	**391**	**391**
MD50-07-75314	50-27437	20.5–22.5	Qbt 3	—[e]	—	—	—	3.9	0.00073 (J-)	—	—
MD50-07-75317	50-27437	32.5–35	Qbt 3	—	—	—	—	0.41	—	—	—
MD50-07-75315	50-27437	60–62.5	Qbt 3	—	—	—	—	0.41	—	—	—
MD50-07-75318	50-27437	80–82	Qbt 3	—	—	—	—	0.37	—	—	—
MD50-07-75351	50-27444	20–22.5	Qbt 3	0.52 (UJ)	—	—	—	1	0.0011 (J-)	0.42	—
MD50-07-75355	50-27444	35–37.5	Qbt 3	—	—	—	—	0.62	0.00086 (J-)	0.36	—
MD50-07-75352	50-27444	60–65	Qbt 3	—	—	—	—	0.34 (J-)	—	0.36	—
MD50-07-75354	50-27444	80–82.5	Qbt 3	—	—	0.17 (U)	—	0.47 (J-)	—	—	—
MD50-07-75357	50-27444	97.5–100	Qbt 3	0.51 (UJ)	—	—	—	0.45 (J-)	—	—	—
MD50-07-75368	50-27444	140–153	Qbt 2	0.51 (UJ)	—	—	—	0.56 (J-)	—	0.35	—
MD50-07-76314	50-27444	197.5–200	Qbt 1v	—	—	—	—	0.24	0.00098 (J-)	0.35	—
MD50-07-76315	50-27444	247.5–250	Qbt 1v	0.55 (UJ)	—	—	—	0.9	0.0018 (J-)	0.47	—
MD50-07-76316	50-27444	296–300	Qbt 1g	0.54 (UJ)	—	—	—	0.26	—	—	—
MD50-07-75356	50-27444	332.5–335	Qct	0.53 (U)	3810	—	2.2 (J-)	0.14 (J)	—	—	5.8

Table C-2.3-6 (continued)

Sample ID	Location ID	Depth (ft)	Media	Cyanide (total)	Iron	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Vanadium
Soil BV[a]				**0.5**	**21,500**	**0.1**	**15.4**	**na**	**na**	**1.52**	**39.6**
Qbt 2,3,4 BV[a]				**0.5**	**14,500**	**0.1**	**6.58**	**na**	**na**	**0.3**	**17**
Qbt 1v BV[a]				**0.5**	**9900**	**0.1**	**2**	**na**	**na**	**0.3**	**4.48**
Qbt 1g, Qct, Qbo BV[a]				**0.5**	**3700**	**0.1**	**2**	**na**	**na**	**0.3**	**4.59**
Industrial SSL[c]				**681**	**795,000**	**341[d]**	**22,500**	**1,820,000**	**795**	**5680**	**5680**
Residential SSL[c]				**46.9**	**54,800**	**23.5[d]**	**1560**	**125,000**	**54.8**	**391**	**391**
MD50-07-75374	50-27445	2.5–5	Fill	—	—	—	—	2.4 (J-)	—	—	—
MD50-07-75375	50-27445	20–22.5	Qbt 3	—	—	—	—	0.45 (J-)	0.014 (J-)	0.39	—
MD50-07-75379	50-27445	35–37.5	Qbt 3	—	—	—	—	0.64 (J-)	0.016 (J-)	0.37	—
MD50-07-75376	50-27445	62.5–65	Qbt 3	—	—	—	—	0.22 (J-)	0.07 (J-)	—	—
MD50-07-75380	50-27445	80–82.5	Qbt 3	0.52 (U)	—	—	—	0.38 (J-)	—	—	—
MD50-07-75398	50-27446	2.5–5	Fill	—	—	—	—	0.96 (J-)	—	—	—
MD50-07-75399	50-27446	20–22.5	Qbt 3	—	—	—	—	0.69 (J-)	—	—	—
MD50-07-75403	50-27446	35–37.5	Qbt 3	—	—	—	—	0.68 (J-)	0.0038 (J-)	—	—
MD50-07-75400	50-27446	61–65	Qbt 3	—	—	—	—	0.18 (J-)	—	—	—

Note: Results are in mg/kg. Data qualifiers are defined in Appendix A.

[a] BVs from LANL (1998, 059730).

[b] na = Not available.

[c] Soil screening levels (SSLs) from NMED (2012, 219971).

[d] SSL for mercury salts.

[e] — = Not detected or not detected above BV.

Table C-2.3-7
Organic Chemicals Detected in Tuff in Boreholes between Pits 2 and 3 during 2007 Sampling

Sample ID	Location ID	Depth (ft)	Media	Acetone	Bis(2-ethylhexyl)phthalate	Carbon Tetrachloride	Chloroform	Isopropyltoluene[4-]	Methylene Chloride	Octachlorodibenzodioxin [1,2,3,4,6,7,8,9-]	Tetrachloroethylene	Toluene	Trichloroethylene
Industrial SSL[a]				**868,000**	**1370**	**59.8**	**32.7**	**14,500[b]**	**4700**	**na[c]**	**36.6**	**57,700**	**41.3**
Residential SSL[a]				**66,600**	**347**	**10.8**	**5.86**	**2430[b]**	**409**	**na**	**7.02**	**5270**	**8.77**
MD50-07-75313	50-27437	4–5	Fill	0.018 (J)	—[d]	—	—	0.0062 (J)	—	—	0.0013 (J)	—	0.00093 (J)
MD50-07-75317	50-27437	32.5–35	Qbt 3	0.0046 (J)	—	—	—	—	—	3.83E-07 (J)	—	—	—
MD50-07-75318	50-27437	80–82	Qbt 3	—	—	—	—	—	—	3.53E-07 (J)	—	—	—
MD50-07-75351	50-27444	20–22.5	Qbt 3	—	—	—	—	—	0.011	—	—	—	—
MD50-07-75355	50-27444	35–37.5	Qbt 3	0.009 (J)	—	—	—	—	0.0088	—	—	—	—
MD50-07-75354	50-27444	80–82.5	Qbt 3	—	—	—	—	—	0.0028 (J)	—	—	—	—
MD50-07-76314	50-27444	197.5–200	Qbt 1v	—	—	—	—	—	0.0032 (J)	—	—	—	—
MD50-07-76315	50-27444	247.5–250	Qbt 1v	—	—	—	—	—	0.0055	—	—	—	—
MD50-07-76316	50-27444	296–300	Qbt 1g	—	—	—	—	—	0.006	—	—	—	—
MD50-07-75356	50-27444	332.5–335	Qct	—	—	—	—	—	0.0035 (J)	—	—	—	0.0009 (J)
MD50-07-75374	50-27445	2.5–5	Fill	—	—	0.0032 (J)	0.0028 (J)	—	—	—	—	0.0046 (J)	0.0022 (J)
MD50-07-75375	50-27445	20–22.5	Qbt 3	0.0094 (J)	0.036 (J)	—	—	—	—	—	—	0.00059 (J)	—
MD50-07-75376	50-27445	62.5–65	Qbt 3	—	—	—	—	—	0.0068	—	—	—	—
MD50-07-75380	50-27445	80–82.5	Qbt 3	—	—	—	—	—	0.0045 (J)	—	—	—	—
MD50-07-75398	50-27446	2.5–5	Fill	—	—	—	—	—	0.0075	—	—	—	—
MD50-07-75399	50-27446	20–22.5	Qbt 3	—	—	—	—	—	0.0082	—	—	—	—
MD50-07-75403	50-27446	35–37.5	Qbt 3	—	—	—	—	—	0.008	—	—	—	—
MD50-07-75400	50-27446	61–65	Qbt 3	—	—	—	—	—	0.0045 (J)	—	—	—	—
MD50-07-75404	50-27446	80–82.5	Qbt 3	—	—	—	—	—	0.0028 (J)	—	—	—	—

Note: Results are in mg/kg. Data qualifiers are defined in Appendix A.

[a] Soil screening levels (SSLs) from NMED (2012, 219971).

[b] Isopropylbenzene used as a surrogate based on structure similarity.

[c] na = Not available.

[d] — = Not detected.

Table C-2.3-8
Radionuclides Detected or Detected in Tuff
in Boreholes between Pits 2 and 3 during 2007 Sampling

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Plutonium-238	Plutonium-239/240
Industrial SAL[a]				**180**	**23**	**240**	**210**
Residential SAL[a]				**30**	**5.6**	**37**	**33**
MD50-07-75351	50-27444	20–22.5	Qbt 3	—[b]	—	0.064	0.352
MD50-07-75355	50-27444	35–37.5	Qbt 3	—	—	—	0.227
MD50-07-75352	50-27444	60–65	Qbt 3	—	—	—	0.052
MD50-07-75354	50-27444	80–82.5	Qbt 3	—	—	—	0.046
MD50-07-75374	50-27445	2.5–5	Fill	0.102	—	—	0.863
MD50-07-75398	50-27446	2.5–5	Fill	0.566	0.164	0.078	8.96

Note: Results are in pCi/g.

[a] Screening action levels (SALs) from LANL (2009, 107655).

[b] — = Not detected.

Table C-2.3-9
Summary of Results of Samples Collected above, within, and beneath Major Fractures during 2005–2006 Sampling

Location ID	Sample ID	Depth (ft)	Media	Sample Source	Inorganic Chemicals above BVs*	Organic Chemicals Detected	Radionuclides Detected or Detected above BVs/FVs
50-24770	MD50-06-64731	18.1–22.5	Qbt 3	Inside fracture	Aluminum, arsenic, barium, calcium, chromium, copper, lead, magnesium, nitrate, perchlorate, and selenium	Dioxins and furans	None
	MD50-06-64717	24.6–25	Qbt 3	Beneath fracture	Barium, calcium, lead, nitrate, perchlorate, and selenium	None	None
50-24784	MD50-06-64363	46.1–47.5	Qbt 3	Above fracture	Selenium	None	None
	MD50-06-64364	48.7–50	Qbt 3	Inside fracture	Aluminum, antimony, arsenic, barium, beryllium, calcium, chromium, cobalt, copper, iron, lead, magnesium, nickel, nitrate, perchlorate, potassium, selenium, vanadium, and zinc	None	None
	MD50-06-64365	51–55	Qbt 3	Beneath fracture	Nitrate and selenium	None	None
50-24799	MD50-06-64516	13.1–15	Qbt 3	Above fracture	Nitrate and selenium	Benzoic acid	None
	MD50-06-64517	15–16.5	Qbt 3	Inside fracture	Aluminum, arsenic, barium, chromium, nitrate, and selenium	Aroclor-1254	None
	MD50-06-64531	18–20	Qbt 3	Beneath fracture	Aluminum, arsenic, barium, calcium, chromium, copper, magnesium, nitrate, and selenium	None	None
	MD50-06-64532	30.6–32.5	Qbt 3	Above fracture	Nitrate and selenium	None	None
	MD50-06-64518	34.5–36	Qbt 3	Inside fracture	Aluminum, arsenic, barium, beryllium, calcium, chromium, copper, iron, lead, magnesium, nitrate, selenium, vanadium, and zinc	None	None
	MD50-06-64519	38.5–40	Qbt 3	Beneath fracture	Chromium, nitrate, perchlorate, and selenium	None	None
50-24804	MD50-06-64965	8.6–9.8	Qbt 3	Above fracture	Arsenic, copper, lead, selenium, and zinc	None	None
	MD50-06-64966	10–11.4	Qbt 3	Inside fracture	Aluminum, arsenic, barium, copper, lead, magnesium, and selenium	None	None
	MD50-06-64980	15.4–17.1	Qbt 3	Beneath fracture	Lead, nitrate, and selenium	Dioxin	None

*Detected at concentrations above BVs, not detected but detection limits are above BVs, or detected but with no BVs.

Table C-2.3-10
Summary of Pore-Gas Samples Collected at MDA C during 2005–2006 Sampling

Location ID	First-Round Sample ID	Depth (ft)	Tritium	VOCs	Second-Round Sample ID	Depth (ft)	Tritium	VOCs
50-09100	MD50-06-70880	20	5372S[a]	5331S	nc[b]	nc	nc	nc
50-09100	MD50-06-70881	50	5372S	5331S	nc	nc	nc	nc
50-09100	MD50-06-70882	90	5321S	5320S	nc	nc	nc	nc
50-09100	MD50-06-70883	103	5321S	5320S	nc	nc	nc	nc
50-09100	MD50-06-70884	120	5314S	5313S	nc	nc	nc	nc
50-09100	MD50-06-70885	160	5314S	5313S	nc	nc	nc	nc
50-09100	MD50-06-70886	200	5372S	5331S	nc	nc	nc	nc
50-09100	MD50-06-70887	233	5311S	5308S	nc	nc	nc	nc
50-09100	MD50-06-70888	260	5309S	5303S	nc	nc	nc	nc
50-10131	MD50-06-70868	25	5316S	5315S	nc	nc	nc	nc
50-10131	MD50-06-70869	50	5316S	5315S	nc	nc	nc	nc
50-10131	MD50-06-70870	75	5316S	5315S	nc	nc	nc	nc
50-10131	MD50-06-70871	100	5310S	5304S	nc	nc	nc	nc
50-10131	MD50-06-70872	125	5310S	5304S	nc	nc	nc	nc
50-10131	MD50-06-70873	150	5302S	5301S	nc	nc	nc	nc
50-10131	MD50-06-70874	175	5302S	5301S	nc	nc	nc	nc
50-10131	MD50-06-70875	200	5302S	5301S	nc	nc	nc	nc
50-10131	MD50-06-70876	225	5292S	5291S	nc	nc	nc	nc
50-10131	MD50-06-70877	250	5292S	5291S	nc	nc	nc	nc
50-24766	MD50-06-64597	17	5154S	5153S	MD50-06-65331	17	5597S	5596S
50-24766	MD50-06-64596	29	5154S	5153S	MD50-06-65330	29	5597S	5596S
50-24766	MD50-06-64595	99	5127S	5126S	MD50-06-65329	99	5597S	5596S
50-24766	MD50-06-64594	124	5127S	5126S	MD50-06-65328	124	5579S	5578S
50-24766	MD50-06-64593	149	5127S	5126S	MD50-06-65327	149	5579S	5578S
50-24767	MD50-06-64625	10	4901S	4900S	MD50-06-65362	10	5377S	5363S
50-24767	MD50-06-64626	30	4901S	4900S	MD50-06-65361	30	5373S	5335S
50-24767	MD50-06-64627	60	4901S	4900S	MD50-06-65360	60	5373S	5335S
50-24767	MD50-06-64628	124	4893S	4874S	MD50-06-65359	124	5373S	5335S
50-24767	MD50-06-64629	149	4892S	4863S	MD50-06-65358	149	5371S	5330S
50-24768	MD50-06-64661	14	4956S	4944S	MD50-06-65370	14	5387S	5384S
50-24768	MD50-06-64660	29	4957S	4945S	MD50-06-65369	29	5387S	5384S
50-24768	MD50-06-64659	99	4954S	4915S	MD50-06-65368	99	5387S	5384S
50-24768	MD50-06-64658	125	4954S	4915S	MD50-06-65367	125	5387S	5384S
50-24768	MD50-06-64657	150	4954S	4915S	MD50-06-65366	150	5387S	5384S
50-24769	MD50-06-64693	20	5205S	5204S	MD50-06-65378	20	5466S	5465S
50-24769	MD50-06-64692	39	5205S	5204S	MD50-06-65377	39	5466S	5465S
50-24769	MD50-06-64691	99	5199S	5197S	MD50-06-65376	99	5466S	5465S

Table C-2.3-10 (continued)

Location ID	First-Round Sample ID	Depth (ft)	Tritium	VOCs	Second-Round Sample ID	Depth (ft)	Tritium	VOCs
50-24769	MD50-06-64690	124	5199S	5197S	MD50-06-65375	124	5430S	5429S
50-24769	MD50-06-64689	149	5199S	5197S	MD50-06-65374	149	5430S	5429S
50-24770	MD50-06-64738	20	5052S	5051S	MD50-06-65387	20	5479S	5478S
50-24770	MD50-06-64725	25	5052S	5051S	MD50-06-65386	25	5479S	5478S
50-24770	MD50-06-64724	39	5052S	5051S	MD50-06-65385	39	5472S	5468S
50-24770	MD50-06-64723	100	5052S	5051S	MD50-06-65384	100	5472S	5468S
50-24770	MD50-06-64722	124	5052S	5051S	MD50-06-65383	124	5472S	5468S
50-24770	MD50-06-64721	150	5052S	5051S	MD50-06-65382	148	5464S	5463S
50-24771	MD50-06-64750	17	5044S	5043S	MD50-06-65394	17	5462S	5461S
50-24771	MD50-06-64749	40	5044S	5043S	MD50-06-65393	40	5462S	5461S
50-24771	MD50-06-64748	100	5016S	5007S	MD50-06-65392	100	5462S	5461S
50-24771	MD50-06-64747	125	5016S	5007S	MD50-06-65391	125	5428S	5427S
50-24771	MD50-06-64746	150	5016S	5007S	MD50-06-65390	149	5428S	5427S
50-24773	MD50-06-64775	20	4996S	4995S	MD50-06-65405	20	5425S	5424S
50-24773	MD50-06-64774	40	4996S	4995S	MD50-06-65404	40	5426S	5423S
50-24773	MD50-06-64773	100	4996S	4995S	MD50-06-65403	100	5426S	5423S
50-24773	MD50-06-64776	125	4993S	4989S	MD50-06-65402	125	5426S	5423S
50-24773	MD50-06-64772	150	4994S	4990S	MD50-06-65401	149	5410S	5407S
50-24782	MD50-06-64803	20	4992S	4988S	MD50-06-65413	21	5409S	5406S
50-24782	MD50-06-64804	40	4971S	4972S	MD50-06-65412	40	5409S	5406S
50-24782	MD50-06-64805	100	4971S	4972S	MD50-06-65411	100	5409S	5406S
50-24782	MD50-06-64806	125	4971S	4972S	MD50-06-65410	125	5409S	5406S
50-24782	MD50-06-64807	155	4965S	4964S	MD50-06-65409	151	5397S	5396S
50-24783	MD50-06-64832	20	4962S	4961S	MD50-06-65421	20	5393S	5392S
50-24783	MD50-06-64831	36	4958S	4951S	MD50-06-65420	36	5391S	5390S
50-24783	MD50-06-64830	100	4958S	4951S	MD50-06-65419	100	5391S	5390S
50-24783	MD50-06-64829	125	4959S	4952S	MD50-06-65418	125	5391S	5390S
50-24783	MD50-06-64828	151	4955S	4943S	MD50-06-65417	148	5391S	5390S
50-24784	MD50-06-64374	10	4775S	4776S	MD50-06-70724	10	5118S	5117S
50-24784	MD50-06-64373	20	4775S	4776S	MD50-06-70723	20	5118S	5117S
50-24784	MD50-06-64372	47	4778S	4770S	MD50-06-70722	47	5104S	5092S
50-24784	MD50-06-64371	49	4778S	4770S	MD50-06-70721	49	5104S	5092S
50-24784	MD50-06-64370	55	4778S	4770S	MD50-06-65292	55	5105S	5094S
50-24784	MD50-06-64375	100	4744S	4743S	MD50-06-65291	100	5105S	5093S
50-24784	MD50-06-64379	168	4744S	4743S	MD50-06-65290	168	5105S	5093S
50-24784	MD50-06-64378	199	4742S	4740S	MD50-06-65289	199	5087S	5086S
50-24784	MD50-06-64377	250	4742S	4740S	MD50-06-65288	250	5084S	5083S
50-24784	MD50-06-64376	268	4742S	4740S	MD50-06-65287	265	5084S	5083S

Table C-2.3-10 (continued)

Location ID	First-Round Sample ID	Depth (ft)	Tritium	VOCs	Second-Round Sample ID	Depth (ft)	Tritium	VOCs
50-24785	MD50-06-64402	10	4421S	4420S	MD50-06-66783	10	5150S	5149S
50-24785	MD50-06-64403	19	4447S	4426S	MD50-06-65300	19	5152S	5151S
50-24785	MD50-06-64408	60	4585S	4563S	MD50-06-65299	60	5152S	5151S
50-24785	MD50-06-64407	120	4585S	4563S	MD50-06-65298	120	5125S	5124S
50-24785	MD50-06-64404	200	4494S	4493S	MD50-06-65297	200	5116S	5115S
50-24785	MD50-06-64405	250	4520S	4515S	MD50-06-65296	250	5116S	5115S
50-24785	MD50-06-64406	275	4522S	4517S	MD50-06-65295	256	5116S	5115S
50-24796	MD50-06-64448	10	4251S	4252S	MD50-06-65308	10	5374S	5337S
50-24796	MD50-06-64447	20	4251S	4252S	MD50-06-65307	20	5370S	5329S
50-24796	MD50-06-64449	40	4262S	4261S	MD50-06-65306	40	5370S	5329S
50-24796	MD50-06-64450	100	4262S	4261S	MD50-06-65305	100	5370S	5329S
50-24796	MD50-06-64451	120	4283S	4282S	MD50-06-65304	120	5323S	5322S
50-24796	MD50-06-64452	150	4285S	4284S	MD50-06-65303	144	5323S	5322S
50-24797	MD50-06-64496	18.3	4302S	4303S	MD50-06-65315	18.3	5395S	5394S
50-24797	MD50-06-64497	38	4318S	4317S	MD50-06-65314	38	5395S	5394S
50-24797	MD50-06-66198	60	4553S	4552S	MD50-06-65313	60	5386S	5383S
50-24797	MD50-06-64498	120	4329S	4330S	MD50-06-65312	120	5375S	5339S
50-24797	MD50-06-64500	160	4445S	4429S	MD50-06-65311	154	5375S	5339S
50-24799	MD50-06-66197	15	4527S	4528S	MD50-06-65323	20	5611S	5610S
50-24799	MD50-06-64521	17.5	4295S	4296S	MD50-06-65322	32.5	5611S	5610S
50-24799	MD50-06-64522	20	4295S	4296S	MD50-06-65321	100	5607S	5606S
50-24799	MD50-06-64523	32.5	4299S	4300S	MD50-06-65320	120	5595S	5594S
50-24799	MD50-06-64538	37.5	4299S	4300S	MD50-06-65319	160	5595S	5594S
50-24799	MD50-06-64524	40.5	4315S	4316S	nc	nc	nc	nc
50-24799	MD50-06-64525	100	4331S	4332S	nc	nc	nc	nc
50-24799	MD50-06-64526	120	4345S	4344S	nc	nc	nc	nc
50-24799	MD50-06-64527	160	4345S	4344S	nc	nc	nc	nc
50-24801	MD50-06-64853	20	4519S	4501S	MD50-06-65429	20	5577S	5576S
50-24801	MD50-06-64870	35	4519S	4501S	MD50-06-65428	35	5577S	5576S
50-24801	MD50-06-64856	80	4530S	4531S	MD50-06-65427	80	5577S	5576S
50-24801	MD50-06-64855	120	4530S	4531S	MD50-06-65426	120	5577S	5576S
50-24801	MD50-06-64854	150	4523S	4518S	MD50-06-65425	150	5566S	5565S
50-24802	MD50-06-64878	15	4799S	4794S	MD50-06-65437	15	5534S	5533S
50-24802	MD50-06-64879	42	4799S	4794S	MD50-06-65436	42	5534S	5533S
50-24802	MD50-06-64880	99.4	4799S	4794S	MD50-06-65435	99	5534S	5533S
50-24802	MD50-06-64881	124.4	4798S	4786S	MD50-06-65434	124	5534S	5533S
50-24802	MD50-06-64882	156.4	4798S	4786S	MD50-06-65433	156	5534S	5533S
50-24803	MD50-06-64904	16	4891S	4862S	MD50-06-65445	16	5525S	5524S

Table C-2.3-10 (continued)

Location ID	First-Round Sample ID	Depth (ft)	Tritium	VOCs	Second-Round Sample ID	Depth (ft)	Tritium	VOCs
50-24803	MD50-06-64903	37	4891S	4862S	MD50-06-65444	37	5525S	5524S
50-24803	MD50-06-64905	99.5	4890S	4820S	MD50-06-65443	99.5	5525S	5524S
50-24803	MD50-06-64906	124	4890S	4820S	MD50-06-65442	124	5520S	5519S
50-24803	MD50-06-64907	151	4810S	4809S	MD50-06-65441	150	5520S	5519S
50-24804	MD50-06-64970	10	5171S	5161S	MD50-06-65454	10	5605S	5604S
50-24804	MD50-06-64971	16	5171S	5161S	MD50-06-65453	16	5593S	5592S
50-24804	MD50-06-64972	33	5171S	5161S	MD50-06-65452	33	5593S	5592S
50-24804	MD50-06-64973	99	5172S	5164S	MD50-06-65451	99	5593S	5592S
50-24804	MD50-06-64974	124	5172S	5164S	MD50-06-65450	124	5593S	5592S
50-24804	MD50-06-64975	149	5172S	5164S	MD50-06-65449	149	5593S	5592S
50-24810	MD50-06-64999	19	5281S	5280S	MD50-06-65461	19	5575S	5574S
50-24810	MD50-06-64998	37	5281S	5280S	MD50-06-65460	37	5575S	5574S
50-24810	MD50-06-64997	99	5281S	5280S	MD50-06-65459	99	5575S	5574S
50-24810	MD50-06-64996	123	5281S	5280S	MD50-06-65458	123	5575S	5574S
50-24810	MD50-06-64995	150	5232S	5225S	MD50-06-65457	150	5575S	5574S
50-24811	MD50-06-65069	20	5230S	5222S	MD50-06-65469	20	5570S	5569S
50-24811	MD50-06-65068	40	5203S	5202S	MD50-06-65468	40	5570S	5569S
50-24811	MD50-06-65067	98	5203S	5202S	MD50-06-65467	98	5570S	5569S
50-24811	MD50-06-65066	125	5203S	5202S	MD50-06-65466	125	5570S	5569S
50-24811	MD50-06-65065	150	5203S	5202S	MD50-06-65465	150	5540S	5539S
50-24812	MD50-06-65094	10	5198S	5196S	MD50-06-65477	10	5536S	5535S
50-24812	MD50-06-65093	35	5198S	5196S	MD50-06-65476	35	5536S	5535S
50-24812	MD50-06-65092	98	5198S	5196S	MD50-06-65474	98	5536S	5535S
50-24812	MD50-06-65091	123	5173S	5165S	MD50-06-65475	123	5527S	5526S
50-24812	MD50-06-65090	150	5173S	5165S	MD50-06-65473	150	5527S	5526S
50-24813	MD50-06-65126	20	5167S	5166S	MD50-06-65485	20	5518S	5517S
50-24813	MD50-06-65125	30	5170S	5160S	MD50-06-65484	30	5518S	5517S
50-24813	MD50-06-65124	99	5170S	5160S	MD50-06-65483	99	5518S	5517S
50-24813	MD50-06-65123	125	5170S	5160S	MD50-06-65482	125	5502S	5501S
50-24813	MD50-06-65122	150	5170S	5160S	MD50-06-65481	150	5502S	5501S
50-24814	MD50-06-65151	10	5294S	5293S	MD50-06-65493	10	5498S	5497S
50-24814	MD50-06-65150	30	5294S	5293S	MD50-06-65492	30	5484S	5483S
50-24814	MD50-06-65149	99	5294S	5293S	MD50-06-65491	99	5484S	5483S
50-24814	MD50-06-65148	124	5283S	5282S	MD50-06-65490	124	5484S	5483S
50-24814	MD50-06-65147	149	5283S	5282S	MD50-06-65489	149	5484S	5483S
50-24815	MD50-06-65183	30	5244S	5243S	MD50-06-65501	30	5475S	5474S
50-24815	MD50-06-65182	40	5231S	5224S	MD50-06-65500	40	5473S	5469S
50-24815	MD50-06-65181	100	5231S	5224S	MD50-06-65499	100	5473S	5469S

Table C-2.3-10 (continued)

Location ID	First-Round Sample ID	Depth (ft)	Tritium	VOCs	Second-Round Sample ID	Depth (ft)	Tritium	VOCs
50-24815	MD50-06-65180	125	5231S	5224S	MD50-06-65498	125	5473S	5469S
50-24815	MD50-06-65179	149	5201S	5200S	MD50-06-65497	149	5460S	5459S
50-24816	MD50-06-65204	25	4410S	4411S	MD50-06-65510	25	5123S	5057S
50-24816	MD50-06-65205	35	4448S	4427S	MD50-06-65509	35	5055S	5054S
50-24816	MD50-06-65209	65	4496S	4495S	MD50-06-65508	65	5055S	5053S
50-24816	MD50-06-65206	120	4448S	4428S	MD50-06-65507	120	5055S	5053S
50-24816	MD50-06-65208	200	4477S	4476S	MD50-06-65506	200	5055S	5053S
50-24816	MD50-06-65207	225	4477S	4476S	MD50-06-65505	215.8	5055S	5053S
50-24817	MD50-05-63841	20	4011S	4010S	MD50-06-65903	20	4116S	4115S
50-24817	MD50-05-63842	40	4011S	4010S	MD50-06-65904	50	4116S	4115S
50-24817	RE50-05-63816	100	4009S	4008S	MD50-06-65905	100	4116S	4115S
50-24817	RE50-05-63817	140	4028S	4027S	MD50-06-65906	140	4116S	4115S
50-24817	RE50-05-63818	200	4030S	4029S	MD50-06-65907	200	4114S	4113S
50-24817	MD50-05-63843	250	4045S	4044S	MD50-06-65908	240.9	4114S	4113S
50-24818	MD50-06-65232	10	4548s	4549S	nc	nc	nc	nc
50-24818	MD50-06-65233	25	4548s	4549S	nc	nc	nc	nc
50-24818	MD50-06-65234	100	4593S	4594S	nc	nc	nc	nc
50-24818	MD50-06-65235	150	4650S	4610S	nc	nc	nc	nc
50-24818	MD50-06-65236	190	4655S	4641S	nc	nc	nc	nc
50-24818	MD50-06-65237	250	4662S	4645S	nc	nc	nc	nc
50-24818	MD50-06-65238	280	4662S	4645S	nc	nc	nc	nc
50-24818	MD50-06-65239	315	4663S	4664S	nc	nc	nc	nc
50-24818	MD50-06-65240	414	5299S	5298S	nc	nc	nc	nc
50-24818	MD50-06-65242	452	5477S	5476S	nc	nc	nc	nc
50-24818	MD50-06-65245	500	5516S	5512S	nc	nc	nc	nc
50-24818	MD50-06-65244	548	5500S	5499S	nc	nc	nc	nc
50-24818	MD50-06-65243	591	5500S	5499S	nc	nc	nc	nc
50-24819	RE50-05-61430	20	3667S	3666S	MD50-06-63863	20	4072S	4073S
50-24819	RE50-05-61431	50	3684S	3685S	MD50-06-63864	50	4072S	4073S
50-24819	RE50-05-61432	100	3709S	3708S	MD50-06-63865	100	4072S	4073S
50-24819	RE50-05-61732	138.5–140	3703S	3702S	MD50-06-63866	140	4072S	4073S
50-24819	RE50-05-61733	200	3724S	3723S	MD50-06-63867	200	4068S	4067S
50-24819	RE50-05-61734	250	3731S	3730S	MD50-06-63868	250	4068S	4067S
50-24819	RE50-05-61735	275	3752S	3751S	MD50-06-63869	275	4068S	4067S
50-24820	RE50-05-61446	20	3786S	3785S	MD50-06-64240	20	4085S	4084S
50-24820	RE50-05-61449	50	3797S	3796S	MD50-06-64241	50	4085S	4084S
50-24820	RE50-05-61447	100	3809S	3808S	MD50-06-64242	100	4085S	4084S
50-24820	RE50-05-61448	140	3809S	3808S	MD50-06-64243	140	4085S	4084S

Table C-2.3-10 (continued)

Location ID	First-Round Sample ID	Depth (ft)	Tritium	VOCs	Second-Round Sample ID	Depth (ft)	Tritium	VOCs
50-24820	RE50-05-61450	200	3827S	3821S	MD50-06-64244	200	4085S	4084S
50-24820	RE50-05-61736	250	3828S	3822S	MD50-06-64245	225	4085S	4084S
50-24821	RE50-05-61464	20	3839S	3838S	MD50-06-64248	20	4108S	4109S
50-24821	RE50-05-61466	50	3839S	3838S	MD50-06-64249	50	4108S	4109S
50-24821	RE50-05-61465	98.4–100	3858S	3855S	MD50-06-64250	100	4104S	4105S
50-24821	RE50-05-61467	137.5–140	3868S	—[c]	MD50-06-64251	140	4102S	4103S
50-24821	RE50-05-61469	137.5–140	—	3867S	MD50-06-64254	160	4130S	4129S
50-24821	RE50-05-61473	160	4059S	4058S	MD50-06-64252	200	4102S	4103S
50-24821	RE50-05-61468	248.6–250	3892S	3891S	MD50-06-64253	238.4	4102S	4103S
50-24822	RE50-05-61482	20	3903S	3904S	MD50-06-64928	20	4097S	4096S
50-24822	RE50-05-61483	50	3922S	3921S	MD50-06-64929	50	4097S	4096S
50-24822	RE50-05-61484	100	3922S	3921S	MD50-06-64930	100	4097S	4096S
50-24822	RE50-05-61485	140	3945S	3944S	MD50-06-64931	140	4097S	4096S
50-24822	RE50-05-61486	200	3950S	3949S	MD50-06-64932	200	4090S	4091S
50-24822	RE50-05-61737	250	3959S	3958S	MD50-06-64933	250	4090S	4091S
50-25451	MD50-06-66691	19	5568S	5567S	nc	nc	nc	nc
50-25451	MD50-06-66690	49	5568S	5567S	nc	nc	nc	nc
50-25451	MD50-06-66689	100	5568S	5567S	nc	nc	nc	nc
50-25451	MD50-06-66688	147	5568S	5567S	nc	nc	nc	nc
50-25451	MD50-06-66687	200	5568S	5567S	nc	nc	nc	nc
50-25451	MD50-06-66686	251	5079S	5075S	nc	nc	nc	nc
50-25451	MD50-06-66685	287	5079S	5076S	nc	nc	nc	nc

[a] Analytical request number.

[b] nc = Not collected.

[c] — = Analysis not requested.

Table C-2.3-11
Summary of VOCs Detected in First Round of 2005–2006 Vapor Sampling 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-]	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Dioxane[1,4-]	Ethanol	Ethylbenzene
50-09100	MD50-06-70880	20	—*	—	—	—	—	—	—	—	300	—	—	—	130	—	—	—	33	—	—	—	—
50-09100	MD50-06-70881	50	86	—	—	—	—	—	28	—	120	—	—	—	38	—	—	—	19	—	—	—	11
50-09100	MD50-06-70882	90	28	—	—	—	—	—	76	—	360	—	—	—	160	—	13	—	68	17	—	—	—
50-09100	MD50-06-70883	103	—	—	—	—	—	—	160	—	820	—	—	—	390	—	—	—	140	—	—	—	—
50-09100	MD50-06-70884	120	—	—	—	—	—	—	150	—	870	—	—	—	480	—	—	—	190	—	—	—	—
50-09100	MD50-06-70885	160	—	—	—	—	—	—	—	—	820	—	—	—	440	—	—	—	220	—	—	—	—
50-09100	MD50-06-70886	200	—	—	—	—	—	—	590	—	1300	—	—	—	800	—	29	—	360	67	—	—	—
50-09100	MD50-06-70887	233	—	—	—	—	—	—	—	—	310	—	—	—	200	—	—	—	96	—	—	—	—
50-09100	MD50-06-70888	260	100	—	—	—	—	—	78	—	290	—	—	—	200	—	—	—	98	—	—	—	—
50-10131	MD50-06-70868	25	—	—	—	—	—	—	66	—	890	—	—	—	150	—	—	—	—	120	—	—	—
50-10131	MD50-06-70869	50	—	—	—	—	—	—	87	—	810	—	—	—	200	—	—	—	—	130	—	—	—
50-10131	MD50-06-70870	75	—	—	—	—	—	—	90	—	920	—	—	—	200	—	28	—	—	130	—	—	—
50-10131	MD50-06-70871	100	—	—	—	—	—	—	—	—	590	—	—	—	130	—	—	—	—	99	—	—	—
50-10131	MD50-06-70872	125	—	—	—	—	—	—	52	—	660	—	—	—	190	—	22	—	24	120	—	—	—
50-10131	MD50-06-70873	150	—	—	—	—	—	—	33	—	310	—	—	61	110	—	—	—	—	73	—	—	—
50-10131	MD50-06-70874	175	—	—	—	—	—	—	100	—	620	—	—	—	230	—	—	—	34	130	—	—	—
50-10131	MD50-06-70875	200	—	—	—	—	—	—	110	—	400	—	—	110	220	—	—	—	—	110	—	—	—
50-10131	MD50-06-70876	225	—	—	—	—	—	—	95	—	760	—	—	67	250	—	—	—	31	91	—	—	—
50-10131	MD50-06-70877	250	—	—	—	—	—	—	100	—	570	—	—	—	210	—	—	—	—	120	—	—	—
50-24766	MD50-06-64597	17	99	—	—	—	—	—	14	—	63	—	—	38	110	—	—	—	—	16	—	—	—
50-24766	MD50-06-64596	29	140	—	—	—	—	—	29	—	99	—	—	89	220	—	—	—	—	26	—	—	—
50-24766	MD50-06-64595	99	—	—	—	—	—	—	450	—	190	—	—	—	210	—	—	—	—	64	—	—	—
50-24766	MD50-06-64594	124	190	—	—	—	—	—	14	—	100	—	—	43	47	7.3	7.3	—	17	60	—	—	—
50-24766	MD50-06-64593	149	62	—	—	—	—	—	41	—	190	—	—	—	84	14	16	9.8	37	130	—	—	—
50-24767	MD50-06-64625	10	—	11	—	—	—	—	—	—	160	—	—	—	100	—	—	—	29	—	—	—	—
50-24767	MD50-06-64626	30	52	24	—	—	—	—	16	—	120	—	—	—	74	—	—	—	24	—	—	—	12
50-24767	MD50-06-64627	60	32	3	—	—	—	—	6.8	—	40	—	—	—	23	—	—	2.9	8.4	—	—	—	2.6
50-24767	MD50-06-64628	124	—	—	—	—	—	—	—	—	73	—	—	—	64	—	—	—	15	—	—	—	—
50-24767	MD50-06-64629	149	—	—	—	—	—	—	—	—	240	—	—	—	150	—	—	—	67	—	—	—	—
50-24768	MD50-06-64661	14	31	—	—	—	—	—	7.2	—	35	—	—	—	36	—	—	—	5.9	—	—	—	—
50-24768	MD50-06-64660	29	35	—	—	—	—	—	—	—	22	—	—	—	17	—	—	—	3.8	—	—	—	—
50-24768	MD50-06-64659	99	—	—	—	—	—	—	—	—	390	—	—	—	390	—	—	—	90	—	—	—	—

Table C-2.3-11 (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-]	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Dioxane[1,4-]	Ethanol	Ethylbenzene
50-24768	MD50-06-64658	125	—	—	—	—	—	—	—	—	320	—	—	—	470	—	—	—	100	—	—	—	—
50-24768	MD50-06-64657	150	—	—	—	—	—	—	—	—	290	—	—	—	450	—	—	—	91	—	—	—	—
50-24769	MD50-06-64693	20	34	—	—	—	—	3.2	8	—	21	—	—	25	25	—	—	—	1.9	—	—	—	—
50-24769	MD50-06-64692	39	44	—	—	—	3	—	7.4	—	33	1.7	—	18	23	—	0.88	—	4.8	1	—	—	—
50-24769	MD50-06-64691	99	—	—	—	—	—	—	440	—	1900	—	—	—	2000	—	—	—	330	—	—	—	—
50-24769	MD50-06-64690	124	—	—	—	—	—	—	170	—	1300	—	—	—	1100	—	—	—	240	—	—	—	—
50-24769	MD50-06-64689	149	—	—	—	—	—	—	—	—	2300	—	—	—	2400	—	—	—	420	—	—	—	—
50-24770	MD50-06-64738	20	—	—	—	—	—	—	2100 (J)	—	1700	—	—	—	1700	—	—	—	160	—	—	—	—
50-24770	MD50-06-64725	25	—	—	—	—	—	—	2500 (J)	—	1900	—	—	—	1700	—	—	—	190	—	—	—	—
50-24770	MD50-06-64724	39	—	—	—	—	—	—	2700 (J)	—	2100	—	—	—	1800	—	—	—	220	—	—	—	—
50-24770	MD50-06-64723	100	—	—	—	—	—	—	1800 (J)	—	1900	—	—	—	1500	—	56	—	280	—	—	—	—
50-24770	MD50-06-64722	124	—	—	—	—	—	—	2900 (J)	—	3200	—	—	—	2400	—	—	—	490	—	—	—	—
50-24770	MD50-06-64721	150	—	—	—	—	—	—	720 (J)	—	1000	—	—	—	850	—	—	—	210	—	—	—	—
50-24771	MD50-06-64750	17	—	—	—	—	—	—	1600 (J)	—	1600	—	—	—	710	—	—	—	110	—	—	—	—
50-24771	MD50-06-64749	40	—	—	—	—	—	—	2500 (J)	—	2300	—	—	—	1100	—	94	—	230	—	—	—	—
50-24771	MD50-06-64748	100	31	—	—	—	—	—	99	—	190	—	—	—	64	—	18	—	32	—	—	—	—
50-24771	MD50-06-64747	125	—	—	—	—	—	—	1200	—	2300	—	—	—	440	—	180	—	330	120	—	—	—
50-24771	MD50-06-64746	150	—	—	—	—	—	—	2400	—	3600	—	—	—	1200	—	270	—	680	—	—	—	—
50-24773	MD50-06-64775	20	—	—	—	—	—	—	350	—	940	—	—	—	340	—	—	—	110	—	—	—	—
50-24773	MD50-06-64774	40	—	—	—	—	—	—	450	—	1200	—	—	—	430	—	75	—	160	—	—	—	—
50-24773	MD50-06-64773	100	—	—	—	—	—	—	490	—	1300	—	—	—	410	—	120	—	210	—	—	—	—
50-24773	MD50-06-64776	125	—	—	—	—	—	—	1000	—	2300	—	—	—	870	—	200	—	430	160	—	—	—
50-24773	MD50-06-64772	150	—	—	—	—	—	—	1800 (J)	—	3000	—	—	—	950	—	260	—	520	—	—	—	—
50-24782	MD50-06-64803	20	—	—	—	—	—	—	—	—	520	—	—	—	170	—	—	—	62	—	—	—	—
50-24782	MD50-06-64804	40	—	—	—	—	—	—	110	—	980	—	—	—	290	—	35	—	110	50	—	—	—
50-24782	MD50-06-64805	100	—	—	—	—	—	—	100	—	710	—	—	—	210	—	54	—	110	58	—	—	—
50-24782	MD50-06-64806	125	—	—	—	—	—	—	320	—	1500	—	—	—	500	—	86	—	260	110	—	—	—
50-24782	MD50-06-64807	155	82	—	—	—	—	—	50	—	240	—	—	—	94	—	—	—	40	42	—	—	—
50-24783	MD50-06-64832	20	—	—	—	—	—	—	180	—	1100	—	—	—	360	—	120	—	250	130	—	—	—
50-24783	MD50-06-64831	36	—	—	—	—	—	—	—	—	200	—	—	—	85	—	—	—	25	38	—	—	—
50-24783	MD50-06-64830	100	—	—	—	—	—	—	—	—	140	—	—	—	42	—	—	—	23	23	—	—	—
50-24783	MD50-06-64829	125	—	—	—	—	—	—	360	—	830	—	—	—	240	—	58	—	130	150	—	—	—
50-24783	MD50-06-64828	151	—	—	—	—	—	—	410	—	1000	—	—	—	370	—	—	—	190	170	—	—	—

Table C-2.3-11 (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-]	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Dioxane[1,4-]	Ethanol	Ethylbenzene
50-24784	MD50-06-64374	10	—	—	—	—	—	—	32	—	73	—	—	—	30	—	—	—	—	—	—	—	—
50-24784	MD50-06-64373	20	—	—	—	—	—	—	5	—	14	0.93	—	—	6.9	—	—	—	—	—	—	—	0.96
50-24784	MD50-06-64372	47	41 (J)	—	—	—	—	48	140	—	190	—	—	—	79	—	—	—	—	31	—	—	—
50-24784	MD50-06-64371	49	58 (J)	—	—	—	—	—	130	—	200	—	—	—	69	—	—	—	—	36	—	—	—
50-24784	MD50-06-64370	55	80 (J)	4.6	—	—	—	22	120	—	210	—	—	—	66	—	4.9	—	8.5	39	—	—	7.7
50-24784	MD50-06-64375	100	21 (J)	3.7	—	—	—	—	51	—	100	—	—	—	34	—	3.5	—	4.8	22	—	—	—
50-24784	MD50-06-64379	168	29 (J)	—	—	—	—	—	190	—	90	—	—	—	83	—	—	—	12	28	—	—	—
50-24784	MD50-06-64378	199	170	9.5	—	—	4.7	3.4	63	—	46	0.94	—	—	31	1.6	1.5	—	6	22 (J)	—	—	8.7
50-24784	MD50-06-64377	250	140	12	—	—	—	—	170	—	58	—	—	—	78	—	—	—	9.1	20 (J)	—	—	9.7
50-24784	MD50-06-64376	268	—	—	—	—	—	—	300	—	70	—	—	—	210	—	—	—	—	—	—	—	—
50-24785	MD50-06-64402	10	20	—	—	—	—	8.7	—	—	76	—	11	—	4.8	—	—	—	—	—	—	—	7.2
50-24785	MD50-06-64403	19	19	—	3	—	3.8	—	9.2	—	350	—	—	—	13	—	5.6	—	—	7.8	—	—	19
50-24785	MD50-06-64408	60	—	—	—	—	—	—	130	—	3000	—	—	—	130	—	44	—	—	110	—	—	—
50-24785	MD50-06-64407	120	—	—	—	—	—	—	170	—	940	—	—	—	140	—	38	—	19	150	—	—	—
50-24785	MD50-06-64404	200	—	—	—	—	—	—	330	—	470	—	—	—	200	—	—	—	35	160	—	—	—
50-24785	MD50-06-64405	250	—	—	—	—	—	—	600 (J)	—	160	—	—	—	260	—	—	—	—	86	—	—	—
50-24785	MD50-06-64406	275	47	4.7	—	—	—	—	11	—	23	—	—	—	7.1	—	—	—	—	6.9 (J)	—	—	—
50-24796	MD50-06-64448	10	120	4.4	—	—	33	14	—	—	1.8	1.9	—	—	6	—	—	—	—	—	—	—	2
50-24796	MD50-06-64447	20	73	10	—	—	12	6.5	5.6	—	44	1.1	—	—	38	0.81	—	—	2	21	—	—	5
50-24796	MD50-06-64449	40	41	—	—	—	—	—	28	—	200	—	—	—	220	—	—	—	9.1	110	—	—	—
50-24796	MD50-06-64450	100	—	—	—	—	—	—	—	—	680	—	—	—	840	—	—	—	63	420	—	—	—
50-24796	MD50-06-64451	120	38	1.8	—	—	—	—	4.7	—	27	1.3	—	—	26	—	2.5	0.91	2.4	19	—	—	—
50-24796	MD50-06-64452	150	83	10	—	—	—	—	92	—	290	—	—	—	220	—	25	15	37	280	—	—	—
50-24797	MD50-06-64496	18.3	42 (J)	3.2	—	—	7.5	—	11 (J)	—	49	1.2	—	3.7	180 (J)	2	—	—	2.5	18	—	—	3 (J)
50-24797	MD50-06-64497	38	31 (J)	—	—	—	—	—	28 (J)	—	180	—	—	—	400 (J)	—	—	—	14	99	—	—	—
50-24797	MD50-06-66198	60	—	—	—	—	—	—	—	—	180	—	—	—	350	—	—	—	24	160	—	—	—
50-24797	MD50-06-64498	120	49	—	—	—	—	—	41	—	210	—	—	—	260	—	—	—	38 (J+)	200	—	—	—
50-24797	MD50-06-64500	160	—	—	—	—	—	—	200	—	460	—	—	—	620	45	—	65	94 (J+)	460	—	—	—
50-24799	MD50-06-66197	15	120	—	—	—	—	—	—	—	61	—	—	—	31	—	—	—	8	24 (J)	—	—	—
50-24799	MD50-06-64521	17.5	56	2.7	—	—	12	—	—	—	4	1.3	—	—	4.5	—	—	—	—	—	—	—	1.7 (J)
50-24799	MD50-06-64522	20	89	5.1	—	—	20	—	—	—	5.1	1.4	—	—	5.4	—	—	—	—	—	—	—	2.8 (J)
50-24799	MD50-06-64523	32.5	290 (J)	27	—	—	110	—	—	—	68	—	—	—	38 (J)	—	—	—	5.7	17	—	—	11 (J)
50-24799	MD50-06-64538	37.5	390 (J)	21	—	—	160	—	8.7 (J)	—	95	—	—	—	43 (J)	5.2	—	—	8.9	26	—	—	7.5 (J)

Table C-2.3-11 (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-]	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Dioxane[1,4-]	Ethanol	Ethylbenzene
50-24799	MD50-06-64524	40.5	330	—	—	32	120	3.9	5.7	—	76	—	—	—	35	3.7	—	—	—	—	—	7.2	—
50-24799	MD50-06-64525	100	26	—	13	—	—	—	—	—	11	—	—	—	—	—	—	—	—	—	2300	—	—
50-24799	MD50-06-64526	120	60	—	1.8	65	9.7	—	5.4	—	40	—	—	—	17	—	4.9	—	8.7 (J+)	16	980	—	—
50-24799	MD50-06-64527	160	—	—	22	—	—	—	110	61	440	—	—	—	160	18	42	—	100 (J+)	230	—	—	—
50-24801	MD50-06-64853	20	35	—	—	—	—	—	—	—	69	—	—	—	18	—	—	—	—	9.5 (J)	—	—	—
50-24801	MD50-06-64870	35	27	—	—	—	—	—	—	—	140	—	—	—	34	—	—	—	11	24 (J)	—	—	—
50-24801	MD50-06-64856	80	—	—	—	—	—	—	370 (J)	—	720	—	—	—	340	—	51	—	120	210	—	—	—
50-24801	MD50-06-64855	120	—	—	—	—	—	—	51 (J)	—	260	—	—	—	120	—	16	—	41	71	—	—	—
50-24801	MD50-06-64854	150	50	—	—	—	—	—	25	—	130	—	—	—	25	—	17	—	24	42 (J)	—	—	—
50-24802	MD50-06-64878	15	—	—	—	—	—	—	—	—	350	—	—	—	130	—	—	—	48	55	—	—	—
50-24802	MD50-06-64879	42	—	—	—	—	—	—	—	—	690	—	—	—	250	—	—	—	97	110	—	—	—
50-24802	MD50-06-64880	99.4	—	—	—	—	—	—	—	—	360	—	—	—	130	—	—	—	59	60	—	—	—
50-24802	MD50-06-64881	124.4	—	—	—	—	—	—	78 (J)	—	490	—	—	—	210	—	41	—	88	75	—	—	—
50-24802	MD50-06-64882	156.4	—	—	—	—	—	—	85 (J)	—	480	—	—	—	210	—	—	—	67	81	—	—	—
50-24803	MD50-06-64904	16	28 (J)	—	—	—	—	20	16	—	36	—	—	—	12	3	—	—	4.2	3.6	—	—	4.3
50-24803	MD50-06-64903	37	19 (J)	5.1	—	—	—	—	40	—	93	—	—	—	27	2.8	5.3	—	14	13	—	—	3.2
50-24803	MD50-06-64905	99.5	42	—	—	—	—	—	—	—	230	—	—	—	70	—	15	—	41	21	—	—	—
50-24803	MD50-06-64906	124	—	—	—	—	—	—	51	—	290	—	—	—	120	—	—	—	49	32	—	—	—
50-24803	MD50-06-64907	151	—	—	—	—	—	—	—	—	140	—	—	—	54	—	—	—	25	18	—	—	—
50-24804	MD50-06-64970	10	150	2.9	—	—	—	—	22	—	49	—	—	150	47	—	—	—	—	—	—	—	—
50-24804	MD50-06-64971	16	70	—	—	—	—	—	64	—	230	—	—	150	160	—	—	—	22	—	—	—	—
50-24804	MD50-06-64972	33	90	—	—	—	—	—	110	—	240	—	—	—	72	—	—	—	28	23	—	—	—
50-24804	MD50-06-64973	99	—	—	—	—	—	—	130	—	560	—	—	—	200	—	—	—	88	61	—	—	—
50-24804	MD50-06-64974	124	—	—	—	—	—	—	310	—	990	—	—	—	370	—	48	—	160	74	—	—	—
50-24804	MD50-06-64975	149	—	—	—	—	—	—	240	—	860	—	—	—	330	—	67	—	150	93	—	—	—
50-24810	MD50-06-64999	19	30 (J)	—	—	—	—	—	49	—	71	—	—	—	30	—	—	—	6.3	—	—	—	—
50-24810	MD50-06-64998	37	27	—	—	—	—	—	41	—	180	—	—	—	70	—	—	—	24	—	—	—	—
50-24810	MD50-06-64997	99	24 (J)	—	—	—	—	—	57	—	140	—	—	—	39	—	9	—	21	13	—	—	—
50-24810	MD50-06-64996	123	—	—	—	—	—	—	160	—	400	—	—	—	170	—	—	—	57	34	—	—	—
50-24810	MD50-06-64995	150	—	—	—	—	—	—	170	—	540	—	—	—	200	—	41	—	91	46	—	—	—
50-24811	MD50-06-65069	20	—	—	—	—	—	—	1500	—	2500	—	—	—	440	—	—	—	84	—	—	—	—
50-24811	MD50-06-65068	40	—	—	—	—	—	—	1700	—	2900	—	—	—	610	—	—	—	160	—	—	—	—
50-24811	MD50-06-65067	98	—	—	—	—	—	—	580	—	1400	—	—	—	300	—	43	—	140	—	—	—	—

Table C-2.3-11 (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-]	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Dioxane[1,4-]	Ethanol	Ethylbenzene
50-24811	MD50-06-65066	125	—	—	—	—	—	—	410	—	750	—	—	—	250	—	—	—	89	—	—	—	—
50-24811	MD50-06-65065	150	—	—	—	—	—	—	2000	—	3900	—	—	—	1000	—	230	—	660	—	—	—	—
50-24812	MD50-06-65094	10	—	—	—	—	—	—	7200	—	2900	—	—	—	1400	—	—	—	270	—	—	—	—
50-24812	MD50-06-65093	35	—	—	—	—	—	—	1800	—	830	—	—	—	95	—	—	—	66	—	—	—	—
50-24812	MD50-06-65092	98	—	—	—	—	—	—	5200	—	2800	—	—	—	1200	—	88	—	330	—	—	—	—
50-24812	MD50-06-65091	123	—	—	—	—	—	—	2900	—	2300	—	—	—	980	—	80	—	310	—	—	—	—
50-24812	MD50-06-65090	150	—	—	—	—	—	—	3800	—	3800	—	—	—	2000	—	140	—	840	—	—	—	—
50-24813	MD50-06-65126	20	—	—	—	—	—	—	490	—	540	—	—	—	630	—	—	—	76	—	—	—	—
50-24813	MD50-06-65125	30	—	—	—	—	—	—	1100	—	1000	—	—	65	1000	—	—	—	170	—	—	—	—
50-24813	MD50-06-65124	99	—	—	—	—	—	—	1200	—	1300	—	—	—	1100	—	—	—	240	—	—	—	—
50-24813	MD50-06-65123	125	—	—	—	—	—	—	1900	—	2400	—	—	—	1900	—	57	—	470	—	—	—	—
50-24813	MD50-06-65122	150	—	—	—	—	—	—	2100	—	3700	—	—	—	2600	—	120	—	820	—	—	—	—
50-24814	MD50-06-65151	10	—	—	—	—	—	—	67	—	220	—	—	51	380	—	—	—	38	—	—	—	—
50-24814	MD50-06-65150	30	42	—	—	—	—	—	57	—	170	—	—	45	280	—	—	—	32	—	—	—	—
50-24814	MD50-06-65149	99	62	—	—	—	—	—	30	—	72	—	—	38	72	—	—	—	12	—	—	—	—
50-24814	MD50-06-65148	124	—	—	—	—	—	—	140	—	340	—	—	—	400	—	—	—	79	—	—	—	—
50-24814	MD50-06-65147	149	—	—	—	—	—	—	72	—	320	—	—	—	240	—	—	—	77	—	—	—	—
50-24815	MD50-06-65183	30	96 (J)	—	—	—	—	—	37	—	120	—	—	33	77	—	—	—	17	—	—	—	—
50-24815	MD50-06-65182	40	58	—	—	—	—	—	34	—	270	—	—	28 (J)	260	—	—	—	51	—	—	—	—
50-24815	MD50-06-65181	100	51 (J)	—	—	—	—	—	15	—	60	—	—	14	35	—	—	—	8.8	—	—	—	—
50-24815	MD50-06-65180	125	75 (J)	—	—	—	5.2	—	4.2	—	23	0.93	—	8.9	11	—	1.1	—	3.4	—	—	—	—
50-24815	MD50-06-65179	149	110	—	—	—	—	—	72	—	310	—	—	24	150	—	20	—	61	—	—	—	—
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	—	—	—	—	140	—	—	—
50-24816	MD50-06-65206	120	43	—	—	—	—	—	40	—	140	—	—	—	34 (J)	—	—	—	—	55	—	—	—
50-24816	MD50-06-65208	200	67	—	—	—	—	—	250	—	92	—	—	—	130	—	—	—	17	63	—	—	—
50-24816	MD50-06-65207	225	—	—	—	—	—	—	440	—	130	—	—	—	200	—	—	—	—	88	—	—	—
50-24817	MD50-05-63841	20	96	—	14	—	11	6.9	10	—	9.8	—	14	—	64	—	—	—	—	—	—	—	4.2
50-24817	MD50-05-63842	40	65	11	16	21	9.3	10	46	—	48	—	—	—	210	—	—	8.8	—	18	—	—	3.9
50-24817	RE50-05-63816	100	62	—	200	—	—	21	150	—	210	—	—	—	500	28	—	73	39	280	—	—	33
50-24817	RE50-05-63817	140	210	—	33	—	24	13	210	—	300	—	—	—	580	36	—	78	62 (J+)	430	—	—	—
50-24817	RE50-05-63818	200	—	—	230	—	—	89	390	—	400	—	—	—	640	50	—	110	120 (J+)	860	—	—	—

Table C-2.3-11 (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-]	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Dioxane[1,4-]	Ethanol	Ethylbenzene
50-24817	MD50-05-63843	250	—	—	20	—	—	—	510	—	240	—	—	—	550	34	—	88	110	630	—	—	—
50-24818	MD50-06-65232	10	33	9.1	—	—	6.5	8.8	1.5	—	5.7	0.82	—	—	5.4	—	—	—	—	—	—	—	2.8
50-24818	MD50-06-65233	25	56	9	—	—	—	71	35	—	180	—	—	—	68	—	—	—	—	—	—	—	—
50-24818	MD50-06-65234	100	—	—	—	—	—	—	330 (J)	—	1500	—	—	—	600	—	—	—	200	—	—	—	—
50-24818	MD50-06-65235	150	—	—	—	—	—	—	—	—	1900	—	—	—	610	—	—	—	340	—	—	—	—
50-24818	MD50-06-65236	190	—	—	—	—	—	—	—	—	390	—	—	—	79	—	—	—	90	—	—	—	—
50-24818	MD50-06-65237	250	—	—	—	—	—	—	370	—	1000	—	—	—	500	—	—	—	270	—	—	—	—
50-24818	MD50-06-65238	280	—	—	—	—	—	—	390	—	830	—	—	—	480	—	—	—	220	—	—	—	—
50-24818	MD50-06-65239	315	—	—	—	—	—	—	290 (J)	—	430	—	—	—	310	—	—	—	120	—	—	—	—
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	—	—	—	5	14	—	—	—
50-24819	RE50-05-61432	100	54	—	—	—	5.1	—	31	—	110	—	—	—	40	—	6.4	—	14	56	—	—	—
50-24819	RE50-05-61732	138.5–140	32	—	—	—	—	—	140	—	260	—	—	—	150	—	14	12	38	140	—	—	—
50-24819	RE50-05-61733	200	55	—	8.9	—	13	—	160	—	250	—	—	—	160	—	—	—	47	160	—	—	—
50-24819	RE50-05-61734	250	—	—	—	—	—	—	190	—	220	—	—	—	180	—	—	—	55	140	—	—	—
50-24819	RE50-05-61735	275	—	—	9.8	—	—	—	150	—	170	—	—	—	140	—	—	—	43	110	—	—	—
50-24820	RE50-05-61446	20	55	—	4.4	—	9.2	—	91	—	140	—	—	—	70	—	—	—	11	—	—	—	—
50-24820	RE50-05-61449	50	92	—	17	—	14	—	160	—	240	—	—	—	110	—	—	—	29	—	—	—	—
50-24820	RE50-05-61447	100	140	15	29	—	12	7.9	85	—	180	—	—	—	74	—	11	—	32	—	—	—	7.7
50-24820	RE50-05-61448	140	300	60	19	—	29	—	470	—	670	—	—	—	340	—	34	—	120	—	—	—	—
50-24820	RE50-05-61450	200	—	—	—	—	—	—	720	—	920	—	—	—	500	—	—	—	220	—	—	—	—
50-24820	RE50-05-61736	250	—	—	—	—	—	—	760	—	890	—	—	—	510	—	—	—	260	—	—	—	—
50-24821	RE50-05-61464	20	84	5.2	5.8	—	4.4	3.2	54	—	68	—	—	—	76	—	—	—	9.2	—	—	—	—
50-24821	RE50-05-61466	50	76	58	91	—	—	22	190	—	320	—	—	—	250	—	—	—	72	—	—	—	20
50-24821	RE50-05-61465	98.4–100	—	—	30	—	—	—	190	—	380	—	—	—	270	—	—	—	97	—	—	—	—
50-24821	RE50-05-61469	137.5–140	180	—	—	—	—	29	220	—	350	—	—	—	270	—	—	—	91	—	—	—	—
50-24821	RE50-05-61473	160	—	—	—	—	—	—	510	—	610	—	—	—	620	—	—	—	210 (J+)	—	—	—	—
50-24821	RE50-05-61468	248.6–250	—	—	—	—	—	—	340	—	450	—	—	—	450	—	—	—	180	—	—	—	—

Table C-2.3-11 (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-]	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Dioxane[1,4-]	Ethanol	Ethylbenzene
50-24822	RE50-05-61482	20	180	—	—	—	6.2	—	11	—	72	—	30	—	74	—	—	—	—	—	—	—	—
50-24822	RE50-05-61483	50	54	—	—	—	—	—	64	—	340	—	—	—	400	—	—	—	63	—	—	—	—
50-24822	RE50-05-61484	100	100	—	—	13	—	—	—	—	36	—	17	—	30	—	—	—	—	—	—	—	5
50-24822	RE50-05-61485	140	120	—	—	—	—	—	84	—	380	—	—	—	460	—	—	—	87	—	—	—	—
50-24822	RE50-05-61486	200	110	—	—	—	—	—	43	—	160	—	28	—	180	—	—	—	48	—	—	—	—
50-24822	RE50-05-61737	250	59	—	—	—	—	—	43	—	150	—	—	—	140	—	—	—	45	—	—	—	—
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	—	—	—	6.6	—	—	—	—
50-25451	MD50-06-66688	147	49	—	—	—	—	—	25	—	26	—	—	200	41	—	—	—	5.7	—	—	—	—
50-25451	MD50-06-66687	200	62	—	—	—	—	—	86 (J)	—	63	—	—	490	250	—	—	—	19	—	—	—	—
50-25451	MD50-06-66686	251	—	—	—	—	—	—	120	—	100	—	—	—	120	—	—	—	33	—	—	—	—
50-25451	MD50-06-66685	287	—	—	—	—	—	—	98	—	90	—	—	—	210	—	—	—	—	—	—	—	—

Table C-2.3-11 (continued)

Location ID	Sample ID	Depth (ft)	Ethyltoluene[4-]	Hexane	Hexanone[2-]	Methanol	Methyl-2-pentanone[4-]	Methylene Chloride	n-Heptane	Propylene	Styrene	Tetrachloroethylene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethylene	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	—	—	—	—	—	25	—	—	—	210	—	500	77	—	4100	—	—	—	—	—	—
50-09100	MD50-06-70881	50	—	—	—	—	—	21	—	—	—	77	—	87	21	—	1800	—	—	—	1100	—	—
50-09100	MD50-06-70882	90	—	—	—	—	—	61	—	—	—	200	—	390	79	—	4400	—	—	—	—	—	—
50-09100	MD50-06-70883	103	—	—	—	—	—	150	—	—	—	600	—	1100	190	—	14,000	—	—	—	—	—	—
50-09100	MD50-06-70884	120	—	—	—	—	—	290	—	—	—	730	—	1300	160	—	17,000	—	—	—	—	—	—
50-09100	MD50-06-70885	160	—	—	—	—	—	490	—	—	—	730	—	960	—	—	19,000	—	—	—	—	—	—
50-09100	MD50-06-70886	200	—	—	—	—	—	710	—	—	—	990	—	1600	250	—	29,000	64	—	—	—	—	—
50-09100	MD50-06-70887	233	—	—	—	—	—	240	—	—	—	300	—	370	—	—	8800	—	—	—	—	—	—
50-09100	MD50-06-70888	260	—	—	—	—	—	250	—	—	—	240	—	280	—	—	7900	—	—	—	—	—	—
50-10131	MD50-06-70868	25	—	—	—	—	—	31	—	—	—	8300	—	170	89	—	6600	—	—	—	—	—	—
50-10131	MD50-06-70869	50	—	—	—	—	—	30	—	—	—	6000	—	210	87	—	5700	—	—	—	—	—	—
50-10131	MD50-06-70870	75	—	—	—	—	—	34	—	—	—	6000	—	220	90	—	5500	—	—	—	—	—	—
50-10131	MD50-06-70871	100	—	—	—	—	—	41	—	—	—	5400	85	160	51	—	4700	—	—	—	—	—	—
50-10131	MD50-06-70872	125	—	—	—	—	—	57	—	—	—	3800	130	270	70	—	3900	—	—	—	—	—	—
50-10131	MD50-06-70873	150	—	—	—	—	—	27	—	—	—	2700	—	130	36	—	2700	—	—	—	—	—	—
50-10131	MD50-06-70874	175	—	—	—	—	—	81	—	—	—	5400	80	270	83	—	5700	—	—	—	—	—	—
50-10131	MD50-06-70875	200	—	—	—	—	—	57	—	—	—	4800	24	190	57	—	5500	—	—	—	—	—	—
50-10131	MD50-06-70876	225	—	—	—	—	—	70	—	—	—	6700	—	220	83	—	6100	—	—	—	—	—	—
50-10131	MD50-06-70877	250	—	—	—	—	—	66	—	—	—	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	—	—	—	—	—	36	—	—	—	3000	—	86	62	—	5400	—	—	—	—	—	—
50-24766	MD50-06-64594	124	—	—	—	—	—	18	—	—	—	350	—	43	24	—	1300	—	—	—	—	—	—
50-24766	MD50-06-64593	149	—	—	—	—	—	50	—	—	—	580	—	130	59	—	3100	—	—	—	—	—	—
50-24767	MD50-06-64625	10	—	—	—	—	—	16	—	—	—	140	29	390	62	—	1900	—	—	—	19	—	—
50-24767	MD50-06-64626	30	10	—	—	—	—	—	—	—	—	100	59	260	51	—	1500	—	—	—	53	13	—
50-24767	MD50-06-64627	60	—	—	—	—	—	3.2	—	—	—	26	8.4	72	18	—	490	—	—	—	13	3.3	—
50-24767	MD50-06-64628	124	—	—	—	—	—	17	—	—	—	55	26	450	64	—	1400	—	—	—	—	—	—
50-24767	MD50-06-64629	149	—	—	—	—	—	110	—	—	—	140	55	730	120	—	4300	—	30	—	63	—	—
50-24768	MD50-06-64661	14	—	—	—	—	—	—	—	—	—	46	—	150	38	—	930	—	—	—	11	—	—
50-24768	MD50-06-64660	29	—	—	—	—	—	—	4.8	—	—	27	4	59	16	—	480	—	—	—	—	—	11
50-24768	MD50-06-64659	99	—	—	—	—	—	69	—	—	—	490	—	2500	410	—	13,000	—	—	—	—	—	—

Table C-2.3-11 (continued)

Location ID	Sample ID	Depth (ft)	Ethyltoluene[4-]	Hexane	Hexanone[2-]	Methanol	Methyl-2-pentanone[4-]	Methylene Chloride	n-Heptane	Propylene	Styrene	Tetrachloroethylene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethylene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene (total)	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
50-24768	MD50-06-64658	125	—	—	—	—	—	120	—	—	—	260	—	2900	440	—	14,000	—	—	—	—	—	—
50-24768	MD50-06-64657	150	—	—	—	—	—	130	—	—	—	210	—	2600	380	—	13,000	—	—	—	—	—	—
50-24769	MD50-06-64693	20	—	—	—	—	—	—	—	—	—	19	—	9.1	1.8	1.5	320	5.1	—	—	—	—	—
50-24769	MD50-06-64692	39	—	—	—	—	—	0.91	—	—	—	19	—	7.1	1.7	3.6	460	4.4	—	—	—	—	—
50-24769	MD50-06-64691	99	—	—	—	—	—	—	—	—	—	1300	—	840	—	—	31,000	—	—	—	—	—	—
50-24769	MD50-06-64690	124	—	—	—	—	—	—	—	—	—	600	—	360	—	—	18,000	—	—	—	—	—	—
50-24769	MD50-06-64689	149	—	—	—	—	—	—	—	—	—	1100	—	940	—	—	43,000	—	—	—	—	—	—
50-24770	MD50-06-64738	20	—	—	—	—	—	—	—	—	—	24,000	—	500	—	—	15,000	—	—	—	—	—	—
50-24770	MD50-06-64725	25	—	—	—	—	—	49	—	—	—	19,000	—	540	—	—	16,000	—	—	—	—	—	—
50-24770	MD50-06-64724	39	—	—	—	—	—	—	—	—	—	14,000	—	570	120	—	19,000	—	—	—	—	—	—
50-24770	MD50-06-64723	100	—	—	—	—	—	120	—	—	—	2600	—	450	100	75	16,000	—	—	—	—	—	—
50-24770	MD50-06-64722	124	—	—	—	—	—	310	—	—	—	3800	—	870	190	—	37,000	—	—	—	—	—	—
50-24770	MD50-06-64721	150	—	—	—	—	—	240	—	—	—	890	—	310	—	—	16,000	—	—	—	—	—	—
50-24771	MD50-06-64750	17	—	—	—	—	—	58	—	—	—	840	—	260	—	—	11,000	—	—	—	—	—	—
50-24771	MD50-06-64749	40	—	—	—	—	—	84	—	—	—	1100	—	420	—	—	16,000	—	—	—	—	—	—
50-24771	MD50-06-64748	100	—	—	—	—	—	29	—	—	—	80	—	—	—	—	1900	—	—	—	—	—	—
50-24771	MD50-06-64747	125	—	—	—	—	—	320	—	—	—	1000	—	—	—	—	21,000	—	—	—	—	—	—
50-24771	MD50-06-64746	150	—	—	—	—	—	1200	—	—	—	1800	—	—	—	—	50,000	—	—	—	—	—	—
50-24773	MD50-06-64775	20	—	—	—	—	—	110	—	—	—	470	—	190	—	—	6500	—	—	—	—	—	—
50-24773	MD50-06-64774	40	—	—	—	—	—	100	—	—	—	840	—	250	—	—	12,000	—	—	—	—	—	—
50-24773	MD50-06-64773	100	—	—	—	—	—	270	—	—	—	880	—	270	—	—	15,000	—	—	—	—	—	—
50-24773	MD50-06-64776	125	—	—	—	—	—	700	—	—	—	1700	—	510	—	—	29,000	—	—	—	—	—	—
50-24773	MD50-06-64772	150	—	—	—	—	—	1100	—	—	—	2100	—	380	—	—	43,000	—	—	—	—	—	—
50-24782	MD50-06-64803	20	—	—	—	—	—	58	—	—	—	770	—	100	—	—	5000	—	—	—	—	—	—
50-24782	MD50-06-64804	40	—	—	—	—	—	56	—	—	—	1200	—	180	49	—	7100	—	—	—	—	—	—
50-24782	MD50-06-64805	100	—	—	—	—	—	130	—	—	—	840	—	130	—	—	8400	—	—	—	—	—	—
50-24782	MD50-06-64806	125	—	—	—	—	—	450	—	—	—	1300	—	350	—	—	16000	—	—	—	—	—	—
50-24782	MD50-06-64807	155	—	—	—	—	—	52	—	—	—	460	40	66	35	—	3800	—	—	—	36	—	—
50-24783	MD50-06-64832	20	—	—	—	—	—	930	—	—	—	1500	—	—	—	—	23,000	—	—	—	—	—	—
50-24783	MD50-06-64831	36	—	—	—	—	—	—	—	—	—	450	—	54	33	—	3100	—	—	—	—	—	—
50-24783	MD50-06-64830	100	—	—	—	—	—	49	—	—	—	270	—	46	—	—	2700	—	—	—	—	—	—
50-24783	MD50-06-64829	125	—	—	—	—	—	170	—	—	—	1300	—	180	73	—	14,000	—	—	—	—	—	—
50-24783	MD50-06-64828	151	—	—	—	—	—	470	—	—	—	1600	—	190	—	—	19,000	—	—	—	—	—	—

Table C-2.3-11 (continued)

Location ID	Sample ID	Depth (ft)	Ethyltoluene[4-]	Hexane	Hexanone[2-]	Methanol	Methyl-2-pentanone[4-]	Methylene Chloride	n-Heptane	Propylene	Styrene	Tetrachloroethylene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethylene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene (total)	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
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	—	—	—	—	—	11	—	—	—	1600	—	78	56	—	2300	—	—	—	—	—	—
50-24784	MD50-06-64371	49	—	—	—	—	—	11	—	—	—	1700	12	77	57	—	2200	—	—	—	—	—	—
50-24784	MD50-06-64370	55	—	—	—	—	—	11	—	—	—	1700	28	72	64	—	1500	13	—	—	37	8.9	—
50-24784	MD50-06-64375	100	—	—	—	—	—	6.9	—	—	—	680	10	43	28	—	1000	—	—	—	16	3.8	—
50-24784	MD50-06-64379	168	—	—	—	—	—	18	—	—	—	1400		65	40	—	2700	—	—	—	—	—	—
50-24784	MD50-06-64378	199	2	—	1.8 (J)	—	—	9.5	—	—	—	370	33	12	17	—	760	5	—	—	27	5.4	—
50-24784	MD50-06-64377	250	—	—	—	—	—	19	—	—	—	850	34	29	24	—	2100	—	—	—	53	12	—
50-24784	MD50-06-64376	268	—	—	—	—	—	37	—	—	—	1900	—	76	40	—	3900	—	—	—	—	—	—
50-24785	MD50-06-64402	10	12	49	—	—	—	—	15	—	—	270	54	—	—	—	140	—	14	4.5	—	10	24
50-24785	MD50-06-64403	19	15	4.8	—	—	—	—	13	—	—	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	—	—	—	—	—	24	—	—	—	4900	—	160	85	—	4900	—	—	—	—	—	—
50-24785	MD50-06-64404	200	—	—	—	—	—	49	—	—	—	5400	—	190	92	—	7600	—	—	—	—	—	—
50-24785	MD50-06-64405	250	—	—	—	—	—	49	—	—	—	4600	—	130	79	—	7700	—	—	—	—	—	—
50-24785	MD50-06-64406	275	—	—	—	—	—	7	—	—	—	130	260	—	—	—	330	—	—	—	—	—	—
50-24796	MD50-06-64448	10	2 (J)	—	3 (J)	—	—	—	—	—	—	180	12	—	—	—	19	—	2.1	—	4.8	1.6	—
50-24796	MD50-06-64447	20	—	—	1.7 (J)	—	—	0.8	—	—	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	—	—	—	—	—	71 (J)	—	—	—	3000	—	900	180	—	6000	84	—	—	—	—	—
50-24796	MD50-06-64451	120	—	—	—	—	—	2.9	—	—	—	110	5.9	13	5.3	—	270	3.9	—	—	2.7	—	—
50-24796	MD50-06-64452	150	—	—	—	—	—	49	—	—	—	1200	25	320	100	—	2200		—	—	—	—	—
50-24797	MD50-06-64496	18.3	19 (J)	—	—	—	—	—	—	—	—	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	—	—	—	—	—	35	—	—	—	780	—	180	66	—	3200	35	—	—	—	—	—
50-24797	MD50-06-64500	160	—	—	—	—	—	120	—	—	—	2300	—	700	490	—	9600	87	—	—	—	—	—
50-24799	MD50-06-66197	15	—	—	—	—	—	4	—	—	—	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	2.7 (J)	—	2.1 (J)	—	—	—	—	—	—	98	15	—	—	—	62	—	2.9	—	10 (J)	2.9 (J)	—
50-24799	MD50-06-64523	32.5	—	—	11 (J)	—	—	—	—	—	—	1600	54	26	14	—	1100	—	—	—	26 (J)	—	—
50-24799	MD50-06-64538	37.5	—	—	18 (J)	—	—	—	—	—	—	1800	34	30	19	—	1300	—	—	—	—	—	—

Table C-2.3-11 (continued)

Location ID	Sample ID	Depth (ft)	Ethyltoluene[4-]	Hexane	Hexanone[2-]	Methanol	Methyl-2-pentanone[4-]	Methylene Chloride	n-Heptane	Propylene	Styrene	Tetrachloroethylene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethylene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene (total)	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
50-24799	MD50-06-64524	40.5	—	12	—	130	7.6	—	11	—	—	1100	15	18	12	—	960	—	—	—	—	—	6.1
50-24799	MD50-06-64525	100	—	—	—	—	—	—	—	—	—	43	10	—	—	—	95	—	—	—	—	—	—
50-24799	MD50-06-64526	120	—	—	—	—	—	11	—	13	—	80	5.7	8.3	4.8	—	450	—	—	—	—	—	—
50-24799	MD50-06-64527	160	—	—	—	—	—	220	—	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	—	—	—	—	—	170	—	—	—	1700	—	270	93	—	14,000	—	—	—	—	—	—
50-24801	MD50-06-64855	120	—	—	—	—	—	32	—	—	—	600	32	66	34	—	3800	12	—	—	—	—	—
50-24801	MD50-06-64854	150	—	—	—	—	—	65	—	—	—	160	32	—	—	—	1900	—	—	—	—	—	—
50-24802	MD50-06-64878	15	—	—	—	—	—	73	—	—	—	600	—	81	—	—	5500	—	—	—	—	—	—
50-24802	MD50-06-64879	42	—	—	—	—	—	140	—	—	—	1200	—	170	—	—	11,000	—	—	—	—	—	—
50-24802	MD50-06-64880	99.4	—	—	—	—	—	79	—	—	—	560	—	73	—	—	5400	—	—	—	—	—	—
50-24802	MD50-06-64881	124.4	—	—	—	—	—	260	—	—	—	760	—	110	—	—	9400	—	—	—	—	—	—
50-24802	MD50-06-64882	156.4	—	—	—	—	—	150	—	—	—	770	—	130	—	—	8600	—	—	—	—	—	—
50-24803	MD50-06-64904	16	—	—	—	—	—	2.6	—	—	—	56	5.2	—	3.2	—	570	—	—	—	23	5.6	—
50-24803	MD50-06-64903	37	—	—	—	—	—	5.7	—	—	—	120	11	13	6.9	6	1100	3.5	—	—	15	3.6	—
50-24803	MD50-06-64905	99.5	—	—	—	—	—	55	—	—	—	160	—	26	—	—	2100	—	—	—	20	20	—
50-24803	MD50-06-64906	124	—	—	—	—	—	97	—	—	—	350	—	57	—	—	4600	—	—	—	33	33	—
50-24803	MD50-06-64907	151	—	—	—	—	—	91	—	—	—	190	—	—	—	—	2700	—	—	—	—	—	—
50-24804	MD50-06-64970	10	—	—	—	—	—	—	—	—	—	44	6.5	16	—	—	500	18	—	—	—	—	—
50-24804	MD50-06-64971	16	—	—	—	—	—	16	—	—	—	320	—	53	—	—	3300	—	—	—	—	—	—
50-24804	MD50-06-64972	33	—	—	—	—	—	13	—	—	—	270	—	—	—	—	4000	—	—	—	—	—	—
50-24804	MD50-06-64973	99	—	—	—	—	—	86	—	—	—	600	—	81	—	—	7500	—	—	—	—	—	—
50-24804	MD50-06-64974	124	—	—	—	—	—	250	—	—	—	840	—	160	—	—	11,000	—	—	—	—	—	—
50-24804	MD50-06-64975	149	—	—	—	—	—	480	—	—	—	1200	—	130	—	—	16,000	—	—	—	—	—	—
50-24810	MD50-06-64999	19	—	—	—	—	—	—	—	—	—	92	8.5	—	—	—	1200	—	—	—	18	—	—
50-24810	MD50-06-64998	37	—	—	—	—	—	21	—	—	—	150	—	24	—	—	1700	—	—	—	55	17	—
50-24810	MD50-06-64997	99	—	—	—	—	—	21	—	—	—	120	37	—	—	—	1900	—	—	—	—	—	—
50-24810	MD50-06-64996	123	—	—	—	—	—	110	—	—	—	480	—	68	—	—	6200	—	—	—	—	—	—
50-24810	MD50-06-64995	150	—	—	—	—	—	200	—	—	—	550	—	74	—	—	8100	—	—	—	—	—	—
50-24811	MD50-06-65069	20	—	—	—	—	—	43	—	—	—	730	—	—	—	—	6100	—	—	—	—	—	—
50-24811	MD50-06-65068	40	—	—	—	—	—	63	—	—	—	750	—	—	—	—	10000	—	—	—	—	—	—
50-24811	MD50-06-65067	98	—	—	—	—	—	130	—	—	—	290	—	—	—	—	6300	—	—	—	—	—	—

Table C-2.3-11 (continued)

Location ID	Sample ID	Depth (ft)	Ethyltoluene[4-]	Hexane	Hexanone[2-]	Methanol	Methyl-2-pentanone[4-]	Methylene Chloride	n-Heptane	Propylene	Styrene	Tetrachloroethylene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethylene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene (total)	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
50-24811	MD50-06-65066	125	—	—	—	—	—	130	—	—	—	340	—	—	—	—	7300	—	—	—	—	—	—
50-24811	MD50-06-65065	150	—	—	—	—	—	1800	—	—	—	1400	—	—	—	—	36,000	—	—	—	—	—	—
50-24812	MD50-06-65094	10	—	—	—	—	—	180	—	—	—	1100	—	—	—	—	23,000	—	—	—	—	—	—
50-24812	MD50-06-65093	35	—	—	—	—	—	41	—	—	—	380	—	—	—	—	4600	—	—	—	—	—	—
50-24812	MD50-06-65092	98	—	—	—	—	—	270	—	—	—	810	—	—	—	—	23,000	—	—	—	—	—	—
50-24812	MD50-06-65091	123	—	—	—	—	—	310	—	—	—	570	—	—	—	92	13,000	—	—	—	—	—	—
50-24812	MD50-06-65090	150	—	—	—	—	—	1900	—	—	—	1100	—	—	—	—	51,000	—	—	—	—	—	—
50-24813	MD50-06-65126	20	—	—	—	—	—	32	—	—	—	150	—	—	—	—	4800	—	—	—	—	—	—
50-24813	MD50-06-65125	30	—	—	—	—	—	40	—	—	—	310	—	—	—	—	11,000	—	—	—	—	—	—
50-24813	MD50-06-65124	99	—	—	—	—	—	110	—	—	—	270	—	—	—	—	11,000	—	—	—	—	—	—
50-24813	MD50-06-65123	125	—	—	—	—	—	220	—	—	—	520	—	—	—	100	26,000	—	—	—	—	—	—
50-24813	MD50-06-65122	150	—	—	—	—	—	960	—	—	—	900	—	—	—	190	54,000	—	—	—	—	—	—
50-24814	MD50-06-65151	10	—	—	—	—	—	17	—	—	—	57	—	—	—	—	3700	—	—	—	—	—	—
50-24814	MD50-06-65150	30	—	—	—	—	—	11	—	—	—	84	32	—	—	—	2500	—	—	—	—	—	—
50-24814	MD50-06-65149	99	—	—	—	—	—	—	—	—	—	14	—	—	—	—	1300	—	—	—	—	—	—
50-24814	MD50-06-65148	124	—	—	—	—	—	50	—	—	—	93	—	—	—	—	6000	—	—	—	—	—	—
50-24814	MD50-06-65147	149	—	—	—	—	—	110	—	—	—	72	39	—	—	25	4800	—	—	—	—	—	—
50-24815	MD50-06-65183	30	—	—	—	—	—	—	—	—	—	24	—	—	—	16	1600	—	—	—	—	—	—
50-24815	MD50-06-65182	40	—	—	—	—	—	13	—	—	—	41	—	25	—	12	1900	—	—	—	—	—	—
50-24815	MD50-06-65181	100	—	—	—	—	—	—	—	—	—	10	—	—	—	7.7	660	—	—	—	—	—	—
50-24815	MD50-06-65180	125	—	—	—	—	—	1	—	—	—	5.1	—	—	—	4.4	230	3	—	—	—	—	—
50-24815	MD50-06-65179	149	—	—	—	—	—	28	—	—	—	67	—	—	—	69	3700	—	—	—	—	—	—
50-24816	MD50-06-65204	25	—	—	—	—	—	—	—	—	—	26	6.1	—	—	—	18	—	—	—	—	—	3.8
50-24816	MD50-06-65205	35	—	4.3	—	—	—	—	—	—	—	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	—	—	—	—	—	23	—	—	—	2000	—	110	45	—	3800	—	—	—	—	—	—
50-24816	MD50-06-65207	225	—	—	—	—	—	31	—	—	—	3900	—	170	75	—	6500	—	—	—	—	—	—
50-24817	MD50-05-63841	20	4.6	6.9	—	—	—	—	—	110	—	150	20	130	40	—	210	16	4.4	—	—	4.4	12
50-24817	MD50-05-63842	40	—	7.2	—	—	—	—	3.6	99	—	480	17	470	140	—	1000	39	—	—	—	6.7	8
50-24817	RE50-05-63816	100	22	170	—	—	—	30	66	—	17	1300	140	1400	390	—	4600	—	—	—	—	24	49
50-24817	RE50-05-63817	140	—	13	—	—	—	59	—	—	—	1700	54	1800	450	—	6700	68	—	—	—	—	33
50-24817	RE50-05-63818	200	—	100	—	—	—	130	37	—	—	2300	140	1900	530	—	9900	—	—	—	—	—	44

Table C-2.3-11 (continued)

Location ID	Sample ID	Depth (ft)	Ethyltoluene[4-]	Hexane	Hexanone[2-]	Methanol	Methyl-2-pentanone[4-]	Methylene Chloride	n-Heptane	Propylene	Styrene	Tetrachloroethylene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethylene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene (total)	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
50-24817	MD50-05-63843	250	—	—	—	—	—	110	—	—	—	2400	41	1200	390	—	9800	62	—	—	—	—	—
50-24818	MD50-06-65232	10	3	—	—	—	—	—	—	—	—	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	—	—	—	—	—	92	—	—	—	2000	—	2200	440	—	27,000	—	—	—	—	—	—
50-24818	MD50-06-65235	150	—	—	—	—	—	270	—	—	—	2100	750	1500	310	—	37,000	—	—	—	—	—	—
50-24818	MD50-06-65236	190	—	—	—	—	—	240	—	—	—	280	530	79	—	—	7600	—	—	—	—	—	—
50-24818	MD50-06-65237	250	—	—	—	—	—	760	—	—	—	1700	490	640	—	—	37,000	—	—	—	—	—	—
50-24818	MD50-06-65238	280	—	—	—	—	—	760	—	—	—	1600	190	410	—	—	36,000	—	—	—	—	—	—
50-24818	MD50-06-65239	315	—	—	—	—	—	370	—	—	—	1000	110	220	—	—	23,000	—	—	—	—	—	—
50-24818	MD50-06-65240	414	—	—	—	—	9.2	3.9	—	—	—	4.9	3.8	—	—	—	170	—	2.3	2.3	6.9	1.6	—
50-24818	MD50-06-65242	452	—	—	—	—	11	4.8	—	—	—	25	—	—	—	—	840	—	—	—	—	—	—
50-24818	MD50-06-65245	500	—	—	4.9	—	26	1.5	—	—	—	51	5.3	—	—	—	470	—	—	—	16	3	—
50-24818	MD50-06-65244	548	—	—	—	—	8.6	—	—	—	—	18	3.1	—	—	—	210	—	—	—	5.6	—	—
50-24818	MD50-06-65243	591	—	—	—	—	8.1	—	—	—	—	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	—	5.4	—	—	—	20	—	50	—	430	4.1	51	22	—	1600	6.1	—	—	—	—	—
50-24819	RE50-05-61732	138.5–140	—	—	—	—	—	67	—	—	—	1400	—	280	85	—	5100	19	—	—	—	—	—
50-24819	RE50-05-61733	200	—	—	—	—	—	120	—	66	—	1400	—	250	79	—	5900	22	—	—	—	—	—
50-24819	RE50-05-61734	250	—	—	—	—	—	160	—	52	—	1500	—	210	70	—	7800	—	—	—	—	—	—
50-24819	RE50-05-61735	275	—	—	—	—	—	160	—	89	—	1200	—	120	46	—	6400	—	—	—	—	—	—
50-24820	RE50-05-61446	20	8.6 (J-)	—	—	—	—	—	—	31	—	91	21	—	—	—	2000	—	9.5	—	—	—	21
50-24820	RE50-05-61449	50	—	9.9	—	—	—	16	—	170	—	140	23	—	—	—	3400	—	—	—	—	—	14
50-24820	RE50-05-61447	100	—	15	—	—	—	43	6.6	280	—	68	23	—	—	11	2200	—	—	—	—	8.3	20
50-24820	RE50-05-61448	140	—	45	—	—	—	200	—	180	—	360	140	—	—	—	10,000	—	—	—	—	—	76
50-24820	RE50-05-61450	200	—	—	—	—	—	790	—	160	—	780	82	—	—	—	25,000	—	—	—	—	—	—
50-24820	RE50-05-61736	250	—	—	—	—	—	1100	—	—	—	1100	—	—	—	—	35,000	—	—	—	—	—	—
50-24821	RE50-05-61464	20	—	3.1	—	—	—	—	—	50	—	33	13	—	—	—	1600	—	—	—	—	—	6.8
50-24821	RE50-05-61466	50	—	50	—	—	—	—	20	760	—	120	100	—	—	—	6600	—	—	—	—	16	32
50-24821	RE50-05-61465	98.4–100	—	26	—	—	—	64 (J+)	—	250	—	120	27	—	—	—	7200	—	—	—	—	—	—
50-24821	RE50-05-61469	137.5–140	—	44	—	—	—	100	—	730	—	140	54	—	—	—	7600	—	—	—	—	—	—
50-24821	RE50-05-61473	160	—	60	—	—	—	390	86	—	—	350	—	—	—	—	21,000	—	—	—	—	—	—
50-24821	RE50-05-61468	248.6–250	—	120	—	—	—	610	—	—	—	310	250	—	—	—	22,000	—	—	—	—	—	160

Table C-2.3-11 (continued)

Location ID	Sample ID	Depth (ft)	Ethyltoluene[4-]	Hexane	Hexanone[2-]	Methanol	Methyl-2-pentanone[4-]	Methylene Chloride	n-Heptane	Propylene	Styrene	Tetrachloroethylene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethylene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene (total)	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
50-24822	RE50-05-61482	20	—	—	—	—	—	—	—	17	—	18	—	—	—	—	1700	—	—	—	—	—	—
50-24822	RE50-05-61483	50	—	—	—	—	—	34 (J+)	—	—	—	81	—	48	—	—	9100	—	—	—	—	—	—
50-24822	RE50-05-61484	100	10	3.6	—	—	—	—	—	14	—	—	19	—	—	—	680	—	10	—	—	7.3	20
50-24822	RE50-05-61485	140	—	—	—	—	—	80	—	—	—	100	31	58	200	—	13,000	—	—	—	—	—	—
50-24822	RE50-05-61486	200	18	—	—	—	—	100	—	—	—	33	33	—	—	—	7100	—	21	—	—	—	31
50-24822	RE50-05-61737	250	—	—	—	—	—	120	—	—	—	29	—	—	—	—	7300	—	—	—	—	—	—
50-25451	MD50-06-66691	19	—	—	—	—	—	—	—	—	—	2.4	3.3	—	—	—	79	6	—	—	—	—	—
50-25451	MD50-06-66690	49	—	—	—	—	—	8.1	—	—	—	19	—	—	—	—	870	65	—	—	—	—	—
50-25451	MD50-06-66689	100	—	—	—	—	—	8.9	—	—	—	14	—	—	—	—	720	33	—	—	—	—	—
50-25451	MD50-06-66688	147	—	—	—	—	—	9.8	—	—	—	12	—	13	—	—	560	29	—	—	—	—	—
50-25451	MD50-06-66687	200	—	—	—	—	—	48	—	—	—	41	—	40	—	—	1900	68	—	—	—	—	—
50-25451	MD50-06-66686	251	—	—	—	—	—	82	—	—	—	130	—	—	—	—	6400	—	—	—	—	—	—
50-25451	MD50-06-66685	287	—	—	—	—	—	72	—	—	—	170	—	—	—	—	7300	—	—	—	—	—	—

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

*— = Not detected.

Table C-2.3-12
Summary of VOCs Detected in Second Round of 2005–2006 Vapor Sampling 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	—
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	—

Table C-2.3-12 (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-]
50-24773	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
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

Table C-2.3-12 (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-]
50-24796	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
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
50-24804	MD50-06-65450	124	—	—	—	—	—	—	410	—	—	—	150	—	—	—	—	—
50-24804	MD50-06-65449	149	—	—	—	220	—	—	530	—	—	—	180	—	—	—	86	49

Table C-2.3-12 (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-]
50-24810	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	—
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

Table C-2.3-12 (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-]
50-24816	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
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 C-2.3-12 (continued)

Location ID	Sample ID	Depth (ft)	Ethylbenzene	Ethyltoluene[4-]	Methylene Chloride	n-Heptane	Styrene	Tetrachloroethylene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethylene	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	—	—	—	—	—	14,000	—	350	—	—	13,000	—	—	—	—	—	—
50-24770	MD50-06-65386	25	—	—	—	—	—	12,000	—	370	—	—	13,000	—	—	—	—	—	—
50-24770	MD50-06-65385	39	—	—	—	—	—	8200	—	460	—	—	17,000	—	—	—	—	—	—
50-24770	MD50-06-65384	100	—	—	130	—	—	2400	—	550	—	—	21,000	—	—	—	—	—	—
50-24770	MD50-06-65383	124	—	—	250	—	—	2100	—	530	—	—	25,000	—	—	—	—	—	—
50-24770	MD50-06-65382	148	—	—	920	—	—	3500	—	1400	300	—	57,000	—	—	—	—	—	—
50-24771	MD50-06-65394	17	—	—	42	—	—	550	—	210	46 (J)	—	6700	—	—	—	—	—	—
50-24771	MD50-06-65393	40	—	—	50	—	—	730	—	280	60 (J)	—	10,000	—	—	—	—	—	—
50-24771	MD50-06-65392	100	—	—	40	—	—	110	—	36	16 (J)	11	2300	—	—	—	—	—	—
50-24771	MD50-06-65391	125	—	—	460	—	—	830	—	260	—	—	16,000	—	—	—	—	—	—
50-24771	MD50-06-65390	149	—	—	1600	—	—	2300	—	520	—	—	77,000	—	—	—	—	—	—
50-24773	MD50-06-65405	20	—	—	44	—	—	330	—	120	—	—	4800	—	—	—	—	—	—

Table C-2.3-12 (continued)

Location ID	Sample ID	Depth (ft)	Ethylbenzene	Ethyltoluene[4-]	Methylene Chloride	n-Heptane	Styrene	Tetrachloroethylene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethylene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene (total)	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
50-24773	MD50-06-65404	40	—	—	65	—	—	690	—	280	58 (J)	—	11,000	—	—	—	—	—	—
50-24773	MD50-06-65403	100	—	—	91	—	—	310	—	97	—	—	6400	—	—	—	—	—	—
50-24773	MD50-06-65402	125	—	—	240	—	—	1200	—	390	81 (J)	—	19,000	—	—	—	—	—	—
50-24773	MD50-06-65401	149	—	—	1100	—	—	1100	—	360	—	—	22,000	—	—	—	—	—	—
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	—	—	22,000	—	—	—	—	—	—
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	—	—
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	—

Table C-2.3-12 (continued)

Location ID	Sample ID	Depth (ft)	Ethylbenzene	Ethyltoluene[4-]	Methylene Chloride	n-Heptane	Styrene	Tetrachloroethylene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethylene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene (total)	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
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	—	—	—	—	—	—
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	—	—	13,000	—	—	—	—	—	—
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 C-2.3-12 (continued)

Location ID	Sample ID	Depth (ft)	Ethylbenzene	Ethyltoluene[4-]	Methylene Chloride	n-Heptane	Styrene	Tetrachloroethylene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethylene	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	—	—	—	—	10,000	—	—	—	—	—	—
50-24811	MD50-06-65466	125	—	—	190	—	—	470	—	—	—	—	10,000	—	—	—	—	—	—
50-24811	MD50-06-65465	150	—	—	840	—	—	820	—	—	—	—	27,000	—	—	—	—	—	—
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	—	—	—	—	25,000	—	—	—	—	—	—
50-24813	MD50-06-65481	150	—	—	480	—	—	460	—	—	—	100	31,000	—	—	—	—	—	—
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	—	—	—	—	16,000	—	—	—	—	—	—
50-24815	MD50-06-65501	30	—	—	—	—	—	340	—	—	—	—	23,000	—	—	—	—	—	—
50-24815	MD50-06-65500	40	—	—	64	—	—	460	—	160	—	110	24,000	—	—	—	—	—	—
50-24815	MD50-06-65499	100	—	—	78	—	—	500	—	—	—	120	29,000	—	—	—	—	—	—
50-24815	MD50-06-65498	125	—	—	86	—	—	320	—	—	—	—	22,000	—	—	—	—	—	—
50-24815	MD50-06-65497	149	—	—	56	—	—	180	—	—	—	—	12,000	—	—	—	—	—	—
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	—	—	—	—	—

Table C-2.3-12 (continued)

Location ID	Sample ID	Depth (ft)	Ethylbenzene	Ethyltoluene[4-]	Methylene Chloride	n-Heptane	Styrene	Tetrachloroethylene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethylene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene (total)	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
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	—	—
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	—	—	—	—	18,000	—	—	—	—	—	—
50-24820	MD50-06-64244	200	—	—	590	—	—	600	—	—	—	—	24,000	—	—	—	—	—	—
50-24820	MD50-06-64245	225	—	—	620	—	—	690	—	—	—	—	26,000	—	—	—	—	—	—
50-24821	MD50-06-64248	20	—	—	150	—	—	220	—	—	—	—	9800	—	—	—	—	—	—
50-24821	MD50-06-64249	50	—	—	180	—	—	230	—	—	—	—	10,000	—	—	—	—	—	—
50-24821	MD50-06-64250	100	—	—	—	—	70	1800	—	—	11	29	8200	—	—	—	—	—	—
50-24821	MD50-06-64251	140	—	—	120	—	—	230	—	—	—	—	13,000	—	—	—	—	—	—
50-24821	MD50-06-64254	160	—	—	450	—	—	360	—	—	—	—	20,000	—	—	—	—	—	—
50-24821	MD50-06-64252	200	—	—	450	—	—	270	—	—	—	—	23,000	—	—	—	—	—	—
50-24821	MD50-06-64253	238.4	—	—	560	—	—	370	—	—	—	—	31,000	—	—	—	—	—	—
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	—	—	—	—	—	—	—	12,000	—	—	—	—	—	—

Note: Units are µg/m^3.
* — = Not detected.

Table C-2.3-13
Tritium Detected in 2005–2006 Vapor Sampling at MDA C

Location ID	First-Round Sample ID	Depth (ft)	Analytical Result (pCi/L)	Second-Round Sample ID	Depth (ft)	Analytical Result (pCi/L)
50-09100	MD50-06-70880	20	171,000	nc[a]	nc	nc
50-09100	MD50-06-70881	50	432,000	nc	nc	nc
50-09100	MD50-06-70882	90	94,400	nc	nc	nc
50-09100	MD50-06-70883	103	54,600	nc	nc	nc
50-09100	MD50-06-70884	120	26,880	nc	nc	nc
50-09100	MD50-06-70885	160	9640	nc	nc	nc
50-09100	MD50-06-70886	200	3740	nc	nc	nc
50-09100	MD50-06-70887	233	4400	nc	nc	nc
50-09100	MD50-06-70888	260	4240	nc	nc	nc
50-10131	MD50-06-70868	25	10,320	nc	nc	nc
50-10131	MD50-06-70869	50	14,300	nc	nc	nc
50-10131	MD50-06-70870	75	12,880	nc	nc	nc
50-10131	MD50-06-70871	100	11,900	nc	nc	nc
50-10131	MD50-06-70872	125	18,100	nc	nc	nc
50-10131	MD50-06-70873	150	14,520	nc	nc	nc
50-10131	MD50-06-70874	175	13,980	nc	nc	nc
50-10131	MD50-06-70875	200	18,560	nc	nc	nc
50-10131	MD50-06-70876	225	12,120	nc	nc	nc
50-10131	MD50-06-70877	250	15,680	nc	nc	nc
50-24766	MD50-06-64597	17	3341.99	MD50-06-65331	17	11,467.9
50-24766	MD50-06-64596	29	5097.58	MD50-06-65330	29	13,448.7
50-24766	MD50-06-64595	99	11,253.1	MD50-06-65329	99	24,401.7
50-24766	MD50-06-64594	124	10,609.6	MD50-06-65328	124	20,816.3
50-24766	MD50-06-64593	149	2955.98	MD50-06-65327	149	14,724.6
50-24767	MD50-06-64625	10	1108	MD50-06-65362	10	3180
50-24767	MD50-06-64626	30	1551.2	MD50-06-65361	30	2360
50-24767	MD50-06-64627	60	4986	MD50-06-65360	60	4280
50-24767	MD50-06-64628	124	1329.6	MD50-06-65359	124	1340
50-24767	MD50-06-64629	149	753.44	MD50-06-65358	149	1660
50-24768	MD50-06-64661	14	1192.21	MD50-06-65370	14	2711.3
50-24768	MD50-06-64660	29	2858.64	MD50-06-65369	29	3297.62
50-24768	MD50-06-64659	99	2459.76	MD50-06-65368	99	1023.18
50-24768	MD50-06-64658	125	2105.2	MD50-06-65367	125	558.117
50-24768	MD50-06-64657	150	2725.68	MD50-06-65366	150	783.485
50-24769	MD50-06-64693	20	49,600	MD50-06-65378	20	99075.5
50-24769	MD50-06-64692	39	264,491	MD50-06-65377	39	319,122

Table C-2.3-13 (continued)

Location ID	First-Round Sample ID	Depth (ft)	Analytical Result (pCi/L)	Second-Round Sample ID	Depth (ft)	Analytical Result (pCi/L)
50-24769	MD50-06-64691	99	3.59E+06	MD50-06-65376	99	4.39E+06
50-24769	MD50-06-64690	124	216,821	MD50-06-65375	124	165,719
50-24769	MD50-06-64689	149	145,435	MD50-06-65374	149	60,565.8
50-24770	MD50-06-64738	20	405,198	MD50-06-65387	20	476,528
50-24770	MD50-06-64725	25	1.16E+06	MD50-06-65386	25	672,994
50-24770	MD50-06-64724	39	778,220	MD50-06-65385	39	711,987
50-24770	MD50-06-64723	100	25,090.1	MD50-06-65384	100	65,371.3
50-24770	MD50-06-64722	124	34,489.6	MD50-06-65383	124	38,857.9
50-24770	MD50-06-64721	150	39,565.3	MD50-06-65382	148	48,480.3
50-24771	MD50-06-64750	17	45,942.7	MD50-06-65394	17	41,698.9
50-24771	MD50-06-64749	40	76,227.9	MD50-06-65393	40	52,255.2
50-24771	MD50-06-64748	100	62,003.8	MD50-06-65392	100	75,094.8
50-24771	MD50-06-64747	125	77,408	MD50-06-65391	125	64,189.9
50-24771	MD50-06-64746	150	60,982.3	MD50-06-65390	149	54,347.8
50-24773	MD50-06-64775	20	294,285	MD50-06-65405	20	176,600
50-24773	MD50-06-64774	40	374,726	MD50-06-65404	40	458,000
50-24773	MD50-06-64773	100	86,645.6	MD50-06-65403	100	130,600
50-24773	MD50-06-64776	125	102,379	MD50-06-65402	125	76,600
50-24773	MD50-06-64772	150	305,586	MD50-06-65401	149	86,600
50-24782	MD50-06-64803	20	2.59E+06	MD50-06-65413	21	1.89E+06
50-24782	MD50-06-64804	40	2.74E+06	MD50-06-65412	40	2.19E+06
50-24782	MD50-06-64805	100	329,680	MD50-06-65411	100	152,200
50-24782	MD50-06-64806	125	405,760	MD50-06-65410	125	179,200
50-24782	MD50-06-64807	155	1.50E+06	MD50-06-65409	151	228,400
50-24783	MD50-06-64832	20	1.94E+08	MD50-06-65421	20	1.85E+08
50-24783	MD50-06-64831	36	1.28E+08	MD50-06-65420	36	1.20E+08
50-24783	MD50-06-64830	100	7.42E+06	MD50-06-65419	100	9.26E+06
50-24783	MD50-06-64829	125	4.01E+06	MD50-06-65418	125	5.56E+06
50-24783	MD50-06-64828	151	1.97E+06	MD50-06-65417	148	892,000
50-24784	MD50-06-64374	10	4638.62	MD50-06-70724	10	12,520.7
50-24784	MD50-06-64373	20	5691.32	MD50-06-70723	20	15,190.6
50-24784	MD50-06-64372	47	5316.08	MD50-06-70722	47	17,357.6
50-24784	MD50-06-64371	49	6073.6	MD50-06-70721	49	12,025.1
50-24784	MD50-06-64370	55	4265.68	MD50-06-65292	55	11,534.1
50-24784	MD50-06-64375	100	2533.65	MD50-06-65291	100	9924.32
50-24784	MD50-06-64379	168	4191.78	MD50-06-65290	168	14,904.3
50-24784	MD50-06-64378	199	1847.67	MD50-06-65289	199	13,883.2

Table C-2.3-13 (continued)

Location ID	First-Round Sample ID	Depth (ft)	Analytical Result (pCi/L)	Second-Round Sample ID	Depth (ft)	Analytical Result (pCi/L)
50-24784	MD50-06-64377	250	5990.16	MD50-06-65288	250	11,573.5
50-24784	MD50-06-64376	268	7867.6	MD50-06-65287	265	15,021.7
50-24785	MD50-06-64402	10	1351.87	MD50-06-66783	10	13,716.8
50-24785	MD50-06-64403	19	2304.74	MD50-06-65300	19	17,954.6
50-24785	MD50-06-64408	60	6795.89	MD50-06-65299	60	22,232.3
50-24785	MD50-06-64407	120	9276.57	MD50-06-65298	120	19,364.2
50-24785	MD50-06-64404	200	9661.76	MD50-06-65297	200	15,705.8
50-24785	MD50-06-64405	250	7701.07	MD50-06-65296	250	16,951.9
50-24785	MD50-06-64406	275	—[b]	MD50-06-65295	256	20,061.8
50-24796	MD50-06-64448	10	10,802.4	MD50-06-65308	10	13,180
50-24796	MD50-06-64447	20	9216.98	MD50-06-65307	20	7500
50-24796	MD50-06-64449	40	41,568.4	MD50-06-65306	40	14,380
50-24796	MD50-06-64450	100	79,647.2	MD50-06-65305	100	13,520
50-24796	MD50-06-64451	120	6166.27	MD50-06-65304	120	17,420
50-24796	MD50-06-64452	150	21,472.2	MD50-06-65303	144	18,900
50-24797	MD50-06-64496	18.3	67,519.3	MD50-06-65315	18.3	976,000
50-24797	MD50-06-64497	38	9.13E+06	MD50-06-65314	38	6.30E+06
50-24797	MD50-06-66198	60	391,496	MD50-06-65313	60	759,762
50-24797	MD50-06-64498	120	84,346.3	MD50-06-65312	120	34,200
50-24797	MD50-06-64500	160	20,013.6	MD50-06-65311	154	23,840
50-24799	MD50-06-66197	15	64,928.8	MD50-06-65323	20	36,447.5
50-24799	MD50-06-64521	17.5	2569.3	MD50-06-65322	32.5	47,309.9
50-24799	MD50-06-64522	20	3691.82	MD50-06-65321	100	1.36E+06
50-24799	MD50-06-64523	32.5	3952.91	MD50-06-65320	120	406,875
50-24799	MD50-06-64538	37.5	5069.45	MD50-06-65319	160	21,225.2
50-24799	MD50-06-64524	40.5	4528.53	nc	nc	nc
50-24799	MD50-06-64525	100	1.64E+06	nc	nc	nc
50-24799	MD50-06-64526	120	883,850	nc	nc	nc
50-24799	MD50-06-64527	160	57,908.4	nc	nc	nc
50-24801	MD50-06-64853	20	2867.02	MD50-06-65429	20	25,055.3
50-24801	MD50-06-64870	35	6784.73	MD50-06-65428	35	35,286.4
50-24801	MD50-06-64856	80	4990.51	MD50-06-65427	80	22,566.1
50-24801	MD50-06-64855	120	9899.57	MD50-06-65426	120	18,781.7
50-24801	MD50-06-64854	150	—	MD50-06-65425	150	21,432.1
50-24802	MD50-06-64878	15	41,660.8	MD50-06-65437	15	38,300.5
50-24802	MD50-06-64879	42	17,462.1	MD50-06-65436	42	43,716.5
50-24802	MD50-06-64880	99.4	5052.48	MD50-06-65435	99	13,555.1

Table C-2.3-13 (continued)

Location ID	First-Round Sample ID	Depth (ft)	Analytical Result (pCi/L)	Second-Round Sample ID	Depth (ft)	Analytical Result (pCi/L)
50-24802	MD50-06-64881	124.4	6116.16	MD50-06-65434	124	17,240
50-24802	MD50-06-64882	156.4	4986	MD50-06-65433	156	17,485.7
50-24803	MD50-06-64904	16	2038.72	MD50-06-65445	16	13,688.5
50-24803	MD50-06-64903	37	2016.56	MD50-06-65444	37	14,782.6
50-24803	MD50-06-64905	99.5	1972.24	MD50-06-65443	99.5	16,541.2
50-24803	MD50-06-64906	124	5118.96	MD50-06-65442	124	11,625.2
50-24803	MD50-06-64907	151	4077.44	MD50-06-65441	150	12,962.8
50-24804	MD50-06-64970	10	844.906	MD50-06-65454	10	2521.99
50-24804	MD50-06-64971	16	2247.76	MD50-06-65453	16	2554.37
50-24804	MD50-06-64972	33	5226.16	MD50-06-65452	33	4082.54
50-24804	MD50-06-64973	99	2129.36	MD50-06-65451	99	2358.25
50-24804	MD50-06-64974	124	2484.63	MD50-06-65450	124	1805.49
50-24804	MD50-06-64975	149	3616.22	MD50-06-65449	149	2958.39
50-24810	MD50-06-64999	19	8320	MD50-06-65461	19	4120.19
50-24810	MD50-06-64998	37	8900	MD50-06-65460	37	2208.91
50-24810	MD50-06-64997	99	52,400	MD50-06-65459	99	4368.79
50-24810	MD50-06-64996	123	5940	MD50-06-65458	123	2639.7
50-24810	MD50-06-64995	150	8532.89	MD50-06-65457	150	2643.06
50-24811	MD50-06-65069	20	253,371	MD50-06-65469	20	311,840
50-24811	MD50-06-65068	40	482,009	MD50-06-65468	40	544,683
50-24811	MD50-06-65067	98	18,354.1	MD50-06-65467	98	8723.73
50-24811	MD50-06-65066	125	16,931.5	MD50-06-65466	125	4260.77
50-24811	MD50-06-65065	150	20,833.6	MD50-06-65465	150	2988.19
50-24812	MD50-06-65094	10	431,202	MD50-06-65477	10	206,297
50-24812	MD50-06-65093	35	435,669	MD50-06-65476	35	311,191
50-24812	MD50-06-65092	98	483,598	MD50-06-65474	98	618,414
50-24812	MD50-06-65091	123	116,972	MD50-06-65475	123	161,030
50-24812	MD50-06-65090	150	27,855.1	MD50-06-65473	150	11,770
50-24813	MD50-06-65126	20	18,041.6	MD50-06-65485	20	5337.42
50-24813	MD50-06-65125	30	18,926.7	MD50-06-65484	30	7572.56
50-24813	MD50-06-65124	99	50,065.5	MD50-06-65483	99	21,617.4
50-24813	MD50-06-65123	125	74,026.3	MD50-06-65482	125	58,730.7
50-24813	MD50-06-65122	150	279,016	MD50-06-65481	150	197,983
50-24814	MD50-06-65151	10	9025.11	MD50-06-65493	10	25,557.8
50-24814	MD50-06-65150	30	19,019.6	MD50-06-65492	30	50,393.2
50-24814	MD50-06-65149	99	68,456.2	MD50-06-65491	99	66,823.9
50-24814	MD50-06-65148	124	501,906	MD50-06-65490	124	674,050

Table C-2.3-13 (continued)

Location ID	First-Round Sample ID	Depth (ft)	Analytical Result (pCi/L)	Second-Round Sample ID	Depth (ft)	Analytical Result (pCi/L)
50-24814	MD50-06-65147	149	26,982.9	MD50-06-65489	149	180,276
50-24815	MD50-06-65183	30	3972.74	MD50-06-65501	30	20,567.5
50-24815	MD50-06-65182	40	11,182.8	MD50-06-65500	40	2406.48
50-24815	MD50-06-65181	100	86,190.8	MD50-06-65499	100	2754.79
50-24815	MD50-06-65180	125	5221.05	MD50-06-65498	125	3286.58
50-24815	MD50-06-65179	149	4053.38	MD50-06-65497	149	837.264
50-24816	MD50-06-65204	25	8466.02	MD50-06-65510	25	825.214
50-24816	MD50-06-65205	35	1015.48	MD50-06-65509	35	3669.37
50-24816	MD50-06-65209	65	6855.32	MD50-06-65508	65	3749.99
50-24816	MD50-06-65206	120	4007.47	MD50-06-65507	120	6093.67
50-24816	MD50-06-65208	200	3459.75	MD50-06-65506	200	4509.88
50-24816	MD50-06-65207	225	6503.3	MD50-06-65505	215.8	3831.86
50-24817	MD50-05-63841	20	92,996.7	MD50-06-65903	20	359,845
50-24817	MD50-05-63842	40	69,591.3	MD50-06-65904	50	493,463
50-24817	RE50-05-63816	100	1.55E+06	MD50-06-65905	100	381,500
50-24817	RE50-05-63817	140	280,852	MD50-06-65906	140	501,606
50-24817	RE50-05-63818	200	103,015	MD50-06-65907	200	164,658
50-24817	MD50-05-63843	250	15,032	MD50-06-65908	240.9	47,666.4
50-24818	MD50-06-65232	10	11,510.1	nc	nc	nc
50-24818	MD50-06-65233	25	619,618	nc	nc	nc
50-24818	MD50-06-65234	100	39,888	nc	nc	nc
50-24818	MD50-06-65235	150	5717.28	nc	nc	nc
50-24818	MD50-06-65236	190	1839.28	nc	nc	nc
50-24818	MD50-06-65237	250	3013.76	nc	nc	nc
50-24818	MD50-06-65238	280	1950.08	nc	nc	nc
50-24818	MD50-06-65239	315	—	nc	nc	nc
50-24818	MD50-06-65240	414	189,308	nc	nc	nc
50-24818	MD50-06-65242	452	1720	nc	nc	nc
50-24818	MD50-06-65245	500	32,297.5	nc	nc	nc
50-24818	MD50-06-65244	548	24,880	nc	nc	nc
50-24818	MD50-06-65243	591	38,200	nc	nc	nc
50-24819	RE50-05-61430	20	1389.62	MD50-06-63863	20	1668.83
50-24819	RE50-05-61431	50	1800.85	MD50-06-63864	50	4605.01
50-24819	RE50-05-61432	100	2826.52	MD50-06-63865	100	3717.75
50-24819	RE50-05-61732	138.5–140	5607.89	MD50-06-63866	140	2582.25
50-24819	RE50-05-61733	200	6138.57	MD50-06-63867	200	985.997
50-24819	RE50-05-61734	250	9173.39	MD50-06-63868	250	1263.79

Table C-2.3-13 (continued)

Location ID	First-Round Sample ID	Depth (ft)	Analytical Result (pCi/L)	Second-Round Sample ID	Depth (ft)	Analytical Result (pCi/L)
50-24819	RE50-05-61735	275	—	MD50-06-63869	275	3994.56
50-24820	RE50-05-61446	20	—	MD50-06-64240	20	1569.89
50-24820	RE50-05-61449	50	—	MD50-06-64241	50	294831
50-24820	RE50-05-61447	100	—	MD50-06-64242	100	1881.11
50-24820	RE50-05-61448	140	—	MD50-06-64243	140	3300.83
50-24820	RE50-05-61450	200	—	MD50-06-64244	200	3514.5
50-24820	RE50-05-61736	250	—	MD50-06-64245	225	7248.23
50-24821	RE50-05-61464	20	—	MD50-06-64248	20	1530.78
50-24821	RE50-05-61466	50	—	MD50-06-64249	50	2513.57
50-24821	RE50-05-61465	98.4–100	—	MD50-06-64250	100	—
50-24821	RE50-05-61467	137.5–140	—	MD50-06-64251	140	—
50-24821	RE50-05-61473	160	723.206	MD50-06-64254	160	3815.93
50-24821	RE50-05-61468	248.6–250	—	MD50-06-64252	200	—
50-24821	nc	nc	nc	MD50-06-64253	238.4	2642.63
50-24822	RE50-05-61482	20	—	MD50-06-64928	20	128,096
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	18421.2
50-24822	RE50-05-61486	200	—	MD50-06-64932	200	—
50-24822	RE50-05-61737	250	—	MD50-06-64933	250	2798.02
50-25451	MD50-06-66691	19	28,394.1	nc	nc	nc
50-25451	MD50-06-66690	49	18,892.4	nc	nc	nc
50-25451	MD50-06-66689	100	15,779.5	nc	nc	nc
50-25451	MD50-06-66688	147	20,485.1	nc	nc	nc
50-25451	MD50-06-66687	200	23,704.5	nc	nc	nc
50-25451	MD50-06-66686	251	11,706.8	nc	nc	nc
50-25451	MD50-06-66685	287	8850.87	nc	nc	nc

[a] nc = Sample not collected.

[b] — = Not detected.

Table C-2.3-14
VOCs Detected in Vapor Samples from Boreholes between Pits 2 and 3 during 2007 Sampling

Sample ID	Location ID	Depth (ft)	Acetone	Benzene	Butadiene[1,3-]	Butanone[2-]	Carbon Tetrachloride	Chloroform	Dichlorodifluoromethane	Dichloroethane[1,2-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Ethanol	Ethylbenzene	Ethyltoluene[4-]	Hexane	Methylene Chloride	n-Heptane	Propylene	Tetrachloroethylene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,2-]	Trichloroethylene	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene (total)	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
MD50-07-75329	50-27437	10	—*	11	—	—	310	1200	130	29	47	28	—	—	—	—	12	—	—	1900	37	30	39	5200	—	—	—	—	20
MD50-07-75328	50-27437	20	18	40	9	3.2	84	340	37	8.9	14	8.6	—	9.9	9.6	6.6	3.7	4.3	36	490	71	8.8	12	1500	13	—	—	13	38
MD50-07-75327	50-27437	32	33	12	—	—	100	590	52	22	28	17	—	17	15	9.5	7.7	10	—	540	160	—	32	2200	16	—	—	23	61
MD50-07-75326	50-27437	60	—	—	—	—	390	1800	200	71	120	53	—	—	—	—	25	—	—	1200	170	—	90	8500	—	—	—	—	—
MD50-07-75325	50-27437	80	310	—	—	—	330	1500	170	66	96	49	47	—	—	—	23	—	30	860	130	33	72	7000	—	—	—	—	—
MD50-07-75367	50-27444	20	—	—	—	—	22	57	7.2	3.2	5.4	—	—	—	—	—	21	—	—	27	27	—	5.9	570	—	—	—	—	—
MD50-07-75366	50-27444	35	—	—	—	—	260	350	55	18	31	—	—	—	—	—	100	—	—	140	45	—	—	3000	—	—	—	—	—
MD50-07-75365	50-27444	60	—	—	—	—	370	590	—	39	57	—	—	—	—	—	150	—	—	180	49	—	44	4400	—	—	—	—	—
MD50-07-75364	50-27444	80	—	—	—	—	180	490	59	35	43	—	—	—	—	—	120	—	—	120	31	—	38	3000	—	—	—	—	—
MD50-07-75363	50-27444	97	—	—	—	—	5400	4800	1100	240	410	—	—	—	—	—	500	—	—	2000	—	—	—	41,000	—	—	—	—	—
MD50-07-75362	50-27444	140	—	—	—	—	9100	5600	1700	330	590	—	—	—	—	—	1100	—	—	2300	—	—	—	57,000	—	—	—	—	—
MD50-07-75361	50-27444	197	—	—	—	—	2600	2700	1100	—	670	—	—	—	—	—	3100	—	—	1900	—	—	—	75,000	—	—	—	—	—
MD50-07-75360	50-27444	247	—	—	—	—	1500	1700	750	—	510	—	—	—	—	—	2400	—	—	1400	—	—	—	53,000	—	—	—	—	—
MD50-07-75359	50-27444	296	—	—	—	—	820	1200	710	—	350	—	—	—	—	—	2100	—	—	—	—	—	—	29,000	—	—	—	—	—
MD50-07-75358	50-27444	335	—	—	—	—	850	810	660	—	240	—	—	—	—	—	1500	—	—	1300	—	—	—	51,000	—	—	—	—	—
MD50-07-75386	50-27445	10	—	—	—	—	54,000 (J)	8100	590	—	75	—	—	—	—	—	—	—	—	1100	—	—	59	8400	—	—	—	—	—
MD50-07-75385	50-27445	20	—	—	—	—	18,000 (J)	3200	210	—	30	—	—	—	—	—	—	—	—	400	28	—	26	3100	—	—	—	—	—
MD50-07-75384	50-27445	35	—	—	—	—	12,000 (J)	3000	260	30	56	—	—	—	—	—	—	—	—	330	58	—	46	3900	—	—	88	23	65
MD50-07-75383	50-27445	62	30	—	—	—	4500 (J)	1300	37	22	31	11	—	20	30	—	—	—	—	130	82	—	33	1700	28	10	130	35	90
MD50-07-75382	50-27445	80	34	—	—	—	2400	1200	56	22	24	8.7	—	31	28	—	—	—	—	100	120	—	34	1200	30	11	—	40	110
MD50-07-75410	50-27446	10	—	—	—	—	7900	2200	960	—	180	—	—	—	—	—	—	—	—	540	—	—	—	13,000	—	—	—	—	—
MD50-07-75409	50-27446	20	—	—	—	—	370	240	44	—	21	—	—	—	—	—	—	—	—	45	—	—	32	1200	—	—	—	—	—
MD50-07-75408	50-27446	32	—	—	—	—	13,000	3800	1700	—	310	—	—	—	—	—	—	—	—	950	—	—	—	24,000	—	—	—	—	—
MD50-07-75407	50-27446	61	—	—	—	—	4000	1300	630	—	130	—	—	—	—	—	—	—	—	360	—	—	77	9500	—	—	—	—	—
MD50-07-75406	50-27446	80	—	—	—	—	11,000	4100	1900	—	400	—	—	—	—	—	—	—	—	990	—	—	210	27,000	—	—	—	—	—

Note: Results are in $\mu g/m^3$. Data qualifiers are defined in Appendix A.
* — = Not detected.

Table C-2.3-15
Tritium Detected in Vapor Samples from
Boreholes between Pits 2 and 3 during 2007 Sampling

Sample ID	Location ID	Depth (ft)	Analytical Result
MD50-07-75329	50-27437	10	7540 (J)
MD50-07-75328	50-27437	20	11,840 (J)
MD50-07-75327	50-27437	32	9860 (J)
MD50-07-75326	50-27437	60	2720 (J)
MD50-07-75325	50-27437	80	3800 (J)
MD50-07-75367	50-27444	20	184,600 (J)
MD50-07-75366	50-27444	35	40,600 (J)
MD50-07-75365	50-27444	60	12,840 (J)
MD50-07-75364	50-27444	80	7160 (J)
MD50-07-75363	50-27444	97	8540 (J)
MD50-07-75362	50-27444	140	7900 (J)
MD50-07-75361	50-27444	197	5220 (J)
MD50-07-75360	50-27444	247	3980 (J)
MD50-07-75359	50-27444	296	6780 (J)
MD50-07-75358	50-27444	335	1440 (J)
MD50-07-75386	50-27445	10	2640 (J)
MD50-07-75385	50-27445	20	2880 (J)
MD50-07-75384	50-27445	35	4520 (J)
MD50-07-75383	50-27445	62	5260 (J)
MD50-07-75382	50-27445	800	3960 (J)
MD50-07-75410	50-27446	10	3600 (J)
MD50-07-75409	50-27446	20	3020 (J)
MD50-07-75408	50-27446	32	7560 (J)
MD50-07-75407	50-27446	611	8240 (J)
MD50-07-75406	50-27446	80	10,980 (J)

Note: Results are in pCi/L. Data qualifiers are defined in Appendix A.

Table C-2.3-16
Comparison of Vapor and Core Sample VOC Concentrations during 2005–2006 Sampling

Location ID	Depth (ft)	Analyte	Pore-Gas Concentration (µg/m^3)	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	Tetrachloroethylene	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	Trichloroethylene	11,000	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	Tetrachloroethylene	760	0.00116 (U)
50-26823	37.5	Toluene	58 (U)	0.00116 (U)
50-26823	37.5	Trichloro-1,2,2-trifluoroethane[1,1,2-]	270	0.00581 (U)

Table C-2.3-16 (continued)

Location ID	Depth (ft)	Analyte	Pore-Gas Concentration (µg/m^3)	Core Concentration (mg/kg)
50-26823	37.5	Trichloroethane[1,1,1-]	84 (U)	0.00116 (U)
50-26823	37.5	Trichloroethylene	15,000	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	Tetrachloroethylene	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	Trichloroethylene	12,000	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)
50-26823	99	Methylene Chloride	470	0.0051 (UJ)
50-26823	99	Styrene	240 (U)	0.00102 (U)

Table C-2.3-16 (continued)

Location ID	Depth (ft)	Analyte	Pore-Gas Concentration (µg/m^3)	Core Concentration (mg/kg)
50-26823	99	Tetrachloroethylene	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	Trichloroethylene	38,000	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	Tetrachloroethylene	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	Trichloroethylene	51,000	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)
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)

Table C-2.3-16 (continued)

Location ID	Depth (ft)	Analyte	Pore-Gas Concentration (µg/m^3)	Core Concentration (mg/kg)
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	Tetrachloroethylene	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	Trichloroethylene	64,000	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	Tetrachloroethylene	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	Trichloroethylene	56,000	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)
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)

Table C-2.3-16 (continued)

Location ID	Depth (ft)	Analyte	Pore-Gas Concentration (µg/m³)	Core Concentration (mg/kg)
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	Tetrachloroethylene	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	Trichloroethylene	54,000	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	Tetrachloroethylene	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	Trichloroethylene	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)
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)

Table C-2.3-16 (continued)

Location ID	Depth (ft)	Analyte	Pore-Gas Concentration (µg/m³)	Core Concentration (mg/kg)
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	Tetrachloroethylene	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	Trichloroethylene	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	Tetrachloroethylene	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)
50-26824	70	Trichloroethane[1,1,1-]	59	0.00106 (U)
50-26824	70	Trichloroethylene	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)

Table C-2.3-16 (continued)

Location ID	Depth (ft)	Analyte	Pore-Gas Concentration (µg/m³)	Core Concentration (mg/kg)
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	Tetrachloroethylene	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	Trichloroethylene	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)
50-26824	150	Styrene	47 (U)	0.00122 (U)
50-26824	150	Tetrachloroethylene	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	Trichloroethylene	59 (U)	0.00122 (U)
50-26824	150	Trichlorofluoromethane	61 (UJ)	0.00122 (UJ)

Table C-2.3-16 (continued)

Location ID	Depth (ft)	Analyte	Pore-Gas Concentration (µg/m^3)	Core Concentration (mg/kg)
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	Tetrachloroethylene	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	Trichloroethylene	16,000	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)
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	Tetrachloroethylene	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)

Table C-2.3-16 (continued)

Location ID	Depth (ft)	Analyte	Pore-Gas Concentration (µg/m^3)	Core Concentration (mg/kg)
50-26825	20	Trichloroethane[1,1,1-]	63	0.00104 (U)
50-26825	20	Trichloroethylene	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	Tetrachloroethylene	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	Trichloroethylene	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)
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)

Table C-2.3-16 (continued)

Location ID	Depth (ft)	Analyte	Pore-Gas Concentration (µg/m^3)	Core Concentration (mg/kg)
50-26825	69	Tetrachloroethylene	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	Trichloroethylene	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	Tetrachloroethylene	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	Trichloroethylene	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)
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)

Table C-2.3-16 (continued)

Location ID	Depth (ft)	Analyte	Pore-Gas Concentration (µg/m^3)	Core Concentration (mg/kg)
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	Tetrachloroethylene	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	Trichloroethylene	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	Tetrachloroethylene	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)
50-26825	200	Trichloroethylene	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)

Note: Data qualifiers are defined in Appendix A.

Table C-3.1-1
Surface and Near-Surface Samples Collected and Analyses Requested at MDA C during Phase II Investigation

Sample ID	Location ID	Depth (ft)	Media	TAL Metals
MD50-08-8373	50-603065	0.0–0.5	Fill	08-1264
MD50-08-8374	50-603065	1.0–1.5	Fill	08-1264
MD50-08-8376	50-603066	0.0–0.5	Fill	08-1285
MD50-08-8386	50-603066	1.0–1.5	Fill	08-1285
MD50-08-8377	50-603067	0.0–0.5	Fill	08-1264
MD50-08-8378	50-603067	1.0–1.5	Fill	08-1264
MD50-08-8379	50-603068	0.0–0.5	Fill	08-1264
MD50-08-8380	50-603068	1.0–1.5	Fill	08-1264
MD50-08-8381	50-603069	0.0–0.5	Fill	08-1264
MD50-08-8382	50-603069	1.0–1.5	Fill	08-1264
MD50-08-8383	50-603070	0.0–0.5	Fill	08-1285
MD50-08-8384	50-603070	0.9–1.0	Qbt 3	08-1285
MD50-08-8385	50-603071	0.0–0.5	Fill	08-1264
MD50-08-8375	50-603071	1.0–1.5	Fill	08-1264
MD50-08-8387	50-603072	0.0–0.5	Fill	08-1285
MD50-08-8388	50-603072	1.0–1.5	Fill	08-1285
MD50-08-8389	50-603073	0.0–0.5	Fill	08-1285
MD50-08-8390	50-603073	0.5–1.0	Fill	08-1285
MD50-08-8391	50-603074	0.0–0.5	Soil	08-1287
MD50-08-8392	50-603074	1.0–1.5	Soil	08-1287
MD50-08-8393	50-603075	0.0–0.5	Soil	08-1287
MD50-08-8394	50-603075	0.5–0.7	Soil	08-1287
MD50-08-8395	50-603076	0.0–0.5	Soil	08-1287
MD50-08-8396	50-603076	0.5–1.0	Soil	08-1287
MD50-08-8397	50-603077	0.0–0.3	Soil	08-1287
MD50-08-8399	50-603078	0.0–0.5	Soil	08-1287
MD50-08-8400	50-603078	1.0–1.5	Soil	08-1287
MD50-08-8401	50-603079	0.0–0.5	Fill	08-1118
MD50-08-8402	50-603079	1.0–1.5	Fill	08-1118
MD50-08-8403	50-603080	0.0–0.5	Fill	08-1118
MD50-08-8404	50-603080	1.0–1.5	Fill	08-1118
MD50-08-8405	50-603081	0.0–0.5	Fill	08-1118
MD50-08-8406	50-603081	1.0–1.5	Fill	08-1118
MD50-08-8407	50-603082	0.0–0.5	Fill	08-1118
MD50-08-8408	50-603082	1.0–1.2	Fill	08-1118

Table C-3.1-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	TAL Metals
MD50-08-8409	50-603083	0.0–0.5	Fill	08-1118
MD50-08-8410	50-603083	1.0–1.5	Fill	08-1118
MD50-08-8411	50-603084	0.0–0.5	Fill	08-1179
MD50-08-8412	50-603084	1.0–1.5	Fill	08-1179
MD50-08-8413	50-603085	0.0–0.5	Fill	08-1179
MD50-08-8414	50-603085	1.0–1.5	Fill	08-1179
MD50-08-8415	50-603086	0.0–0.5	Fill	08-1179
MD50-08-8416	50-603086	1.0–1.5	Fill	08-1179
MD50-08-8417	50-603087	0.0–0.5	Fill	08-1179
MD50-08-8418	50-603087	1.0–1.5	Fill	08-1179
MD50-08-8419	50-603088	0.0–0.5	Fill	08-1179
MD50-08-8420	50-603088	1.0–1.5	Fill	08-1179
MD50-08-8421	50-603089	0.0–0.5	Fill	08-1179
MD50-08-8422	50-603089	1.0–1.5	Fill	08-1179
MD50-08-8423	50-603090	0.0–0.5	Fill	08-1179
MD50-08-8424	50-603090	1.0–1.5	Fill	08-1179
MD50-08-8425	50-603091	0.0–0.5	Fill	08-1179
MD50-08-8426	50-603091	1.0–1.5	Fill	08-1179
MD50-08-8427	50-603092	0.0–0.5	Fill	08-1229
MD50-08-8428	50-603092	1.0–1.5	Fill	08-1229
MD50-08-8429	50-603093	0.0–0.5	Soil	08-1287
MD50-08-8430	50-603093	1.0–1.5	Soil	08-1287
MD50-08-8431	50-603094	0.0–0.3	Soil	08-1287
MD50-08-8432	50-603094	0.3–0.5	Soil	08-1287

Note: Numbers in analyte columns are request numbers.

Table C-3.1-2
Inorganic Chemicals above BVs in Surface and Near-Surface Samples at MDA C during Phase II Investigation

Sample ID	Location ID	Depth (ft)	Media	Cadmium	Chromium	Cobalt	Manganese	Selenium	Zinc
Soil BV[a]				**0.4**	**19.3**	**8.64**	**671**	**1.52**	**48.8**
Qbt 3 BV[a]				**1.63**	**7.14**	**3.14**	**482**	**0.3**	**63.5**
Industrial SSL[b]				**897**	**1,700,000**[c]	**300**[d]	**26,700**	**5680**	**341,000**
Residential SSL[b]				**70.3**	**117,000**[c]	**23**[d]	**1860**	**391**	**23,500**
MD50-08-8374	50-603065	1.0–1.5	Fill	—[e]	—	—	—	1.7 (U)	—
MD50-08-8386	50-603066	1.0–1.5	Fill	—	—	—	—	1.58 (U)	—
MD50-08-8377	50-603067	0.0–0.5	Fill	—	—	—	—	1.57 (U)	—
MD50-08-8378	50-603067	1.0–1.5	Fill	—	—	—	—	1.59 (U)	—
MD50-08-8379	50-603068	0.0–0.5	Fill	0.511 (U)	—	—	—	—	—
MD50-08-8382	50-603069	1.0–1.5	Fill	—	—	—	—	1.54 (U)	—
MD50-08-8383	50-603070	0.0–0.5	Fill	—	—	—	—	1.57 (U)	—
MD50-08-8384	50-603070	0.9–1.0	Qbt 3	—	18.2	—	—	1.47 (U)	—
MD50-08-8385	50-603071	0.0–0.5	Fill	—	—	—	—	—	82.2
MD50-08-8391	50-603074	0.0–0.5	Soil	—	—	—	—	1.98	—
MD50-08-8393	50-603075	0.0–0.5	Soil	—	—	—	—	1.56 (U)	—
MD50-08-8394	50-603075	0.5–0.7	Soil	—	—	—	—	1.76	—
MD50-08-8396	50-603076	0.5–1.0	Soil	0.522 (U)	—	—	—	—	—
MD50-08-8397	50-603077	0.0–0.3	Soil	0.521 (U)	—	—	—	—	—
MD50-08-8399	50-603078	0.0–0.5	Soil	0.555 (U)	—	—	—	1.8	—
MD50-08-8401	50-603079	0.0–0.5	Fill	0.887	—	—	—	4.27	—
MD50-08-8402	50-603079	1.0–1.5	Fill	0.546 (U)	—	—	—	2.7 (U)	—
MD50-08-8403	50-603080	0.0–0.5	Fill	0.52 (U)	—	—	—	4.3	—
MD50-08-8404	50-603080	1.0–1.5	Fill	0.54 (U)	—	10.7	836	5.43	—
MD50-08-8405	50-603081	0.0–0.5	Fill	0.505 (U)	—	—	—	3.52 (U)	—
MD50-08-8406	50-603081	1.0–1.5	Fill	0.524 (U)	—	—	—	6.18	—
MD50-08-8407	50-603082	0.0–0.5	Fill	0.507 (U)	—	—	—	3.81	—
MD50-08-8408	50-603082	1.0–1.2	Fill	0.515 (U)	—	—	—	5.17	—
MD50-08-8409	50-603083	0.0–0.5	Fill	—	—	—	—	3.76	53.8
MD50-08-8410	50-603083	1.0–1.5	Fill	0.537 (U)	—	—	—	5.92	—
MD50-08-8411	50-603084	0.0–0.5	Fill	—	—	—	—	1.61 (U)	—
MD50-08-8412	50-603084	1.0–1.5	Fill	—	—	—	—	1.55 (U)	—
MD50-08-8413	50-603085	0.0–0.5	Fill	0.549 (U)	—	—	—	1.81 (U)	—
MD50-08-8414	50-603085	1.0–1.5	Fill	0.539 (U)	—	—	—	—	—
MD50-08-8415	50-603086	0.0–0.5	Fill	—	—	—	—	1.64 (U)	—

Table C-3.1-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Cadmium	Chromium	Cobalt	Manganese	Selenium	Zinc
Soil BV[a]				**0.4**	**19.3**	**8.64**	**671**	**1.52**	**48.8**
Qbt 3 BV[a]				**1.63**	**7.14**	**3.14**	**482**	**0.3**	**63.5**
Industrial SSL[b]				**897**	**1,700,000[c]**	**300[d]**	**26,700**	**5680**	**341,000**
Residential SSL[b]				**70.3**	**117,000[c]**	**23[d]**	**1860**	**391**	**23,500**
MD50-08-8416	50-603086	1.0–1.5	Fill	0.575 (U)	—	—	—	1.73 (U)	—
MD50-08-8417	50-603087	0.0–0.5	Fill	—	—	—	—	1.63 (U)	—
MD50-08-8418	50-603087	1.0–1.5	Fill	—	—	—	—	1.57 (U)	—
MD50-08-8419	50-603088	0.0–0.5	Fill	—	—	—	—	1.64 (U)	—
MD50-08-8420	50-603088	1.0–1.5	Fill	0.537 (U)	—	—	—	—	—
MD50-08-8421	50-603089	0.0–0.5	Fill	—	—	—	—	1.81 (U)	—
MD50-08-8422	50-603089	1.0–1.5	Fill	—	—	—	—	1.55 (U)	—
MD50-08-8424	50-603090	1.0–1.5	Fill	0.544 (U)	—	—	—	1.63 (U)	—
MD50-08-8426	50-603091	1.0–1.5	Fill	0.534 (U)	—	—	—	1.6 (U)	—
MD50-08-8427	50-603092	0.0–0.5	Fill	0.519 (U)	—	—	—	4.85	—
MD50-08-8428	50-603092	1.0–1.5	Fill	0.531 (U)	—	—	—	4.05	—
MD50-08-8429	50-603093	0.0–0.5	Soil	0.547 (U)	—	—	—	1.98	—
MD50-08-8430	50-603093	1.0–1.5	Soil	0.535 (U)	—	—	—	—	—
MD50-08-8431	50-603094	0.0–0.3	Soil	—	—	—	—	2.15	—

Note: Results are in mg/kg. Data qualifiers are defined in Appendix A.

[a] BVs from LANL (1998, 059730).

[b] Soil screening levels (SSLs) from NMED (2012, 219971) unless indicated otherwise.

[c] SSL for trivalent chromium.

[d] SSLs from U.S. Environmental Protection Agency (EPA) regional screening tables (https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables).

[e] — = Not detected or not detected above BV.

Table C-3.2-1
Summary of Phase II Investigation Boreholes

Borehole or Grouped Boreholes	Location ID	Year Drilled	Final Total Depth (ft)	Core Samples Depth Range (ft)	Vapor Samples Depth Range (ft)	Vapor-Sampling System
1	50-24769	2006; extended in 2008	300	18.1–300	20–300	Packer (2006)
	50-603470	2008	653	360–653	351–650	SS[a] Tubing (2008)
2	50-24771	2006; extended in 2008	300	15.9–300	17–300	Packer (2006, 2008)
	50-603471	2008	460	350–452	360–450	FLUTe (2008)
3	50-24783	2006; extended in 2008	300	17.5–300	20–300	Packer (2006)
	50-603472	2008	460	350–452	364–450	SS Tubing (2008)
4	50-24784	2006; extended in 2009	460	8–452	10–450	Packer (2006); SS Tubing (2009)
5	50-24813	2006; extended in 2008 and 2009	635	18.2–602	20–600	Packer (2006); SS Tubing (2008)
6	50-24817	2005; extended in 2008	460	18.4–452.5	20–250	Packer (2005, 2008)
	50-603383	2008	460	n/a[b]	286–450	FLUTe (2008)
7	50-24820	2005; extended in 2008	602.5	17.5–602.5	20–250	Packer (2005)
	50-603467	2008	600	n/a	287–600	FLUTe (2008)
8	50-24821	2005	250	18.6–250	20–250	Packer (2005)
	50-603373	2008	300	n/a	30–260	Packer and SS Tubing (2008)
	50-603468	2008	460	300–451.5	300–450	FLUTe (2008)
9	50-24822	2005; extended in 2008	452.5	18.6–452.5	20–450	Packer (2005); SS Tubing (2008)
10	50-603060	2008	451.5	48–451.5	50–450	None
	50-603503	2008	460	n/a	347–450	SS Tubing (2008)
11	50-603061	2008	460	8–452	13–450	SS Tubing (2008)
12	50-603062	2008	460	48.5–452	50–450	SS Tubing (2008)
13	50-603063	2008	460	8–452	10–450	SS Tubing (2008)
14	50-603064	2008	510	8.5–502	25–500	SS Tubing (2008)

[a] SS = Stainless steel.

[b] n/a = Not applicable; no core collected.

Table C-3.2-2
Tuff and Vapor Samples Collected and Analyses Requested for Phase II Investigation at MDA C

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Anions	Gamma-Emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (total)
Boreholes 50-24769 and 50-603470																
MD50-08-7442	50-24769	198–200	Qbt 1v	08-1103	08-1103	08-1103	—*	08-1103	08-1103	08-1103	08-1103	08-1103	08-1103	08-1103	—	08-1103
MD50-08-7443	50-24769	248–250	Qbt 1g	08-1102	08-1102	08-1102	—	08-1102	08-1102	08-1102	08-1102	08-1102	08-1102	08-1102	—	08-1102
MD50-08-7444	50-24769	298–300	Qbt 1g	08-1102	08-1102	08-1102	—	08-1102	08-1102	08-1102	08-1102	08-1102	08-1102	08-1102	—	08-1102
MD50-08-7445	50-603470	360–362	Qct	08-1651	08-1651	08-1651	—	08-1651	08-1651	08-1651	08-1651	08-1651	08-1651	08-1651	—	08-1651
MD50-08-7446	50-603470	400–402	Qbo	08-1654	08-1654	08-1654	—	08-1654	08-1654	08-1654	08-1654	08-1654	08-1654	08-1654	—	08-1654
MD50-08-7447	50-603470	450–452.5	Qbo	08-1677	08-1677	08-1677	—	08-1677	08-1677	08-1677	08-1677	08-1677	08-1677	08-1677	—	08-1677
MD50-08-7448	50-603470	500–502	Qbo	08-1717	08-1717	08-1717	—	08-1717	08-1717	08-1717	08-1717	08-1717	08-1717	08-1717	—	08-1717
MD50-08-7449	50-603470	550.5–552.5	Qbo	08-1746	08-1746	08-1746	—	08-1746	08-1746	08-1746	08-1746	08-1746	08-1746	08-1746	—	08-1746
MD50-08-7450	50-603470	600–602	Qbo	08-1747	08-1747	08-1747	—	08-1747	08-1747	08-1747	08-1747	08-1747	08-1747	08-1747	—	08-1747
MD50-08-7441	50-603470	650–653	Tvt 2	09-10	09-10	09-10	—	09-10	09-10	09-10	09-10	09-10	09-10	09-10	—	09-10
MD50-08-7459	50-24769	200	Vapor	—	—	—	08-1112	—	—	—	—	—	—	—	08-1111	—
MD50-08-7460	50-24769	250	Vapor	—	—	—	08-1112	—	—	—	—	—	—	—	08-1111	—
MD50-08-7451	50-24769	300	Vapor	—	—	—	08-1112	—	—	—	—	—	—	—	08-1111	—
MD50-08-7465	50-603470	351	Vapor	—	—	—	09-375	—	—	—	—	—	—	—	09-376	—
MD50-08-7464	50-603470	450	Vapor	—	—	—	09-375	—	—	—	—	—	—	—	09-376	—
MD50-08-7462	50-603470	600	Vapor	—	—	—	09-411	—	—	—	—	—	—	—	09-412	—
MD50-08-7461	50-603470	650	Vapor	—	—	—	09-306	—	—	—	—	—	—	—	09-305	—
Boreholes 50-24783 and 50-603472																
MD50-08-7646	50-24783	198–200	Qbt 1v	08-1125	08-1125	08-1125	—	08-1125	08-1125	08-1125	08-1125	08-1125	08-1125	08-1125	—	08-1125
MD50-08-7647	50-24783	248.5–250	Qbt 1v	08-1125	08-1125	08-1125	—	08-1125	08-1125	08-1125	08-1125	08-1125	08-1125	08-1125	—	08-1125
MD50-08-7648	50-24783	298.5–300	Qbt 1g	08-1144	08-1144	08-1144	—	08-1144	08-1144	08-1144	08-1144	08-1144	08-1144	08-1144	—	08-1144
MD50-08-7649	50-603472	350–354	Qct	08-1603	08-1603	08-1603	—	08-1603	08-1603	08-1603	08-1603	08-1603	08-1603	08-1603	—	08-1603
MD50-08-7650	50-603472	400–402.5	Qbo	08-1607	08-1607	08-1607	—	08-1607	08-1607	08-1607	08-1607	08-1607	08-1607	08-1607	—	08-1607
MD50-08-7651	50-603472	450–452	Qbo	08-1612	08-1612	08-1612	—	08-1612	08-1612	08-1612	08-1612	08-1612	08-1612	08-1612	—	08-1612
MD50-08-7656	50-24783	200	Vapor	—	—	—	08-1158	—	—	—	—	—	—	—	08-1157	—
MD50-08-7657	50-24783	250	Vapor	—	—	—	08-1158	—	—	—	—	—	—	—	08-1157	—
MD50-08-7655	50-24783	300	Vapor	—	—	—	08-1146	—	—	—	—	—	—	—	08-1145	—
MD50-08-7658	50-603472	364	Vapor	—	—	—	09-201	—	—	—	—	—	—	—	09-202	—
MD50-08-7659	50-603472	414	Vapor	—	—	—	09-201	—	—	—	—	—	—	—	09-202	—
MD50-08-7660	50-603472	450	Vapor	—	—	—	09-211	—	—	—	—	—	—	—	09-212	—

Table C-3.2-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Anions	Gamma-Emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (total)
Borehole 50-24784																
MD50-08-7676	50-24784	350–352	Qct	09-753	09-753	09-753	—	09-753	09-753	09-753	09-753	09-753	09-753	09-753	—	09-753
MD50-08-7677	50-24784	400–402	Qbo	09-753	09-753	09-753	—	09-753	09-753	09-753	09-753	09-753	09-753	09-753	—	09-753
MD50-08-7678	50-24784	450–452	Qbo	09-766	09-766	09-766	—	09-766	09-766	09-766	09-766	09-766	09-766	09-766	—	09-766
MD50-08-7691	50-24784	362	Vapor	—	—	—	09-1108	—	—	—	—	—	—	—	09-1107	—
MD50-08-7690	50-24784	411	Vapor	—	—	—	09-1108	—	—	—	—	—	—	—	09-1107	—
MD50-08-7689	50-24784	450	Vapor	—	—	—	09-1085	—	—	—	—	—	—	—	09-1084	—
Borehole 50-24813																
MD50-08-7706	50-24813	198.5–200	Qbt 1v	08-1164	08-1164	08-1164	—	08-1164	08-1164	08-1164	08-1164	08-1164	08-1164	08-1164	—	08-1164
MD50-08-7707	50-24813	248.5–250	Qbt 1v	08-1180	08-1180	08-1180	—	08-1180	08-1180	08-1180	08-1180	08-1180	08-1180	08-1180	—	08-1180
MD50-08-7708	50-24813	298–300	Qbt 1g	08-1189	08-1189	08-1189	—	08-1189	08-1189	08-1189	08-1189	08-1189	08-1189	08-1189	—	08-1189
MD50-08-7709	50-24813	350–352	Qct	09-840	09-840	09-840	—	09-840	09-840	09-840	09-840	09-840	09-840	09-840	—	09-840
MD50-08-7710	50-24813	400–402	Qbo	09-854	09-854	09-854	—	09-854	09-854	09-854	09-854	09-854	09-854	09-854	—	09-854
MD50-08-7711	50-24813	450–452	Qbo	09-873	09-873	09-873	—	09-873	09-873	09-873	09-873	09-873	09-873	09-873	—	09-873
MD50-08-7712	50-24813	500–502	Qbo	09-900	09-900	09-900	—	09-900	09-900	09-900	09-900	09-900	09-900	09-900	—	09-900
MD50-08-7713	50-24813	550–552	Qbo	09-929	09-929	09-929	—	09-929	09-929	09-929	09-929	09-929	09-929	09-929	—	09-929
MD50-08-7714	50-24813	600–602	Qbo	09-957	09-957	09-957	—	09-957	09-957	09-957	09-957	09-957	09-957	09-957	—	09-957
MD50-08-7716	50-24813	200	Vapor	—	—	—	08-1228	—	—	—	—	—	—	—	08-1227	—
MD50-08-7717	50-24813	2500	Vapor	—	—	—	08-1242	—	—	—	—	—	—	—	08-1241	—
MD50-08-7715	50-24813	300	Vapor	—	—	—	08-1191	—	—	—	—	—	—	—	08-1190	—
MD50-08-7721	50-24813	358	Vapor	—	—	—	09-1251	—	—	—	—	—	—	—	09-1250	—
MD50-08-7720	50-24813	408	Vapor	—	—	—	09-1251	—	—	—	—	—	—	—	09-1250	—
MD50-08-7719	50-24813	450	Vapor	—	—	—	09-1246	—	—	—	—	—	—	—	09-1245	—
MD50-08-7718	50-24813	600	Vapor	—	—	—	09-1246	—	—	—	—	—	—	—	09-1245	—
Borehole 50-603468																
MD50-08-7888	50-603468	300–301.5	Qbt 1g	08-1257	08-1257	08-1257	—	08-1257	08-1257	08-1257	08-1257	08-1257	08-1257	08-1257	—	08-1257
MD50-08-7889	50-603468	350–351	Qct	08-1257	08-1257	08-1257	—	08-1257	08-1257	08-1257	08-1257	08-1257	08-1257	08-1257	—	08-1257
MD50-08-7890	50-603468	400–401.5	Qbo	08-1274	08-1274	08-1274	—	08-1274	08-1274	08-1274	08-1274	08-1274	08-1274	08-1274	—	08-1274
MD50-08-7891	50-603468	450–451.5	Qbo	08-1280	08-1280	08-1280	—	08-1280	08-1280	08-1280	08-1280	08-1280	08-1280	08-1280	—	08-1280
MD50-08-7894	50-603468	300	Vapor	—	—	—	08-1650	—	—	—	—	—	—	—	08-1649	—
MD50-08-7895	50-603468	354	Vapor	—	—	—	08-1650	—	—	—	—	—	—	—	08-1649	—
MD50-08-7896	50-603468	403	Vapor	—	—	—	08-1650	—	—	—	—	—	—	—	08-1649	—
MD50-08-7897	50-603468	450	Vapor	—	—	—	08-1656	—	—	—	—	—	—	—	08-1655	—

Table C-3.2-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Anions	Gamma-Emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (total)
Borehole 50-24822																
MD50-08-7940	50-24822	300–302	Qbt 1g	09-374	09-374	09-374	—	09-374	09-374	09-374	09-374	09-374	09-374	09-374	—	09-374
MD50-08-7941	50-24822	350–352.5	Qbt 1g	09-389	09-389	09-389	—	09-389	09-389	09-389	09-389	09-389	09-389	09-389	—	09-389
MD50-08-7942	50-24822	400–402	Qbo	09-394	09-394	09-394	—	09-394	09-394	09-394	09-394	09-394	09-394	09-394	—	09-394
MD50-08-7943	50-24822	450–452.5	Qbo	09-404	09-404	09-404	—	09-404	09-404	09-404	09-404	09-404	09-404	09-404	—	09-404
MD50-08-7949	50-24822	351	Vapor	—	—	—	09-783	—	—	—	—	—	—	—	09-782	—
MD50-08-7948	50-24822	402	Vapor	—	—	—	09-778	—	—	—	—	—	—	—	09-777	—
MD50-08-7947	50-24822	450	Vapor	—	—	—	09-778	—	—	—	—	—	—	—	09-777	—
Borehole 50-603060																
MD50-08-8148	50-603060	48–50	Qbt 3	08-704	08-704	08-704	—	08-704	08-704	08-704	08-704	08-704	08-704	08-704	—	08-704
MD50-08-8149	50-603060	99–100	Qbt 3	08-710	08-710	08-710	—	08-710	08-710	08-710	08-710	08-710	08-710	08-710	—	08-710
MD50-08-8150	50-603060	149–150	Qbt 2	08-710	08-710	08-710	—	08-710	08-710	08-710	08-710	08-710	08-710	08-710	—	08-710
MD50-08-8151	50-603060	199–200	Qbt 1v	08-717	08-717	08-717	—	08-717	08-717	08-717	08-717	08-717	08-717	08-717	—	08-717
MD50-08-8152	50-603060	248.5–250	Qbt 1v	08-722	08-722	08-722	—	08-722	08-722	08-722	08-722	08-722	08-722	08-722	—	08-722
MD50-08-8153	50-603060	298.5–300	Qbt 1g	08-737	08-737	08-737	—	08-737	08-737	08-737	08-737	08-737	08-737	08-737	—	08-737
MD50-08-8154	50-603060	360–362	Qct	08-834	08-834	08-834	—	08-834	08-834	08-834	08-834	08-834	08-834	08-834	—	08-834
MD50-08-8156	50-603060	410–412.5	Qbo	08-848	08-848	08-848	—	08-848	08-848	08-848	08-848	08-848	08-848	08-848	—	08-848
MD50-08-8182	50-603060	450–451.5	Qbo	08-848	08-848	08-848	—	08-848	08-848	08-848	08-848	08-848	08-848	08-848	—	08-848
MD50-08-8161	50-603060	50	Vapor	—	—	—	08-770	—	—	—	—	—	—	—	08-769	—
MD50-08-8160	50-603060	100	Vapor	—	—	—	08-770	—	—	—	—	—	—	—	08-769	—
MD50-08-8159	50-603060	150	Vapor	—	—	—	08-764	—	—	—	—	—	—	—	08-765	—
MD50-08-8158	50-603060	200	Vapor	—	—	—	08-758	—	—	—	—	—	—	—	08-757	—
MD50-08-8157	50-603060	250	Vapor	—	—	—	08-758	—	—	—	—	—	—	—	08-757	—
MD50-08-8162	50-603503	347	Vapor	—	—	—	09-2	—	—	—	—	—	—	—	09-1	—
MD50-08-8163	50-603503	397	Vapor	—	—	—	09-2	—	—	—	—	—	—	—	09-1	—
MD50-08-8164	50-603503	450	Vapor	—	—	—	09-17	—	—	—	—	—	—	—	09-16	—
Borehole 50-603061																
MD50-08-8192	50-603061	8–10	Fill	08-645	08-645	08-645	—	08-645	08-645	08-645	08-645	08-645	08-645	08-645	—	08-645
MD50-08-8193	50-603061	24–25	Qbt 3	08-645	08-645	08-645	—	08-645	08-645	08-645	08-645	08-645	08-645	08-645	—	08-645
MD50-08-8194	50-603061	49–50	Qbt 3	08-645	08-645	08-645	—	08-645	08-645	08-645	08-645	08-645	08-645	08-645	—	08-645
MD50-08-8195	50-603061	97.5–100	Qbt 2	08-645	08-645	08-645	—	08-645	08-645	08-645	08-645	08-645	08-645	08-645	—	08-645
MD50-08-8196	50-603061	149–150	Qbt 2	08-662	08-662	08-662	—	08-662	08-662	08-662	08-662	08-662	08-662	08-662	—	08-662
MD50-08-8197	50-603061	198.5–200	Qbt 1v	08-670	08-670	08-670	—	08-670	08-670	08-670	08-670	08-670	08-670	08-670	—	08-670
MD50-08-8198	50-603061	249–250	Qbt 1g	08-670	08-670	08-670	—	08-670	08-670	08-670	08-670	08-670	08-670	08-670	—	08-670
MD50-08-8199	50-603061	300–302	Qbt 1g	09-635	09-635	09-635	—	09-635	09-635	09-635	09-635	09-635	09-635	09-635	—	09-635

Table C-3.2-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Anions	Gamma-Emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (total)
MD50-08-8200	50-603061	350–352	Qct	09-635	09-635	09-635	—	09-635	09-635	09-635	09-635	09-635	09-635	09-635	—	09-635
MD50-08-8221	50-603061	400–402	Qbo	09-662	09-662	09-662	—	09-662	09-662	09-662	09-662	09-662	09-662	09-662	—	09-662
MD50-08-8222	50-603061	450–452	Qbo	09-680	09-680	09-680	—	09-680	09-680	09-680	09-680	09-680	09-680	09-680	—	09-680
MD50-08-8206	50-603061	13	Vapor	—	—	—	08-735	—	—	—	—	—	—	—	08-734	—
MD50-08-8205	50-603061	25	Vapor	—	—	—	08-726	—	—	—	—	—	—	—	08-725	—
MD50-08-8204	50-603061	50	Vapor	—	—	—	08-726	—	—	—	—	—	—	—	08-725	—
MD50-08-8203	50-603061	100	Vapor	—	—	—	08-724	—	—	—	—	—	—	—	08-723	—
MD50-08-8202	50-603061	150	Vapor	—	—	—	08-724	—	—	—	—	—	—	—	08-723	—
MD50-08-8201	50-603061	185	Vapor	—	—	—	08-715	—	—	—	—	—	—	—	08-714	—
MD50-08-8230	50-603061	228	Vapor	—	—	—	09-1010	—	—	—	—	—	—	—	09-988	—
MD50-08-8231	50-603061	274	Vapor	—	—	—	09-1010	—	—	—	—	—	—	—	09-988	—
MD50-08-8209	50-603061	347	Vapor	—	—	—	09-902	—	—	—	—	—	—	—	09-901	—
MD50-08-8208	50-603061	397	Vapor	—	—	—	09-902	—	—	—	—	—	—	—	09-901	—
MD50-08-8207	50-603061	450	Vapor	—	—	—	09-872	—	—	—	—	—	—	—	09-871	—
Borehole 50-603062																
MD50-08-8238	50-603062	48.5–50	Qbt 3	08-759	08-759	08-759	—	08-759	08-759	08-759	08-759	08-759	08-759	08-759	—	08-759
MD50-08-8239	50-603062	98.5–100	Qbt 2	08-771	08-771	08-771	—	08-771	08-771	08-771	08-771	08-771	08-771	08-771	—	08-771
MD50-08-8240	50-603062	148.5–150	Qbt 2	08-771	08-771	08-771	—	08-771	08-771	08-771	08-771	08-771	08-771	08-771	—	08-771
MD50-08-8241	50-603062	198.5–200	Qbt 1v	08-780	08-780	08-780	—	08-780	08-780	08-780	08-780	08-780	08-780	08-780	—	08-780
MD50-08-8242	50-603062	248.5–250	Qbt 1g	08-785	08-785	08-785	—	08-785	08-785	08-785	08-785	08-785	08-785	08-785	—	08-785
MD50-08-8243	50-603062	298.5–300	Qbt 1g	08-798	08-798	08-798	—	08-798	08-798	08-798	08-798	08-798	08-798	08-798	—	08-798
MD50-08-8244	50-603062	350–352	Qct	09-239	09-239	09-239	—	09-239	09-239	09-239	09-239	09-239	09-239	09-239	—	09-239
MD50-08-8245	50-603062	400–402	Qbo	09-247	09-247	09-247	—	09-247	09-247	09-247	09-247	09-247	09-247	09-247	—	09-247
MD50-08-8246	50-603062	450–452	Qbo	09-321	09-321	09-321	—	09-321	09-321	09-321	09-321	09-321	09-321	09-321	—	09-321
MD50-08-8251	50-603062	50	Vapor	—	—	—	08-871	—	—	—	—	—	—	—	08-839	—
MD50-08-8250	50-603062	100	Vapor	—	—	—	08-829	—	—	—	—	—	—	—	08-828	—
MD50-08-8249	50-603062	150	Vapor	—	—	—	08-829	—	—	—	—	—	—	—	08-828	—
MD50-08-8248	50-603062	200	Vapor	—	—	—	08-815	—	—	—	—	—	—	—	08-814	—
MD50-08-8247	50-603062	250	Vapor	—	—	—	08-815	—	—	—	—	—	—	—	08-814	—
MD50-08-8252	50-603062	337	Vapor	—	—	—	09-665	—	—	—	—	—	—	—	09-666	—
MD50-08-8253	50-603062	387	Vapor	—	—	—	09-700	—	—	—	—	—	—	—	09-699	—
MD50-08-8254	50-603062	450	Vapor	—	—	—	09-700	—	—	—	—	—	—	—	09-699	—

Table C-3.2-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Anions	Gamma-Emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (total)
Borehole 50-603064																
MD50-08-8328	50-603064	8.5–10	Qbt 3	08-835	08-835	08-835	—	08-835	08-835	08-835	08-835	08-835	08-835	08-835	—	08-835
MD50-08-8329	50-603064	23–25	Qbt 3	08-835	08-835	08-835	—	08-835	08-835	08-835	08-835	08-835	08-835	08-835	—	08-835
MD50-08-8330	50-603064	48.5–50	Qbt 3	08-835	08-835	08-835	—	08-835	08-835	08-835	08-835	08-835	08-835	08-835	—	08-835
MD50-08-8331	50-603064	98.5–100	Qbt 2	08-852	08-852	08-852	—	08-852	08-852	08-852	08-852	08-852	08-852	08-852	—	08-852
MD50-08-8332	50-603064	148.5–150	Qbt 1v	08-852	08-852	08-852	—	08-852	08-852	08-852	08-852	08-852	08-852	08-852	—	08-852
MD50-08-8333	50-603064	198.5–200	Qbt 1v	08-867	08-867	08-867	—	08-867	08-867	08-867	08-867	08-867	08-867	08-867	—	08-867
MD50-08-8334	50-603064	247.5–250	Qbt 1g	08-868	08-868	08-868	—	08-868	08-868	08-868	08-868	08-868	08-868	08-868	—	08-868
MD50-08-8335	50-603064	298.5–300	Qbt 1g	08-870	08-870	08-870	—	08-870	08-870	08-870	08-870	08-870	08-870	08-870	—	08-870
MD50-08-8336	50-603064	350–351.5	Qct	09-63	09-63	09-63	—	09-63	09-63	09-63	09-63	09-63	09-63	09-63	—	09-63
MD50-08-8357	50-603064	400–401.5	Qbo	09-65	09-65	09-65	—	09-65	09-65	09-65	09-65	09-65	09-65	09-65	—	09-65
MD50-08-8358	50-603064	450–451.5	Qbo	09-66	09-66	09-66	—	09-66	09-66	09-66	09-66	09-66	09-66	09-66	—	09-66
MD50-08-8359	50-603064	500–502	Qbo	09-184	09-184	09-184	—	09-184	09-184	09-184	09-184	09-184	09-184	09-184	—	09-184
MD50-08-8343	50-603064	25	Vapor	—	—	—	09-733	—	—	—	—	—	—	—	09-732	—
MD50-08-8342	50-603064	66	Vapor	—	—	—	09-663	—	—	—	—	—	—	—	09-664	—
MD50-08-8344	50-603064	113	Vapor	—	—	—	09-733	—	—	—	—	—	—	—	09-732	—
MD50-08-8345	50-603064	176	Vapor	—	—	—	09-720	—	—	—	—	—	—	—	09-719	—
MD50-08-8338	50-603064	200	Vapor	—	—	—	08-1043	—	—	—	—	—	—	—	08-1042	—
MD50-08-8337	50-603064	250	Vapor	—	—	—	08-1038	—	—	—	—	—	—	—	08-1037	—
MD50-08-8341	50-603064	332	Vapor	—	—	—	09-634	—	—	—	—	—	—	—	09-633	—
MD50-08-8340	50-603064	400	Vapor	—	—	—	09-634	—	—	—	—	—	—	—	09-633	—
MD50-08-8339	50-603064	500	Vapor	—	—	—	09-601	—	—	—	—	—	—	—	09-600	—
Boreholes 50-24771 and 50-603471																
MD50-08-7616	50-24771	198–200	Qbt 1v	08-1072	08-1072	08-1072	—	08-1072	08-1072	08-1072	08-1072	08-1072	08-1072	08-1072	—	08-1072
MD50-08-7617	50-24771	248.5–250	Qbt 1g	08-1072	08-1072	08-1072	—	08-1072	08-1072	08-1072	08-1072	08-1072	08-1072	08-1072	—	08-1072
MD50-08-7618	50-24771	297.5–300	Qbt 1g	08-1089	08-1089	08-1089	—	08-1089	08-1089	08-1089	08-1089	08-1089	08-1089	08-1089	—	08-1089
MD50-08-7620	50-603471	350–351.5	Qct	08-1465	08-1465	08-1465	—	08-1465	08-1465	08-1465	08-1465	08-1465	08-1465	08-1465	—	08-1465
MD50-08-7619	50-603471	400–402	Qbo	08-1489	08-1489	08-1489	—	08-1489	08-1489	08-1489	08-1489	08-1489	08-1489	08-1489	—	08-1489
MD50-08-7621	50-603471	450–452	Qbo	08-1490	08-1490	08-1490	—	08-1490	08-1490	08-1490	08-1490	08-1490	08-1490	08-1490	—	08-1490
MD50-08-7626	50-24771	200	Vapor	—	—	—	08-1100	—	—	—	—	—	—	—	08-1099	—
MD50-08-7627	50-24771	250	Vapor	—	—	—	08-1100	—	—	—	—	—	—	—	08-1099	—
MD50-08-7625	50-24771	300	Vapor	—	—	—	08-1095	—	—	—	—	—	—	—	08-1088	—
MD50-08-7628	50-603471	360	Vapor	—	—	—	08-1615	—	—	—	—	—	—	—	08-1616	—
MD50-08-7629	50-603471	410	Vapor	—	—	—	08-1615	—	—	—	—	—	—	—	08-1616	—
MD50-08-7630	50-603471	450	Vapor	—	—	—	08-1615	—	—	—	—	—	—	—	08-1616	—

Table C-3.2-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Anions	Gamma-Emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (total)
MD50-09-3534	50-603471	450	Vapor	—	—	—	09-814	—	—	—	—	—	—	—	09-813	—
Boreholes 50-24817 and 50-603383																
MD50-08-7739	50-24817	300–302.5	Qbt 1g	08-978	08-978	08-978	—	08-978	08-978	08-978	08-978	08-978	08-978	08-978	—	08-978
MD50-08-7743	50-24817	350–352	Qct	08-992	08-992	08-992	—	08-992	08-992	08-992	08-992	08-992	08-992	08-992	—	08-992
D50-08-7742	50-24817	400–402	Qbo	08-996	08-996	08-996	—	08-996	08-996	08-996	08-996	08-996	08-996	08-996	—	08-996
MD50-08-7741	50-24817	450–452.5	Qbo	08-996	08-996	08-996	—	08-996	08-996	08-996	08-996	08-996	08-996	08-996	—	08-996
MD50-08-14863	50-603383	286	Vapor	—	—	—	08-1903	—	—	—	—	—	—	—	08-1902	—
MD50-08-14864	50-603383	359	Vapor	—	—	—	08-1942	—	—	—	—	—	—	—	08-1941	—
MD50-08-14865	50-603383	408	Vapor	—	—	—	08-1965	—	—	—	—	—	—	—	08-1966	—
MD50-08-14866	50-603383	450	Vapor	—	—	—	08-1992	—	—	—	—	—	—	—	08-1991	—
Boreholes 50-24820 and 50-603467																
MD50-08-7829	50-24820	300–303	Qbt 1g	08-644	08-644	08-644	—	08-644	08-644	08-644	08-644	08-644	08-644	08-644	—	08-644
MD50-08-7830	50-24820	350–351.5	Qct	08-644	08-644	08-644	—	08-644	08-644	08-644	08-644	08-644	08-644	08-644	—	08-644
MD50-08-7831	50-24820	400–401.5	Qbo	08-644	08-644	08-644	—	08-644	08-644	08-644	08-644	08-644	08-644	08-644	—	08-644
MD50-08-7832	50-24820	450–452	Qbo	08-671	08-671	08-671	—	08-671	08-671	08-671	08-671	08-671	08-671	08-671	—	08-671
MD50-08-7833	50-24820	500–502.5	Qbo	08-718	08-718	08-718	—	08-718	08-718	08-718	08-718	08-718	08-718	08-718	—	08-718
MD50-08-7834	50-24820	550–552.5	Qbo	08-736	08-736	08-736	—	08-736	08-736	08-736	08-736	08-736	08-736	08-736	—	08-736
MD50-08-7828	50-24820	600–602.5	Qbo	08-781	08-781	08-781	—	08-781	08-781	08-781	08-781	08-781	08-781	08-781	—	08-781
MD50-08-14858	50-603467	287	Vapor	—	—	—	08-1734	—	—	—	—	—	—	—	08-1733	—
MD50-08-14860	50-603467	360	Vapor	—	—	—	08-1786	—	—	—	—	—	—	—	08-1769	—
MD50-08-14859	50-603467	409	Vapor	—	—	—	08-1753	—	—	—	—	—	—	—	08-1754	—
MD50-08-14857	50-603467	500	Vapor	—	—	—	08-1740	—	—	—	—	—	—	—	08-1723	—
MD50-08-14856	50-603467	600	Vapor	—	—	—	08-1679	—	—	—	—	—	—	—	08-1678	—
Borehole 50-603063																
MD50-08-8282	50-603063	8–10	Qbt 3	08-606	08-606	08-606	—	08-606	08-606	08-606	08-606	08-606	08-606	08-606	—	08-606
MD50-08-8283	50-603063	23.5–25	Qbt 3	08-606	08-606	08-606	—	08-606	08-606	08-606	08-606	08-606	08-606	08-606	—	08-606
MD50-08-8284	50-603063	48.5–50	Qbt 3	08-606	08-606	08-606	—	08-606	08-606	08-606	08-606	08-606	08-606	08-606	—	08-606
MD50-08-8285	50-603063	97.5–99	Qbt 3	08-607	08-607	08-607	—	08-607	08-607	08-607	08-607	08-607	08-607	08-607	—	08-607
MD50-08-8286	50-603063	148–150	Qbt 2	08-622	08-622	08-622	—	08-622	08-622	08-622	08-622	08-622	08-622	08-622	—	08-622
MD50-08-8287	50-603063	198–200	Qbt 1v	08-622	08-622	08-622	—	08-622	08-622	08-622	08-622	08-622	08-622	08-622	—	08-622
MD50-08-8288	50-603063	248–250	Qbt 1g	08-629	08-629	08-629	—	08-629	08-629	08-629	08-629	08-629	08-629	08-629	—	08-629
MD50-08-8311	50-603063	300–302.5	Qbt 1g	08-799	08-799	08-799	—	08-799	08-799	08-799	08-799	08-799	08-799	08-799	—	08-799
MD50-08-8290	50-603063	400–402.5	Qbo	08-821	08-821	08-821	—	08-821	08-821	08-821	08-821	08-821	08-821	08-821	—	08-821
MD50-08-8312	50-603063	450–452	Qbo	08-851	08-851	08-851	—	08-851	08-851	08-851	08-851	08-851	08-851	08-851	—	08-851
MD50-08-8296	50-603063	10	Vapor	—	—	—	08-716	—	—	—	—	—	—	—	08-713	—

Table C-3.2-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Anions	Gamma-Emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (total)
MD50-08-8295	50-603063	25	Vapor	—	—	—	08-708	—	—	—	—	—	—	—	08-709	—
MD50-08-8294	50-603063	50	Vapor	—	—	—	08-708	—	—	—	—	—	—	—	08-709	—
MD50-08-8291	50-603063	99	Vapor	—	—	—	08-702	—	—	—	—	—	—	—	08-703	—
MD50-08-8292	50-603063	150	Vapor	—	—	—	08-702	—	—	—	—	—	—	—	08-703	—
MD50-08-8293	50-603063	200	Vapor	—	—	—	08-708	—	—	—	—	—	—	—	08-709	—
MD50-09-1668	50-603063	347	Vapor	—	—	—	09-793	—	—	—	—	—	—	—	09-792	—
MD50-09-1667	50-603063	397	Vapor	—	—	—	09-793	—	—	—	—	—	—	—	09-792	—
MD50-09-1666	50-603063	450	Vapor	—	—	—	09-793	—	—	—	—	—	—	—	09-792	—

Note: Numbers in analyte columns are request numbers.

* — = Analysis not requested.

Table C-3.2-3
Inorganic Chemicals above BVs in Tuff at MDA C during Phase II Investigation

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Cyanide (total)	Iron	Lead	Magnesium	Manganese	Nickel	Nitrate	Perchlorate	Potassium	Selenium	Silver	Sodium	Vanadium	Zinc
Soil BV[a]				**29,200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**0.5**	**21,500**	**22.3**	**4610**	**671**	**15.4**	**na[b]**	**na**	**3460**	**1.52**	**1**	**915**	**39.6**	**48.8**
Qbt 2,3 BV[a]				**7340**	**0.5**	**2.79**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**0.5**	**14,500**	**11.2**	**1690**	**482**	**6.58**	**na**	**na**	**3500**	**0.3**	**1**	**2770**	**17**	**63.5**
Qbt 1v BV[a]				**8170**	**0.5**	**1.81**	**26.5**	**1.7**	**0.4**	**3700**	**2.24**	**1.78**	**3.26**	**0.5**	**9900**	**18.4**	**780**	**408**	**2**	**na**	**na**	**6670**	**0.3**	**1**	**6330**	**4.48**	**84.6**
Qbt 1g, Qct, Qbo BV[a]				**3560**	**0.5**	**0.56**	**25.7**	**1.44**	**0.4**	**1900**	**2.6**	**8.89**	**3.96**	**0.5**	**3700**	**13.5**	**739**	**189**	**2**	**na**	**na**	**2390**	**0.3**	**1**	**4350**	**4.59**	**40**
Qbt Tvt 2 BV				**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
Industrial SSL[c]				**1,130,000**	**454**	**17.7**	**223,000**	**2260**	**897**	**na**	**1,700,000[d]**	**300[e]**	**45400**	**681**	**795,000**	**800**	**na**	**26,700**	**22,500**	**1,820,000**	**795**	**na**	**5680**	**5680**	**na**	**5680**	**341,000**
Residential SSL[c]				**78,000**	**31.3**	**3.9**	**15,600**	**156**	**70.3**	**na**	**117,000[d]**	**23[e]**	**3130**	**46.9**	**54,800**	**400**	**na**	**1860**	**1560**	**125,000**	**54.8**	**na**	**391**	**391**	**na**	**391**	**23,500**
Boreholes 50-24769 and 50-603470																											
MD50-08-7442	50-24769	198–200	Qbt 1v	—[f]	—	—	—	—	0.494 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—	5.26	—	—	—	—
MD50-08-7443	50-24769	248–250	Qbt 1g	—	—	1.18 (J)	42.2	—	0.526 (U)	—	—	—	—	—	6550	—	—	233	—	—	—	—	4.6	—	—	—	—
MD50-08-7444	50-24769	298–300	Qbt 1g	—	—	0.649 (J)	—	—	0.526 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—	1.39 (J)	—	—	—	—
MD50-08-7445	50-603470	360–362	Qct	—	—	15.7 (U)	—	—	0.523 (U)	—	7.79	—	—	—	4970	—	—	—	2.41	—	—	—	1.57 (U)	—	—	5.64 (J)	—
MD50-08-7446	50-603470	400–402	Qbo	—	—	1.58 (U)	—	—	0.527 (U)	—	6.37 (J)	—	—	—	4850	—	—	—	—	—	—	—	1.38 (U)	—	—	—	—
MD50-08-7447	50-603470	450–452.5	Qbo	—	—	1.61 (U)	—	—	0.535 (U)	—	6.34	—	—	—	4780	—	—	—	—	—	—	—	1.61 (U)	—	—	—	—
MD50-08-7448	50-603470	500–502	Qbo	—	—	7.91 (U)	26.2	—	0.527 (U)	—	3.59	—	—	—	3720	—	763 (J+)	—	2.01	0.715 (J)	—	—	1.58 (U)	—	—	—	—

Table C-3.2-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Cyanide (total)	Iron	Lead	Magnesium	Manganese	Nickel	Nitrate	Perchlorate	Potassium	Selenium	Silver	Sodium	Vanadium	Zinc
Soil BV[a]				**29,200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**0.5**	**21,500**	**22.3**	**4610**	**671**	**15.4**	**na[b]**	**na**	**3460**	**1.52**	**1**	**915**	**39.6**	**48.8**
Qbt 2,3 BV[a]				**7340**	**0.5**	**2.79**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**0.5**	**14,500**	**11.2**	**1690**	**482**	**6.58**	**na**	**na**	**3500**	**0.3**	**1**	**2770**	**17**	**63.5**
Qbt 1v BV[a]				**8170**	**0.5**	**1.81**	**26.5**	**1.7**	**0.4**	**3700**	**2.24**	**1.78**	**3.26**	**0.5**	**9900**	**18.4**	**780**	**408**	**2**	**na**	**na**	**6670**	**0.3**	**1**	**6330**	**4.48**	**84.6**
Qbt 1g, Qct, Qbo BV[a]				**3560**	**0.5**	**0.56**	**25.7**	**1.44**	**0.4**	**1900**	**2.6**	**8.89**	**3.96**	**0.5**	**3700**	**13.5**	**739**	**189**	**2**	**na**	**na**	**2390**	**0.3**	**1**	**4350**	**4.59**	**40**
Qbt Tvt 2 BV				**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
Industrial SSL[c]				**1,130,000**	**454**	**17.7**	**223,000**	**2260**	**897**	**na**	**1,700,000[d]**	**300[e]**	**45400**	**681**	**795,000**	**800**	**na**	**26,700**	**22,500**	**1,820,000**	**795**	**na**	**5680**	**5680**	**na**	**5680**	**341,000**
Residential SSL[c]				**78,000**	**31.3**	**3.9**	**15,600**	**156**	**70.3**	**na**	**117,000[d]**	**23[e]**	**3130**	**46.9**	**54,800**	**400**	**na**	**1860**	**1560**	**125,000**	**54.8**	**na**	**391**	**391**	**na**	**391**	**23,500**
MD50-08-7449	50-603470	550.5–552.5	Qbo	—	—	8.15 (U)	—	—	0.543 (U)	—	6.78	—	5.5	—	5310	—	1330 (J+)	—	3.67	—	—	—	1.63 (U)	—	—	8.12	—
MD50-08-7450	50-603470	600–602	Qbo	—	—	7.99 (U)	—	—	0.533 (U)	—	2.82	—	—	—	—	—	—	—	—	—	—	—	1.6 (U)	—	—	—	—
MD50-08-7441	50-603470	650–653	Tvt 2	17,200	—	12.6	151 (J)	0.749	0.333 (J)	22,000	25.4	9.13	14.7	—	19,300	7.46	6590 (J)	366 (J)	40.2	—	—	4250	3.69	0.124 (J-)	331	28.8	34.8
Boreholes 50-24771 and 50-603471																											
MD50-08-7616	50-24771	198–200	Qbt 1v	—	—	—	—	—	0.498 (U)	—	5.45 (J)	—	—	—	—	—	—	—	—	—	—	—	1.27 (J)	—	—	—	—
MD50-08-7617	50-24771	248.5–250	Qbt 1g	—	—	1.58 (J)	30.1	—	0.532 (U)	—	—	—	—	—	5580	—	—	340	—	0.912 (J)	—	—	1.6 (U)	—	—	—	—
MD50-08-7618	50-24771	297.5–300	Qbt 1g	—	—	1.63 (U)	—	—	0.543 (U)	—	3.19	—	—	—	4040	53.4	—	290	—	—	—	—	2.99	—	—	9.5 (J)	—
MD50-08-7620	50-603471	350–351.5	Qct	—	—	1.67 (U)	—	—	0.557 (U)	—	5.99	—	—	—	—	—	—	—	—	0.955 (J)	—	—	0.561 (J)	—	—	—	—
MD50-08-7619	50-603471	400–402	Qbo	—	—	1.61 (U)	—	—	0.535 (U)	—	3.18	—	—	—	4330	—	—	—	—	0.836 (J)	—	—	0.608 (J)	—	—	—	—
MD50-08-7621	50-603471	450–452	Qbo	—	—	1.64 (U)	—	—	0.548 (U)	—	5.92	—	—	—	4320	—	—	—	—	0.837 (J)	—	—	0.952 (J)	—	—	—	—
Boreholes 50-24783 and 50-603472																											
MD50-08-7646	50-24783	198–200	Qbt 1v	—	—	—	—	—	0.492 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—	1.99 (U)	—	—	—	—
MD50-08-7647	50-24783	248.5–250	Qbt 1v	—	—	—	33	—	0.527 (U)	—	—	—	—	—	—	—	—	—	—	0.975 (J)	0.00073 (J)	—	3.55	—	—	—	—
MD50-08-7648	50-24783	298.5–300	Qbt 1g	—	—	1.65 (U)	—	—	0.551 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—	1.65 (U)	—	—	—	—
MD50-08-7649	50-603472	350–354	Qct	—	—	0.66 (J)	37.5	—	—	—	3.9	—	—	0.54 (UJ)	—	—	1210 (J)	195	4.2	—	—	—	0.54 (U)	—	—	4.9 (J)	—
MD50-08-7650	50-603472	400–402.5	Qbo	—	0.54 (U)	—	—	—	—	—	6	—	—	0.54 (UJ)	—	—	—	—	2.6	—	—	—	0.54 (U)	—	—	—	—
MD50-08-7651	50-603472	450–452	Qbo	—	—	8.09 (U)	33.5	—	0.539 (U)	—	11.1	—	4.23	—	5750	—	869 (J+)	—	2.36	—	—	—	1.62 (U)	—	—	6.24	—
Borehole 50-24784																											
MD50-08-7676	50-24784	350–352	Qct	—	—	0.57 (J)	27.9	—	—	—	4.2 (J)	—	—	—	—	—	—	—	4.5	—	—	—	0.55 (U)	—	—	—	—
MD50-08-7677	50-24784	400–402	Qbo	—	0.55 (U)	1.1 (U)	29.9	—	—	—	4.2 (J)	—	—	—	—	—	1310	—	2.2	—	—	—	0.55 (U)	—	—	4.8	—
MD50-08-7678	50-24784	450–452	Qbo	—	0.54 (U)	—	33.6	—	—	—	10.2	—	—	—	—	—	—	—	5.3	0.12 (J)	—	—	0.54 (U)	—	—	—	—
Borehole 50-24813																											
MD50-08-7706	50-24813	198.5–200	Qbt 1v	—	—	2.71	—	—	0.52 (U)	—	—	—	—	—	—	—	—	—	—	1.11	0.00123 (J+)	—	0.533 (U)	—	—	—	—
MD50-08-7707	50-24813	248.5–250	Qbt 1v	—	—	2.07	55.5 (J)	—	0.556 (U)	—	—	—	—	—	—	—	—	—	—	1.69 (J-)	0.000576 (J+)	—	0.895 (J)	—	—	—	—
MD50-08-7708	50-24813	298–300	Qbt 1g	—	—	1.62 (U)	—	—	0.539 (U)	—	—	—	—	—	—	—	—	—	—	1.04 (J-)	—	—	1.62 (U)	—	—	—	—
MD50-08-7709	50-24813	350–352	Qct	—	1.11 (U)	—	27.8	—	0.553 (U)	—	4.94	—	—	—	—	—	741 (J+)	—	2.73	0.667 (J)	—	—	1.08 (U)	—	—	4.83	—
MD50-08-7710	50-24813	400–402	Qbo	—	1.02 (UJ)	1.05 (U)	—	—	0.509 (U)	—	4	—	—	—	—	—	—	—	—	—	—	—	1.05 (U)	—	—	—	—
MD50-08-7711	50-24813	450–452	Qbo	—	1.06 (U)	1.07 (U)	—	—	0.531 (U)	—	5.04	—	—	—	4530	—	—	—	—	—	—	—	1.07 (U)	—	—	—	—
MD50-08-7712	50-24813	500–502	Qbo	—	1.02 (U)	1.07 (U)	—	—	0.512 (U)	—	4.01	—	—	—	—	—	—	—	—	—	—	—	1.07 (U)	—	—	—	—
MD50-08-7713	50-24813	550–552	Qbo	—	1.06 (U)	1.07 (U)	—	—	0.53 (U)	—	5.5	—	—	—	4870	—	1400	—	2.84	—	—	—	1.07 (U)	—	—	5.95	—
MD50-08-7714	50-24813	600–602	Qbo	—	1.07 (U)	1.09 (U)	—	—	0.534 (U)	—	3.29	—	—	—	—	—	—	—	—	—	0.000683 (J)	—	1.09 (U)	—	—	—	—

Table C-3.2-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Cyanide (total)	Iron	Lead	Magnesium	Manganese	Nickel	Nitrate	Perchlorate	Potassium	Selenium	Silver	Sodium	Vanadium	Zinc
Soil BV[a]				**29,200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**0.5**	**21,500**	**22.3**	**4610**	**671**	**15.4**	**na[b]**	**na**	**3460**	**1.52**	**1**	**915**	**39.6**	**48.8**
Qbt 2,3 BV[a]				**7340**	**0.5**	**2.79**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**0.5**	**14,500**	**11.2**	**1690**	**482**	**6.58**	**na**	**na**	**3500**	**0.3**	**1**	**2770**	**17**	**63.5**
Qbt 1v BV[a]				**8170**	**0.5**	**1.81**	**26.5**	**1.7**	**0.4**	**3700**	**2.24**	**1.78**	**3.26**	**0.5**	**9900**	**18.4**	**780**	**408**	**2**	**na**	**na**	**6670**	**0.3**	**1**	**6330**	**4.48**	**84.6**
Qbt 1g, Qct, Qbo BV[a]				**3560**	**0.5**	**0.56**	**25.7**	**1.44**	**0.4**	**1900**	**2.6**	**8.89**	**3.96**	**0.5**	**3700**	**13.5**	**739**	**189**	**2**	**na**	**na**	**2390**	**0.3**	**1**	**4350**	**4.59**	**40**
Qbt Tvt 2 BV				**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
Industrial SSL[c]				**1,130,000**	**454**	**17.7**	**223,000**	**2260**	**897**	**na**	**1,700,000[d]**	**300[e]**	**45400**	**681**	**795,000**	**800**	**na**	**26,700**	**22,500**	**1,820,000**	**795**	**na**	**5680**	**5680**	**na**	**5680**	**341,000**
Residential SSL[c]				**78,000**	**31.3**	**3.9**	**15,600**	**156**	**70.3**	**na**	**117,000[d]**	**23[e]**	**3130**	**46.9**	**54,800**	**400**	**na**	**1860**	**1560**	**125,000**	**54.8**	**na**	**391**	**391**	**na**	**391**	**23,500**
Borehole 50-24817																											
MD50-08-7739	50-24817	300–302.5	Qbt 1g	—	—	0.786 (J)	—	—	0.534 (U)	—	—	—	—	—	—	—	—	—	—	1.18	—	—	1.6 (U)	—	—	—	—
MD50-08-7743	50-24817	350–352	Qct	6340 (J+)	—	3.04	93.8	—	0.591 (U)	2890 (J+)	7.4	—	7.95	—	7910	—	1930 (J+)	269 (J+)	6.85	1.4	—	—	1.77 (U)	—	—	11.7	—
MD50-08-7742	50-24817	400–402	Qbo	—	—	—	—	—	0.544 (U)	—	3.81	—	—	—	4240	—	—	—	—	—	—	—	1.63 (U)	—	—	—	—
MD50-08-7741	50-24817	450–452.5	Qbo	—	—	0.596 (J)	—	—	0.53 (U)	—	5.4	—	—	—	4680	—	—	—	—	—	—	—	0.683 (J)	—	—	—	—
Borehole 50-24820																											
MD50-08-7829	50-24820	300–303	Qbt 1g	—	—	1.56 (U)	—	—	0.52 (U)	—	16.6 (U)	—	—	—	—	22.1	—	—	—	—	—	—	0.707 (J)	—	—	—	—
MD50-08-7830	50-24820	350–351.5	Qct	5270 (J+)	—	1.63 (U)	57.2	—	0.543 (U)	2300	5.24 (J)	—	6.13	—	7260	—	1440	256	5.15	—	—	—	2.72	—	—	9.58	—
MD50-08-7831	50-24820	400–401.5	Qbo	—	—	1.56 (U)	—	—	0.52 (U)	—	2.93 (J)	—	—	—	6430	—	—	—	—	—	—	—	2.01	—	—	6.99	—
MD50-08-7832	50-24820	450–452	Qbo	—	—	1.6 (U)	—	—	0.534 (U)	—	—	—	—	—	4560	—	—	—	—	—	—	—	1.6 (U)	—	—	—	—
MD50-08-7833	50-24820	500–502.5	Qbo	—	—	1.62 (U)	—	—	0.54 (U)	—	9.48	—	—	—	3840	—	—	—	2.72 (J)	—	—	—	1.28 (J)	—	—	—	—
MD50-08-7834	50-24820	550–552.5	Qbo	—	—	1.62 (U)	34.2	—	0.538 (U)	2640 (J)	6.12 (J)	—	4.7	—	5320	—	1420 (J+)	—	4.53 (J+)	—	—	—	1.08 (J)	—	—	7.44	—
MD50-08-7828	50-24820	600–602.5	Qbo	—	—	1.61 (U)	—	—	0.538 (U)	—	3.71	—	—	—	—	—	—	—	—	—	—	—	1.61 (U)	—	—	—	—
Borehole 50-603468																											
MD50-08-7888	50-603468	300–301.5	Qbt 1g	—	—	0.674 (J)	—	—	0.541 (U)	—	2.69	—	—	—	—	48.8 (J-)	—	—	—	—	—	—	1.23 (J)	—	—	—	68.7 (J-)
MD50-08-7889	50-603468	350–351	Qct	—	—	1.52 (J)	—	—	0.52 (U)	—	5.78	—	—	—	4660 (J)	—	—	—	2.64	—	—	—	2.46	—	—	5.38	—
MD50-08-7890	50-603468	400–401.5	Qbo	—	—	1.56 (U)	—	—	0.519 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—	1.56 (U)	—	—	—	—
MD50-08-7891	50-603468	450–451.5	Qbo	—	—	1.11 (J)	29.5	—	0.541 (U)	—	7.57 (J-)	—	—	—	4930	—	—	—	—	—	—	—	1.94	—	—	—	—
Borehole 50-24822																											
MD50-08-7940	50-24822	300–302	Qbt 1g	—	1.08 (U)	0.818 (J)	—	—	0.54 (U)	—	—	—	—	—	—	—	—	—	—	1.1 (J-)	—	—	1.07 (U)	—	—	—	—
MD50-08-7941	50-24822	350–352.5	Qbt 1g	—	—	1.11 (J)	—	—	0.546 (U)	—	3.43	—	—	—	—	—	—	—	—	1.15 (J-)	—	—	1.11 (U)	—	—	—	—
MD50-08-7942	50-24822	400–402	Qbo	—	0.676 (U)	1.43 (J)	—	—	0.519 (U)	—	6.36 (J)	—	—	—	4280	—	—	—	—	—	—	—	1.04 (U)	—	—	—	—
MD50-08-7943	50-24822	450–452.5	Qbo	—	—	1.72	—	—	0.534 (U)	—	7.01	—	—	—	4330	—	—	—	2.05 (J)	—	—	—	1.09 (UJ)	—	—	—	—
Borehole 50-603060																											
MD50-08-8148	50-603060	48–50	Qbt 3	—	2 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3.03	—	—	—	—
MD50-08-8149	50-603060	99–100	Qbt 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.989 (J)	—	—	—	—
MD50-08-8150	50-603060	149–150	Qbt 2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.51	—	—	—	—
MD50-08-8151	50-603060	199–200	Qbt 1v	—	—	—	—	—	0.494 (U)	—	6.92	—	—	—	—	—	—	—	—	—	0.000704 (J)	—	1.05 (J)	—	—	—	—
MD50-08-8152	50-603060	248.5–250	Qbt 1v	—	—	—	—	—	0.583 (U)	—	3.09	—	—	—	—	—	—	—	—	—	—	—	1.71 (J)	—	—	—	—
MD50-08-8153	50-603060	298.5–300	Qbt 1g	—	—	1.63 (U)	—	—	0.543 (U)	—	2.69 (J)	—	—	—	—	—	—	—	—	—	—	—	0.641 (J)	—	—	—	—
MD50-08-8154	50-603060	360–362	Qct	—	—	1.57 (U)	28.8	—	0.523 (U)	—	3.88	—	—	—	—	—	—	199	—	—	—	—	1.57 (U)	—	—	4.6	—

Table C-3.2-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Cyanide (total)	Iron	Lead	Magnesium	Manganese	Nickel	Nitrate	Perchlorate	Potassium	Selenium	Silver	Sodium	Vanadium	Zinc
Soil BV[a]				**29,200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**0.5**	**21,500**	**22.3**	**4610**	**671**	**15.4**	**na[b]**	**na**	**3460**	**1.52**	**1**	**915**	**39.6**	**48.8**
Qbt 2,3 BV[a]				**7340**	**0.5**	**2.79**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**0.5**	**14,500**	**11.2**	**1690**	**482**	**6.58**	**na**	**na**	**3500**	**0.3**	**1**	**2770**	**17**	**63.5**
Qbt 1v BV[a]				**8170**	**0.5**	**1.81**	**26.5**	**1.7**	**0.4**	**3700**	**2.24**	**1.78**	**3.26**	**0.5**	**9900**	**18.4**	**780**	**408**	**2**	**na**	**na**	**6670**	**0.3**	**1**	**6330**	**4.48**	**84.6**
Qbt 1g, Qct, Qbo BV[a]				**3560**	**0.5**	**0.56**	**25.7**	**1.44**	**0.4**	**1900**	**2.6**	**8.89**	**3.96**	**0.5**	**3700**	**13.5**	**739**	**189**	**2**	**na**	**na**	**2390**	**0.3**	**1**	**4350**	**4.59**	**40**
Qbt Tvt 2 BV				**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
Industrial SSL[c]				**1,130,000**	**454**	**17.7**	**223,000**	**2260**	**897**	**na**	**1,700,000[d]**	**300[e]**	**45400**	**681**	**795,000**	**800**	**na**	**26,700**	**22,500**	**1,820,000**	**795**	**na**	**5680**	**5680**	**na**	**5680**	**341,000**
Residential SSL[c]				**78,000**	**31.3**	**3.9**	**15,600**	**156**	**70.3**	**na**	**117,000[d]**	**23[e]**	**3130**	**46.9**	**54,800**	**400**	**na**	**1860**	**1560**	**125,000**	**54.8**	**na**	**391**	**391**	**na**	**391**	**23,500**
MD50-08-8156	50-603060	410–412.5	Qbo	—	—	1.54 (U)	—	—	0.514 (U)	—	3.24 (J)	—	—	—	4050	—	—	—	—	—	—	—	0.593 (J)	—	—	—	—
MD50-08-8182	50-603060	450–451.5	Qbo	—	—	1.58 (U)	—	—	0.527 (U)	—	2.71 (J)	—	—	—	3900	—	—	—	—	—	—	—	0.763 (J)	—	—	—	—
Borehole 50-603061																											
MD50-08-8192	50-603061	8–10	Fill	—	—	—	—	—	0.573 (U)	—	—	—	—	—	—	—	—	—	—	13.3	0.000648 (J)	—	3.67	—	—	—	—
MD50-08-8193	50-603061	24–25	Qbt 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.03	—	—	2.57	—	—	—	—
MD50-08-8194	50-603061	49–50	Qbt 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8.95	0.00212 (J)	—	2.99	—	—	—	—
MD50-08-8195	50-603061	97.5–100	Qbt 2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.02	0.00151 (J)	—	2.2	—	—	—	—
MD50-08-8196	50-603061	149–150	Qbt 2	—	—	—	—	—	—	—	8.33 (J)	—	—	—	—	—	—	—	—	—	0.00236	—	2.38	—	—	—	—
MD50-08-8197	50-603061	198.5–200	Qbt 1v	—	—	—	—	—	0.539 (U)	—	6.71 (J)	—	—	—	—	—	—	—	—	—	—	—	0.54 (J)	—	—	—	—
MD50-08-8198	50-603061	249–250	Qbt 1g	—	—	1.71 (U)	—	—	0.571 (U)	—	—	—	—	—	4160	—	—	—	—	—	—	—	1.71 (U)	—	—	—	—
MD50-08-8199	50-603061	300–302	Qbt 1g	—	1.12 (U)	1.67 (U)	—	—	—	—	3.31	—	—	—	—	—	—	—	—	—	—	—	1.13 (U)	—	—	—	92.7
MD50-08-8200	50-603061	350–352	Qct	—	1.2 (U)	1.03 (J)	41.6	1.58	0.598 (U)	—	9.06	—	—	—	5670	—	1770	—	6.6	—	—	—	1.19 (U)	—	—	6.74	40.5
MD50-08-8221	50-603061	400–402	Qbo	—	0.55 (UJ)	1.1 (U)	—	—	—	—	3.3	—	—	0.55 (UJ)	—	—	—	—	—	—	—	—	0.55 (U)	—	—	—	—
MD50-08-8222	50-603061	450–452	Qbo	—	0.55 (UJ)	1.1 (U)	—	—	—	—	4.5	—	—	0.55 (UJ)	3710	—	—	—	2.6	—	—	—	0.55 (U)	—	—	—	—
Borehole 50-603062																											
MD50-08-8238	50-603062	48.5–50	Qbt 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.55 (U)	—	—	—	—
MD50-08-8239	50-603062	98.5–100	Qbt 2	—	—	7.84 (U)	—	—	—	—	9.7	—	—	—	—	—	—	—	—	—	—	—	2.06	—	—	—	—
MD50-08-8240	50-603062	148.5–150	Qbt 2	—	—	7.97 (U)	—	1.31	—	—	11	—	—	—	—	—	—	—	—	—	—	—	0.604 (J)	—	—	—	—
MD50-08-8241	50-603062	198.5–200	Qbt 1v	—	—	7.8 (U)	—	—	0.52 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—	1.56 (U)	—	—	—	—
MD50-08-8242	50-603062	248.5–250	Qbt 1g	—	—	1.62 (U)	—	—	0.538 (U)	—	—	—	—	—	3710	—	—	—	—	—	—	—	1.62 (U)	—	—	—	—
MD50-08-8243	50-603062	298.5–300	Qbt 1g	—	—	1.67 (U)	—	—	0.557 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—	1.67 (U)	—	—	—	—
MD50-08-8244	50-603062	350–352	Qct	—	—	5.26	27.2	—	—	—	3.7	—	—	—	5490	—	—	243	2.37 (J)	—	—	—	1.59 (U)	—	—	5.29	—
MD50-08-8245	50-603062	400–402	Qbo	—	—	0.828 (J)	—	—	0.527 (U)	—	3.45	—	—	—	4430	—	—	—	—	—	—	—	1.12 (J)	—	—	—	—
MD50-08-8246	50-603062	450–452	Qbo	—	0.606 (J)	2.42	46.6 (J-)	—	0.529 (U)	—	5.96	—	—	—	5830	—	—	326 (J)	—	—	—	—	1.06 (U)	—	—	6.31 (J)	—
Borehole 50-603063																											
MD50-08-8282	50-603063	8–10	Qbt 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.49	—	—	2.88	—	—	—	—
MD50-08-8283	50-603063	23.5–25	Qbt 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.65	—	—	2.21	—	—	—	—
MD50-08-8284	50-603063	48.5–50	Qbt 3	—	—	7.91 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—	3.5	0.00115 (J)	—	3.66	—	—	—	—
D50-08-8285	50-603063	97.5–99	Qbt 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.27	—	—	2.97	—	—	—	—
MD50-08-8286	50-603063	148–150	Qbt 2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.59	—	—	—	—
MD50-08-8287	50-603063	198–200	Qbt 1v	—	—	—	—	—	0.516 (U)	—	2.42	—	—	—	—	—	—	—	—	—	—	—	2.89	—	—	—	—

Table C-3.2-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Cyanide (total)	Iron	Lead	Magnesium	Manganese	Nickel	Nitrate	Perchlorate	Potassium	Selenium	Silver	Sodium	Vanadium	Zinc
Soil BV[a]				**29,200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**0.5**	**21,500**	**22.3**	**4610**	**671**	**15.4**	**na[b]**	**na**	**3460**	**1.52**	**1**	**915**	**39.6**	**48.8**
Qbt 2,3 BV[a]				**7340**	**0.5**	**2.79**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**0.5**	**14,500**	**11.2**	**1690**	**482**	**6.58**	**na**	**na**	**3500**	**0.3**	**1**	**2770**	**17**	**63.5**
Qbt 1v BV[a]				**8170**	**0.5**	**1.81**	**26.5**	**1.7**	**0.4**	**3700**	**2.24**	**1.78**	**3.26**	**0.5**	**9900**	**18.4**	**780**	**408**	**2**	**na**	**na**	**6670**	**0.3**	**1**	**6330**	**4.48**	**84.6**
Qbt 1g, Qct, Qbo BV[a]				**3560**	**0.5**	**0.56**	**25.7**	**1.44**	**0.4**	**1900**	**2.6**	**8.89**	**3.96**	**0.5**	**3700**	**13.5**	**739**	**189**	**2**	**na**	**na**	**2390**	**0.3**	**1**	**4350**	**4.59**	**40**
Qbt Tvt 2 BV				**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
Industrial SSL[c]				**1,130,000**	**454**	**17.7**	**223,000**	**2260**	**897**	**na**	**1,700,000[d]**	**300[e]**	**45400**	**681**	**795,000**	**800**	**na**	**26,700**	**22,500**	**1,820,000**	**795**	**na**	**5680**	**5680**	**na**	**5680**	**341,000**
Residential SSL[c]				**78,000**	**31.3**	**3.9**	**15,600**	**156**	**70.3**	**na**	**117,000[d]**	**23[e]**	**3130**	**46.9**	**54,800**	**400**	**na**	**1860**	**1560**	**125,000**	**54.8**	**na**	**391**	**391**	**na**	**391**	**23,500**
MD50-08-8288	50-603063	248–250	Qbt 1g	—	—	1.74 (U)	—	—	0.579 (U)	—	9.08	—	—	—	5390	—	—	216 (J-)	—	—	—	—	2.28	—	—	—	—
MD50-08-8311	50-603063	300–302.5	Qbt 1g	—	—	1.71 (U)	—	—	0.57 (U)	—	3.25 (J)	—	—	—	—	—	—	—	—	—	0.00176 (J)	—	1.71 (U)	—	—	—	—
MD50-08-8290	50-603063	400–402.5	Qbo	—	—	1.71 (U)	—	—	0.571 (U)	—	—	—	—	—	4920	—	—	—	—	—	—	—	1.71 (U)	—	—	—	—
MD50-08-8312	50-603063	450–452	Qbo	—	—	1.69 (U)	—	—	0.564 (U)	—	2.7	—	—	—	4480	—	—	—	2.16 (J+)	—	0.000752 (J)	—	2.34	—	—	—	—
Borehole 50-603064																											
MD50-08-8328	50-603064	8.5–10	Qbt 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3.6 (J)	—	—	—	—
MD50-08-8329	50-603064	23–25	Qbt 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4.12 (J)	—	—	—	—
MD50-08-8330	50-603064	48.5–50	Qbt 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4.73 (J)	—	—	—	—
MD50-08-8331	50-603064	98.5–100	Qbt 2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.56 (U)	—	—	—	—
MD50-08-8332	50-603064	148.5–150	Qbt 1v	—	—	—	—	—	0.523 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—	1.57 (U)	—	—	—	—
MD50-08-8333	50-603064	198.5–200	Qbt 1v	—	—	2.38	—	—	0.518 (U)	—	3.23	—	—	—	—	—	—	—	—	—	—	—	1.55 (U)	—	—	—	—
MD50-08-8334	50-603064	247.5–250	Qbt 1g	—	—	0.907 (J)	—	—	0.538 (U)	—	—	—	—	—	4770 (J+)	—	—	—	—	—	—	—	0.72 (J)	—	—	—	—
MD50-08-8335	50-603064	298.5–300	Qbt 1g	—	—	0.725 (J)	—	—	0.557 (U)	—	2.97	—	—	—	—	—	—	—	—	—	—	—	1.67 (U)	—	—	—	—
MD50-08-8336	50-603064	350–351.5	Qct	3680	—	6.51	35.6	—	—	—	6.14	—	5.05	—	7320	—	1220 (J+)	304	3.45	—	—	—	4.43	—	—	7.85	—
MD50-08-8357	50-603064	400–401.5	Qbo	—	—	1.47 (J)	—	—	0.528 (U)	—	—	—	—	—	4500	—	—	—	—	—	—	—	1.71	—	—	—	—
MD50-08-8358	50-603064	450–451.5	Qbo	—	—	1.5 (J)	—	—	0.547 (U)	—	4.4	—	—	—	—	—	—	—	—	—	—	—	1.2 (J)	—	—	—	—
MD50-08-8359	50-603064	500–502	Qbo	—	—	2.02	36.8	—	0.542 (U)	—	4.93	—	—	—	4280	—	1190	—	2.18 (J+)	—	—	—	0.588 (J)	—	—	5.73	—

Note: Results are in mg/kg. Data qualifiers are defined in Appendix A.

[a] BVs from LANL (1998, 059730).

[b] na = Not available.

[c] Soil screening levels (SSLs) from NMED (2012, 219971) unless indicated otherwise.

[d] SSL for trivalent chromium.

[e] SSLs from U.S. Environmental Protection Agency (EPA) regional screening tables (https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables).

[f] — = Not detected or not detected above BV.

Table C-3.2-4
Organic Chemicals Detected in Tuff at MDA C during Phase II Investigation

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acenaphthylene	Anthracene	Aroclor-1242	Aroclor-1248	Aroclor-1254	Aroclor-1260	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene
Industrial SSL[a]				**36,700**	**18,300[b]**	**183,000**	**8.26**	**8.26**	**8.26**	**8.26**	**2.34**	**23.4**	**18,300[b]**	**234**
Residential SSL[a]				**3440**	**1720[b]**	**17,200**	**2.22**	**2.22**	**1.12**	**2.22**	**0.148**	**1.48**	**1720[b]**	**14.8**
Boreholes 50-24769 and 50-603470														
MD50-08-7444	50-24769	298–300	Qbt 1g	—[c]	—	—	0.0022 (J)	—	—	—	—	—	—	—
MD50-08-7446	50-603470	400–402	Qbo	—	—	—	0.0081	—	0.0182	0.0047	—	—	—	—
MD50-08-7450	50-603470	600–602	Qbo	—	—	0.00826 (J)	—	—	—	—	0.0128 (J)	0.0248 (J)	—	—
MD50-08-7441	50-603470	650–653	Tvt 2	—	—	—	—	—	—	—	—	—	—	—
Borehole 50-24820														
MD50-08-7829	50-24820	300–303	Qbt 1g	—	—	—	—	—	—	—	—	—	—	—
Borehole 50-603468														
MD50-08-7891	50-603468	450–451.5	Qbo	—	—	—	—	—	—	—	—	—	—	—
Borehole 50-24822														
MD50-08-7942	50-24822	400–402	Qbo	—	—	—	0.0104	—	—	—	—	—	—	—
Borehole 50-603060														
MD50-08-8151	50-603060	199–200	Qbt 1v	—	—	—	—	—	0.0017 (J)	—	—	—	—	—
MD50-08-8156	50-603060	410–412.5	Qbo	—	—	—	—	—	0.0052	—	—	—	—	—
Borehole 50-603061														
MD50-08-8197	50-603061	198.5–200	Qbt 1v	—	—	—	0.0181	—	—	—	—	—	—	—
MD50-08-8221	50-603061	400–402	Qbo	—	—	—	—	—	—	—	—	—	—	—
MD50-08-8222	50-603061	450–452	Qbo	—	—	—	—	—	—	—	—	—	—	—
Borehole 50-603062														
MD50-08-8244	50-603062	350–352	Qct	0.0185 (J)	0.0165 (J)	0.0206 (J)	—	—	—	—	0.0182 (J)	0.026 (J)	0.0812 (J)	0.0196 (J)
MD50-08-8245	50-603062	400–402	Qbo	—	—	—	—	—	—	—	—	—	—	—
Borehole 50-603063														
MD50-08-8282	50-603063	8–10	Qbt 3	—	—	—	—	—	—	0.0018 (J)	—	—	—	—

Table C-3.2-4 (continued)

Sample ID	Location ID	Depth (ft)	Media	Benzoic Acid	Bis(2-ethylhexyl)phthalate	Chloronaphthalene[2-]	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Methylnaphthalene[2-]	Naphthalene	Phenanthrene	Pyrene
Industrial SSL[a]				**2,500,000[d]**	**1370**	**90,800**	**2340**	**2.34**	**24,400**	**24,400**	**23.4**	**2200[d]**	**241**	**20,500**	**18,300**
Residential SSL[a]				**240,000[d]**	**347**	**6260**	**148**	**0.148**	**2290**	**2290**	**1.48**	**230[d]**	**43**	**1830**	**1720**
Borehole 50-603064															
MD50-08-8330				50-603064	48.5–50	Qbt 3	—	—	—	—	0.109	—	0.0061	—	—
MD50-08-8332				50-603064	148.5–150	Qbt 1v	—	—	—	0.002 (J)	—	—	—	—	—
MD50-08-8334				50-603064	247.5–250	Qbt 1g	—	—	—	0.0093	—	0.0145	0.0078	—	—
Boreholes 50-24769 and 50-603470															
MD50-08-7444	50-24769	298–300	Qbt 1g	—	—	—	—	—	—	—	—	—	—	—	—
MD50-08-7446	50-603470	400–402	Qbo	—	—	—	—	—	—	—	—	—	—	—	—
MD50-08-7450	50-603470	600–602	Qbo	—	—	—	0.0147 (J)	—	0.0379	—	—	—	—	0.0363 (J)	0.0283 (J)
MD50-08-7441	50-603470	650–653	Tvt 2	—	0.0995 (J)	—	—	—	—	—	—	—	—	—	—
Borehole 50-24820															
MD50-08-7829	50-24820	300–303	Qbt 1g	—	0.121 (J)	—	—	—	—	—	—	—	—	—	—
Borehole 50-603468															
MD50-08-7891	50-603468	450–451.5	Qbo	—	0.0831 (J)	—	—	—	—	—	—	—	—	—	—
Borehole 50-24822															
MD50-08-7942	50-24822	400–402	Qbo	—	—	—	—	—	—	—	—	—	—	—	—
Borehole 50-603060															
MD50-08-8151	50-603060	199–200	Qbt 1v	—	—	—	—	—	—	—	—	—	—	—	—
MD50-08-8156	50-603060	410–412.5	Qbo	—	—	—	—	—	—	—	—	—	—	—	—
Borehole 50-603061															
MD50-08-8197	50-603061	198.5–200	Qbt 1v	—	—	—	—	—	—	—	—	—	—	—	—
MD50-08-8221	50-603061	400–402	Qbo	—	0.34 (J)	—	—	—	—	—	—	—	—	—	—
MD50-08-8222	50-603061	450–452	Qbo	—	0.1 (J)	—	—	—	—	—	—	—	—	—	—
Borehole 50-603062															
MD50-08-8244	50-603062	350–352	Qct	—	0.12 (J)	0.02 (J)	0.018 (J)	0.0815 (J)	0.0239 (J)	0.0204 (J)	0.0723 (J)	0.0203 (J)	0.0178 (J)	0.0276 (J)	0.0217 (J)
MD50-08-8245	50-603062	400–402	Qbo	—	0.0828 (J)	—	0.0184 (J)	—	—	—	—	—	—	—	—

Table C-3.2-4 (continued)

Sample ID	Location ID	Depth (ft)	Media	Benzoic Acid	Bis(2-ethylhexyl)phthalate	Chloronaphthalene[2-]	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Methylnaphthalene[2-]	Naphthalene	Phenanthrene	Pyrene
Industrial SSL[a]				**2,500,000[d]**	**1370**	**90,800**	**2340**	**2.34**	**24,400**	**24,400**	**23.4**	**2200[d]**	**241**	**20,500**	**18,300**
Residential SSL[a]				**240,000[d]**	**347**	**6260**	**148**	**0.148**	**2290**	**2290**	**1.48**	**230[d]**	**43**	**1830**	**1720**
Borehole 50-603063															
MD50-08-8282	50-603063	8–10	Qbt 3	—	0.225	—	—	—	—	—	—	—	—	—	—
Borehole 50-603064															
MD50-08-8330	50-603064	48.5–50	Qbt 3	—	—	—	—	—	—	—	—	—	—	—	—
MD50-08-8332	50-603064	148.5–150	Qbt 1v	0.317 (J)	—	—	—	—	—	—	—	—	—	—	—
MD50-08-8334	50-603064	247.5–250	Qbt 1g	—	—	—	—	—	—	—	—	—	—	—	—

Note: Results are in mg/kg. Data qualifiers are defined in Appendix A.

[a] Soil screening levels (SSLs) from NMED (2012, 219971).

[b] Pyrene used as a surrogate based on structural similarity.

[c] — = Not detected.

[d] SSLs from U.S. Environmental Protection Agency (EPA) regional screening tables (https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables).

Table C-3.2-5
Radionuclides Detected or above BVs in Tuff at MDA C during Phase II Investigation

Sample ID	Location ID	Depth (ft)	Media	Cesium-134	Plutonium-239/240	Uranium-234	Uranium-235/236	Uranium-238
Soil BV[a]				**na[b]**	**na**	**2.59**	**0.2**	**2.29**
Qbt 2, Qbt 3 BV[a]				**na**	**na**	**1.98**	**0.09**	**1.93**
Qbt 1v BV[a]				**na**	**na**	**3.12**	**0.14**	**3.05**
Qbt 1g, QBO BV[a]				**na**	**na**	**4**	**0.18**	**3.9**
Tvt 2 BV				**na**	**na**	**na**	**na**	**na**
Industrial SAL[c]				**9.7**	**210**	**1500**	**87**	**430**
Residential SAL[c]				**2.4**	**33**	**170**	**17**	**87**
Boreholes 50-24769 and 50-603470								
MD50-08-7443	50-24769	248–250	Qbt 1g	—[d]	—	—	0.26	—
MD50-08-7444	50-24769	298–300	Qbt 1g	—	—	—	0.201	—
MD50-08-7450	50-603470	600–602	Qbo	—	—	—	0.226	—
MD50-08-7441	50-603470	650–653	Tvt 2	—	—	1.02	0.0673	0.912
Borehole 50-24771								
MD50-08-7616	50-24771	198–200	Qbt 1v	—	—	—	0.189	—
MD50-08-7617	50-24771	248.50–250	Qbt 1g	—	—	—	0.22	—
MD50-08-7618	50-24771	297.50–300	Qbt 1g	—	—	—	0.199	—
Borehole 50-24783								
MD50-08-7647	50-24783	248.50–250	Qbt 1v	—	—	—	0.156	—
MD50-08-7648	50-24783	298.50–300	Qbt 1g	—	—	—	0.181	—
Borehole 50-24784								
MD50-08-7677	50-24784	400–402	Qbo	0.062	—	—	0.196	—
Borehole 50-24813								
MD50-08-7707	50-24813	248.50–250	Qbt 1v	—	—	—	0.175	—
MD50-08-7708	50-24813	298–300	Qbt 1g	—	—	—	0.25	—
Borehole 50-24820								
MD50-08-7829	50-24820	300–303	Qbt 1g	—	—	—	0.26	—
MD50-08-7828	50-24820	600–602.50	Qbo	—	—	—	0.359	—
Borehole 50-603468								
MD50-08-7888	50-603468	300–301.50	Qbt 1g	—	—	—	0.182	—
MD50-08-7890	50-603468	400–401.50	Qbo	—	—	—	0.185 (J)	—
Borehole 50-603060								
MD50-08-8151	50-603060	199–200	Qbt 1v	—	—	—	0.237	—
MD50-08-8153	50-603060	298.50–300	Qbt 1g	—	—	—	0.224	—
MD50-08-8156	50-603060	410–412.50	Qbo	—	—	—	0.19	—

Table C-3.2-5 (continued)

Sample ID	Location ID	Depth (ft)	Media	Cesium-134	Plutonium-239/240	Uranium-234	Uranium-235/236	Uranium-238
Soil BV[a]				**na[b]**	**na**	**2.59**	**0.2**	**2.29**
Qbt 2, Qbt 3 BV[a]				**na**	**na**	**1.98**	**0.09**	**1.93**
Qbt 1v BV[a]				**na**	**na**	**3.12**	**0.14**	**3.05**
Qbt 1g, QBO BV[a]				**na**	**na**	**4**	**0.18**	**3.9**
Qbtt BV				**na**	**na**	**na**	**na**	**na**
Industrial SAL[c]				**9.7**	**210**	**1500**	**87**	**430**
Residential SAL[c]				**2.4**	**33**	**170**	**17**	**87**
Borehole 50-603061								
MD50-08-8192	50-603061	8–10	Fill	—	0.195	—	—	—
MD50-08-8196	50-603061	149–150	Qbt 2	—	—	—	0.0984	—
MD50-08-8199	50-603061	300–302	Qbt 1g	—	—	—	0.237	—
Borehole 50-603062								
MD50-08-8239	50-603062	98.5–100	Qbt 2	—	—	—	0.11	—
MD50-08-8240	50-603062	148.5–150	Qbt 2	—	—	—	0.0989	—
MD50-08-8241	50-603062	198.5–200	Qbt 1v	—	—	—	0.198	—
MD50-08-8242	50-603062	248.5–250	Qbt 1g	—	—	—	0.242	—
MD50-08-8246	50-603062	450–452	Qbo	—	—	—	0.214	—
Borehole 50-603063								
MD50-08-8282	50-603063	8–10	Qbt 3	—	0.0371	—	—	—
MD50-08-8284	50-603063	48.5–50	Qbt 3	—	—	—	0.107	—
MD50-08-8285	50-603063	97.5–99	Qbt 3	—	—	—	0.101	—
MD50-08-8287	50-603063	198–200	Qbt 1v	—	—	—	0.15	—
MD50-08-8288	50-603063	248–250	Qbt 1g	—	—	—	0.237	—
MD50-08-8311	50-603063	300–302.5	Qbt 1g	—	—	—	0.189	—
Borehole 50-603064								
MD50-08-8328	50-603064	8.5–10	Qbt 3	—	—	—	0.103	—
MD50-08-8330	50-603064	48.5–50	Qbt 3	—	—	—	0.116	—
MD50-08-8334	50-603064	247.5–250	Qbt 1g	—	—	—	0.222	—
MD50-08-8335	50-603064	298.5–300	Qbt 1g	—	—	—	0.224	—
MD50-08-8359	50-603064	500–502	Qbo	—	—	—	0.221	—

Note: Results are in pCi/g. Data qualifiers are defined in Appendix A.

[a] BVs from LANL (1998, 059730).

[b] na = Not available.

[c] Screening action levels (SALs) from LANL (2009, 107655).

[d] — = Not detected or not detected above BV.

Table C-3.3-1
VOCs Detected in Vapor Samples at MDA C during Phase II Investigation

Sample ID	Location ID	Depth (ft)	Media	Acetone	Benzene	Butadiene[1,3-]	Butanol[1-]	Butanone[2-]	Carbon Disulfide	Carbon Tetrachloride	Chlorobenzene	Chlorodifluoromethane	Chloroform	Cyclohexane	Dichloro-1,1,2,2-tetrafluoroethane[1,2-]	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Ethanol
Boreholes 50-24769 and 50-603470																						
MD50-08-7459	50-24769	200	Vapor	—*	—	—	—	—	—	550	—	—	1500	—	—	1700	—	—	—	490	—	—
MD50-08-7460	50-24769	250	Vapor	—	—	—	—	—	—	570	—	—	1200	—	—	1600	—	—	—	410	—	—
MD50-08-7451	50-24769	300	Vapor	—	—	—	—	—	—	630	—	—	980	—	—	1500	—	—	—	330	—	—
MD50-08-7465	50-603470	351	Vapor	—	—	—	—	—	—	71	—	—	97	—	—	340	—	—	—	—	—	—
MD50-08-7464	50-603470	450	Vapor	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
MD50-08-7461	50-603470	650	Vapor	—	—	—	—	—	27	—	—	—	—	—	—	140	—	—	—	—	—	—
Boreholes 50-24771 and 50-603471																						
MD50-08-7626	50-24771	200	Vapor	—	—	—	—	—	—	2400	—	—	3400	—	—	1600	—	—	—	800	—	—
MD50-08-7627	50-24771	250	Vapor	—	—	—	—	—	—	2100	—	—	2700	—	—	1600	—	—	—	700	—	—
MD50-08-7625	50-24771	300	Vapor	—	—	—	—	—	—	1200	—	—	1500	—	—	1100	—	—	—	510	—	—
MD50-08-7628	50-603471	360	Vapor	—	—	—	—	—	—	680	—	—	600	—	—	780	—	—	—	200	—	—
MD50-08-7629	50-603471	410	Vapor	—	—	—	—	—	—	600	—	—	710	—	—	230	—	—	—	220	—	—
MD50-08-7630	50-603471	450	Vapor	—	—	—	—	—	—	450	—	—	1100	—	—	—	—	—	—	290	—	—
MD50-09-3534	50-603471	450	Vapor	—	—	—	—	—	—	210	—	—	960	—	—	—	—	—	—	200	—	—
Boreholes 50-24783 and 50-603472																						
MD50-08-7656	50-24783	200	Vapor	—	—	—	—	—	—	350	—	—	720	—	—	320	—	—	—	190	110	—
MD50-08-7657	50-24783	250	Vapor	—	—	—	—	—	—	490	—	—	710	—	—	400	—	—	—	210	93	—
MD50-08-7655	50-24783	300	Vapor	—	—	—	—	—	—	570	—	250	640	—	—	480	—	—	—	190	—	—
MD50-08-7658	50-603472	364	Vapor	—	—	—	—	—	—	170	—	50	140	—	—	170	—	—	—	32	16	—
MD50-08-7659	50-603472	414	Vapor	86	—	—	—	—	—	130	—	—	38	—	—	130	—	—	—	—	—	—
MD50-08-7660	50-603472	450	Vapor	56	—	—	—	—	38	240	—	—	42	—	—	260	—	—	—	—	—	—
Borehole 50-24784																						
MD50-08-7691	50-24784	362	Vapor	18	—	—	—	4.8	17	330	—	—	16	—	—	170	—	—	5.4	3.5	—	—
MD50-08-7690	50-24784	411	Vapor	—	—	—	—	—	22	370	—	—	7.3	—	—	210	—	—	4.4	—	—	—
MD50-08-7689	50-24784	450	Vapor	—	—	—	—	—	14	120	—	—	—	—	—	83	—	—	—	—	—	—

Table C-3.3-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Acetone	Benzene	Butadiene[1,3-]	Butanol[1-]	Butanone[2-]	Carbon Disulfide	Carbon Tetrachloride	Chlorobenzene	Chlorodifluoromethane	Chloroform	Cyclohexane	Dichloro-1,1,2,2-tetrafluoroethane[1,2-]	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Ethanol
Borehole 50-24813																						
MD50-08-7716	50-24813	200	Vapor	—	—	—	—	—	—	2400	—	—	2300	—	—	2400	—	—	—	690	—	—
MD50-08-7717	50-24813	250	Vapor	120	—	—	—	—	—	260	—	—	440	—	—	250	—	—	—	130	—	—
MD50-08-7715	50-24813	300	Vapor	—	—	—	—	—	—	360	—	—	420	—	—	430	—	—	—	130	—	—
MD50-08-7721	50-24813	358	Vapor	—	—	—	—	—	29	640	—	—	500	—	—	980	—	—	—	170	—	—
MD50-08-7720	50-24813	408	Vapor	—	—	—	—	—	—	500	—	—	220	—	—	960	—	—	—	85	—	—
MD50-08-7719	50-24813	450	Vapor	—	—	—	—	—	—	280	—	—	—	—	—	610	—	—	—	—	—	—
MD50-08-7718	50-24813	600	Vapor	—	—	—	—	—	14	110	—	—	—	—	—	240	—	—	—	—	—	—
Borehole 50-603383																						
MD50-08-14863	50-603383	286	Vapor	26	—	—	12	4.7	—	120	4.3	—	27	—	8.7	83	4	—	11	14	69	—
MD50-08-14864	50-603383	359	Vapor	14	11	—	18	5.6	39	—	6.4	—	—	—	—	—	—	—	—	—	—	—
MD50-08-14865	50-603383	408	Vapor	—	4.3	—	50	—	—	250	25	14 (J)	7.9	—	8.4	210	—	—	10	6.2	7	—
MD50-08-14866	50-603383	450	Vapor	—	4.7	—	39	3.6	—	140	21	13 (J)	5.7	—	8.5	170	—	—	6.8	4.8	5.9	—
Borehole 50-603467																						
MD50-08-14858	50-603467	287	Vapor	—	—	—	—	—	—	630	—	—	530	—	—	340	—	—	—	160	—	—
MD50-08-14860	50-603467	360	Vapor	—	—	—	—	—	—	340	—	—	230	—	—	200	—	—	—	76	—	—
MD50-08-14859	50-603467	409	Vapor	—	—	—	—	—	—	300 (J)	—	—	82 (J)	—	—	200 (J)	—	—	—	—	—	—
MD50-08-14857	50-603467	500	Vapor	—	—	—	—	—	—	270	—	—	54	—	—	230	—	—	—	—	—	—
MD50-08-14856	50-603467	600	Vapor	140	—	—	140	45	—	310	27	—	52	—	—	230	—	—	—	—	—	160
Borehole 50-603468																						
MD50-08-7894	50-603468	300	Vapor	—	—	—	—	—	—	580	—	—	370	—	—	670	—	—	—	140	—	—
MD50-08-7895	50-603468	354	Vapor	—	—	—	—	—	—	500	—	—	190	—	—	640	—	—	—	—	—	—
MD50-08-7896	50-603468	403	Vapor	—	—	—	—	—	—	370	—	—	85	—	—	450	—	—	—	—	—	—
MD50-08-7897	50-603468	450	Vapor	180	—	—	—	78	—	270	—	—	140	—	—	260	—	—	—	—	—	—
Borehole 50-24822																						
MD50-08-7949	50-24822	351	Vapor	—	—	—	—	—	9.6	21	—	—	20	—	—	63	—	—	—	5.5	—	—
MD50-08-7948	50-24822	402	Vapor	—	—	—	—	—	—	210	—	—	64	—	—	530	—	—	—	—	—	—
MD50-08-7947	50-24822	450	Vapor	—	—	—	—	—	18	160	—	—	31	—	—	430	—	—	—	—	—	—

Table C-3.3-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Acetone	Benzene	Butadiene[1,3-]	Butanol[1-]	Butanone[2-]	Carbon Disulfide	Carbon Tetrachloride	Chlorobenzene	Chlorodifluoromethane	Chloroform	Cyclohexane	Dichloro-1,1,2,2-tetrafluoroethane[1,2-]	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Ethanol
Boreholes 50-603060 and 50-603503																						
MD50-08-8161	50-603060	50	Vapor	11	—	—	—	2.4	—	15	—	—	29	—	—	19	—	—	—	3.7	7.6	5.3
MD50-08-8160	50-603060	100	Vapor	12	—	—	—	—	2.8	34	—	—	60	—	—	35	—	3.5	—	8.8	21	—
MD50-08-8159	50-603060	150	Vapor	20	—	—	—	—	—	18	—	—	27	—	—	17	—	—	—	4.5	10	—
MD50-08-8158	50-603060	200	Vapor	—	—	—	—	—	—	36	—	—	34	—	—	28	—	—	—	8.5	12	—
MD50-08-8157	50-603060	250	Vapor	17	—	—	—	—	—	57	—	—	50	—	—	47	—	—	—	13	14	—
MD50-08-8162	50-603503	347	Vapor	49	—	—	—	6.7	8	24	—	—	25	3.4	—	23	—	—	—	5.8	—	—
MD50-08-8163	50-603503	397	Vapor	18	—	—	—	3.2	—	22	—	—	46	—	—	19	—	—	—	4.7	9.2	—
MD50-08-8164	50-603503	450	Vapor	57	—	—	—	22	130	88	—	—	12	—	—	68	—	—	—	5.6	—	—
Borehole 50-603061																						
MD50-08-8206	50-603061	13	Vapor	—	—	—	—	—	—	—	—	—	—	3.5	—	510	—	—	24	—	—	—
MD50-08-8205	50-603061	25	Vapor	—	—	—	—	—	—	—	—	—	—	—	—	46	—	—	6.3	—	—	—
MD50-08-8204	50-603061	50	Vapor	40	—	—	—	—	—	—	—	—	4.2	—	—	64	—	—	30	—	—	—
MD50-08-8203	50-603061	100	Vapor	16	—	—	—	2.8	—	6	—	—	5.8	8.6	—	63	—	—	90	—	—	—
MD50-08-8202	50-603061	150	Vapor	—	—	—	—	—	—	—	—	—	—	—	—	220	—	—	1200	—	—	—
MD50-08-8201	50-603061	185	Vapor	—	—	—	—	—	—	—	—	—	—	—	—	200	—	—	500	—	—	—
MD50-08-8230	50-603061	228	Vapor	—	—	—	—	—	—	130	—	—	—	—	—	340	—	—	1600	—	—	—
MD50-08-8231	50-603061	274	Vapor	—	—	—	—	—	25	120	—	—	—	—	—	280	—	—	710	—	—	—
MD50-08-8209	50-603061	347	Vapor	—	—	—	—	—	3.6	7.3	—	—	—	—	—	20	—	—	18	—	—	—
MD50-08-8208	50-603061	397	Vapor	29	53	10	—	—	16	16	—	—	—	3.3	—	51	—	—	33	—	—	15
MD50-08-8207	50-603061	450	Vapor	35	5.7	—	—	5.9	59	36	—	—	—	—	—	130	—	—	44	—	—	—
Borehole 50-603062																						
MD50-08-8251	50-603062	50	Vapor	12	—	—	—	—	—	8.1	—	—	16	—	—	31	—	—	—	—	—	—
MD50-08-8250	50-603062	100	Vapor	—	—	—	—	—	—	49	—	—	36	—	—	180	—	—	—	—	—	—
MD50-08-8249	50-603062	150	Vapor	—	—	—	—	—	—	44	—	—	33	—	—	180	—	—	—	—	—	—
MD50-08-8248	50-603062	200	Vapor	—	—	—	—	—	—	40	—	—	26	—	—	160	—	—	—	—	—	—
MD50-08-8247	50-603062	250	Vapor	—	—	—	—	—	—	44	—	—	19	—	—	170	—	—	—	—	—	—
MD50-08-8252	50-603062	337	Vapor	170	—	—	—	22	5.8	8.3	—	—	—	—	—	46	—	—	—	—	—	—
MD50-08-8253	50-603062	387	Vapor	—	—	—	—	—	15	28	—	—	—	—	—	110	—	—	—	—	—	—
MD50-08-8254	50-603062	450	Vapor	—	—	—	—	—	27	14	—	—	—	—	—	71	—	—	—	—	—	—

Table C-3.3-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Acetone	Benzene	Butadiene[1,3-]	Butanol[1-]	Butanone[2-]	Carbon Disulfide	Carbon Tetrachloride	Chlorobenzene	Chlorodifluoromethane	Chloroform	Cyclohexane	Dichloro-1,1,2,2-tetrafluoroethane[1,2-]	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Ethanol
Borehole 50-603063																						
MD50-08-8296	50-603063	10	Vapor	12	—	—	—	—	—	6.7	—	—	9.9	—	—	35	—	—	6.3	—	—	—
MD50-08-8295	50-603063	25	Vapor	17	—	—	—	—	—	—	—	—	12	—	—	14	—	—	5.5	—	—	—
MD50-08-8294	50-603063	50	Vapor	12	—	—	—	—	—	12	—	—	25	—	—	36	5.1	—	17	—	—	—
MD50-08-8291	50-603063	99	Vapor	50	—	—	—	—	—	31	—	—	100	—	—	80	21	—	51	12	—	—
MD50-08-8292	50-603063	150	Vapor	—	—	—	—	—	—	160	—	91	270	—	—	310	43	—	180	48	—	—
MD50-08-8293	50-603063	200	Vapor	—	—	—	—	—	—	240	—	130	390	—	—	430	34	—	210	82	—	—
MD50-09-1668	50-603063	347	Vapor	—	—	—	—	—	4.6	45	—	—	31	—	—	72	—	—	7	6.9	—	—
MD50-09-1667	50-603063	397	Vapor	—	—	—	—	—	63	200	—	—	170	—	—	240	23	—	—	22	—	—
MD50-09-1666	50-603063	450	Vapor	—	—	—	—	—	55	140	—	—	130	—	—	200	20	—	—	15	—	—
Borehole 50-603064																						
MD50-08-8343	50-603064	25	Vapor	—	—	—	—	—	50	160	—	—	480	—	—	620	—	—	530	150	—	—
MD50-08-8342	50-603064	66	Vapor	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	9.3
MD50-08-8344	50-603064	113	Vapor	—	—	—	—	—	—	—	—	—	170	—	—	120	—	—	100	—	—	—
MD50-08-8345	50-603064	176	Vapor	—	—	—	—	—	—	230	—	—	480	—	—	720	—	—	540	190	—	—
MD50-08-8338	50-603064	200	Vapor	—	—	—	—	—	—	56	—	—	140	—	—	170	—	—	100	47	—	—
MD50-08-8337	50-603064	250	Vapor	16	20	—	—	—	—	11	—	—	43	6.3	—	34	—	—	23	18	—	—
MD50-08-8341	50-603064	332	Vapor	50	6.8	—	—	12 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
MD50-08-8340	50-603064	400	Vapor	8.2	64	6.8	—	—	—	—	—	—	—	42	—	—	—	—	—	—	—	—
MD50-08-8339	50-603064	500	Vapor	—	3.2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Table C-3.3-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Ethylbenzene	Ethyltoluene[4-]	Hexane	Methanol	Methylene Chloride	n-Heptane	Propylene	Styrene	Tetrachloroethylene	Tetrahydrofuran	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethylene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
Boreholes 50-24769 and 50-603470																						
MD50-08-7459	50-24769	200	Vapor	—	—	—	—	780	—	—	—	670	—	—	940	—	57,000	—	—	—	—	—
MD50-08-7460	50-24769	250	Vapor	—	—	—	—	860	—	—	—	590	—	—	800	—	56,000	—	—	—	—	—
MD50-08-7451	50-24769	300	Vapor	—	—	—	—	970	—	—	—	610	—	—	680	—	60,000	—	—	—	—	—
MD50-08-7465	50-603470	351	Vapor	—	—	—	—	120	—	—	—	—	—	—	—	—	8700	—	—	—	—	—
MD50-08-7464	50-603470	450	Vapor	—	—	—	—	—	—	—	—	—	—	—	—	—	150	—	—	—	—	—
MD50-08-7461	50-603470	650	Vapor	—	—	—	—	—	—	—	—	—	—	—	—	—	180	—	—	—	—	—
Boreholes 50-24771 and 50-603471																						
MD50-08-7626	50-24771	200	Vapor	—	—	—	—	2800	—	—	—	2500	—	—	780	—	88,000	—	—	—	—	—
MD50-08-7627	50-24771	250	Vapor	—	—	—	—	2900	—	—	—	2300	—	—	600	—	91,000	—	—	—	—	—
MD50-08-7625	50-24771	300	Vapor	—	—	—	—	2200	—	—	—	1600	—	—	—	—	69,000	—	—	—	—	—
MD50-08-7628	50-603471	360	Vapor	—	—	—	—	890	—	—	—	820	—	—	—	—	43,000	—	—	—	—	—
MD50-08-7629	50-603471	410	Vapor	—	—	—	—	900	—	—	—	790	—	—	—	—	43,000	—	—	—	—	—
MD50-08-7630	50-603471	450	Vapor	—	—	—	—	940	—	—	—	880	—	—	—	—	48,000	—	—	—	—	—
MD50-09-3534	50-603471	450	Vapor	—	—	—	—	680	—	—	—	950	—	—	—	—	34,000	—	—	—	—	—
Boreholes 50-24783 and 50-603472																						
MD50-08-7656	50-24783	200	Vapor	—	—	—	—	760	—	—	—	1400	—	—	140	—	21,000	—	—	—	—	—
MD50-08-7657	50-24783	250	Vapor	—	—	—	—	890	—	—	—	1900	—	—	140	—	28,000	—	—	—	—	—
MD50-08-7655	50-24783	300	Vapor	—	—	—	—	850	—	—	—	2000	—	—	—	—	30,000	—	—	—	—	—
MD50-08-7658	50-603472	364	Vapor	—	—	—	—	100	—	—	—	440	—	—	38	—	6900	—	—	—	—	—
MD50-08-7659	50-603472	414	Vapor	—	—	—	—	47	—	—	—	190	—	—	—	—	4700	—	—	—	—	—
MD50-08-7660	50-603472	450	Vapor	—	—	—	—	52	—	—	—	230	—	29	—	—	6500	—	—	—	—	—
Borehole 50-24784																						
MD50-08-7691	50-24784	362	Vapor	—	—	—	—	4.5	—	—	—	800	—	—	36	14	1600	17	—	—	—	—
MD50-08-7690	50-24784	411	Vapor	—	—	—	—	—	—	—	—	440	—	4.2	20	8.1	1200	18	—	—	—	—
MD50-08-7689	50-24784	450	Vapor	—	—	—	—	—	—	—	—	130	—	3.3	—	—	350	7.4	—	—	—	—

Table C-3.3-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Ethylbenzene	Ethyltoluene[4-]	Hexane	Methanol	Methylene Chloride	n-Heptane	Propylene	Styrene	Tetrachloroethylene	Tetrahydrofuran	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethylene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
Borehole 50-24813																						
MD50-08-7716	50-24813	200	Vapor	—	—	—	—	2300	—	—	—	940	—	—	—	—	78,000	—	—	—	—	—
MD50-08-7717	50-24813	250	Vapor	—	—	—	—	540	—	—	—	130	—	—	—	—	13,000	53	—	—	—	—
MD50-08-7715	50-24813	300	Vapor	—	—	—	—	500	—	—	—	210	—	—	—	—	19,000	—	—	—	—	—
MD50-08-7721	50-24813	358	Vapor	—	—	—	—	640	—	—	—	350	—	—	—	—	40,000	—	—	—	—	—
MD50-08-7720	50-24813	408	Vapor	—	—	—	—	310	—	—	—	270	—	—	—	—	32,000	—	—	—	—	—
MD50-08-7719	50-24813	450	Vapor	—	—	—	—	140	—	—	—	—	—	—	—	—	15,000	—	—	—	—	—
MD50-08-7718	50-24813	600	Vapor	—	—	—	—	—	—	14	—	19	—	—	—	—	2400	15	—	—	—	—
Borehole 50-603383																						
MD50-08-14863	50-603383	286	Vapor	—	—	—	—	14	—	—	—	400	—	5.1	150	46	1700	10	—	—	—	—
MD50-08-14864	50-603383	359	Vapor	4.4	—	6.7	—	—	—	7.5	—	—	—	27	—	—	16	—	—	—	4.7	12
MD50-08-14865	50-603383	408	Vapor	—	—	—	—	4.4	—	—	—	320	—	16	89	19	1600	20	—	—	—	—
MD50-08-14866	50-603383	450	Vapor	—	—	—	—	3.7	—	—	—	290	86	16	170	12	1400	14	—	—	—	—
Borehole 50-603467																						
MD50-08-14858	50-603467	287	Vapor	—	—	—	—	580	—	—	—	980	—	—	—	—	21,000	—	—	—	—	—
MD50-08-14860	50-603467	360	Vapor	—	—	—	—	250	—	—	—	560	—	—	—	—	14,000	—	—	—	—	—
MD50-08-14859	50-603467	409	Vapor	—	—	—	—	78 (J)	—	—	—	450 (J)	—	—	—	—	11,000 (J)	—	—	—	—	—
MD50-08-14857	50-603467	500	Vapor	—	—	—	—	40	—	—	—	280	—	—	—	—	10,000	—	—	—	—	—
MD50-08-14856	50-603467	600	Vapor	—	—	160	—	32	630	58	—	200	35	—	—	—	6900	—	—	—	—	—
Borehole 50-603468																						
MD50-08-7894	50-603468	300	Vapor	—	—	—	—	430	—	—	—	350	—	—	—	—	32,000	—	—	—	—	—
MD50-08-7895	50-603468	354	Vapor	—	—	—	—	230	—	—	—	260	—	—	—	—	24,000	—	—	—	—	—
MD50-08-7896	50-603468	403	Vapor	—	—	—	—	100	—	—	—	280	—	—	—	—	18,000	—	—	—	—	—
MD50-08-7897	50-603468	450	Vapor	—	—	—	—	120	—	—	—	200	340	—	—	—	18,000	—	—	—	—	—
Borehole 50-24822																						
MD50-08-7949	50-24822	351	Vapor	—	—	—	—	21	—	—	—	16	—	—	—	—	1900	—	—	—	—	—
MD50-08-7948	50-24822	402	Vapor	—	—	—	—	51	—	—	—	46	—	—	—	—	12,000	—	—	—	—	—
MD50-08-7947	50-24822	450	Vapor	—	—	—	—	22	—	—	—	—	—	—	—	—	7700	—	—	—	—	—

Table C-3.3-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Ethylbenzene	Ethyltoluene[4-]	Hexane	Methanol	Methylene Chloride	n-Heptane	Propylene	Styrene	Tetrachloroethylene	Tetrahydrofuran	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethylene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
Boreholes 50-603060 and 50-603503																						
MD50-08-8161	50-603060	50	Vapor	—	—	—	—	5.8	—	—	—	110	—	9.2	20	8.5	590	—	—	—	—	—
MD50-08-8160	50-603060	100	Vapor	—	—	—	—	14	—	—	—	210	—	14	52	20	1200	—	—	—	—	—
MD50-08-8159	50-603060	150	Vapor	—	—	—	—	9.2	—	—	—	93	—	5.2	29	10	620	—	—	—	—	—
MD50-08-8158	50-603060	200	Vapor	—	—	—	—	24	—	—	—	160	—	13	21	9.7	1400	—	—	—	—	—
MD50-08-8157	50-603060	250	Vapor	—	—	—	—	45	—	—	—	240	—	18	34	16	2200	—	—	—	—	—
MD50-08-8162	50-603503	347	Vapor	—	—	—	—	28	—	—	—	72	—	—	24	7.7	970	—	—	—	—	—
MD50-08-8163	50-603503	397	Vapor	—	—	—	—	9.8	—	—	—	190	—	—	21	9.7	990	—	—	—	—	—
MD50-08-8164	50-603503	450	Vapor	—	—	—	—	13	—	—	—	120	—	—	—	—	2000	—	—	—	—	—
Borehole 50-603061																						
MD50-08-8206	50-603061	13	Vapor	—	—	—	—	—	—	—	—	8.2	—	31	2400	260	58	5.6	—	—	—	—
MD50-08-8205	50-603061	25	Vapor	—	—	—	—	—	—	—	—	—	—	56	240	55	28	—	—	—	—	—
MD50-08-8204	50-603061	50	Vapor	—	—	—	—	—	—	—	—	22	—	260	640	320	170	—	—	—	—	—
MD50-08-8203	50-603061	100	Vapor	—	—	—	—	—	—	—	—	30	—	49	2400	520	290	—	—	—	—	—
MD50-08-8202	50-603061	150	Vapor	—	—	—	—	86	—	—	—	130	—	52	25,000	4800	1800	—	—	—	—	—
MD50-08-8201	50-603061	185	Vapor	—	—	—	—	27	—	—	—	84	—	670	13,000	2600	1200	—	—	—	—	—
MD50-08-8230	50-603061	2288	Vapor	—	—	—	—	100	—	—	—	180	—	—	31,000	4800	3400	—	—	—	—	—
MD50-08-8231	50-603061	274	Vapor	—	—	—	—	—	—	—	—	94	—	—	16,000	1900	2300	—	—	—	—	—
MD50-08-8209	50-603061	347	Vapor	—	—	—	—	—	—	—	—	5.7	—	5.4	560	28	110	—	—	—	—	—
MD50-08-8208	50-603061	397	Vapor	9.2	7.5 (J)	5.3	110	—	—	50	6.6	7.4	—	83	900	32	200	6.1	8.7	—	11	32
MD50-08-8207	50-603061	450	Vapor	—	—	13	—	—	110	—	—	8.4	—	5.6	1400	30	230	12	—	—	—	—
Borehole 50-603062																						
MD50-08-8251	50-603062	50	Vapor	—	—	—	—	—	—	—	—	11	—	59	40	13	1200	—	—	—	—	—
MD50-08-8250	50-603062	100	Vapor	—	—	—	—	—	—	—	—	—	—	15	190	28	5100	—	—	—	—	—
MD50-08-8249	50-603062	150	Vapor	—	—	—	—	—	—	—	—	—	—	—	200	27	5000	—	—	—	—	—
MD50-08-8248	50-603062	200	Vapor	—	—	—	—	—	—	—	—	—	—	66	170	23	4500	—	—	—	—	—
MD50-08-8247	50-603062	250	Vapor	—	—	—	—	—	—	—	—	—	—	—	150	—	4100	—	—	—	—	—
MD50-08-8252	50-603062	337	Vapor	—	—	—	—	—	—	—	—	—	—	4.5	18	—	330	—	—	—	—	—
MD50-08-8253	50-603062	387	Vapor	—	—	—	—	—	—	—	—	—	—	—	35	—	1200	7.1	—	—	—	—
MD50-08-8254	50-603062	450	Vapor	—	—	—	—	—	—	—	—	—	—	4	9.5	—	400	—	—	—	—	—

Table C-3.3-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Ethylbenzene	Ethyltoluene[4-]	Hexane	Methanol	Methylene Chloride	n-Heptane	Propylene	Styrene	Tetrachloroethylene	Tetrahydrofuran	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethylene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
Borehole 50-603063																						
MD50-08-8296	50-603063	10	Vapor	—	—	—	—	—	—	—	—	52	—	94	390	65	450	—	—	—	—	—
MD50-08-8295	50-603063	25	Vapor	—	—	—	—	—	—	—	—	36	—	190	100	33	370	—	—	—	—	—
MD50-08-8294	50-603063	50	Vapor	—	—	—	—	—	—	—	—	85	—	90	320	85	880	—	—	—	—	—
MD50-08-8291	50-603063	99	Vapor	—	—	—	—	7.5	—	—	—	170	—	920	920	250	2200	—	—	—	—	—
MD50-08-8292	50-603063	150	Vapor	—	—	—	—	28	—	—	—	670	—	1000	3200	680	8600	33	—	—	—	—
MD50-08-8293	50-603063	200	Vapor	—	—	—	—	84	—	—	—	840	—	130	3700	660	14,000	—	—	—	—	—
MD50-09-1668	50-603063	347	Vapor	—	—	—	—	23	—	—	—	100	—	—	230	7.7	1900	8	—	—	—	—
MD50-09-1667	50-603063	397	Vapor	—	—	—	—	75	—	—	—	270	—	—	160	—	7600	—	—	—	—	—
MD50-09-1666	50-603063	450	Vapor	—	—	—	—	56	—	—	—	150	—	—	77	—	5000	—	—	—	—	—
Borehole 50-603064																						
MD50-08-8343	50-603064	25	Vapor	—	—	—	540	110	—	—	—	220	—	—	9800	2000	15,000	—	—	—	—	—
MD50-08-8342	50-603064	66	Vapor	—	—	—	—	—	—	—	—	—	—	7.9	11	—	15	—	—	—	—	5.9
MD50-08-8344	50-603064	113	Vapor	—	—	—	—	—	—	—	—	110	—	—	2700	510	2500	—	—	—	—	—
MD50-08-8345	50-603064	176	Vapor	—	—	—	—	290	—	—	—	400	—	—	9700	2000	24,000	—	—	—	—	—
MD50-08-8338	50-603064	200	Vapor	—	—	—	—	86	—	—	—	76	—	36	2300	530	6200	—	—	—	—	—
MD50-08-8337	50-603064	250	Vapor	20	25	14	—	35	10	—	—	18	—	120	320	96	1600	—	29	8.5	30	79
MD50-08-8341	50-603064	332	Vapor	4.8	—	4.6 (J)	—	—	—	8.4	—	—	—	18	—	—	13	—	—	—	3.7	11
MD50-08-8340	50-603064	400	Vapor	56	43	68 (J)	—	—	23	22	—	—	—	210	—	—	25	—	47	12	50	140
MD50-08-8339	50-603064	500	Vapor	—	—	—	—	—	—	—	—	—	—	7.6	—	—	6	—	—	—	—	4.6

Note: Results are in µg/m³. Data qualifiers are defined in Appendix A.

* — = Not detected.

Table C-3.3-2
Tritium Detected in Vapor Samples at MDA C during Phase II Investigation

Sample ID	Location ID	Depth (ft)	Media	Analytical Result
Boreholes 50-24769 and 50-603470				
MD50-08-7459	50-24769	200	Vapor	59,527.1
MD50-08-7460	50-24769	250	Vapor	30,720
MD50-08-7451	50-24769	3000	Vapor	3682.7
MD50-08-7465	50-603470	351	Vapor	720.151
MD50-08-7464	50-603470	450	Vapor	1150.88
MD50-08-7462	50-603470	600	Vapor	5825.88
MD50-08-7461	50-603470	650	Vapor	1384.03
Boreholes 50-24771 and 50-603471				
MD50-08-7626	50-24771	200	Vapor	4639.13 (J)
MD50-08-7627	50-24771	250	Vapor	1999.93 (J)
MD50-08-7625	50-24771	300	Vapor	1019.06 (J)
MD50-08-7628	50-603471	360	Vapor	1341.37
MD50-08-7629	50-603471	410	Vapor	1892.02
MD50-08-7630	50-603471	450	Vapor	2365.86
MD50-09-3534	50-603471	450	Vapor	2630.41
Boreholes 50-24783 and 50-603472				
MD50-08-7656	50-24783	200	Vapor	2,738,130
MD50-08-7657	50-24783	250	Vapor	1,633,910
MD50-08-7655	50-24783	300	Vapor	143,251
MD50-08-7658	50-603472	364	Vapor	1655.03
MD50-08-7659	50-603472	414	Vapor	13,087.5
MD50-08-7660	50-603472	450	Vapor	2966.66
Borehole 50-24784				
MD50-08-7691	50-24784	362	Vapor	2361.43
MD50-08-7690	50-24784	411	Vapor	1128.81
MD50-08-7689	50-24784	450	Vapor	727.705
Borehole 50-24813				
MD50-08-7716	50-24813	200	Vapor	17,859.2
MD50-08-7717	50-24813	250	Vapor	57,555.3
MD50-08-7715	50-24813	300	Vapor	8554.36
MD50-08-7721	50-24813	358	Vapor	2170.32
MD50-08-7720	50-24813	408	Vapor	1082.9
MD50-08-7719	50-24813	450	Vapor	775.227
MD50-08-7718	50-24813	600	Vapor	839.79

Table C-3.3-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Analytical Result
Borehole 50-603383				
MD50-08-14863	50-603383	286	Vapor	59,153.5
MD50-08-14864	50-603383	359	Vapor	64,216.3
MD50-08-14865	50-603383	408	Vapor	70,989
MD50-08-14866	50-603383	450	Vapor	52,007.3
Borehole 50-603467				
MD50-08-14858	50-603467	287	Vapor	4199.1 (J)
MD50-08-14860	50-603467	360	Vapor	419.125
MD50-08-14859	50-603467	409	Vapor	—*
MD50-08-14857	50-603467	500	Vapor	7512.63 (J)
MD50-08-14856	50-603467	600	Vapor	—
Borehole 50-603468				
MD50-08-7894	50-603468	300	Vapor	684.274
MD50-08-7895	50-603468	354	Vapor	—
MD50-08-7896	50-603468	403	Vapor	—
MD50-08-7897	50-603468	450	Vapor	—
Borehole 50-24822				
MD50-08-7949	50-24822	351	Vapor	4506.35
MD50-08-7948	50-24822	402	Vapor	1135.58
MD50-08-7947	50-24822	450	Vapor	808.382
Boreholes 50-603060 and 50-603503				
MD50-08-8161	50-603060	50	Vapor	3405.46
MD50-08-8160	50-603060	100	Vapor	2334.79
MD50-08-8159	50-603060	150	Vapor	—
MD50-08-8158	50-603060	200	Vapor	3310.42
MD50-08-8157	50-603060	250	Vapor	2488.95
MD50-08-8162	50-603503	347	Vapor	—
MD50-08-8163	50-603503	397	Vapor	1152.98
MD50-08-8164	50-603503	450	Vapor	—
Borehole 50-603061				
MD50-08-8206	50-603061	13	Vapor	—
MD50-08-8205	50-603061	25	Vapor	1810.75
MD50-08-8204	50-603061	50	Vapor	1364.87
MD50-08-8203	50-603061	100	Vapor	—
MD50-08-8202	50-603061	150	Vapor	1052.23
MD50-08-8201	50-603061	185	Vapor	839.544
MD50-08-8230	50-603061	228	Vapor	1083.26
MD50-08-8231	50-603061	274	Vapor	5836.75
MD50-08-8209	50-603061	347	Vapor	—

Table C-3.3-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Analytical Result
MD50-08-8208	50-603061	397	Vapor	7851.11
MD50-08-8207	50-603061	450	Vapor	1295.12
Borehole 50-603062				
MD50-08-8251	50-603062	50	Vapor	—
MD50-08-8250	50-603062	100	Vapor	2300.12
MD50-08-8249	50-603062	150	Vapor	—
MD50-08-8248	50-603062	200	Vapor	—
MD50-08-8247	50-603062	250	Vapor	—
MD50-08-8252	50-603062	337	Vapor	618.754
MD50-08-8253	50-603062	387	Vapor	405.546 (J)
MD50-08-8254	50-603062	450	Vapor	—
Borehole 50-603063				
MD50-08-8296	50-603063	10	Vapor	856.127
MD50-08-8295	50-603063	25	Vapor	2027.99
MD50-08-8294	50-603063	50	Vapor	1476.79
MD50-08-8291	50-603063	99	Vapor	2009.8
MD50-08-8292	50-603063	150	Vapor	2589.24
MD50-08-8293	50-603063	200	Vapor	7674.74
MD50-09-1668	50-603063	347	Vapor	964.124
MD50-09-1667	50-603063	397	Vapor	1456.73
MD50-09-1666	50-603063	450	Vapor	3262.14
Borehole 50-603064				
MD50-08-8343	50-603064	25	Vapor	—
MD50-08-8342	50-603064	66	Vapor	612.348
MD50-08-8344	50-603064	113	Vapor	1476.51 (J)
MD50-08-8345	50-603064	176	Vapor	1318.47 (J)
MD50-08-8338	50-603064	200	Vapor	534.669
MD50-08-8337	50-603064	250	Vapor	525.898
MD50-08-8341	50-603064	332	Vapor	838.065
MD50-08-8340	50-603064	400	Vapor	998.676
MD50-08-8339	50-603064	500	Vapor	2077.88

Note: Results are in pCi/L. Data qualifiers are defined in Appendix A.

* — = Not detected.

Table C-4.1-1
Vapor-Monitoring Wells and Ports
Sampled during Phase III Investigation

Sampling Port	Depth (ft bgs)	Unit Screened
Well 50-603470 (stainless steel)		
1	30	Qbt 3
2	83	Qbt 3
3	143	Qbt 2
4	203	Qbt 1v
5	233	Qbt 1-vc
6	278	Qbt 1g
7	351	Qct
8	450	Qbo
9	600	Qbo
10	650	Qbog
Well 50-603471 (FLUTe)		
1	30	Qbt 3
2	90	Qbt 3
3	146	Qbt 2
4	209	Qbt 1v
5	242	Qbt 1-vc
6	288	Qbt 1g
7	360	Qct
8	410	Qbo
9	450	Qbo
Well 50-603472 (stainless steel)		
1	27	Qbt 3
2	93	Qbt 3
3	146	Qbt 2
4	210	Qbt 1v
5	247	Qbt 1-vc
6	292	Qbt 1g
7	364	Qct
8	414	Qbo
9	450	Qbo
Well 50-24784 (stainless steel)		
1	25	Qbt 3
2	96	Qbt 3
3	155	Qbt 2
4	215	Qbt 1v
5	244	Qbt 1-vc
6	289	Qbt 1g
7	362	Qct
8	411	Qbo
9	450	Qbo

Table C-4.1-1 (continued)

Sampling Port	Depth (ft bgs)	Unit Screened
Well 50-24813 (stainless steel)		
1	25	Qbt 3
2	99	Qbt 3
3	150	Qbt 2
4	207	Qbt 1v
5	241	Qbt 1-vc
6	286	Qbt 1g
7	358	Qct
8	408	Qbo
9	450	Qbo
10	600	Qbo
Well 50-603383 (FLUTe)		
1	26	Qbt 3
2	85	Qbt 3
3	139	Qbt 2
4	206	Qbt 1v
5	244	Qbt 1-vc
6	286	Qbt 1g
7	359	Qct
8	408	Qbo
9	450	Qbo
Well 50-603467 (FLUTe)		
1	26	Qbt 3
2	91	Qbt 3
3	143	Qbt 2
4	206	Qbt 1v
5	244	Qbt 1-vc
6	287	Qbt 1g
7	360	Qct
8	409	Qbo
9	500	Qbo
10	600	Qbo
Well 50-603468 (FLUTe)		
1	30	Qbt 3
2	92	Qbt 3
3	142	Qbt 2
4	198	Qbt 1v
5	233	Qbt 1-vc
6	282	Qbt 1g
7	354	Qct
8	403	Qbo
9	450	Qbo

Table C-4.1-1 (continued)

Sampling Port	Depth (ft bgs)	Unit Screened
Well 50-24822 (stainless steel)		
1	25	Qbt 3
2	81	Qbt 3
3	142	Qbt 2
4	204	Qbt 1v
5	235	Qbt 1-vc
6	280	Qbt 1g
7	351	Qct
8	402	Qbo
9	450	Qbo
Well 50-603503 (stainless steel)		
1	25	Qbt 3
2	80	Qbt 3
3	133	Qbt 2
4	198	Qbt 1v
5	237	Qbt 1-vc
6	278	Qbt 1g
7	347	Qct
8	397	Qbo
9	450	Qbo
Well 50-603061 (stainless steel)		
1	25	Qbt 3
2	76	Qbt 3
3	128	Qbt 2
4	190	Qbt 1v
5	228	Qbt 1-vc
6	274	Qbt 1g
7	347	Qct
8	397	Qbo
9	450	Qbo
Well 50-603062 (stainless steel)		
1	25	Qbt 3
2	64	Qbt 3
3	122	Qbt 2
4	184	Qbt 1v
5	217	Qbt 1-vc
6	263	Qbt 1g
7	337	Qct
8	387	Qbo
9	450	Qbo
Well 50-603063 (stainless steel)		
1	25	Qbt 3
2	76	Qbt 3
3	128	Qbt 2
4	190	Qbt 1v
5	228	Qbt 1-vc
6	274	Qbt 1g
7	347	Qct

Table C-4.1-1 (continued)

Sampling Port	Depth (ft bgs)	Unit Screened
8	397	Qbo
9	450	Qbo
Well 50-603064 (stainless steel)		
1	25	Qbt 3
2	66	Qbt 3
3	113	Qbt 2
4	176	Qbt 1v
5	214	Qbt 1-vc
6	259	Qbt 1g
7	332	Qct
8	482	Qbo
9	500	Qbo
Well 50-613182 (stainless steel)		
1	500	Qbo
2	550	Qbo
3	600	Qbog
4	620	Qbog
5	632.5	Tvt 2
Well 50-613183 (stainless steel)		
1	30	Qbt 3
2	500	Qbo
3	550	Qbo
4	600	Qbog
5	630	Qbog
6	642.5	Tvt 2
Well 50-613184 (stainless steel)		
1	30	Qbt 3
2	500	Qbo
3	550	Qbo
4	600	Qbo
5	652	Qbog
6	664.5	Tvt 2
Well 50-613185 (stainless steel)		
1	85	Qbt 3
2	145	Qbt 2
3	205	Qbt 1v
4	235	Qbt 1-vc
5	280	Qbt 1g
6	350	Qct
7	450	Qbo
8	600	Qbo
9	675	Qbog
10	688	Tvt 2

Table C-4.1-2
Samples Collected in and Analyses Requested for MDA C Vapor-Monitoring Wells, January 2010–April 2010 Sampling Event

Sample ID	Location ID	Depth (ft)	Tritium	VOC
MD50-10-8677	50-24784	25	10-2706[a]	10-2705
MD50-10-8680	50-24784	96	10-2720	10-2719
MD50-10-8681	50-24784	155	10-2720	10-2719
MD50-10-8679	50-24784	215	10-2706	10-2705
MD50-10-8685	50-24784	244	10-2720	10-2719
MD50-10-8683	50-24784	289	10-2720	10-2719
MD50-10-8684	50-24784	362	10-2720	10-2719
MD50-10-8682	50-24784	411	10-2720	10-2719
MD50-10-8678	50-24784	450	10-2706	10-2705
MD50-10-8697	50-24813	25	10-2915	10-2914
MD50-10-8696	50-24813	99	10-2915	10-2914
MD50-10-8693	50-24813	150	10-2915	10-2914
MD50-10-8702	50-24813	207	10-2941	10-2940
MD50-10-8699	50-24813	241	10-2941	10-2940
MD50-10-8694	50-24813	286	10-2897	10-2896
MD50-10-8700	50-24813	358	10-2941	10-2940
MD50-10-8695	50-24813	408	10-2915	10-2914
MD50-10-8701	50-24813	450	10-2941	10-2940
MD50-10-8698	50-24813	600	10-2915	10-2914
MD50-10-8703	50-24822	25	10-2642	10-2641
MD50-10-8704	50-24822	81	10-2642	10-2641
MD50-10-8705	50-24822	142	10-2664	10-2663
MD50-10-8706	50-24822	204	10-2664	10-2663
MD50-10-8707	50-24822	235	10-2664	10-2663
MD50-10-8708	50-24822	280	10-2664	10-2663
MD50-10-8709	50-24822	351	10-2664	10-2663
MD50-10-8710	50-24822	402	10-2664	10-2663
MD50-10-8711	50-24822	450	10-2664	10-2663
MD50-10-8715	50-603061	25	10-2307	10-2306
MD50-10-8716	50-603061	76	10-2307	10-2306
MD50-10-8717	50-603061	128	10-2329	10-2328
MD50-10-8718	50-603061	190	10-2329	10-2328
MD50-10-8719	50-603061	228	10-2329	10-2328
MD50-10-8720	50-603061	274	10-2338	10-2337
MD50-10-8721	50-603061	347	10-2338	10-2337
MD50-10-8722	50-603061	397	10-2369	10-2368

Table C-4.1-2 (continued)

Sample ID	Location ID	Depth (ft)	Tritium	VOC
MD50-10-8724	50-603061	450	10-2369	10-2368
MD50-10-8727	50-603062	25	10-2372	10-2371
MD50-10-8728	50-603062	64	10-2372	10-2371
MD50-10-8729	50-603062	122	10-2396	10-2395
MD50-10-8730	50-603062	184	10-2396	10-2395
MD50-10-8731	50-603062	217	10-2396	10-2395
MD50-10-15366	50-603062	263	—[b]	10-2643
MD50-10-8732	50-603062	263	10-2396	—
MD50-10-8733	50-603062	337	10-2450	10-2452
MD50-10-8734	50-603062	387	10-2450	10-2451
MD50-10-8735	50-603062	450	10-2450	10-2452
MD50-10-8755	50-603063	25	10-2163	10-2162
MD50-10-8754	50-603063	76	10-2163	10-2162
MD50-10-8753	50-603063	128	10-2163	10-2162
MD50-10-8752	50-603063	190	10-2163	10-2162
MD50-10-8751	50-603063	228	10-2163	10-2162
MD50-10-8749	50-603063	274	10-2163	10-2162
MD50-10-8750	50-603063	347	10-2163	10-2162
MD50-10-8748	50-603063	397	10-2064	10-2063
MD50-10-8747	50-603063	450	10-2064	10-2063
MD50-10-8759	50-603064	25	10-2615	10-2614
MD50-10-8760	50-603064	66	10-2615	10-2614
MD50-10-8761	50-603064	113	10-2615	10-2614
MD50-10-8762	50-603064	176	10-2615	10-2614
MD50-10-8763	50-603064	214	10-2615	10-2614
MD50-10-8764	50-603064	259	10-2615	10-2614
MD50-10-8765	50-603064	332	10-2615	10-2614
MD50-10-8766	50-603064	400	10-2640	10-2639
MD50-10-8767	50-603064	500	10-2640	10-2639
MD50-10-8771	50-603383	26	10-2228	10-2227
MD50-10-8772	50-603383	85	10-2228	10-2227
MD50-10-8773	50-603383	139	10-2228	10-2227
MD50-10-8774	50-603383	206	10-2266	10-2265
MD50-10-8775	50-603383	244	10-2266	10-2265
MD50-10-8776	50-603383	286	10-2266	10-2265
MD50-10-8777	50-603383	359	10-2266	10-2265
MD50-10-8778	50-603383	408	10-2266	10-2265
MD50-10-8779	50-603383	450	10-2327	10-2326
MD50-10-8785	50-603467	26	10-1891	10-1890

Table C-4.1-2 (continued)

Sample ID	Location ID	Depth (ft)	Tritium	VOC
MD50-10-8783	50-603467	91	10-1858	10-1857
MD50-10-8784	50-603467	91	10-1891	10-1890
MD50-10-8786	50-603467	143	10-1891	10-1890
MD50-10-8787	50-603467	206	10-1891	10-1890
MD50-10-8788	50-603467	244	10-1986	10-1985
MD50-10-8793	50-603467	287	10-1986	10-1985
MD50-10-8790	50-603467	360	10-1986	10-1985
MD50-10-8789	50-603467	409	10-1986	10-1985
MD50-10-8791	50-603467	500	10-1986	10-1985
MD50-10-8852	50-603467	600	10-1988	10-1987
MD50-10-8795	50-603468	30	10-2514	10-2513
MD50-10-8796	50-603468	92	10-2514	10-2513
MD50-10-8797	50-603468	142	10-2514	10-2513
MD50-10-8798	50-603468	198	10-2514	10-2513
MD50-10-8799	50-603468	233	10-2533	10-2532
MD50-10-8800	50-603468	282	10-2550	10-2549
MD50-10-8801	50-603468	354	10-2533	10-2532
MD50-10-8802	50-603468	403	10-2533	10-2532
MD50-10-8803	50-603468	403	10-2533	10-2532
MD50-10-8804	50-603468	450	10-2613	10-2612
MD50-10-8807	50-603470	30	10-2791	10-2790
MD50-10-8809	50-603470	83	10-2785	10-2784
MD50-10-8811	50-603470	1433	10-2791	10-2790
MD50-10-8810	50-603470	203	10-2785	10-2784
MD50-10-8813	50-603470	233	10-2810	10-2809
MD50-10-8808	50-603470	278	10-2785	10-2784
MD50-10-8814	50-603470	351	10-2810	10-2809
MD50-10-8816	50-603470	450	10-2899	10-2898
MD50-10-8815	50-603470	600	10-2810	10-2809
MD50-10-8812	50-603470	650	10-2810	10-2809
MD50-10-8826	50-603471	30	10-2812	10-2811
MD50-10-8822	50-603471	90	10-2753	10-2752
MD50-10-8823	50-603471	146	10-2753	10-2752
MD50-10-8825	50-603471	209	10-2783	10-2782
MD50-10-8819	50-603471	242	10-2753	10-2752
MD50-10-8821	50-603471	288	10-2753	10-2752
MD50-10-8827	50-603471	360	10-2793	10-2792
MD50-10-8824	50-603471	410	10-2783	10-2782
MD50-10-8820	50-603471	450	10-2753	10-2752

Table C-4.1-2 (continued)

Sample ID	Location ID	Depth (ft)	Tritium	VOC
MD50-10-8834	50-603472	27	10-2727	10-2726
MD50-10-8833	50-603472	93	10-2727	10-2726
MD50-10-8837	50-603472	93	10-2737	10-2736
MD50-10-8838	50-603472	146	10-2737	10-2736
MD50-10-8831	50-603472	210	10-2725	10-2724
MD50-10-8835	50-603472	247	10-2737	10-2736
MD50-10-8840	50-603472	292	10-2737	10-2736
MD50-10-8839	50-603472	364	10-2737	10-2736
MD50-10-8836	50-603472	414	10-2737	10-2736
MD50-10-8832	50-603472	450	10-2725	10-2724
MD50-10-8843	50-603503	25	10-1494	10-1534
MD50-10-8844	50-603503	80	10-1533	10-1534
MD50-10-8845	50-603503	133	10-1533	10-1534
MD50-10-8846	50-603503	198	10-1588	10-1587
MD50-10-8847	50-603503	237	10-1664	10-1663
MD50-10-8848	50-603503	278	10-1664	10-1663
MD50-10-8849	50-603503	347	10-1763	10-1762
MD50-10-8850	50-603503	397	10-1763	10-1762
MD50-10-8851	50-603503	450	10-1856	10-1855

[a] Analytical request number.

[b] — = Analysis not requested.

Table C-4.1-3
Samples Collected in and Analyses Requested for MDA C Vapor-Monitoring Wells, April 2010–July 2010 Sampling Event

Sample ID	Location ID	Depth (ft)	Tritium	VOC
MD50-10-15742	50-24784	25	10-3614[a]	10-3613
MD50-10-15745	50-24784	96	10-3614	10-3613
MD50-10-15747	50-24784	155	10-3614	10-3613
MD50-10-15744	50-24784	215	10-3614	10-3613
MD50-10-15741	50-24784	244	10-3614	10-3613
MD50-10-15748	50-24784	289	10-3614	10-3613
MD50-10-15743	50-24784	362	10-3614	10-3613
MD50-10-15746	50-24784	411	10-3614	10-3613
MD50-10-15740	50-24784	450	10-3614	10-3613
MD50-10-15902	50-24813	25	10-3732	10-3731
MD50-10-15906	50-24813	99	10-3732	10-3731
MD50-10-15903	50-24813	150	10-3732	10-3731

Table C-4.1-3 (continued)

Sample ID	Location ID	Depth (ft)	Tritium	VOC
MD50-10-15907	50-24813	207	10-3732	10-3731
MD50-10-15904	50-24813	241	10-3732	10-3731
MD50-10-15909	50-24813	286	10-3732	10-3731
MD50-10-15905	50-24813	358	10-3732	10-3731
MD50-10-15910	50-24813	408	10-3732	10-3731
MD50-10-15908	50-24813	450	10-3732	10-3731
MD50-10-15911	50-24813	600	10-3732	10-3731
MD50-10-15848	50-24822	25	10-3511	10-3510
MD50-10-15854	50-24822	81	10-3511	10-3510
MD50-10-15850	50-24822	142	10-3511	10-3510
MD50-10-15856	50-24822	204	10-3511	10-3510
MD50-10-15849	50-24822	235	10-3511	10-3510
MD50-10-15855	50-24822	280	10-3511	10-3510
MD50-10-15852	50-24822	351	10-3511	10-3510
MD50-10-15851	50-24822	402	10-3511	10-3510
MD50-10-15853	50-24822	450	10-3523	10-3522
MD50-10-15840	50-603061	25	10-3554	10-3553
MD50-10-15837	50-603061	76	10-3525	10-3524
MD50-10-15841	50-603061	128	10-3554	10-3553
MD50-10-15843	50-603061	190	10-3554	10-3553
MD50-10-15839	50-603061	228	10-3525	10-3524
MD50-10-15844	50-603061	274	10-3554	10-3553
MD50-10-15842	50-603061	347	10-3554	10-3553
MD50-10-15838	50-603061	397	10-3525	10-3524
MD50-10-15836	50-603061	450	10-3525	10-3524
MD50-10-15893	50-603062	25	10-3468	10-3469
MD50-10-15894	50-603062	64	10-3468	10-3469
MD50-10-15891	50-603062	122	10-3464	10-3463
MD50-10-15896	50-603062	184	10-3468	10-3469
MD50-10-15895	50-603062	217	10-3475	10-3474
MD50-10-15890	50-603062	263	10-3464	10-3463
MD50-10-15898	50-603062	337	10-3475	10-3474
MD50-10-15892	50-603062	387	10-3468	10-3469
MD50-10-15897	50-603062	450	10-3468	10-3469
MD50-10-15827	50-603063	25	10-3495	10-3494
MD50-10-15832	50-603063	76	10-3495	10-3494
MD50-10-15825	50-603063	128	10-3536	10-3535
MD50-10-15830	50-603063	190	10-3495	10-3494
MD50-10-15824	50-603063	228	10-3495	10-3494

Table C-4.1-3 (continued)

Sample ID	Location ID	Depth (ft)	Tritium	VOC
MD50-10-15829	50-603063	274	10-3536	10-3535
MD50-10-15833	50-603063	347	10-3536	10-3535
MD50-10-15826	50-603063	397	10-3495	10-3494
MD50-10-15831	50-603063	450	10-3495	10-3494
MD50-10-15816	50-603064	25	10-3477	10-3476
MD50-10-15817	50-603064	66	10-3477	10-3476
MD50-10-15814	50-603064	113	10-3487	10-3486
MD50-10-15812	50-603064	176	10-3477	10-3476
MD50-10-15819	50-603064	214	10-3477	10-3476
MD50-10-15820	50-603064	259	10-3477	10-3476
MD50-10-15813	50-603064	332	10-3487	10-3486
MD50-10-15818	50-603064	400	10-3477	10-3476
MD50-10-15821	50-603064	500	10-3487	10-3486
MD50-10-15871	50-603383	26	10-3493	10-3492
MD50-10-15866	50-603383	85	10-3485	10-3484
MD50-10-15873	50-603383	139	10-3493	10-3492
MD50-10-15867	50-603383	206	10-3485	10-3484
MD50-10-15874	50-603383	244	10-3493	10-3492
MD50-10-15869	50-603383	286	10-3485	10-3484
MD50-10-15872	50-603383	359	10-3493	10-3492
MD50-10-15870	50-603383	408	10-3485	10-3484
MD50-10-15875	50-603383	450	10-3493	10-3492
MD50-10-15805	50-603467	26	10-2994	10-2993
MD50-10-15801	50-603467	91	10-2994	10-2993
MD50-10-15807	50-603467	143	10-2994	10-2993
MD50-10-15809	50-603467	206	10-3044	10-3043
MD50-10-15804	50-603467	244	10-2994	10-2993
MD50-10-15800	50-603467	287	10-2994	—[b]
MD50-10-15808	50-603467	360	10-2994	10-2993
MD50-10-15802	50-603467	409	10-2994	10-2993
MD50-10-15803	50-603467	500	10-2994	10-2993
MD50-10-15806	50-603467	600	10-2994	10-2993
MD50-10-15879	50-603468	92	10-3046	10-3045
MD50-10-15882	50-603468	142	10-3046	10-3045
MD50-10-15884	50-603468	198	10-3046	10-3045
MD50-10-15878	50-603468	233	10-3046	10-3045
MD50-10-15885	50-603468	282	10-3046	10-3045
MD50-10-15881	50-603468	354	10-3046	10-3045
MD50-10-15883	50-603468	403	10-3046	10-3045

Table C-4.1-3 (continued)

Sample ID	Location ID	Depth (ft)	Tritium	VOC
MD50-10-15880	50-603468	450	10-3046	10-3045
MD50-10-15752	50-603470	30	10-3726	10-3725
MD50-10-15760	50-603470	83	10-3726	10-3725
MD50-10-15753	50-603470	143	10-3726	10-3725
MD50-10-15761	50-603470	203	10-3726	10-3725
MD50-10-15756	50-603470	233	10-3726	10-3725
MD50-10-15758	50-603470	278	10-3726	10-3725
MD50-10-15754	50-603470	351	10-3734	10-3733
MD50-10-15757	50-603470	450	10-3726	10-3725
MD50-10-15755	50-603470	600	10-3734	10-3733
MD50-10-15759	50-603470	650	10-3726	10-3725
MD50-10-15769	50-603471	90	10-3638	10-3637
MD50-10-15768	50-603471	146	10-3638	10-3637
MD50-10-15766	50-603471	209	10-3638	10-3637
MD50-10-15771	50-603471	242	10-3638	10-3637
MD50-10-15765	50-603471	288	10-3638	10-3637
MD50-10-15772	50-603471	360	10-3638	10-3637
MD50-10-15764	50-603471	410	10-3638	10-3637
MD50-10-15770	50-603471	450	10-3728	10-3727
MD50-10-15779	50-603472	27	10-3640	10-3639
MD50-10-15782	50-603472	93	10-3640	10-3639
MD50-10-15780	50-603472	146	10-3640	10-3639
MD50-10-15783	50-603472	210	10-3640	10-3639
MD50-10-15776	50-603472	247	10-3612	10-3611
MD50-10-15778	50-603472	292	10-3640	10-3639
MD50-10-15777	50-603472	364	10-3612	10-3611
MD50-10-15781	50-603472	414	10-3640	10-3639
MD50-10-15784	50-603472	450	10-3640	10-3639
MD50-10-15793	50-603503	25	10-2992	10-2991
MD50-10-15791	50-603503	80	10-2961	10-2960
MD50-10-15792	50-603503	133	10-2992	10-2991
MD50-10-15788	50-603503	198	10-2943	10-2942
MD50-10-15794	50-603503	237	10-2992	10-2991
MD50-10-15795	50-603503	278	10-2992	10-2991
MD50-10-15790	50-603503	347	10-2961	10-2960
MD50-10-15796	50-603503	397	10-2992	10-2991
MD50-10-15789	50-603503	450	10-2943	10-2942

[a] Analytical request number.

[b] — = Analysis not requested.

Table C-4.1-4
Samples Collected in and Analyses Requested for MDA C Vapor-Monitoring Wells, July 2010–September 2010 Sampling Event

Sample ID	Location ID	Depth (ft)	Tritium	VOC
MD50-10-24362	50-24784	25	10-4280[a]	10-4279
MD50-10-24364	50-24784	96	10-4280	10-4279
MD50-10-24365	50-24784	155	10-4280	10-4279
MD50-10-24361	50-24784	215	10-4280	10-4279
MD50-10-24359	50-24784	244	10-4280	10-4279
MD50-10-24366	50-24784	289	10-4280	10-4279
MD50-10-24360	50-24784	362	10-4303	10-4302
MD50-10-24367	50-24784	411	10-4303	10-4302
MD50-10-24363	50-24784	450	10-4280	10-4279
MD50-10-24369	50-24813	25	10-4461	10-4444
MD50-10-24375	50-24813	99	10-4461	10-4444
MD50-10-24370	50-24813	150	10-4461	10-4444
MD50-10-24376	50-24813	207	10-4461	10-4444
MD50-10-24371	50-24813	241	10-4461	10-4444
MD50-10-24377	50-24813	286	10-4461	10-4460
MD50-10-24372	50-24813	358	10-4461	10-4444
MD50-10-24378	50-24813	408	10-4461	10-4460
MD50-10-24374	50-24813	450	10-4461	10-4460
MD50-10-24373	50-24813	600	10-4461	10-4444
MD50-10-24413	50-24822	25	10-4038	10-4037
MD50-10-24419	50-24822	81	10-4038	10-4037
MD50-10-24416	50-24822	142	10-4038	10-4037
MD50-10-24414	50-24822	204	10-4038	10-4037
MD50-10-24418	50-24822	235	10-4038	10-4037
MD50-10-24412	50-24822	280	10-4038	10-4037
MD50-10-24415	50-24822	351	10-4038	10-4037
MD50-10-24411	50-24822	402	10-4038	10-4037
MD50-10-24417	50-24822	450	10-4038	10-4037
MD50-10-24435	50-603061	25	10-4170	—[b]
MD50-10-26315	50-603061	25	—	10-4494
MD50-10-24432	50-603061	76	10-4170	10-4169
MD50-10-24437	50-603061	128	10-4170	10-4169
MD50-10-24433	50-603061	190	10-4170	10-4169
MD50-10-24436	50-603061	228	10-4170	10-4169
MD50-10-24434	50-603061	274	10-4170	10-4169
MD50-10-24438	50-603061	347	10-4170	10-4169

Table C-4.1-4 (continued)

Sample ID	Location ID	Depth (ft)	Tritium	VOC
MD50-10-24431	50-603061	397	10-4170	—
MD50-10-26314	50-603061	397	—	10-4494
MD50-10-24439	50-603061	450	10-4170	10-4169
MD50-10-24441	50-603062	25	10-4053	10-4052
MD50-10-24446	50-603062	64	10-4082	10-4081
MD50-10-24443	50-603062	122	10-4053	10-4052
MD50-10-24445	50-603062	184	10-4082	10-4081
MD50-10-24447	50-603062	217	10-4103	10-4102
MD50-10-24442	50-603062	263	10-4053	10-4052
MD50-10-24448	50-603062	337	10-4082	10-4081
MD50-10-24444	50-603062	387	10-4103	10-4102
MD50-10-24449	50-603062	450	10-4103	10-4102
MD50-10-24451	50-603063	25	10-4170	10-4169
MD50-10-24457	50-603063	76	10-4170	10-4169
MD50-10-24453	50-603063	128	10-4170	10-4169
MD50-10-24454	50-603063	190	10-4170	10-4169
MD50-10-24456	50-603063	228	10-4170	10-4169
MD50-10-24458	50-603063	274	10-4170	10-4169
MD50-10-24452	50-603063	347	10-4170	10-4169
MD50-10-24455	50-603063	450	10-4170	10-4169
MD50-10-24461	50-603064	25	10-4038	10-4037
MD50-10-24467	50-603064	66	10-4053	10-4052
MD50-10-24462	50-603064	113	10-4038	10-4037
MD50-10-24465	50-603064	176	10-4038	10-4037
MD50-10-24463	50-603064	214	10-4038	10-4037
MD50-10-24468	50-603064	259	10-4053	10-4052
MD50-10-24464	50-603064	332	10-4038	10-4037
MD50-10-24469	50-603064	482	10-4053	10-4060
MD50-10-24466	50-603064	500	10-4038	10-4037
MD50-10-24380	50-603383	26	10-4192	10-4191
MD50-10-24384	50-603383	85	10-4192	10-4191
MD50-10-24388	50-603383	139	10-4280	10-4279
MD50-10-24382	50-603383	206	10-4192	10-4191
MD50-10-24387	50-603383	244	10-4192	10-4191
MD50-10-24385	50-603383	286	10-4280	10-4279
MD50-10-24381	50-603383	359	10-4192	10-4191
MD50-10-24386	50-603383	408	10-4192	10-4191
MD50-10-24383	50-603383	450	10-4192	10-4191
MD50-10-24394	50-603467	26	10-3805	10-3804

Table C-4.1-4 (continued)

Sample ID	Location ID	Depth (ft)	Tritium	VOC
MD50-10-24398	50-603467	91	10-3805	10-3804
MD50-10-24395	50-603467	143	10-3805	10-3804
MD50-10-24396	50-603467	206	10-3805	10-3804
MD50-10-24399	50-603467	244	10-3805	10-3804
MD50-10-24393	50-603467	287	10-3805	10-3804
MD50-10-24397	50-603467	360	10-3805	10-3804
MD50-10-24391	50-603467	409	10-3805	10-3804
MD50-10-24392	50-603467	500	10-3805	10-3804
MD50-10-24390	50-603467	600	10-3805	10-3804
MD50-10-24402	50-603468	92	10-3763	10-3762
MD50-10-24407	50-603468	142	10-3763	10-3762
MD50-10-24401	50-603468	198	10-3763	10-3762
MD50-10-24405	50-603468	233	10-3763	10-3762
MD50-10-24403	50-603468	282	10-3763	10-3762
MD50-10-24404	50-603468	354	10-3763	10-3762
MD50-10-24408	50-603468	403	10-3763	10-3762
MD50-10-24406	50-603468	450	10-3763	10-3762
MD50-10-24328	50-603470	30	10-4461	10-4444
MD50-10-24333	50-603470	83	10-4461	10-4444
MD50-10-24329	50-603470	143	10-4461	10-4444
MD50-10-24334	50-603470	203	10-4461	10-4444
MD50-10-24330	50-603470	233	10-4461	10-4444
MD50-10-24335	50-603470	278	10-4461	10-4444
MD50-10-24331	50-603470	351	10-4461	10-4444
MD50-10-24336	50-603470	450	10-4461	10-4444
MD50-10-24332	50-603470	600	10-4461	10-4444
MD50-10-24337	50-603470	650	10-4461	10-4444
MD50-10-24339	50-603471	90	10-4384	10-4385
MD50-10-24344	50-603471	146	10-4400	10-4399
MD50-10-24340	50-603471	209	10-4400	10-4399
MD50-10-24345	50-603471	242	10-4400	10-4399
MD50-10-24341	50-603471	288	10-4384	10-4385
MD50-10-24343	50-603471	360	10-4400	10-4399
MD50-10-24342	50-603471	410	10-4400	10-4399
MD50-10-24346	50-603471	450	10-4400	10-4399
MD50-10-24354	50-603472	27	10-4340	10-4339
MD50-10-24357	50-603472	93	10-4340	10-4339
MD50-10-24352	50-603472	146	10-4303	10-4302
MD50-10-24356	50-603472	210	10-4340	10-4339

Table C-4.1-4 (continued)

Sample ID	Location ID	Depth (ft)	Tritium	VOC
MD50-10-24350	50-603472	247	10-4303	10-4302
MD50-10-24353	50-603472	292	10-4340	10-4339
MD50-10-24349	50-603472	367	10-4303	10-4302
MD50-10-24355	50-603472	414	10-4340	10-4339
MD50-10-24351	50-603472	450	10-4303	10-4302
MD50-10-24423	50-603503	25	10-3763	10-3762
MD50-10-24426	50-603503	80	10-3805	10-3804
MD50-10-24422	50-603503	133	10-3763	10-3762
MD50-10-24425	50-603503	198	10-3805	10-3804
MD50-10-24421	50-603503	237	10-3763	10-3762
MD50-10-24427	50-603503	278	10-3805	10-3804
MD50-10-24424	50-603503	347	10-3763	10-3762
MD50-10-24428	50-603503	397	10-3805	10-3804
MD50-10-24429	50-603503	450	10-3805	10-3804

[a] Analytical request number.

[b] — = Analysis not requested.

Table C-4.1-5
Samples Collected in and Analyses Requested for MDA C Vapor-Monitoring Wells, October 2010–January 2011 Sampling Event

Sample ID	Location ID	Depth (ft)	Tritium	VOC
MD50-10-27179	50-24784	25	11-533[a]	11-534
MD50-10-27176	50-24784	96	11-533	11-534
MD50-10-27175	50-24784	155	11-533	11-534
MD50-10-27181	50-24784	215	11-533	11-534
MD50-10-27180	50-24784	244	11-533	11-534
MD50-10-27178	50-24784	289	11-543	11-544
MD50-10-27182	50-24784	362	11-533	11-534
MD50-10-27177	50-24784	411	11-607	11-606
MD50-10-27183	50-24784	450	11-587	11-586
MD50-10-27186	50-24813	25	11-993	11-992
MD50-10-27189	50-24813	99	11-1043	11-1042
MD50-10-27185	50-24813	150	11-993	11-992
MD50-10-27190	50-24813	207	11-1031	11-1030
MD50-10-27193	50-24813	241	11-1043	11-1042
MD50-10-27194	50-24813	241	11-1043	11-1042
MD50-10-27191	50-24813	286	11-1031	11-1030
MD50-10-27343	50-24813	358	11-1110	11-1111

Table C-4.1-5 (continued)

Sample ID	Location ID	Depth (ft)	Tritium	VOC
MD50-10-27192	50-24813	408	11-1043	11-1042
MD50-10-27188	50-24813	450	11-1110	11-1111
MD50-10-27195	50-24813	600	11-1065	11-1064
MD50-10-27227	50-24822	25	11-319	11-318
MD50-10-27232	50-24822	81	11-319	11-318
MD50-10-27235	50-24822	142	11-501	11-500
MD50-10-27229	50-24822	204	11-319	11-318
MD50-10-27233	50-24822	235	11-501	11-500
MD50-10-27231	50-24822	280	11-319	11-318
MD50-10-27230	50-24822	351	11-364	11-352
MD50-10-27228	50-24822	450	11-319	11-318
MD50-10-27249	50-603061	25	11-635	11-634
MD50-10-27251	50-603061	76	11-661	11-662
MD50-10-27247	50-603061	128	11-635	11-634
MD50-10-27255	50-603061	190	11-661	11-662
MD50-10-27248	50-603061	228	11-635	11-634
MD50-10-27253	50-603061	274	11-635	11-634
MD50-10-27252	50-603061	347	11-661	11-662
MD50-10-27254	50-603061	397	11-635	11-634
MD50-10-27250	50-603061	450	11-635	11-634
MD50-10-27262	50-603062	25	11-212	11-211
MD50-10-27265	50-603062	64	11-212	11-211
MD50-10-27257	50-603062	122	11-192	11-191
MD50-10-27263	50-603062	184	11-212	11-211
MD50-10-27260	50-603062	217	11-192	11-191
MD50-10-27264	50-603062	263	11-212	11-211
MD50-10-27259	50-603062	337	11-245	11-244
MD50-10-27261	50-603062	387	11-212	11-211
MD50-10-27258	50-603062	450	11-192	11-191
MD50-10-27267	50-603063	25	11-607	11-606
MD50-10-27272	50-603063	76	11-607	11-606
MD50-10-27275	50-603063	128	11-612	11-611
MD50-10-27268	50-603063	190	11-607	11-606
MD50-10-27273	50-603063	228	11-607	11-606
MD50-10-27269	50-603063	274	11-607	11-606
MD50-10-27274	50-603063	347	11-607	11-606
MD50-10-27271	50-603063	450	11-612	11-611
MD50-10-27280	50-603064	25	11-302	11-301
MD50-10-27285	50-603064	66	11-302	11-301

Table C-4.1-5 (continued)

Sample ID	Location ID	Depth (ft)	Tritium	VOC
MD50-10-27279	50-603064	113	11-275	11-274
MD50-10-27283	50-603064	176	11-302	11-301
MD50-10-27277	50-603064	214	11-275	11-274
MD50-10-27281	50-603064	259	11-302	11-301
MD50-10-27278	50-603064	332	11-302	11-301
MD50-10-27282	50-603064	400	11-302	11-301
MD50-10-27284	50-603064	500	11-302	11-301
MD50-10-27199	50-603383	26	11-516	11-515
MD50-10-27197	50-603383	85	11-516	11-515
MD50-10-27205	50-603383	139	11-566	11-565
MD50-10-27204	50-603383	206	11-566	11-565
MD50-10-27203	50-603383	244	11-566	11-565
MD50-10-27201	50-603383	286	11-516	11-515
MD50-10-27202	50-603383	359	11-566	11-565
MD50-10-27200	50-603383	408	11-516	11-515
MD50-10-27196	50-603383	450	11-566	—[b]
MD50-10-27214	50-603467	26	11-261	11-260
MD50-10-27210	50-603467	91	11-261	11-260
MD50-10-27211	50-603467	143	11-261	11-260
MD50-10-27215	50-603467	206	11-261	11-260
MD50-10-27207	50-603467	244	11-261	11-260
MD50-10-27213	50-603467	287	11-261	11-260
MD50-10-27212	50-603467	360	11-275	11-274
MD50-10-27208	50-603467	409	11-275	11-274
MD50-10-27206	50-603467	500	11-261	11-260
MD50-10-27209	50-603467	600	11-275	11-274
MD50-10-27220	50-603468	92	11-946	11-945
MD50-10-27217	50-603468	142	11-935	11-934
MD50-10-27218	50-603468	198	11-935	11-934
MD50-10-27219	50-603468	233	11-946	11-945
MD50-10-27226	50-603468	282	11-935	11-934
MD50-10-27223	50-603468	354	11-946	11-945
MD50-10-27221	50-603468	403	11-935	11-934
MD50-10-27222	50-603468	450	11-935	11-934
MD50-10-27145	50-603470	30	11-790	11-791
MD50-10-27149	50-603470	83	11-862	11-861
MD50-10-27144	50-603470	143	11-790	11-791
MD50-10-27151	50-603470	203	11-862	11-861
MD50-10-27147	50-603470	233	11-790	11-791

Table C-4.1-5 (continued)

Sample ID	Location ID	Depth (ft)	Tritium	VOC
MD50-10-27153	50-603470	278	11-862	11-861
MD50-10-27146	50-603470	351	11-790	11-791
MD50-10-27152	50-603470	450	11-862	11-861
MD50-10-27148	50-603470	600	11-862	11-861
MD50-10-27115	50-603470	650	11-1065	11-1064
MD50-10-27158	50-603471	30	11-792	11-793
MD50-10-27155	50-603471	90	11-678	11-679
MD50-10-27157	50-603471	146	11-711	11-710
MD50-10-27162	50-603471	209	11-711	11-710
MD50-10-27161	50-603471	242	11-792	11-793
MD50-10-27160	50-603471	288	11-792	11-793
MD50-10-27156	50-603471	360	11-792	11-793
MD50-10-27163	50-603471	410	11-792	11-793
MD50-10-27159	50-603471	450	11-792	11-793
MD50-10-27165	50-603472	27	11-1008	11-1007
MD50-10-27168	50-603472	93	11-1008	11-1007
MD50-10-27170	50-603472	146	11-1011	11-1012
MD50-10-27172	50-603472	210	11-1019	11-1018
MD50-10-27166	50-603472	247	11-1008	11-1007
MD50-10-27174	50-603472	292	11-1019	11-1018
MD50-10-27169	50-603472	364	11-1008	11-1007
MD50-10-27167	50-603472	414	11-1011	11-1012
MD50-10-27173	50-603472	450	11-1019	11-1018
MD50-10-27243	50-603503	25	11-245	11-244
MD50-10-27237	50-603503	80	11-245	11-244
MD50-10-27244	50-603503	133	11-245	11-244
MD50-10-27238	50-603503	198	11-245	11-244
MD50-10-27245	50-603503	237	11-245	11-244
MD50-10-27239	50-603503	278	11-245	11-244
MD50-10-27241	50-603503	347	11-245	11-244
MD50-10-27240	50-603503	397	11-245	11-244
MD50-10-27242	50-603503	450	11-245	11-244

[a] Analytical request number.

[b] — = Analysis not requested.

Table C-4.1-6
Samples Collected in and Analyses Requested for MDA C Vapor-Monitoring Wells, January 2011–March 2011 Sampling Event

Sample ID	Location ID	Depth (ft)	Tritium	VOC
MD50-11-4012	50-24784	25	11-1357[a]	11-1356
MD50-11-4010	50-24784	96	11-1357	11-1356
MD50-11-4009	50-24784	155	11-1357	11-1356
MD50-11-4006	50-24784	215	11-1357	11-1356
MD50-11-4004	50-24784	244	11-1341	11-1340
MD50-11-4008	50-24784	289	11-1341	11-1340
MD50-11-4007	50-24784	362	11-1357	11-1356
MD50-11-4005	50-24784	411	11-1341	11-1340
MD50-11-4003	50-24784	450	11-1341	11-1340
MD50-11-4023	50-24813	25	11-1411	11-1410
MD50-11-4021	50-24813	99	11-1408	11-1407
MD50-11-4020	50-24813	150	11-1408	—[b]
MD50-11-4095	50-24813	150	—	11-1623
MD50-11-4019	50-24813	207	11-1372	11-1371
MD50-11-4018	50-24813	241	11-1372	11-1371
MD50-11-4017	50-24813	286	11-1408	11-1407
MD50-11-4014	50-24813	358	11-1372	11-1371
MD50-11-4013	50-24813	408	11-1408	11-1407
MD50-11-4015	50-24813	450	11-1408	11-1407
MD50-11-4016	50-24813	600	11-1408	11-1407
MD50-11-4058	50-24822	25	11-1223	11-1224
MD50-11-4059	50-24822	81	11-1250	—
MD50-11-4057	50-24822	142	11-1223	11-1224
MD50-11-4055	50-24822	204	11-1209	11-1208
MD50-11-4060	50-24822	235	11-1250	11-1249
MD50-11-4061	50-24822	280	11-1223	11-1224
MD50-11-4056	50-24822	351	11-1209	11-1208
MD50-11-4062	50-24822	402	11-1250	—
MD50-11-4064	50-24822	450	11-1250	—
MD50-11-4080	50-603061	25	11-1535	11-1536
MD50-11-4081	50-603061	76	11-1535	11-1536
MD50-11-4083	50-603061	128	11-1535	11-1536
MD50-11-4082	50-603061	190	11-1535	11-1536
MD50-11-4084	50-603061	228	11-1535	11-1536
MD50-11-4076	50-603061	274	11-1530	11-1529
MD50-11-4077	50-603061	347	11-1530	11-1529

Table C-4.1-6 (continued)

Sample ID	Location ID	Depth (ft)	Tritium	VOC
MD50-11-4078	50-603061	397	11-1530	11-1529
MD50-11-4079	50-603061	450	11-1535	11-1536
MD50-11-4092	50-603062	25	11-1265	11-1264
MD50-11-4091	50-603062	64	11-1265	11-1264
MD50-11-4093	50-603062	122	11-1265	11-1264
MD50-11-4090	50-603062	184	11-1265	11-1264
MD50-11-4089	50-603062	217	11-1259	11-1258
MD50-11-4087	50-603062	263	11-1259	11-1258
MD50-11-4086	50-603062	337	11-1259	11-1258
MD50-11-4088	50-603062	387	11-1265	11-1264
MD50-11-4085	50-603062	450	11-1265	11-1264
MD50-11-4103	50-603063	25	11-1665	11-1664
MD50-11-4102	50-603063	76	11-1665	11-1664
MD50-11-4101	50-603063	128	11-1665	11-1664
MD50-11-4100	50-603063	190	11-1665	11-1664
MD50-11-4099	50-603063	228	11-1665	11-1664
MD50-11-4098	50-603063	274	11-1648	11-1647
MD50-11-4096	50-603063	347	11-1648	11-1647
MD50-11-4104	50-603063	397	11-1665	11-1664
MD50-11-4097	50-603063	450	11-1648	11-1647
MD50-11-4113	50-603064	25	11-1600	11-1599
MD50-11-4112	50-603064	66	11-1600	11-1599
MD50-11-4111	50-603064	113	11-1600	11-1599
MD50-11-4109	50-603064	176	11-1600	11-1599
MD50-11-4110	50-603064	214	11-1600	11-1599
MD50-11-4105	50-603064	259	11-1559	11-1558
MD50-11-4106	50-603064	332	11-1559	11-1558
MD50-11-4107	50-603064	400	11-1559	11-1558
MD50-11-4108	50-603064	500	11-1559	11-1558
MD50-11-4024	50-603383	26	11-1408	11-1407
MD50-11-4029	50-603383	85	11-1427	11-1426
MD50-11-4025	50-603383	139	11-1411	11-1410
MD50-11-4030	50-603383	206	11-1411	11-1410
MD50-11-4026	50-603383	244	11-1408	11-1407
MD50-11-4031	50-603383	286	11-1427	11-1426
MD50-11-4027	50-603383	359	11-1411	11-1410
MD50-11-4032	50-603383	408	11-1411	11-1410
MD50-11-4028	50-603383	450	11-1427	11-1426
MD50-11-4034	50-603467	26	11-1427	11-1426

Table C-4.1-6 (continued)

Sample ID	Location ID	Depth (ft)	Tritium	VOC
MD50-11-4038	50-603467	91	11-1452	11-1451
MD50-11-4035	50-603467	143	11-1427	11-1426
MD50-11-4039	50-603467	206	11-1452	11-1451
MD50-11-4036	50-603467	244	11-1427	11-1426
MD50-11-4042	50-603467	287	11-1452	11-1451
MD50-11-4037	50-603467	360	11-1452	11-1451
MD50-11-4040	50-603467	409	11-1452	11-1451
MD50-11-4043	50-603467	500	11-1452	11-1451
MD50-11-4041	50-603467	600	11-1452	11-1451
MD50-11-4047	50-603468	92	11-1468	11-1467
MD50-11-4046	50-603468	142	11-1468	11-1467
MD50-11-4045	50-603468	198	11-1490	11-1489
MD50-11-4054	50-603468	233	11-1468	11-1467
MD50-11-4050	50-603468	282	11-1490	11-1489
MD50-11-4051	50-603468	354	11-1490	11-1489
MD50-11-4052	50-603468	403	11-1490	11-1489
MD50-11-4053	50-603468	450	11-1490	11-1489
MD50-11-3980	50-603470	83	11-1322	11-1321
MD50-11-3975	50-603470	143	11-1302	11-1301
MD50-11-3973	50-603470	203	11-1302	11-1301
MD50-11-3972	50-603470	233	11-1322	11-1321
MD50-11-3974	50-603470	278	11-1302	11-1301
MD50-11-3979	50-603470	351	11-1306	11-1305
MD50-11-3978	50-603470	450	11-1306	11-1305
MD50-11-3977	50-603470	600	11-1306	11-1305
MD50-11-3976	50-603470	650	11-1322	11-1321
MD50-11-3983	50-603471	30	11-1302	11-1301
MD50-11-3992	50-603471	90	11-1341	11-1340
MD50-11-3990	50-603471	146	11-1336	11-1335
MD50-11-3988	50-603471	209	11-1341	11-1340
MD50-11-3989	50-603471	242	11-1336	11-1335
MD50-11-3987	50-603471	288	11-1336	11-1335
MD50-11-3986	50-603471	360	11-1336	11-1335
MD50-11-3984	50-603471	410	11-1322	11-1321
MD50-11-3985	50-603471	450	11-1336	11-1335
MD50-11-4002	50-603472	27	11-1341	11-1340
MD50-11-4000	50-603472	93	11-1341	11-1340
MD50-11-4001	50-603472	146	11-1341	11-1340
MD50-11-3998	50-603472	210	11-1341	11-1340

Table C-4.1-6 (continued)

Sample ID	Location ID	Depth (ft)	Tritium	VOC
MD50-11-3999	50-603472	247	11-1341	11-1340
MD50-11-3996	50-603472	292	11-1341	—
MD50-11-3993	50-603472	364	11-1341	11-1340
MD50-11-3994	50-603472	414	11-1341	11-1340
MD50-11-3995	50-603472	450	11-1341	11-1340
MD50-11-4071	50-603503	25	11-1510	11-1509
MD50-11-4072	50-603503	80	11-1510	11-1509
MD50-11-4069	50-603503	133	11-1510	11-1509
MD50-11-4073	50-603503	198	11-1510	11-1509
MD50-11-4070	50-603503	237	11-1510	11-1509
MD50-11-4067	50-603503	278	11-1494	11-1493
MD50-11-4066	50-603503	347	11-1494	11-1493
MD50-11-4068	50-603503	397	11-1494	11-1493
MD50-11-4065	50-603503	450	11-1494	11-1493
MD50-11-3944	50-613182	500	11-1163	—
MD50-11-3943	50-613182	550	11-1132	11-1131
MD50-11-3942	50-613182	600	11-1132	11-1131
MD50-11-3945	50-613182	620	11-1145	—
MD50-11-3953	50-613182	620	—	11-1451
MD50-11-3941	50-613182	632.5	11-1132	11-1131
MD50-11-3947	50-613183	30	11-1452	11-1451
MD50-11-3948	50-613183	500	11-1490	11-1489
MD50-11-3949	50-613183	550	11-1468	11-1467
MD50-11-3950	50-613183	600	11-1452	11-1451
MD50-11-3951	50-613183	630	11-1490	11-1489
MD50-11-3952	50-613183	642.5	11-1452	11-1451
MD50-11-3959	50-613184	30	11-1613	11-1612
MD50-11-3956	50-613184	500	11-1613	11-1612
MD50-11-3958	50-613184	550	11-1613	11-1612
MD50-11-3954	50-613184	600	11-1613	11-1612
MD50-11-3957	50-613184	652	11-1613	11-1612
MD50-11-3955	50-613184	664.5	11-1613	11-1612
MD50-11-3961	50-613185	85	11-1163	—
MD50-11-3962	50-613185	145	11-1250	11-1249
MD50-11-3963	50-613185	205	11-1145	11-1144
MD50-11-3964	50-613185	235	11-1145	11-1144
MD50-11-3965	50-613185	280	11-1169	11-1168
MD50-11-3966	50-613185	350	11-1169	11-1168
MD50-11-3967	50-613185	450	11-1196	11-1195

Table C-4.1-6 (continued)

Sample ID	Location ID	Depth (ft)	Tritium	VOC
MD50-11-3969	50-613185	600	11-1196	11-1195
MD50-11-3968	50-613185	675	11-1171	11-1170
MD50-11-3970	50-613185	688	11-1196	11-1195

[a] Analytical request number.

[b] — = Analysis not requested.

Table C-4.1-7
Samples Collected in and Analyses Requested for MDA C Vapor-Monitoring Wells, March 2011–May 2011 Sampling Event

Sample ID	Location ID	Depth (ft)	Tritium	VOC
MD50-11-6010	50-24784	25	11-2105[a]	11-2106
MD50-11-6007	50-24784	96	11-2105	11-2106
MD50-11-6011	50-24784	155	11-2105	11-2106
MD50-11-6005	50-24784	215	11-2081	11-2080
MD50-11-6009	50-24784	244	11-2105	11-2106
MD50-11-6006	50-24784	289	11-2081	11-2080
MD50-11-6008	50-24784	362	11-2105	11-2106
MD50-11-6004	50-24784	411	11-2081	11-2080
MD50-11-6003	50-24784	450	11-2081	11-2080
MD50-11-6022	50-24813	25	11-2174	11-2173
MD50-11-6021	50-24813	99	11-2174	11-2173
MD50-11-6019	50-24813	150	11-2174	11-2173
MD50-11-6020	50-24813	207	11-2174	11-2173
MD50-11-6018	50-24813	241	11-2174	11-2173
MD50-11-6017	50-24813	286	11-2164	11-2163
MD50-11-6013	50-24813	358	11-2164	11-2163
MD50-11-6015	50-24813	408	11-2164	11-2163
MD50-11-6016	50-24813	450	11-2164	11-2163
MD50-11-6014	50-24813	600	11-2164	11-2163
MD50-11-6062	50-24822	25	11-1855	11-1854
MD50-11-6059	50-24822	81	11-1855	11-1854
MD50-11-6061	50-24822	142	11-1855	11-1854
MD50-11-6058	50-24822	204	11-1834	11-1833
MD50-11-6060	50-24822	235	11-1855	11-1854
MD50-11-6055	50-24822	280	11-1834	11-1833
MD50-11-6056	50-24822	351	11-1834	11-1833
MD50-11-6063	50-24822	402	11-1855	11-1854

Table C-4.1-7 (continued)

Sample ID	Location ID	Depth (ft)	Tritium	VOC
MD50-11-6057	50-24822	450	11-1834	11-1833
MD50-11-6083	50-603061	25	11-2060	11-2059
MD50-11-6080	50-603061	76	11-2060	11-2059
MD50-11-6079	50-603061	128	11-2060	11-2059
MD50-11-6078	50-603061	190	11-2036	11-2035
MD50-11-6081	50-603061	228	11-2060	11-2059
MD50-11-6077	50-603061	274	11-2036	11-2035
MD50-11-6082	50-603061	347	11-2060	11-2059
MD50-11-6076	50-603061	397	11-2036	11-2035
MD50-11-6075	50-603061	450	11-2036	11-2035
MD50-11-6088	50-603062	25	11-1896	11-1895
MD50-11-6085	50-603062	64	11-1942	11-1941
MD50-11-6087	50-603062	122	11-1896	11-1895
MD50-11-6092	50-603062	184	11-1942	11-1941
MD50-11-6086	50-603062	217	11-1896	11-1895
MD50-11-6090	50-603062	263	11-1942	11-1941
MD50-11-6094	50-603062	337	11-1921	11-1920
MD50-11-6091	50-603062	387	11-1942	11-1941
MD50-11-6089	50-603062	450	11-1942	11-1941
MD50-11-6102	50-603063	25	11-2014	11-2013
MD50-11-6100	50-603063	76	11-2014	11-2013
MD50-11-6099	50-603063	128	11-2014	11-2013
MD50-11-6097	50-603063	190	11-1989	11-1988
MD50-11-6098	50-603063	228	11-1989	11-1988
MD50-11-6103	50-603063	274	11-2014	11-2013
MD50-11-6095	50-603063	347	11-1989	11-1988
MD50-11-6101	50-603063	397	11-2014	11-2013
MD50-11-6096	50-603063	450	11-1989	11-1988
MD50-11-6108	50-603064	25	11-2239	11-2238
MD50-11-6107	50-603064	66	11-2239	11-2238
MD50-11-6105	50-603064	113	11-2239	11-2238
MD50-11-6110	50-603064	176	11-2255	11-2254
MD50-11-6111	50-603064	214	11-2255	11-2254
MD50-11-6112	50-603064	259	11-2255	11-2254
MD50-11-6113	50-603064	332	11-2255	11-2254
MD50-11-6109	50-603064	482	11-2255	11-2254
MD50-11-6106	50-603064	500	11-2252	11-2251
MD50-11-6027	50-603383	26	11-1989	11-1988
MD50-11-6025	50-603383	85	11-1989	11-1988

Table C-4.1-7 (continued)

Sample ID	Location ID	Depth (ft)	Tritium	VOC
MD50-11-6024	50-603383	139	11-1989	11-1988
MD50-11-6032	50-603383	206	11-1989	11-1988
MD50-11-6026	50-603383	244	11-1989	11-1988
MD50-11-6029	50-603383	286	11-1989	11-1988
MD50-11-6028	50-603383	359	11-1989	11-1988
MD50-11-6030	50-603383	408	11-1989	11-1988
MD50-11-6031	50-603383	450	11-1989	11-1988
MD50-11-6041	50-603467	26	11-1981	11-1980
MD50-11-6043	50-603467	91	11-1981	11-1980
MD50-11-6038	50-603467	143	11-1981	11-1980
MD50-11-6042	50-603467	206	11-1981	11-1980
MD50-11-6037	50-603467	244	11-1981	11-1980
MD50-11-6039	50-603467	287	11-1981	11-1980
MD50-11-6040	50-603467	360	11-1981	11-1980
MD50-11-6036	50-603467	409	11-1958	11-1957
MD50-11-6035	50-603467	500	11-1958	11-1957
MD50-11-6034	50-603467	600	11-1958	11-1957
MD50-11-6051	50-603468	92	11-1921	11-1920
MD50-11-6050	50-603468	142	11-1921	11-1920
MD50-11-6052	50-603468	198	11-1921	11-1920
MD50-11-6049	50-603468	233	11-1921	11-1920
MD50-11-6047	50-603468	282	11-1896	11-1895
MD50-11-6046	50-603468	354	11-1896	11-1895
MD50-11-6045	50-603468	403	11-1896	11-1895
MD50-11-6048	50-603468	450	11-1896	11-1895
MD50-11-5978	50-603470	30	11-2239	11-2238
MD50-11-5980	50-603470	83	11-2239	11-2238
MD50-11-5982	50-603470	143	11-2239	11-2238
MD50-11-5977	50-603470	203	11-2239	11-2238
MD50-11-5976	50-603470	233	11-2221	11-2220
MD50-11-5979	50-603470	278	11-2239	11-2238
MD50-11-5973	50-603470	351	11-2221	11-2220
MD50-11-5972	50-603470	450	11-2221	11-2220
MD50-11-5975	50-603470	600	11-2221	11-2220
MD50-11-5974	50-603470	650	11-2221	11-2220
MD50-11-5990	50-603471	90	11-2164	11-2163
MD50-11-5989	50-603471	146	11-2164	11-2163
MD50-11-5988	50-603471	209	11-2164	11-2163
MD50-11-5987	50-603471	242	11-2164	11-2163

Table C-4.1-7 (continued)

Sample ID	Location ID	Depth (ft)	Tritium	VOC
MD50-11-6156	50-603471	288	11-2164	11-2163
MD50-11-5986	50-603471	360	11-2164	11-2163
MD50-11-5983	50-603471	410	11-2164	11-2163
MD50-11-5985	50-603471	450	11-2164	11-2163
MD50-11-6000	50-603472	27	11-2127	11-2126
MD50-11-5998	50-603472	93	11-2124	11-2125
MD50-11-6001	50-603472	146	11-2127	11-2126
MD50-11-5997	50-603472	210	11-2124	11-2125
MD50-11-5999	50-603472	247	11-2124	11-2125
MD50-11-5995	50-603472	292	11-2124	11-2125
MD50-11-5994	50-603472	364	11-2124	11-2125
MD50-11-5993	50-603472	414	11-2124	11-2125
MD50-11-5996	50-603472	450	11-2124	11-2125
MD50-11-6072	50-603503	25	11-1885	11-1884
MD50-11-5992	50-603503	80	—[b]	11-2163
MD50-11-6071	50-603503	80	11-1885	—
MD50-11-6073	50-603503	133	11-1885	11-1884
MD50-11-6069	50-603503	198	11-1885	11-1884
MD50-11-6068	50-603503	237	11-1885	11-1884
MD50-11-6070	50-603503	278	11-1885	11-1884
MD50-11-6065	50-603503	347	11-1885	11-1884
MD50-11-6066	50-603503	397	11-1885	11-1884
MD50-11-6067	50-603503	450	11-1885	11-1884
MD50-11-5933	50-613182	500	11-1756	11-1757
MD50-11-5934	50-613182	550	11-1756	11-1757
MD50-11-5936	50-613182	600	11-1756	11-1757
MD50-11-5937	50-613182	620	11-1756	11-1757
MD50-11-5935	50-613182	632.5	11-1756	11-1757
MD50-11-5942	50-613183	30	11-1788	11-1787
MD50-11-5939	50-613183	500	11-1788	11-1787
MD50-11-5943	50-613183	550	11-1788	11-1787
MD50-11-5941	50-613183	600	11-1802	11-1801
MD50-11-5944	50-613183	630	11-1788	11-1787
MD50-11-5940	50-613183	642.5	11-1788	11-1787
MD50-11-5948	50-613184	30	11-1682	11-1683
MD50-11-5951	50-613184	500	11-1682	11-1683
MD50-11-5946	50-613184	550	11-1682	11-1683
MD50-11-5947	50-613184	600	11-1682	11-1683
MD50-11-5950	50-613184	652	11-1682	11-1683

Table C-4.1-7 (continued)

Sample ID	Location ID	Depth (ft)	Tritium	VOC
MD50-11-5949	50-613184	664.5	11-1682	11-1683
MD50-11-5960	50-613185	85	11-1732	11-1733
MD50-11-5961	50-613185	145	11-1732	11-1733
MD50-11-5957	50-613185	205	11-1732	11-1733
MD50-11-5962	50-613185	235	11-1732	11-1733
MD50-11-5959	50-613185	280	11-1732	11-1733
MD50-11-5955	50-613185	350	11-1709	11-1708
MD50-11-5954	50-613185	450	11-1709	11-1708
MD50-11-5953	50-613185	600	11-1709	11-1708
MD50-11-5958	50-613185	675	11-1732	11-1733
MD50-11-5956	50-613185	688	11-1709	11-1708

[a] Analytical request number.

[b] — = Analysis not requested.

Table C-4.1-8
VOCs Detected in Vapor Samples at MDA C during January 2010–April 2010 Sampling Event

Sample ID	Location ID	Depth (ft)	Acetone	Benzene	Butadiene[1,3-]	Butanone[2-]	Carbon Tetrachloride	Chlorobenzene	Chlorodifluoromethane	Chloroform	Chloromethane	Cyclohexane	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Ethanol	Ethylbenzene
MD50-10-8677	50-24784	25	13 (J)	—[a]	NA[b]	—	39	—	NA	230	—	NA	25	—	—	—	—	—	NA	—
MD50-10-8680	50-24784	96	—	—	NA	—	160	—	NA	690	—	NA	55	—	—	—	—	62	NA	—
MD50-10-8681	50-24784	155	—	—	NA	—	290	—	NA	290	—	NA	80	—	—	—	—	75	NA	—
MD50-10-8679	50-24784	215	—	—	NA	—	190 (J)	—	NA	100	—	NA	—	—	—	—	—	—	NA	—
MD50-10-8685	50-24784	244	—	—	NA	—	700	—	NA	190	—	NA	150	—	—	—	27	70	NA	—
MD50-10-8683	50-24784	289	—	—	NA	—	720	—	NA	88	—	NA	140	—	—	—	—	26	NA	—
MD50-10-8684	50-24784	362	—	—	NA	—	760	—	NA	27	—	NA	180	—	—	—	—	—	NA	—
MD50-10-8682	50-24784	411	—	—	NA	—	400	—	NA	—	—	NA	56	—	—	—	—	—	NA	—
MD50-10-8678	50-24784	450	—	8.2	NA	—	330	—	NA	—	—	NA	120	—	—	—	—	—	NA	—
MD50-10-8697	50-24813	25	—	—	NA	—	1200	—	NA	840	—	NA	360	—	—	—	—	—	NA	—
MD50-10-8696	50-24813	99	—	—	NA	—	1600	—	NA	2300	—	NA	—	—	—	—	—	—	NA	—
MD50-10-8693	50-24813	150	—	—	NA	—	960	—	NA	2200	—	NA	—	—	—	—	—	—	NA	—
MD50-10-8702	50-24813	207	—	—	NA	—	—	—	NA	1800	—	NA	—	—	—	—	—	—	NA	—
MD50-10-8699	50-24813	241	—	—	NA	—	920	—	NA	1400	—	NA	1100	—	—	—	—	—	NA	—
MD50-10-8694	50-24813	286	—	—	NA	—	1300	—	NA	1500	—	NA	1400	—	—	—	460	—	NA	—
MD50-10-8700	50-24813	358	—	—	NA	—	—	—	NA	—	—	NA	—	—	—	—	—	—	NA	—
MD50-10-8695	50-24813	408	—	—	NA	—	—	—	NA	—	—	NA	—	—	—	—	—	—	NA	—
MD50-10-8701	50-24813	450	—	—	NA	—	—	—	NA	—	—	NA	—	—	—	—	—	—	NA	—
MD50-10-8698	50-24813	600	—	—	NA	—	24	—	NA	—	—	NA	40	—	—	—	—	—	NA	—
MD50-10-8703	50-24822	25	—	—	NA	—	43	—	NA	140	—	NA	120	—	—	—	—	—	NA	—
MD50-10-8704	50-24822	81	—	—	NA	—	140	—	NA	490	—	NA	360	—	—	—	110	—	NA	—
MD50-10-8705	50-24822	142	—	—	NA	—	—	—	NA	360	—	NA	640 (J)	—	—	—	—	—	NA	—
MD50-10-8706	50-24822	204	—	—	NA	—	—	—	NA	280	—	NA	—	—	—	—	—	—	NA	—
MD50-10-8707	50-24822	235	—	—	NA	—	—	—	NA	—	—	NA	—	—	—	—	—	—	NA	—
MD50-10-8708	50-24822	280	—	—	NA	—	—	—	NA	—	—	NA	600 (J)	—	—	—	—	—	NA	—
MD50-10-8709	50-24822	351	—	—	NA	—	85	—	NA	—	—	NA	160	—	—	—	—	—	NA	—
MD50-10-8710	50-24822	402	—	—	NA	—	—	—	NA	—	—	NA	290 (J)	—	—	—	—	—	NA	—
MD50-10-8711	50-24822	450	—	—	NA	—	44	—	NA	—	—	NA	71	—	—	—	—	—	NA	—
MD50-10-8715	50-603061	25	—	—	NA	—	—	—	NA	—	—	NA	280	—	—	—	—	—	NA	—
MD50-10-8716	50-603061	76	—	—	NA	—	—	—	NA	36	—	NA	820	—	—	970	—	—	NA	—
MD50-10-8717	50-603061	128	—	140	NA	—	—	—	NA	—	—	NA	7.4	—	—	28	—	—	NA	29
MD50-10-8718	50-603061	190	—	100	NA	—	43	—	NA	19	—	NA	86	—	—	590	4.3	—	NA	14

Table C-4.1-8 (continued)

Sample ID	Location ID	Depth (ft)	Acetone	Benzene	Butadiene[1,3-]	Butanone[2-]	Carbon Tetrachloride	Chlorobenzene	Chlorodifluoromethane	Chloroform	Chloromethane	Cyclohexane	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Ethanol	Ethylbenzene
MD50-10-8719	50-603061	228	—	61	NA	—	46	—	NA	17	—	NA	100	—	—	550	—	—	NA	12
MD50-10-8720	50-603061	274	—	84	NA	—	49	—	NA	—	—	NA	90	—	—	300	—	—	NA	15
MD50-10-8721	50-603061	347	—	68	NA	—	32	—	NA	—	—	NA	64	—	—	82	—	—	NA	8.6
MD50-10-8722	50-603061	397	—	47	NA	—	38	—	NA	4	—	NA	73	—	—	52	—	—	NA	11
MD50-10-8724	50-603061	450	—	37	NA	—	14	—	NA	—	—	NA	42	—	—	14	—	—	NA	19
MD50-10-8727	50-603062	25	—	18	NA	—	—	—	NA	32	—	NA	32	—	—	—	—	—	NA	—
MD50-10-8728	50-603062	64	—	21	NA	—	—	—	NA	18	—	NA	31	—	—	—	—	—	NA	—
MD50-10-8729	50-603062	122	—	130	NA	—	—	—	NA	60	—	NA	150	—	—	—	—	—	NA	—
MD50-10-8730	50-603062	184	—	74	NA	—	14	—	NA	14	—	NA	56	—	—	—	—	—	NA	—
MD50-10-8731	50-603062	217	—	53	NA	—	—	—	NA	—	—	NA	120	—	—	—	—	—	NA	—
MD50-10-15366	50-603062	263	—	41	NA	—	9.8	—	NA	—	—	NA	39	—	—	—	—	—	NA	14
MD50-10-8733	50-603062	337	—	13	NA	—	—	—	NA	—	—	NA	3.5	—	—	—	—	—	NA	2
MD50-10-8734	50-603062	387	—	42	8.1 (J-)	—	15	—	—	—	7.8	3.2	68	—	—	—	—	—	31	6
MD50-10-8735	50-603062	450	—	95	NA	—	—	—	NA	—	—	NA	21	—	—	—	—	—	NA	64
MD50-10-8755	50-603063	25	—	3.2	—	—	20	—	21	21	—	—	120	5.5	—	12	—	—	—	—
MD50-10-8754	50-603063	76	—	41	—	—	74	—	58	130	—	—	240	33	—	100	14	—	—	—
MD50-10-8753	50-603063	128	—	19	—	—	55	—	45	110	—	—	190	27	—	85	12	—	—	—
MD50-10-8752	50-603063	190	—	83	—	—	150	—	110	190	—	—	280	—	—	120	44	—	51 (J)	—
MD50-10-8751	50-603063	228	—	45	—	—	120	—	—	150	—	—	200	—	—	81	36	—	—	—
MD50-10-8749	50-603063	274	—	110	21	—	140	—	—	110	—	—	200	—	—	39	31	—	190	—
MD50-10-8750	50-603063	347	—	18	—	—	54	—	—	42	—	—	93	—	—	9	10	—	—	—
MD50-10-8748	50-603063	397	—	32	NA	—	—	—	NA	35	—	NA	—	—	—	—	—	—	NA	—
MD50-10-8747	50-603063	450	—	39	NA	—	—	—	NA	27	—	NA	48	—	—	—	—	—	NA	—
MD50-10-8759	50-603064	25	—	—	NA	—	41	—	NA	250	—	NA	100	—	—	91	25	—	NA	—
MD50-10-8760	50-603064	66	—	—	NA	—	62	—	NA	270	—	NA	170	—	—	230	43	—	NA	—
MD50-10-8761	50-603064	113	—	—	NA	—	—	—	NA	93	—	NA	71	—	—	65	22	—	NA	—
MD50-10-8762	50-603064	176	—	—	NA	—	—	—	NA	470	—	NA	430	—	—	430	190	—	NA	—
MD50-10-8763	50-603064	214	—	—	NA	—	—	—	NA	200	—	NA	220	—	—	190	—	—	NA	—
MD50-10-8764	50-603064	259	—	—	NA	—	—	—	NA	110	—	NA	180	—	—	110	—	—	NA	—
MD50-10-8765	50-603064	332	—	—	NA	—	170	—	NA	—	—	NA	390	—	—	99	—	—	NA	—
MD50-10-8766	50-603064	400	—	—	NA	—	67	—	NA	—	—	NA	140	—	—	—	—	—	NA	—
MD50-10-8767	50-603064	500	4.4	39	NA	—	16	—	NA	—	—	NA	55	—	—	—	—	—	NA	8.8
MD50-10-8771	50-603383	26	—	9.2	NA	—	—	—	NA	8.3	—	NA	16	—	—	—	—	5.4	NA	—
MD50-10-8772	50-603383	85	—	—	NA	—	84	—	NA	43	—	NA	140	—	—	—	—	47	NA	—

Table C-4.1-8 (continued)

Sample ID	Location ID	Depth (ft)	Acetone	Benzene	Butadiene[1,3-]	Butanone[2-]	Carbon Tetrachloride	Chlorobenzene	Chlorodifluoromethane	Chloroform	Chloromethane	Cyclohexane	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Ethanol	Ethylbenzene
MD50-10-8773	50-603383	139	—	—	NA	—	82	—	NA	120	—	NA	150	—	—	36	31	200	NA	—
MD50-10-8774	50-603383	206	—	—	NA	—	84	—	NA	50	—	NA	110	—	—	—	—	120	NA	—
MD50-10-8775	50-603383	244	—	—	NA	—	100	—	NA	42	—	NA	90	—	—	—	22	110	NA	—
MD50-10-8776	50-603383	286	—	—	NA	—	40	—	NA	—	—	NA	—	—	—	—	—	41	NA	—
MD50-10-8777	50-603383	359	8.4	5.9	NA	—	4.5	1.6	NA	—	—	NA	4.9	—	—	—	—	1.4	NA	3.1
MD50-10-8778	50-603383	408	8.8	86	NA	—	70	9	NA	—	—	NA	46	—	—	2.8	2.1	—	NA	15
MD50-10-8779	50-603383	450	5.8	16	NA	—	17	—	NA	—	—	NA	11	—	—	—	—	—	NA	2.3
MD50-10-8785	50-603467	26	—	11	NA	—	160 (J)	—	NA	170	—	NA	80	—	—	—	17	—	NA	—
MD50-10-8783	50-603467	91	—	—	NA	—	200	—	NA	250	—	NA	—	—	—	—	—	—	NA	—
MD50-10-8784	50-603467	91	18	—	NA	—	120 (J)	—	NA	100	—	NA	47	—	—	—	14	—	NA	—
MD50-10-8786	50-603467	143	—	—	NA	—	480	—	NA	410	—	NA	—	—	—	—	—	—	NA	—
MD50-10-8787	50-603467	206	—	—	NA	—	180	—	NA	170	—	NA	—	—	—	—	—	—	NA	—
MD50-10-8788	50-603467	244	—	—	NA	—	310	—	NA	120	—	NA	100	—	—	—	—	—	NA	—
MD50-10-8793	50-603467	287	—	—	NA	—	200	—	NA	140	—	NA	110	—	—	—	60	—	NA	—
MD50-10-8790	50-603467	360	—	—	NA	—	—	—	NA	—	—	NA	—	—	—	—	—	—	NA	—
MD50-10-8789	50-603467	409	—	—	NA	—	—	—	NA	—	—	NA	48	—	—	—	—	—	NA	—
MD50-10-8791	50-603467	500	—	76	NA	—	—	—	NA	—	—	NA	—	—	—	—	—	—	NA	—
MD50-10-8852	50-603467	600	74	7.7	NA	110	22	—	NA	—	—	NA	25	—	—	—	—	—	NA	—
MD50-10-8795	50-603468	30	—	50	9	—	—	—	—	—	—	6	—	—	—	—	—	—	64	11
MD50-10-8796	50-603468	92	—	75	12	—	72	—	—	140	—	12	46	—	—	—	31	—	180	14
MD50-10-8797	50-603468	142	14	56	10	6	18	—	—	55	—	12	16	—	—	—	16	—	67	10
MD50-10-8798	50-603468	198	—	100	20	—	110	—	—	150	—	—	100	—	—	—	56	—	51	20
MD50-10-8799	50-603468	233	—	30	—	—	140	—	—	180	—	—	170	—	—	—	66	—	—	—
MD50-10-8800	50-603468	282	—	—	—	—	100	—	—	98	—	—	110	—	—	—	37	—	27	—
MD50-10-8801	50-603468	354	—	70	12	—	120	—	—	100	—	—	150	—	—	—	40	—	63	—
MD50-10-8802	50-603468	403	—	—	—	—	270	—	—	140	—	—	370	—	—	—	64	—	—	—
MD50-10-8803	50-603468	403	—	—	—	—	76	—	—	26	—	—	110	—	—	—	11	—	21	—
MD50-10-8804	50-603468	450	—	39	NA	—	81	—	NA	75	—	NA	—	—	—	—	29	—	NA	—
MD50-10-8807	50-603470	30	—	—	NA	—	—	—	NA	520	—	NA	—	—	—	—	—	—	NA	—
MD50-10-8809	50-603470	83	—	—	NA	—	—	—	NA	990	—	NA	400 (J)	—	—	—	—	—	NA	—
MD50-10-8811	50-603470	143	—	—	NA	—	—	—	NA	1400	—	NA	670 (J)	—	—	—	—	—	NA	—
MD50-10-8810	50-603470	203	—	—	NA	—	—	—	NA	990	—	NA	810 (J)	—	—	—	—	—	NA	—
MD50-10-8813	50-603470	233	—	—	NA	—	—	—	NA	1200	—	NA	950	—	—	—	—	—	NA	—
MD50-10-8808	50-603470	278	—	—	NA	—	—	—	NA	—	—	NA	—	—	—	—	—	—	NA	—

Table C-4.1-8 (continued)

Sample ID	Location ID	Depth (ft)	Acetone	Benzene	Butadiene[1,3-]	Butanone[2-]	Carbon Tetrachloride	Chlorobenzene	Chlorodifluoromethane	Chloroform	Chloromethane	Cyclohexane	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Ethanol	Ethylbenzene
MD50-10-8814	50-603470	351	—	—	NA	—	—	—	NA	—	—	NA	230	—	—	—	—	—	NA	—
MD50-10-8816	50-603470	450	—	—	NA	—	180	—	NA	49	—	NA	—	—	—	—	—	—	NA	—
MD50-10-8815	50-603470	600	8.8 (J)	—	NA	—	65	—	NA	—	—	NA	160	—	—	—	—	—	NA	—
MD50-10-8812	50-603470	650	7.1 (J)	1.6	NA	—	6.2	—	NA	—	—	NA	34	—	—	—	—	—	NA	—
MD50-10-8826	50-603471	30	—	—	NA	—	1400	—	NA	1800	—	NA	260	—	64	—	150	—	NA	—
MD50-10-8822	50-603471	90	—	—	NA	—	1100 (J)	—	NA	2100	—	NA	—	—	—	—	—	—	NA	—
MD50-10-8823	50-603471	146	—	—	NA	—	—	—	NA	2300	—	NA	670 (J)	—	—	—	470	—	NA	—
MD50-10-8825	50-603471	209	—	—	NA	—	—	—	NA	1700	—	NA	—	—	—	—	—	—	NA	—
MD50-10-8819	50-603471	242	—	—	NA	—	—	—	NA	1600	—	NA	—	—	—	—	—	—	NA	—
MD50-10-8821	50-603471	288	—	—	NA	—	—	—	NA	1000	—	NA	—	—	—	—	—	—	NA	—
MD50-10-8827	50-603471	360	—	—	NA	—	—	—	NA	640	—	NA	—	—	—	—	—	—	NA	—
MD50-10-8824	50-603471	410	—	—	NA	—	—	—	NA	530	—	NA	—	—	—	—	—	—	NA	—
MD50-10-8820	50-603471	450	—	—	NA	—	—	—	NA	—	—	NA	—	—	—	—	—	—	NA	—
MD50-10-8834	50-603472	27	—	—	NA	—	—	—	NA	380	—	NA	—	—	—	—	—	—	NA	—
MD50-10-8833	50-603472	93	—	—	NA	—	—	—	NA	340	—	NA	—	—	—	—	—	—	NA	—
MD50-10-8837	50-603472	93	—	—	NA	—	—	—	NA	460	—	NA	—	—	—	—	—	—	NA	—
MD50-10-8838	50-603472	146	—	—	NA	—	—	—	NA	570	—	NA	—	—	—	—	—	—	NA	—
MD50-10-8831	50-603472	210	—	—	NA	—	—	—	NA	440	—	NA	—	—	—	—	—	—	NA	—
MD50-10-8835	50-603472	247	—	—	NA	—	—	—	NA	210	—	NA	—	—	—	—	—	—	NA	—
MD50-10-8840	50-603472	292	—	—	NA	—	—	—	NA	430	—	NA	—	—	—	—	—	—	NA	—
MD50-10-8839	50-603472	364	—	—	NA	—	—	—	NA	—	—	NA	—	—	—	—	—	—	NA	—
MD50-10-8836	50-603472	414	—	—	NA	—	—	—	NA	—	—	NA	—	—	—	—	—	—	NA	—
MD50-10-8832	50-603472	450	—	—	NA	—	—	—	NA	—	—	NA	280 (J)	—	—	—	—	—	NA	—
MD50-10-8843	50-603503	25	—	—	NA	—	81	—	NA	76	—	NA	53	—	—	—	12	16	NA	—
MD50-10-8844	50-603503	80	—	—	NA	—	57	—	NA	78	—	NA	32	—	—	—	9.6	17	NA	—
MD50-10-8845	50-603503	133	100	15	NA	66	32	—	NA	42	—	NA	22	—	—	—	7.1	8.1	NA	19
MD50-10-8846	50-603503	198	9.3	3.1	NA	—	24	—	NA	29	—	NA	18	—	—	—	5.6	9.2	NA	—
MD50-10-8847	50-603503	237	—	—	NA	—	55	—	NA	47	—	NA	32	—	—	—	11	10	NA	—
MD50-10-8848	50-603503	278	—	—	NA	—	84	—	NA	65	—	NA	49	—	—	—	14	12	NA	—
MD50-10-8849	50-603503	347	14 (J)	—	NA	—	16 (J)	—	NA	14	—	NA	14	—	—	—	2.4	2.6	NA	—
MD50-10-8850	50-603503	397	18 (J)	14	NA	—	2.7 (J)	—	NA	—	—	NA	4.1	—	—	—	—	—	NA	1.4
MD50-10-8851	50-603503	450	—	—	NA	—	46 (J)	—	NA	6.6	—	NA	28	—	—	—	—	—	NA	—

Table C-4.1-8 (continued)

Sample ID	Location ID	Depth (ft)	Ethyltoluene[4-]	Hexane	Hexanone[2-]	Methylene Chloride	n-Heptane	Propylene	Styrene	Tetrachloroethylene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethylene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene (total)	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
MD50-10-8677	50-24784	25	—	NA	—	—	NA	NA	—	1600	—	49	62	1100	—	—	—	—	—	—
MD50-10-8680	50-24784	96	—	NA	—	—	NA	NA	—	4000	—	170	93	3700	—	—	—	—	—	—
MD50-10-8681	50-24784	155	—	NA	—	20	NA	NA	—	3000	—	160	70	3800	—	—	—	—	—	—
MD50-10-8679	50-24784	215	—	NA	—	54	NA	NA	—	3000	—	110	—	5200	—	—	—	—	—	—
MD50-10-8685	50-24784	244	—	NA	—	48	NA	NA	—	4600	—	170	85	6800	—	—	—	—	—	—
MD50-10-8683	50-24784	289	—	NA	—	26	NA	NA	—	3300	—	110	49	4000	—	—	—	—	—	—
MD50-10-8684	50-24784	362	—	NA	—	—	NA	NA	—	2000	—	—	—	4300	—	—	—	—	—	—
MD50-10-8682	50-24784	411	—	NA	—	—	NA	NA	—	590	—	—	—	1400	—	—	—	—	—	—
MD50-10-8678	50-24784	450	—	NA	—	—	NA	NA	—	430	11	—	—	1000	13	—	—	—	—	—
MD50-10-8697	50-24813	25	—	NA	—	—	NA	NA	—	350	—	—	—	13,000	—	—	—	—	—	—
MD50-10-8696	50-24813	99	—	NA	—	—	NA	NA	—	—	—	—	—	31,000	—	—	—	—	—	—
MD50-10-8693	50-24813	150	—	NA	—	620	NA	NA	—	—	—	—	—	44,000	—	—	—	—	—	—
MD50-10-8702	50-24813	207	—	NA	—	1100	NA	NA	—	—	—	—	—	67,000	—	—	—	—	—	—
MD50-10-8699	50-24813	241	—	NA	—	1300	NA	NA	—	—	—	—	—	67,000	—	—	—	—	—	—
MD50-10-8694	50-24813	286	—	NA	—	1200 (J)	NA	NA	—	720	—	—	—	62,000	—	—	—	—	—	—
MD50-10-8700	50-24813	358	—	NA	—	270	NA	NA	—	—	—	—	—	19,000	—	—	—	—	—	—
MD50-10-8695	50-24813	408	—	NA	—	350	NA	NA	—	—	—	—	—	35,000	—	—	—	—	—	—
MD50-10-8701	50-24813	450	—	NA	—	82	NA	NA	—	—	—	—	—	6000	—	—	—	—	—	—
MD50-10-8698	50-24813	600	—	NA	—	—	NA	NA	—	—	—	—	—	430	—	—	—	—	—	—
MD50-10-8703	50-24822	25	—	NA	—	—	NA	NA	—	—	—	—	—	4100	—	—	—	—	—	—
MD50-10-8704	50-24822	81	—	NA	—	—	NA	NA	—	—	—	—	—	12,000	—	—	—	—	—	—
MD50-10-8705	50-24822	142	—	NA	—	310	NA	NA	—	—	—	—	—	29,000	—	—	—	—	—	—
MD50-10-8706	50-24822	204	—	NA	—	—	NA	NA	—	—	—	—	—	17,000	—	—	—	—	—	—
MD50-10-8707	50-24822	235	—	NA	—	400	NA	NA	—	—	—	—	—	27,000	—	—	—	—	—	—
MD50-10-8708	50-24822	280	—	NA	—	360	NA	NA	—	—	—	—	—	30,000	—	—	—	—	—	—
MD50-10-8709	50-24822	351	—	NA	—	—	NA	NA	—	—	—	—	—	5700	—	—	—	—	—	—
MD50-10-8710	50-24822	402	—	NA	—	—	NA	NA	—	—	—	—	—	11,000	—	—	—	—	—	—
MD50-10-8711	50-24822	450	—	NA	—	—	NA	NA	—	—	—	—	—	2400	—	—	—	—	—	—
MD50-10-8715	50-603061	25	—	NA	—	—	NA	NA	—	—	—	6000	830	160	—	—	—	—	—	—
MD50-10-8716	50-603061	76	—	NA	—	—	NA	NA	—	220	—	29000	4400	1800	—	—	—	—	—	—
MD50-10-8717	50-603061	128	16	NA	—	—	NA	NA	8.1	—	250	400	92	42	—	18	5.6	120	29	90
MD50-10-8718	50-603061	190	—	NA	—	35	NA	NA	—	83	130	13000	3200	2100	—	—	—	63	15	47

Table C-4.1-8 (continued)

Sample ID	Location ID	Depth (ft)	Ethyltoluene[4-]	Hexane	Hexanone[2-]	Methylene Chloride	n-Heptane	Propylene	Styrene	Tetrachloroethylene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethylene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene (total)	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
MD50-10-8719	50-603061	228	—	NA	—	30	NA	NA	—	78	93	13,000	3800	3300	—	—	—	50	12	38
MD50-10-8720	50-603061	274	—	NA	—	—	NA	NA	—	55	—	6500	880	1100	—	—	—	63	15	49
MD50-10-8721	50-603061	347	—	NA	—	—	NA	NA	—	24	—	4700	150	470	—	—	—	36	8.9	27
MD50-10-8722	50-603061	397	10	NA	—	—	NA	NA	6.2	26	—	1600	74	610	8.5	13	—	52	14	38
MD50-10-8724	50-603061	450	12	NA	—	—	NA	NA	3	7.7	—	500	13	180	4.6	12	4.3	71	19	52
MD50-10-8727	50-603062	25	—	NA	—	—	NA	NA	—	—	24	130	26	1700	—	—	—	—	—	—
MD50-10-8728	50-603062	64	—	NA	—	—	NA	NA	—	—	33	83	19	890	—	—	—	13	—	13
MD50-10-8729	50-603062	122	—	NA	—	—	NA	NA	—	—	200	340	45	2700	—	—	—	81	—	81
MD50-10-8730	50-603062	184	—	NA	—	—	NA	NA	—	—	46	110	13	1800	—	—	—	27	7.1	20
MD50-10-8731	50-603062	217	—	NA	—	—	NA	NA	—	—	81	210	—	2300	—	—	—	—	—	—
MD50-10-15366	50-603062	263	—	NA	—	—	NA	NA	—	—	90	44	—	970	—	—	—	57	14	43
MD50-10-8733	50-603062	337	—	NA	—	—	NA	NA	—	—	—	—	—	14	—	—	—	9.8	2.5	7.3
MD50-10-8734	50-603062	387	4.8	8.4	—	—	—	38	—	—	57	24	—	680	—	5.2	—	NA	7	22
MD50-10-8735	50-603062	450	56	NA	—	—	NA	NA	—	—	320	—	—	140	—	57	18	250	66	180
MD50-10-8755	50-603063	25	—	—	—	—	—	—	—	200	5.4	1500	210	1000	10	—	—	NA	—	—
MD50-10-8754	50-603063	76	—	—	—	—	—	49	—	510	58	3400	530	4200	21	—	—	NA	—	20
MD50-10-8753	50-603063	128	—	—	—	—	—	21	—	430	25	2800	440	3500	17	—	—	NA	—	—
MD50-10-8752	50-603063	190	—	—	—	37	—	68	—	760	120	2500	360	9400	—	—	—	NA	—	39
MD50-10-8751	50-603063	228	—	—	—	46	—	—	—	510	65	1600	200	7400	—	—	—	NA	—	—
MD50-10-8749	50-603063	274	—	—	—	56	—	100	—	490	130	730	75	7400	—	—	—	NA	—	46
MD50-10-8750	50-603063	347	—	—	—	26	—	—	—	260	31	380	—	2900	—	—	—	NA	—	13
MD50-10-8748	50-603063	397	—	NA	—	30	NA	NA	—	88	45	53	—	2400	—	—	—	—	—	—
MD50-10-8747	50-603063	450	—	NA	—	—	NA	NA	—	59	51	—	—	1700	—	—	—	—	—	—
MD50-10-8759	50-603064	25	—	NA	—	—	NA	NA	—	190	—	4600	870	4600	—	—	—	—	—	—
MD50-10-8760	50-603064	66	—	NA	—	—	NA	NA	—	220	—	9200	1200	5100	—	—	—	—	—	—
MD50-10-8761	50-603064	113	—	NA	—	—	NA	NA	—	—	48	1700	290	2900	—	—	—	—	—	—
MD50-10-8762	50-603064	176	—	NA	—	300 (J)	NA	NA	—	310	—	9100	1800	20,000	—	—	—	—	—	—
MD50-10-8763	50-603064	214	—	NA	—	150 (J)	NA	NA	—	180	—	4500	800	11,000	—	—	—	—	—	—
MD50-10-8764	50-603064	259	—	NA	—	93 (J)	NA	NA	—	130	—	2600	330	8200	—	—	—	—	—	—
MD50-10-8765	50-603064	332	—	NA	—	76 (J)	NA	NA	—	130	—	3000	150	8600	—	—	—	—	—	—
MD50-10-8766	50-603064	400	—	NA	—	—	NA	NA	—	—	25	490	—	3600	—	—	—	—	—	—
MD50-10-8767	50-603064	500	5.6 (J+)	NA	—	—	NA	NA	2.8	4.9	65	30	—	290	5.8	5.6	—	35	8.5	27
MD50-10-8771	50-603383	26	—	NA	—	—	NA	NA	—	68	—	69	15	180	—	—	—	—	—	—
MD50-10-8772	50-603383	85	—	NA	—	27	NA	NA	—	360	—	620	120	1200	—	—	—	—	—	—

Table C-4.1-8 (continued)

Sample ID	Location ID	Depth (ft)	Ethyltoluene[4-]	Hexane	Hexanone[2-]	Methylene Chloride	n-Heptane	Propylene	Styrene	Tetrachloroethylene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethylene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene (total)	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
MD50-10-8773	50-603383	139	—	NA	—	44	NA	NA	—	850	—	920	180	3600	—	—	—	—	—	—
MD50-10-8774	50-603383	206	—	NA	—	28	NA	NA	—	490	33	340	75	2100	—	—	—	—	—	—
MD50-10-8775	50-603383	244	—	NA	—	29	NA	NA	—	490	32	230	61	2200	—	—	—	—	—	—
MD50-10-8776	50-603383	286	—	NA	—	19	NA	NA	—	220	—	83	—	1100	—	—	—	—	—	—
MD50-10-8777	50-603383	359	2.8	NA	—	—	NA	NA	—	12	18	—	—	80	—	3.6	—	15	4.1	11
MD50-10-8778	50-603383	408	11	NA	—	—	NA	NA	10	90	140	21	5.2	520	5.8	12	—	74	19	55
MD50-10-8779	50-603383	450	—	NA	—	—	NA	NA	—	20	22	4.9	—	110	—	—	—	11	2.6	8
MD50-10-8785	50-603467	26	—	NA	—	18	NA	NA	—	110	14	—	—	3500	—	—	—	—	—	—
MD50-10-8783	50-603467	91	—	NA	—	—	NA	NA	—	160	—	—	—	4900	—	—	—	—	—	—
MD50-10-8784	50-603467	91	—	NA	—	22	NA	NA	—	61	—	—	—	3200	—	—	—	—	—	—
MD50-10-8786	50-603467	143	—	NA	—	—	NA	NA	—	320	—	—	—	12,000	—	—	—	—	—	—
MD50-10-8787	50-603467	206	—	NA	—	150	NA	NA	—	190	—	—	—	7700	—	—	—	—	—	—
MD50-10-8788	50-603467	244	—	NA	—	200	NA	NA	—	200	—	—	—	8000	—	—	—	—	—	—
MD50-10-8793	50-603467	287	—	NA	—	220	NA	NA	—	190	—	—	—	7900	—	—	—	—	—	—
MD50-10-8790	50-603467	360	—	NA	—	200	NA	NA	—	310	—	—	—	12,000	—	—	—	—	—	—
MD50-10-8789	50-603467	409	—	NA	—	36	NA	NA	—	41	31	—	—	1900	—	—	—	—	—	—
MD50-10-8791	50-603467	500	—	NA	—	25	NA	NA	—	—	100	—	—	1000	—	—	—	42	—	42
MD50-10-8852	50-603467	600	—	NA	250	—	NA	NA	—	16	22	—	—	530	—	—	—	21	5.7	15
MD50-10-8795	50-603468	30	9.8	16	—	—	4.8	43	5.5	—	75	—	—	28	—	12	—	NA	12	38
MD50-10-8796	50-603468	92	13	38	—	18	9.6	68	—	60	110	—	—	2900	—	16	—	NA	16	50
MD50-10-8797	50-603468	142	8.1	37	—	23	7.7	56	3.9	31	76	—	—	1500	—	8.4	—	NA	10	32
MD50-10-8798	50-603468	198	—	17	—	130	—	96	—	100	140	—	—	6400	—	—	—	NA	20	62
MD50-10-8799	50-603468	233	—	—	—	160	—	34	—	120	42	—	—	7600	—	—	—	NA	—	—
MD50-10-8800	50-603468	282	—	—	—	94	—	—	—	80	—	—	—	5600	—	—	—	NA	—	—
MD50-10-8801	50-603468	354	—	20	—	100	—	62	—	120	96	—	—	7600	—	—	—	NA	—	42
MD50-10-8802	50-603468	403	—	—	—	150	—	—	—	240	—	—	—	16000	—	—	—	NA	—	—
MD50-10-8803	50-603468	403	—	—	—	24	—	—	—	60	—	—	—	4000	—	—	—	NA	—	—
MD50-10-8804	50-603468	450	—	NA	—	92	NA	NA	—	86	81	—	—	6700	—	—	—	—	—	—
MD50-10-8807	50-603470	30	—	NA	—	—	NA	NA	—	500	—	200	—	9700	—	—	—	—	—	—
MD50-10-8809	50-603470	83	—	NA	—	—	NA	NA	—	750	—	—	—	19,000	—	—	—	—	—	—
MD50-10-8811	50-603470	143	—	NA	—	410	NA	NA	—	670	—	—	—	35,000	—	—	—	—	—	—
MD50-10-8810	50-603470	203	—	NA	—	630	NA	NA	—	—	—	—	—	48,000	—	—	—	—	—	—
MD50-10-8813	50-603470	233	—	NA	—	800	NA	NA	—	—	—	—	—	49,000	—	—	—	—	—	—
MD50-10-8808	50-603470	278	—	NA	—	760	NA	NA	—	—	—	—	—	52,000	—	—	—	—	—	—

Table C-4.1-8 (continued)

Sample ID	Location ID	Depth (ft)	Ethyltoluene[4-]	Hexane	Hexanone[2-]	Methylene Chloride	n-Heptane	Propylene	Styrene	Tetrachloroethylene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethylene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene (total)	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
MD50-10-8814	50-603470	351	—	NA	—	130	NA	NA	—	—	—	—	—	10,000	—	—	—	—	—	—
MD50-10-8816	50-603470	450	—	NA	—	70 (J)	NA	NA	—	82	—	80	—	11,000	—	—	—	—	—	—
MD50-10-8815	50-603470	600	—	NA	—	—	NA	NA	—	—	—	—	—	1200	11	—	—	—	—	—
MD50-10-8812	50-603470	650	—	NA	—	—	NA	NA	—	—	3.1	—	—	14	2.6	—	—	—	—	—
MD50-10-8826	50-603471	30	—	NA	—	110 (J)	NA	NA	—	650	—	210	43	18,000	—	—	—	—	—	—
MD50-10-8822	50-603471	90	—	NA	—	470	NA	NA	—	1100	—	—	—	27,000	—	—	—	—	—	—
MD50-10-8823	50-603471	146	—	NA	—	1600	NA	NA	—	1100	—	—	—	47,000	—	—	—	—	—	—
MD50-10-8825	50-603471	209	—	NA	—	1400	NA	NA	—	1000	—	—	—	41,000	—	—	—	—	—	—
MD50-10-8819	50-603471	242	—	NA	—	2500	NA	NA	—	—	—	—	—	62,000	—	—	—	—	—	—
MD50-10-8821	50-603471	288	—	NA	—	1700	NA	NA	—	—	—	—	—	48,000	—	—	—	—	—	—
MD50-10-8827	50-603471	360	—	NA	—	1000	NA	NA	—	980	—	—	—	45,000	—	—	—	—	—	—
MD50-10-8824	50-603471	410	—	NA	—	650	NA	NA	—	840	—	—	—	36,000	—	—	—	—	—	—
MD50-10-8820	50-603471	450	—	NA	—	640	NA	NA	—	—	—	—	—	30,000	—	—	—	—	—	—
MD50-10-8834	50-603472	27	—	NA	—	—	NA	NA	—	730	—	—	63	4800	—	—	—	—	—	—
MD50-10-8833	50-603472	93	—	NA	—	450	NA	NA	—	750	—	—	—	15,000	—	—	—	—	—	—
MD50-10-8837	50-603472	93	—	NA	—	80	NA	NA	—	730	—	—	—	7400	—	—	—	—	—	—
MD50-10-8838	50-603472	146	—	NA	—	360	NA	NA	—	870	—	—	—	13,000	—	—	—	—	—	—
MD50-10-8831	50-603472	210	—	NA	—	560	NA	NA	—	1100	—	—	—	20,000	—	—	—	—	—	—
MD50-10-8835	50-603472	247	—	NA	—	310	NA	NA	—	570	—	—	—	12,000	—	—	—	—	—	—
MD50-10-8840	50-603472	292	—	NA	—	830	NA	NA	—	1600	—	—	—	35,000	—	—	—	—	—	—
MD50-10-8839	50-603472	364	—	NA	—	190	NA	NA	—	790	—	—	—	17,000	—	—	—	—	—	—
MD50-10-8836	50-603472	414	—	NA	—	—	NA	NA	—	760	—	—	—	17,000	—	—	—	—	—	—
MD50-10-8832	50-603472	450	—	NA	—	80	NA	NA	—	560	—	—	—	12,000	—	—	—	—	—	—
MD50-10-8843	50-603503	25	—	NA	—	27	NA	NA	—	290	7.3	49	13	2800	—	—	—	—	—	—
MD50-10-8844	50-603503	80	—	NA	—	18	NA	NA	—	250	—	50	14	2000	—	—	—	—	—	—
MD50-10-8845	50-603503	133	13	NA	—	14	NA	NA	—	95	100	24	5.8	990	—	12	—	71	17	53
MD50-10-8846	50-603503	198	—	NA	—	18	NA	NA	—	110	4.6	15	4.5	1000	—	—	—	—	—	—
MD50-10-8847	50-603503	237	—	NA	—	42	NA	NA	—	160	—	27	8.7	2000	—	—	—	—	—	—
MD50-10-8848	50-603503	278	—	NA	—	65	NA	NA	—	290	—	—	—	3200	—	—	—	—	—	—
MD50-10-8849	50-603503	347	—	NA	—	8.2	NA	NA	—	65	—	7.7	2.1	530	2.3	—	—	—	—	—
MD50-10-8850	50-603503	397	—	NA	—	—	NA	NA	—	5.8	18	—	—	70	—	—	—	8.4	1.9	6.5
MD50-10-8851	50-603503	450	—	NA	—	6.6	NA	NA	—	90	4.9	—	—	910	—	—	—	—	—	—

Note: Results are in µg/m^3. Data qualifiers are defined in Appendix A.

[a] — = Not detected.

[b] NA = Not analyzed.

Table C-4.1-9
VOCs Detected in Vapor Samples at MDA C during April 2010–July 2010 Sampling Event

Sample ID	Location ID	Depth (ft)	Acetone	Benzene	Butanone[2-]	Carbon Disulfide	Carbon Tetrachloride	Chlorobenzene	Chloroform	Chloromethane	Dichloro-1,1,2,2-tetrafluoroethane[1,2-]	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Hexanone[2-]	Methylene Chloride	Tetrachloroethylene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethylene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]
MD50-10-15742	50-24784	25	—*	—	—	—	49	—	340	—	—	—	—	—	—	—	—	—	3100	—	—	81	1300	—	—
MD50-10-15745	50-24784	96	—	—	—	—	120 (J)	—	480	—	—	—	—	—	—	61	—	17	2700	—	120	60	2500	—	—
MD50-10-15747	50-24784	155	—	—	—	—	190 (J)	—	180	—	—	75	—	—	—	—	—	76	1800	—	110	—	2600	—	—
MD50-10-15744	50-24784	215	—	—	—	—	730 (J)	—	140	—	—	140	—	—	—	—	—	—	2600	—	130	—	4700	—	—
MD50-10-15741	50-24784	244	—	—	—	—	580 (J)	—	120	—	—	140	—	—	—	—	—	46	2400	—	110	—	4300	—	—
MD50-10-15748	50-24784	289	—	—	—	—	910 (J)	—	79	—	—	170	—	—	—	—	—	42	2500	—	93	—	4500	—	—
MD50-10-15743	50-24784	362	—	—	—	—	650	—	—	—	—	210	—	—	—	—	—	—	1900	—	—	—	3900	—	—
MD50-10-15746	50-24784	411	—	—	—	—	430	—	—	—	—	150	—	—	—	—	—	—	730	—	—	—	1600	—	—
MD50-10-15740	50-24784	450	—	44	—	—	400	—	—	—	—	170	—	—	—	—	—	—	570	54	—	—	1200	—	—
MD50-10-15902	50-24813	25	—	—	—	—	1700 (J)	—	960	—	—	370 (J-)	—	—	—	—	—	—	470	—	—	—	12,000	—	—
MD50-10-15906	50-24813	99	—	—	—	—	2100 (J)	—	2600	—	—	790 (J-)	—	—	400	—	—	—	690	—	—	—	32,000	—	—
MD50-10-15903	50-24813	150	—	—	—	—	890 (J)	—	2200	—	—	690 (J-)	—	—	460	—	—	620	640	—	—	—	37,000	—	—
MD50-10-15907	50-24813	207	—	—	—	—	—	—	1700	—	—	980 (J-)	—	—	450	—	—	1100	—	—	—	—	50,000	—	—
MD50-10-15904	50-24813	241	—	—	—	—	—	—	1900	—	—	1400 (J-)	—	—	660	—	—	1900	960 (J)	—	—	—	70,000	—	—
MD50-10-15909	50-24813	286	—	—	—	—	—	—	—	—	—	740 (J-)	—	—	—	—	—	420	—	—	—	—	33,000	—	—
MD50-10-15905	50-24813	358	—	—	—	—	—	—	—	—	—	900 (J-)	—	—	—	—	—	560	—	—	—	—	46,000	—	—
MD50-10-15910	50-24813	408	—	—	—	—	—	—	1200	—	—	1200 (J-)	—	—	—	—	—	1200	—	—	—	—	60,000	—	—
MD50-10-15908	50-24813	450	—	—	—	—	—	—	—	—	—	560 (J-)	—	—	—	—	—	180	—	—	—	—	23,000	—	—
MD50-10-15911	50-24813	600	—	—	—	—	130 (J)	—	—	—	—	230 (J-)	—	—	—	—	—	—	30	—	—	—	2400	—	—
MD50-10-15848	50-24822	25	—	—	—	—	—	—	350	—	—	480	—	—	—	—	—	260	—	—	—	—	32,000	—	—
MD50-10-15854	50-24822	81	—	—	—	—	170 (J)	—	350	—	—	180	—	—	—	—	—	—	—	—	—	—	11,000	—	—
MD50-10-15850	50-24822	142	—	—	—	—	—	—	260	—	—	240	—	—	—	—	—	100	—	240	—	—	14,000	—	—
MD50-10-15856	50-24822	204	—	—	—	—	—	—	470	—	—	540	—	—	—	—	—	270	—	—	—	—	33,000	—	—
MD50-10-15849	50-24822	235	—	—	—	—	—	—	180	—	—	—	—	—	—	—	—	—	—	—	—	—	6000	—	—
MD50-10-15855	50-24822	280	—	—	—	—	—	—	—	—	—	470	—	—	—	—	—	230	—	—	—	—	27,000	—	—
MD50-10-15852	50-24822	351	—	—	—	—	270 (J)	—	—	—	—	360	—	—	—	—	—	—	—	—	—	—	17,000	—	—
MD50-10-15851	50-24822	402	—	—	—	—	330 (J)	—	—	—	—	300	—	—	—	—	—	—	690	—	—	—	14,000	—	—
MD50-10-15853	50-24822	450	—	—	—	—	210 (J)	—	—	—	—	290	—	—	—	—	—	—	—	—	—	—	10,000	—	—
MD50-10-15840	50-603061	25	—	—	—	—	—	—	—	—	—	—	—	120	—	—	—	36	49	—	9800	1400	250	—	—
MD50-10-15837	50-603061	76	—	—	—	—	90 (J)	—	44	—	—	460	—	770	—	—	—	—	240	—	22,000	4100	1900	—	—

Table C-4.1-9 (continued)

Sample ID	Location ID	Depth (ft)	Acetone	Benzene	Butanone[2-]	Carbon Disulfide	Carbon Tetrachloride	Chlorobenzene	Chloroform	Chloromethane	Dichloro-1,1,2,2-tetrafluoroethane[1,2-]	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Hexanone[2-]	Methylene Chloride	Tetrachloroethylene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethylene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]
MD50-10-15841	50-603061	128	—	—	—	—	—	—	—	—	—	—	—	1300	—	—	—	—	—	—	30,000	6400	2400	—	—
MD50-10-15843	50-603061	190	—	—	—	—	—	—	—	—	—	—	—	640	—	—	—	—	—	—	14,000	2600	1800	—	—
MD50-10-15839	50-603061	228	—	—	—	—	170 (J)	—	31	—	—	190	—	1100	—	—	—	55	190	—	21,000	3700	2800	—	—
MD50-10-15844	50-603061	274	—	—	—	—	—	—	—	—	—	—	—	520	—	—	—	—	—	—	15,000	1700	2100	—	—
MD50-10-15842	50-603061	347	—	—	—	—	110 (J)	—	—	—	—	150	—	160	—	—	—	—	—	—	6200	370	1100	—	—
MD50-10-15838	50-603061	397	—	—	—	54	98	—	—	—	—	110	—	120	—	—	—	—	61	—	4000	190	1600	—	—
MD50-10-15836	50-603061	450	—	—	—	—	54	—	—	—	—	99	—	38	—	—	—	—	26	—	1400	41	500	—	—
MD50-10-15893	50-603062	25	—	—	—	—	—	—	47	—	—	75	—	—	—	—	—	—	—	18	200	51	1700	—	—
MD50-10-15894	50-603062	64	—	—	—	—	—	—	26	—	—	70	—	—	—	—	—	—	—	—	170	34	2100	—	—
MD50-10-15891	50-603062	122	—	—	—	—	—	—	—	—	—	76	—	—	—	—	—	42	—	—	220	—	3900	—	—
MD50-10-15896	50-603062	184	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	430	—	8300	—	—
MD50-10-15895	50-603062	217	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	460	—	8400	—	—
MD50-10-15890	50-603062	263	—	—	—	—	—	—	—	32 (J+)	—	130	—	—	—	—	—	—	—	—	210	—	4400	—	—
MD50-10-15898	50-603062	337	—	—	—	—	40	—	—	—	—	110	—	—	—	—	—	—	—	—	73	—	2400	—	—
MD50-10-15892	50-603062	387	—	—	—	—	32	—	—	—	—	77	—	—	—	—	—	—	—	—	37	—	1100	—	—
MD50-10-15897	50-603062	450	10	—	—	—	24	—	—	—	—	68	—	—	—	—	—	—	—	—	14	—	500	—	—
MD50-10-15827	50-603063	25	—	—	—	—	37	—	37	—	—	—	—	13	—	—	—	—	230	—	3100	400	1800	—	—
MD50-10-15832	50-603063	76	—	—	—	—	—	—	—	—	—	230 (J-)	—	150	—	—	—	—	710	—	5000	790	7200	—	—
MD50-10-15825	50-603063	128	—	—	—	—	140 (J)	—	150	—	—	—	—	—	—	—	—	—	450	—	1300	470	5700	—	—
MD50-10-15830	50-603063	190	—	—	—	—	320 (J)	—	300	—	—	330 (J-)	—	170	—	—	—	—	1000	—	4100	570	16,000	—	—
MD50-10-15824	50-603063	228	—	—	—	—	290 (J)	—	300	—	—	330	—	160	—	—	—	120	980	—	3700	450	17,000	—	—
MD50-10-15829	50-603063	274	—	—	—	—	480 (J)	—	280	—	—	—	—	—	—	—	—	—	1100	—	1700	—	20,000	—	—
MD50-10-15833	50-603063	347	—	—	—	—	220 (J)	—	120	—	—	160 (J-)	—	—	—	—	—	92	380	—	910	—	8700	—	—
MD50-10-15826	50-603063	397	—	—	—	—	270 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	9300	—	—
MD50-10-15831	50-603063	450	—	—	—	—	250 (J)	—	140	—	—	—	—	—	—	—	—	—	260	—	—	—	8600	—	—
MD50-10-15816	50-603064	25	—	—	—	—	—	—	170	—	—	83	—	120	—	—	—	—	230	—	3400	680	3300	—	—
MD50-10-15817	50-603064	66	—	—	—	—	—	—	160	—	—	77	—	140	32	—	—	42	210	—	4000	790	3300	—	—
MD50-10-15814	50-603064	113	—	—	—	—	510 (J)	—	580	—	—	—	—	450	—	—	—	—	470	—	9500	1900	18,000	—	—
MD50-10-15812	50-603064	176	—	—	—	—	—	—	700	—	—	—	—	650	—	—	—	530	580	—	18,000	3000	45,000	—	—
MD50-10-15819	50-603064	214	—	—	—	—	—	—	97	—	—	120	—	110	—	—	—	95	—	59	2300	360	5700	—	—
MD50-10-15820	50-603064	259	—	—	—	—	—	—	—	—	—	420	—	270	—	—	—	310	—	—	5700	620	17,000	—	—
MD50-10-15813	50-603064	332	—	—	—	—	—	—	—	—	—	410	—	—	—	—	—	100	—	—	2700	130	9500	—	—
MD50-10-15818	50-603064	400	—	74	—	—	—	—	—	—	—	88	—	—	—	—	—	16	32	100	320	—	2000	—	—

Table C-4.1-9 (continued)

Sample ID	Location ID	Depth (ft)	Acetone	Benzene	Butanone[2-]	Carbon Disulfide	Carbon Tetrachloride	Chlorobenzene	Chloroform	Chloromethane	Dichloro-1,1,2,2-tetrafluoroethane[1,2-]	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Hexanone[2-]	Methylene Chloride	Tetrachloroethylene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethylene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]
MD50-10-15821	50-603064	500	19	—	—	—	79	—	—	—	—	150	—	—	—	—	—	—	18	—	100	—	1200	19	15
MD50-10-15871	50-603383	26	—	—	—	—	58	—	40	—	—	100	—	—	—	18	—	—	380	—	500	110	1100	25	—
MD50-10-15866	50-603383	85	—	—	—	—	140 (J)	—	110	—	—	200	13	34	16	110	—	11	800	—	940	210	2200	29	—
MD50-10-15873	50-603383	139	—	—	—	—	210	—	230	—	—	180	30	57	46	430	—	45	1100	—	1500	320	4500	33	—
MD50-10-15867	50-603383	206	—	—	—	—	420 (J)	—	160	—	—	160	20	39	55	400	—	57	1300	—	700	210	4800	27	—
MD50-10-15874	50-603383	244	—	—	—	—	510	—	200	—	36	210	25	50	79	600	—	79	1400	—	830	260	6500	38	—
MD50-10-15869	50-603383	286	—	—	—	—	150 (J)	—	33	—	—	91	—	22	26	140	—	39	610	—	270	75	2700	—	—
MD50-10-15872	50-603383	359	—	—	4.4 (J-)	—	—	1.7 (J-)	—	—	—	2.3 (J-)	—	—	—	2 (J-)	—	—	4.3 (J-)	—	—	—	18 (J-)	—	—
MD50-10-15870	50-603383	408	—	—	—	—	320	—	—	—	—	120	—	8.4	—	8.9	—	12	300	—	66	20	1100	—	—
MD50-10-15875	50-603383	450	—	—	—	—	11	—	—	—	—	6.8	—	—	—	—	—	—	44	—	—	—	220	—	—
MD50-10-15805	50-603467	26	—	—	—	—	130 (J)	—	180	—	—	63 (J-)	—	—	28	—	—	40	93	—	—	—	2700	—	—
MD50-10-15801	50-603467	91	—	—	—	—	500 (J)	—	650	—	—	—	—	—	—	—	—	170	400	—	—	—	12,000	—	—
MD50-10-15807	50-603467	143	—	—	—	—	—	—	460	—	—	—	—	—	—	—	—	210	380	—	—	—	12,000	—	—
MD50-10-15809	50-603467	206	—	—	—	—	610 (J)	—	550	—	—	—	—	—	—	—	—	400	780	—	—	—	25,000	—	—
MD50-10-15804	50-603467	244	—	—	—	—	—	—	590	—	—	—	—	—	—	—	—	740	—	—	—	—	24,000	—	—
MD50-10-15808	50-603467	360	—	—	—	—	590 (J)	—	220	—	—	290 (J-)	—	—	—	—	—	270	580	—	—	—	19,000	—	—
MD50-10-15802	50-603467	409	—	—	—	—	290 (J)	—	—	—	—	—	—	—	—	—	—	98	240	—	—	—	7600	—	—
MD50-10-15803	50-603467	500	—	—	—	—	200 (J)	—	—	—	—	—	—	—	—	—	—	—	170	—	—	—	5500	—	—
MD50-10-15806	50-603467	600	110	—	160	—	120 (J)	—	—	—	—	—	—	—	—	—	710	—	48	—	—	—	1500	—	—
MD50-10-15879	50-603468	92	—	—	—	—	150	—	300	—	—	—	—	—	—	—	—	—	—	—	—	—	9200	—	—
MD50-10-15882	50-603468	142	—	—	—	—	—	—	130	—	—	—	—	—	—	—	—	69	99	—	—	—	6400	—	—
MD50-10-15884	50-603468	198	—	—	—	—	—	—	330	—	—	—	—	—	—	—	—	370	—	—	—	—	18,000	—	—
MD50-10-15878	50-603468	233	—	—	—	—	—	—	410	—	—	—	—	—	—	—	—	480	—	—	—	—	27,000	—	—
MD50-10-15885	50-603468	282	—	—	—	—	—	—	300	—	—	—	—	—	—	—	—	330	—	—	—	—	23,000	—	—
MD50-10-15881	50-603468	354	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	300	—	—	—	—	24,000	—	—
MD50-10-15883	50-603468	403	—	—	—	—	—	—	—	—	—	370	—	—	—	—	—	210	—	—	—	—	19,000	—	—
MD50-10-15880	50-603468	450	—	—	—	—	—	—	—	—	—	240	—	—	—	—	—	96	—	—	—	—	12,000	—	—
MD50-10-15752	50-603470	30	—	—	—	—	—	—	730	—	—	—	—	—	—	—	—	—	730	—	—	—	12,000	—	—
MD50-10-15760	50-603470	83	—	—	—	—	440 (J)	—	1100	—	—	330	—	—	130	—	—	—	740	—	290	—	18,000	—	—
MD50-10-15753	50-603470	143	—	—	—	—	—	—	1400	—	—	—	—	—	—	—	—	—	670	—	—	—	32,000	—	—
MD50-10-15761	50-603470	203	—	—	—	—	—	—	—	—	—	610	—	—	—	—	—	320	—	—	—	—	34,000	—	—
MD50-10-15756	50-603470	233	—	—	—	—	—	—	1100	—	—	—	—	—	—	—	—	680	—	—	—	—	53,000	—	—
MD50-10-15758	50-603470	278	—	—	—	—	—	—	920	—	—	890	—	—	—	—	—	760	—	—	—	—	61,000	—	—

Table C-4.1-9 (continued)

Sample ID	Location ID	Depth (ft)	Acetone	Benzene	Butanone[2-]	Carbon Disulfide	Carbon Tetrachloride	Chlorobenzene	Chloroform	Chloromethane	Dichloro-1,1,2,2-tetrafluoroethane[1,2-]	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Hexanone[2-]	Methylene Chloride	Tetrachloroethylene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethylene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]
MD50-10-15754	50-603470	351	—	—	—	—	—	—	—	—	—	720	—	—	—	—	—	420	—	—	—	—	29,000	—	—
MD50-10-15757	50-603470	450	—	—	—	—	—	—	1000	—	—	—	—	—	—	—	—	640	—	—	—	—	47,000	—	—
MD50-10-15755	50-603470	600	—	—	—	—	80 (J)	—	—	—	—	200	—	—	—	—	—	—	—	—	—	—	1400	—	—
MD50-10-15759	50-603470	650	—	—	—	—	37 (J)	—	—	—	—	100	—	—	—	—	—	—	—	—	—	—	—	8.5 (J)	—
MD50-10-15769	50-603471	90–90	—	—	—	—	1700 (J)	—	1800	—	—	330	—	—	240	—	—	300	1000	—	—	—	17,000	—	—
MD50-10-15768	50-603471	146	—	—	—	—	—	—	1700	—	—	—	—	—	330	—	—	960	850	—	—	—	27,000	—	—
MD50-10-15766	50-603471	209	—	—	—	—	—	—	1800	—	—	—	—	—	—	—	—	1600	1300	—	—	—	44,000	—	—
MD50-10-15771	50-603471	242	—	—	—	—	—	—	1600	—	—	—	—	—	650	—	—	2000	1200	—	—	—	50,000	—	—
MD50-10-15765	50-603471	288	—	—	—	—	—	—	1700	—	—	—	—	—	—	—	—	2200	1300	—	—	—	58,000	—	—
MD50-10-15772	50-603471	360	—	—	—	—	—	—	710	—	—	720	—	—	—	—	—	1000	960	—	—	—	43,000	—	—
MD50-10-15764	50-603471	410	—	—	—	—	—	—	770	—	—	—	—	—	—	—	—	1100	930	—	—	—	40,000	—	—
MD50-10-15770	50-603471	450	—	—	—	—	—	—	1000	—	—	—	—	—	—	—	—	650	830	—	—	—	42,000	—	—
MD50-10-15779	50-603472	27	—	—	—	—	—	—	390	—	—	—	—	—	—	—	—	—	670	—	—	67	4400	—	—
MD50-10-15782	50-603472	93	—	—	—	—	—	—	420	—	—	—	—	—	—	—	—	51	620	—	—	—	6000	—	—
MD50-10-15780	50-603472	146	—	—	—	—	—	—	360	—	—	—	—	—	—	—	—	200	460	—	—	—	7700	—	—
MD50-10-15783	50-603472	210	—	—	—	—	200 (J)	—	400	—	—	—	—	—	—	—	—	410	790	—	—	—	15,000	—	—
MD50-10-15776	50-603472	247	—	—	—	—	—	—	240	—	—	—	—	—	—	—	—	320	570	—	—	—	9400	—	—
MD50-10-15778	50-603472	292	—	—	—	—	—	—	580	—	—	—	—	—	—	—	—	780	2000	—	—	—	39,000	—	—
MD50-10-15777	50-603472	364	—	—	—	—	—	—	—	—	—	380	—	—	—	—	—	360	1200	—	—	—	20,000	—	—
MD50-10-15781	50-603472	414	—	—	—	—	400 (J)	—	—	—	—	—	—	—	—	—	—	190	750	—	—	—	17,000	—	—
MD50-10-15784	50-603472	450	—	—	—	—	430 (J)	—	—	—	—	260	—	—	—	—	—	100	640	—	—	—	14,000	—	—
MD50-10-15793	50-603503	25	—	—	—	—	140 (J)	—	120	—	—	76	—	—	15	25	—	40	530	—	100	24	4200	—	—
MD50-10-15791	50-603503	80	—	—	—	—	70 (J)	—	48	—	—	24	—	—	—	—	—	28	200	—	—	—	4300	—	—
MD50-10-15792	50-603503	133	—	—	—	—	140 (J)	—	130	—	—	82	—	—	—	25	—	44	450	—	130	—	4200	—	—
MD50-10-15788	50-603503	198	—	—	—	—	110 (J)	—	110	—	—	47	—	—	20	32	—	69	400	—	48	—	4400	—	—
MD50-10-15794	50-603503	237	—	—	—	—	—	—	100	—	—	—	—	—	—	—	—	150	470	—	—	—	4600	—	—
MD50-10-15795	50-603503	278	—	—	—	—	16 (J)	—	7.7	—	—	11	—	—	—	—	—	6.3	41	—	—	—	490	—	—
MD50-10-15790	50-603503	347	—	—	—	—	77 (J)	—	86	—	—	49	—	—	11	15	—	23	300	—	55	—	2600	—	—
MD50-10-15796	50-603503	397	—	—	—	—	—	—	82	—	—	—	—	—	—	—	—	110	500	—	—	—	5200	—	—
MD50-10-15789	50-603503	450	—	—	—	—	55 (J)	—	—	—	—	32	—	—	—	—	—	7	91	—	—	—	1500	—	—

Note: Results are in µg/m^3. Data qualifiers are defined in Appendix A.
*— = Not detected.

Table C-4.1-10
VOCs Detected in Vapor Samples at MDA C during July 2010–September 2010 Sampling Event

Sample ID	Location ID	Depth (ft)	Acetone	Benzene	Bromomethane	Butanone[2-]	Carbon Disulfide	Carbon Tetrachloride	Chloroform	Chloromethane	Dichlorodifluoromethane	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Ethylbenzene	Ethyltoluene[4-]
MD50-10-24362	50-24784	25	—[a]	—	—	—	—	27	230	—	—	—	—	—	—	—	—
MD50-10-24364	50-24784	96	—	—	—	—	—	85	530	—	68	—	—	—	43	—	—
MD50-10-24365	50-24784	155	—	—	—	—	—	140	210	—	71 (J)	—	—	—	—	—	—
MD50-10-24361	50-24784	215	—	—	—	—	—	250	110	—	100	—	—	—	—	—	—
MD50-10-24359	50-24784	244	—	—	—	—	—	270	96	—	120 (J)	—	—	—	—	—	—
MD50-10-24366	50-24784	289	—	—	—	—	—	340	57	—	130	—	—	—	—	—	—
MD50-10-24360	50-24784	362	—	—	—	—	—	250	—	—	100	—	—	—	—	—	—
MD50-10-24367	50-24784	411	—	—	—	—	—	510 (J)	—	—	110	—	—	—	—	—	—
MD50-10-24363	50-24784	450	—	—	—	—	—	230 (J)	—	—	88	—	—	—	—	—	—
MD50-10-24369	50-24813	25	—	—	—	—	—	1200	960	—	330	—	—	—	—	—	—
MD50-10-24375	50-24813	99	—	—	—	—	—	2800 (J-)	3200	—	730	58	—	450	—	—	—
MD50-10-24370	50-24813	150	—	—	—	—	—	—	2100	—	—	—	—	380	—	—	—
MD50-10-24376	50-24813	207	—	—	—	—	—	1700	2100	—	1300	—	—	590	—	—	—
MD50-10-24371	50-24813	241	—	—	—	—	—	1400	1800	—	1200	—	—	—	—	—	—
MD50-10-24377	50-24813	286	—	—	—	—	—	—	1100	—	—	—	—	—	—	—	—
MD50-10-24372	50-24813	358	—	—	—	—	—	740	520	—	960	—	—	—	—	—	—
MD50-10-24378	50-24813	408	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
MD50-10-24374	50-24813	450	—	—	—	—	—	—	—	—	82	—	—	—	—	—	—
MD50-10-24373	50-24813	600	—	—	—	—	—	130	—	—	240	—	—	—	—	—	—
MD50-10-24413	50-24822	25	—	—	—	—	—	—	210	—	130 (J-)	—	—	—	—	—	—
MD50-10-24419	50-24822	81	—	—	—	—	—	—	430	—	300 (J-)	—	—	—	—	—	—
MD50-10-24416	50-24822	142	—	—	—	—	—	—	470	—	470 (J-)	—	—	—	—	—	—
MD50-10-24414	50-24822	204	—	—	—	—	—	—	510	—	660 (J-)	—	—	—	—	—	—
MD50-10-24418	50-24822	235	—	—	—	—	—	—	480	—	670 (J-)	—	—	—	—	—	—
MD50-10-24412	50-24822	280	—	—	—	—	—	—	310	—	550 (J-)	—	—	—	—	—	—
MD50-10-24415	50-24822	351	—	—	—	—	—	—	—	—	490 (J-)	—	—	—	—	—	—
MD50-10-24411	50-24822	402	5.9 (J)	1.2	—	—	—	—	—	—	2.2	—	—	—	—	—	—
MD50-10-24417	50-24822	450	—	—	—	—	—	—	—	—	330 (J-)	—	—	—	—	—	—
MD50-10-26315	50-603061	25	—	—	—	—	—	—	—	—	730	—	210	—	—	—	—

Table C-4.1-10 (continued)

Sample ID	Location ID	Depth (ft)	Acetone	Benzene	Bromomethane	Butanone[2-]	Carbon Disulfide	Carbon Tetrachloride	Chloroform	Chloromethane	Dichlorodifluoromethane	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Ethylbenzene	Ethyltoluene[4-]
MD50-10-24432	50-603061	76	—	—	—	—	—	—	40	—	350	—	1100	—	—	—	—
MD50-10-24437	50-603061	128	—	—	—	—	—	—	42	—	150	—	1500	—	—	—	—
MD50-10-24433	50-603061	190	—	—	—	—	—	—	29	—	150	—	1400	—	—	—	—
MD50-10-24436	50-603061	228	—	—	—	—	—	—	40	—	220	—	1700	—	—	—	—
MD50-10-24434	50-603061	274	—	—	—	—	—	—	—	—	—	—	940	—	—	—	—
MD50-10-24438	50-603061	347	—	—	23 (J-)	—	—	—	—	—	210 (J-)	—	340	—	—	—	—
MD50-10-26314	50-603061	397	—	—	—	—	—	130 (J)	—	—	160 (J)	—	110	—	—	—	—
MD50-10-24439	50-603061	450	—	—	—	—	100	70 (J)	—	—	79	—	42	—	—	—	—
MD50-10-24441	50-603062	25	14 (J-)	—	—	—	—	10	25	—	42	—	—	—	—	—	—
MD50-10-24446	50-603062	64	—	—	—	—	—	—	46	—	—	—	—	—	—	—	—
MD50-10-24443	50-603062	122	—	—	—	—	—	—	57	—	110	—	—	—	—	—	—
MD50-10-24445	50-603062	184	—	—	—	—	—	—	—	—	140 (J-)	—	—	—	—	—	—
MD50-10-24447	50-603062	217	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
MD50-10-24442	50-603062	263	—	—	—	—	—	—	—	—	110	—	—	—	—	—	—
MD50-10-24448	50-603062	337	—	—	—	—	—	—	—	—	150	—	—	—	—	—	—
MD50-10-24444	50-603062	387	—	—	—	—	—	50 (J)	—	—	84	—	—	—	—	—	—
MD50-10-24449	50-603062	450	—	—	—	—	—	22 (J)	—	—	94	—	—	—	—	—	—
MD50-10-24451	50-603063	25	—	—	—	—	—	—	19	—	160	—	110	—	—	—	—
MD50-10-24457	50-603063	76	—	—	—	—	—	—	190	—	260	—	310	—	—	—	—
MD50-10-24453	50-603063	128	—	—	—	—	—	—	63	—	230	—	190	—	—	—	—
MD50-10-24454	50-603063	190	—	—	—	—	—	—	430	—	480	—	430	—	—	—	—
MD50-10-24456	50-603063	228	—	—	—	—	—	—	120	—	—	—	110	—	—	—	—
MD50-10-24458	50-603063	274	—	—	—	—	—	—	270	—	—	—	—	—	—	—	—
MD50-10-24452	50-603063	347	—	—	—	—	—	—	51	—	76	—	—	—	—	—	—
MD50-10-24455	50-603063	450	—	—	—	—	—	—	140	—	180	—	—	—	—	—	—
MD50-10-24461	50-603064	25	—	—	—	—	—	—	230	—	73 (J-)	—	240	28	—	—	—
MD50-10-24467	50-603064	66	—	—	—	—	—	—	480	—	140	—	270	72	—	—	—
MD50-10-24462	50-603064	113	—	—	—	—	—	—	760	—	390 (J-)	—	900	210	—	—	—
MD50-10-24465	50-603064	176	—	240	—	—	—	—	450	—	460 (J-)	—	850	190	—	—	—
MD50-10-24463	50-603064	214	—	—	—	—	—	—	530	—	—	—	880	—	—	—	—

Table C-4.1-10 (continued)

Sample ID	Location ID	Depth (ft)	Acetone	Benzene	Bromomethane	Butanone[2-]	Carbon Disulfide	Carbon Tetrachloride	Chloroform	Chloromethane	Dichlorodifluoromethane	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Ethylbenzene	Ethyltoluene[4-]
MD50-10-24468	50-603064	259	—	—	—	—	—	—	220	—	410	—	240	—	—	—	—
MD50-10-24464	50-603064	332	—	—	—	—	—	—	—	—	440 (J-)	—	150	—	—	—	—
MD50-10-24469	50-603064	482	—	—	—	—	—	200 (J)	—	—	260	—	—	—	—	—	—
MD50-10-24466	50-603064	500	—	—	—	—	—	70	—	—	150	—	—	—	—	—	—
MD50-10-24380	50-603383	26	—	—	—	—	—	51 (J)	34	—	66	—	—	—	16	—	—
MD50-10-24384	50-603383	85	—	—	—	—	—	79	83	—	200	—	29	—	87	—	—
MD50-10-24388	50-603383	139	—	—	—	—	—	130	160	—	190 (J)	—	43	36	220	—	—
MD50-10-24382	50-603383	206	—	—	—	—	—	300	170	—	200	—	—	—	430	—	—
MD50-10-24387	50-603383	244	—	—	—	—	—	300	120	—	190	—	—	—	370	—	—
MD50-10-24385	50-603383	286	—	—	—	—	—	150	55	—	85 (J)	—	—	31	160	—	—
MD50-10-24381	50-603383	359	8 (J)	—	—	3.8 (J-)	—	—	—	1.7	2	—	—	—	1.8	—	—
MD50-10-24386	50-603383	408	—	—	—	—	—	220 (J)	—	—	120	—	—	—	—	—	—
MD50-10-24383	50-603383	450	—	—	—	—	—	140 (J)	—	—	30	—	—	—	—	—	—
MD50-10-24394	50-603467	26	—	—	—	—	—	360 (J)	310	—	—	—	—	—	—	—	—
MD50-10-24398	50-603467	91	—	—	—	—	—	660 (J)	700	—	190	—	—	97	—	—	—
MD50-10-24395	50-603467	143	—	—	—	—	—	770 (J)	650	—	180	—	—	100	—	—	—
MD50-10-24396	50-603467	206	—	—	—	—	—	760 (J)	610	—	—	—	—	—	—	—	—
MD50-10-24399	50-603467	244	—	—	—	—	—	780 (J)	650	—	—	—	—	—	—	—	—
MD50-10-24393	50-603467	287	—	—	—	—	—	790 (J)	480	—	—	—	—	—	—	—	—
MD50-10-24397	50-603467	360	—	—	—	—	—	—	360	—	—	—	—	—	—	—	—
MD50-10-24391	50-603467	409	—	—	—	—	—	430 (J)	—	—	—	—	—	—	—	—	—
MD50-10-24392	50-603467	500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
MD50-10-24390	50-603467	600	50	12	—	56	—	370	65	—	160	—	—	13	—	—	—
MD50-10-24402	50-603468	92	—	—	—	—	—	290 (J)	340	NA[b]	140 (J-)	—	—	79	—	—	—
MD50-10-24407	50-603468	142	—	—	—	—	—	—	160	NA	NA	—	—	49	—	—	—
MD50-10-24401	50-603468	198	—	—	—	—	—	—	510	NA	320 (J-)	—	—	—	—	—	—
MD50-10-24405	50-603468	233	—	—	—	—	—	—	600	NA	440 (J-)	—	—	210	—	—	—
MD50-10-24403	50-603468	282	—	—	—	—	—	—	450	NA	390 (J-)	—	—	—	—	—	—
MD50-10-24404	50-603468	354	—	—	—	—	—	—	370	NA	490 (J-)	—	—	—	—	—	—
MD50-10-24408	50-603468	403	—	—	—	—	—	520 (J)	—	—	420	—	—	—	—	—	—

Table C-4.1-10 (continued)

Sample ID	Location ID	Depth (ft)	Acetone	Benzene	Bromomethane	Butanone[2-]	Carbon Disulfide	Carbon Tetrachloride	Chloroform	Chloromethane	Dichlorodifluoromethane	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Ethylbenzene	Ethyltoluene[4-]
MD50-10-24406	50-603468	450	—	—	—	—	—	—	—	NA	350 (J-)	—	—	—	—	—	—
MD50-10-24328	50-603470	30	—	—	—	—	—	—	700	—	250	—	—	—	—	—	—
MD50-10-24333	50-603470	83	—	—	—	—	—	400	1200	—	450	—	—	190	—	—	—
MD50-10-24329	50-603470	143	—	—	—	—	—	—	1600	—	740	—	—	340	—	—	—
MD50-10-24334	50-603470	203	—	—	—	—	—	—	970	—	—	—	—	—	—	—	—
MD50-10-24330	50-603470	233	—	—	—	—	—	—	1200	—	990	—	—	400	—	—	—
MD50-10-24335	50-603470	278	—	—	—	—	—	—	1100	—	1100	—	—	—	—	—	—
MD50-10-24331	50-603470	351	—	—	—	—	—	350	300	—	810	—	—	—	—	—	—
MD50-10-24336	50-603470	450	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
MD50-10-24332	50-603470	600	—	—	—	—	—	92 (J)	—	—	120	—	—	—	—	—	—
MD50-10-24337	50-603470	650	17 (J)	—	—	—	—	21 (J)	—	—	70	—	—	—	—	—	—
MD50-10-24339	50-603471	90	—	—	—	—	—	1400	1900	—	—	—	—	200	—	—	—
MD50-10-24344	50-603471	146	—	—	—	—	—	—	1900	—	—	—	—	—	—	—	—
MD50-10-24340	50-603471	209	—	—	—	—	—	720 (J-)	2000	—	—	—	—	510	—	—	—
MD50-10-24345	50-603471	242	—	—	—	—	—	—	1400	—	—	—	—	—	—	—	—
MD50-10-24341	50-603471	288	—	—	—	—	—	—	1300	—	—	—	—	—	—	—	—
MD50-10-24343	50-603471	360	—	—	—	—	—	—	660	—	—	—	—	—	—	—	—
MD50-10-24342	50-603471	410	—	—	—	—	—	—	750	—	—	—	—	—	—	—	—
MD50-10-24346	50-603471	450	—	—	—	—	—	—	540	—	—	—	—	—	—	—	—
MD50-10-24354	50-603472	27	—	—	—	—	—	—	350	—	—	—	—	—	—	—	—
MD50-10-24357	50-603472	93	—	—	—	—	—	—	310	—	—	—	—	—	—	—	—
MD50-10-24352	50-603472	146	—	—	—	—	—	—	410	—	—	—	—	—	—	—	—
MD50-10-24356	50-603472	210	—	—	—	—	—	—	460	—	—	—	—	—	—	—	—
MD50-10-24350	50-603472	247	—	—	—	—	—	—	200	—	—	—	—	—	—	—	—
MD50-10-24353	50-603472	292	—	—	—	—	—	—	470	—	—	—	—	—	—	—	—
MD50-10-24349	50-603472	367	—	—	—	—	—	270	—	—	—	—	—	—	—	—	—
MD50-10-24355	50-603472	414	—	—	—	—	—	240	—	—	290	—	—	—	—	—	—
MD50-10-24351	50-603472	450	—	—	—	—	—	230	—	—	—	—	—	—	—	—	—
MD50-10-24423	50-603503	25	—	67	—	—	—	22 (J)	31	—	11	—	—	3.8	6.5	8.7	3.5
MD50-10-24426	50-603503	80	—	—	—	—	—	—	72	—	41	—	—	—	—	—	—

Table C-4.1-10 (continued)

Sample ID	Location ID	Depth (ft)	Acetone	Benzene	Bromomethane	Butanone[2-]	Carbon Disulfide	Carbon Tetrachloride	Chloroform	Chloromethane	Dichlorodifluoromethane	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Ethylbenzene	Ethyltoluene[4-]
MD50-10-24422	50-603503	133	—	—	—	—	—	44 (J)	66	—	—	—	—	—	—	—	—
MD50-10-24425	50-603503	198	—	—	—	—	—	130 (J)	120	—	—	—	—	—	—	—	—
MD50-10-24421	50-603503	237	—	—	—	—	—	—	120	NA	NA	—	—	—	—	—	—
MD50-10-24427	50-603503	278	—	—	—	—	—	170 (J)	110	—	—	—	—	—	—	—	—
MD50-10-24424	50-603503	347	—	—	—	—	—	—	56	—	—	—	—	—	—	—	—
MD50-10-24428	50-603503	397	—	—	—	—	—	38	45	—	—	—	—	—	—	—	—
MD50-10-24429	50-603503	450	—	22	—	—	—	190 (J)	—	—	—	—	—	—	—	—	—

Table C-4.1-10 (continued)

Sample ID	Location ID	Depth (ft)	Hexanone[2-]	Methylene Chloride	Tetrachloroethylene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethylene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Vinyl Chloride	Xylene (total)	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
MD50-10-24362	50-24784	25	—	—	2000	—	37	53	—	900	—	—	—	—	—	—
MD50-10-24364	50-24784	96	—	—	2800	—	110	65	—	2700	—	—	—	—	—	—
MD50-10-24365	50-24784	155	—	25	2100	—	93	49	—	3200	—	—	—	—	—	—
MD50-10-24361	50-24784	215	—	—	2600	—	86	—	—	4900	—	—	—	—	—	—
MD50-10-24359	50-24784	244	—	—	2400	—	86	—	—	4500	—	—	—	—	—	—
MD50-10-24366	50-24784	289	—	—	2300	—	—	—	—	4600	—	—	—	—	—	—
MD50-10-24360	50-24784	362	—	20	860	—	—	—	—	1800	—	—	—	—	—	—
MD50-10-24367	50-24784	411	—	—	910	—	—	—	—	1700	—	—	—	—	—	—
MD50-10-24363	50-24784	450	—	—	300	—	—	—	—	630	—	—	—	—	—	—
MD50-10-24369	50-24813	25	—	—	380	—	—	—	—	11,000	—	—	—	—	—	—
MD50-10-24375	50-24813	99	—	100	720	—	—	—	140	—	—	—	—	—	—	—
MD50-10-24370	50-24813	150	—	480	—	—	—	—	—	41,000	—	—	—	—	—	—
MD50-10-24376	50-24813	207	—	1300	800	—	—	—	—	62,000	—	—	—	—	—	—
MD50-10-24371	50-24813	241	—	1600	—	—	—	—	—	62,000	—	—	—	—	—	—
MD50-10-24377	50-24813	286	—	1000	—	—	—	—	—	75,000	—	—	—	—	—	—
MD50-10-24372	50-24813	358	—	610	—	—	—	—	—	45,000	—	—	—	—	—	—
MD50-10-24378	50-24813	408	—	440	—	—	—	—	—	43,000	—	—	—	—	—	—
MD50-10-24374	50-24813	450	—	30	—	—	—	—	—	3900	—	—	—	—	—	—
MD50-10-24373	50-24813	600	—	—	—	—	—	—	—	2400	—	—	—	—	—	—
MD50-10-24413	50-24822	25	—	—	73	—	—	—	—	6100	—	—	—	—	—	—
MD50-10-24419	50-24822	81	—	81	130	—	—	—	—	11,000	—	—	—	—	—	—
MD50-10-24416	50-24822	142	—	210	—	—	—	—	—	19,000	—	—	—	—	—	—
MD50-10-24414	50-24822	204	—	390	—	—	—	—	—	32,000	—	—	—	—	—	—
MD50-10-24418	50-24822	235	—	470	—	—	—	—	—	32,000	—	—	—	—	—	—
MD50-10-24412	50-24822	280	—	—	—	—	—	—	—	30,000	—	—	—	—	—	—
MD50-10-24415	50-24822	351	—	170	—	—	—	—	—	17,000	—	—	—	—	—	—
MD50-10-24411	50-24822	402	—	—	—	1.7	—	—	—	—	—	—	—	—	—	—
MD50-10-24417	50-24822	450	—	—	—	—	—	—	—	9300	—	—	—	—	—	—
MD50-10-26315	50-603061	25	—	—	—	—	15,000	1700	—	370	—	—	—	—	—	—

Table C-4.1-10 (continued)

Sample ID	Location ID	Depth (ft)	Hexanone[2-]	Methylene Chloride	Tetrachloroethylene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethylene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Vinyl Chloride	Xylene (total)	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
MD50-10-24432	50-603061	76	—	31	160	—	14,000	2000	—	1200	—	—	57	—	—	—
MD50-10-24437	50-603061	128	—	29	170	—	18,000	2700	—	1700	—	—	—	—	—	—
MD50-10-24433	50-603061	190	—	64	140	—	13,000	2100	—	2000	—	—	—	—	—	—
MD50-10-24436	50-603061	228	—	72	220	—	22,000	2600	—	3400	29	—	—	—	—	—
MD50-10-24434	50-603061	274	—	21	140	—	12,000	1200	—	2100	26	—	—	—	—	—
MD50-10-24438	50-603061	347	—	21	78	—	6100	330	—	1200	28	—	—	—	—	—
MD50-10-26314	50-603061	397	—	—	55	—	3900	170	—	1200	—	—	—	—	—	—
MD50-10-24439	50-603061	450	—	—	26	—	2000	44	—	620	30 (J+)	—	—	—	—	—
MD50-10-24441	50-603062	25	—	—	15	—	100	27	—	1600	—	—	—	—	—	—
MD50-10-24446	50-603062	64	—	—	—	—	170	40	—	2900	—	—	—	—	—	—
MD50-10-24443	50-603062	122	—	—	—	—	290	—	—	6700	—	—	—	—	—	—
MD50-10-24445	50-603062	184	—	—	—	—	370	—	—	8000	—	—	—	—	—	—
MD50-10-24447	50-603062	217	—	46	—	—	300	—	—	4800	—	—	—	—	—	—
MD50-10-24442	50-603062	263	—	—	—	—	140	—	—	4000	—	—	—	—	—	—
MD50-10-24448	50-603062	337	—	—	—	—	—	—	—	2000	—	—	—	—	—	—
MD50-10-24444	50-603062	387	—	—	—	—	57	—	—	1700	—	—	—	—	—	—
MD50-10-24449	50-603062	450	—	—	—	—	—	—	—	660	—	—	—	—	—	—
MD50-10-24451	50-603063	25	—	19	220	—	2500	210	—	960	—	—	—	—	—	—
MD50-10-24457	50-603063	76	—	—	660	—	4600	580	—	5600	—	—	—	—	—	—
MD50-10-24453	50-603063	128	—	32	310	—	2900	230	—	2700	—	—	—	—	—	—
MD50-10-24454	50-603063	190	—	150	1500	—	5200	550	—	18,000	—	—	—	—	—	—
MD50-10-24456	50-603063	228	—	400	390	—	1500	—	—	5500	—	—	—	—	—	—
MD50-10-24458	50-603063	274	—	—	1100	—	2000	—	—	18,000	—	—	—	—	—	—
MD50-10-24452	50-603063	347	—	45	150	—	320	—	—	2900	—	—	—	—	—	—
MD50-10-24455	50-603063	450	—	74	300	—	—	—	—	6700	—	—	—	—	—	—
MD50-10-24461	50-603064	25	—	23	260	—	3100	560	—	3700	—	—	—	—	—	—
MD50-10-24467	50-603064	66	—	—	460	—	9300	1900	—	9000	—	—	—	—	—	—
MD50-10-24462	50-603064	113	—	190	560	—	11,000	1800	—	23,000	—	—	—	—	—	—
MD50-10-24465	50-603064	176	—	360	410	250	9700	1400	—	24,000	—	—	—	—	—	—
MD50-10-24463	50-603064	214	—	550	—	—	12,000	1500	—	32,000	—	—	—	—	—	—

Table C-4.1-10 (continued)

Sample ID	Location ID	Depth (ft)	Hexanone[2-]	Methylene Chloride	Tetrachloroethylene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethylene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Vinyl Chloride	Xylene (total)	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
MD50-10-24468	50-603064	259	—	200	310	—	6800	770	—	28,000	—	—	—	—	—	—
MD50-10-24464	50-603064	332	—	120	200	—	2700	—	—	12,000	—	—	—	—	—	—
MD50-10-24469	50-603064	482	—	—	91	—	1000	—	—	8200	—	—	—	—	—	—
MD50-10-24466	50-603064	500	—	—	—	—	94 (J)	—	—	1200	—	—	—	—	—	—
MD50-10-24380	50-603383	26	—	—	390	—	390	81	—	910	19	—	—	—	—	—
MD50-10-24384	50-603383	85	—	19	780	—	940	190	—	2400	28	—	—	—	—	—
MD50-10-24388	50-603383	139	—	39	980	—	1100	240	—	4100	—	—	—	—	—	—
MD50-10-24382	50-603383	206	—	84	1800	—	930	230	—	7100	—	—	—	—	—	—
MD50-10-24387	50-603383	244	—	73	1400	—	640	190	—	6700	—	—	—	—	—	—
MD50-10-24385	50-603383	286	—	34	880	—	200	73	—	3900	—	—	—	—	—	—
MD50-10-24381	50-603383	359	—	—	4.8	—	—	—	—	29	—	—	—	—	—	—
MD50-10-24386	50-603383	408	—	—	210	—	46	—	—	1800	—	—	—	—	—	—
MD50-10-24383	50-603383	450	—	—	260	—	—	—	—	2000	—	—	—	—	—	—
MD50-10-24394	50-603467	26	—	43	190	—	—	—	—	5900	—	—	—	—	—	—
MD50-10-24398	50-603467	91	—	150	360	—	—	—	—	13,000	—	—	—	—	—	—
MD50-10-24395	50-603467	143	—	160	400	—	—	—	—	15,000	—	—	—	—	—	—
MD50-10-24396	50-603467	206	—	420	560	—	—	—	—	24,000	—	—	—	—	—	—
MD50-10-24399	50-603467	244	—	600	720	—	—	—	—	31,000	—	—	—	—	—	—
MD50-10-24393	50-603467	287	—	510	790	—	—	—	—	33,000	—	—	—	—	—	—
MD50-10-24397	50-603467	360	—	480	730	—	—	—	—	24,000	—	—	—	—	—	—
MD50-10-24391	50-603467	409	—	—	430	—	—	—	—	18,000	—	—	—	—	—	—
MD50-10-24392	50-603467	500	—	94	260	—	—	—	—	8100	—	—	—	—	—	—
MD50-10-24390	50-603467	600	190	36	210	14	—	—	—	8500	—	—	—	—	—	—
MD50-10-24402	50-603468	92	—	58	130	—	—	—	—	6400	—	—	—	—	—	—
MD50-10-24407	50-603468	142	—	82	68	—	—	—	—	3900	—	—	—	—	—	—
MD50-10-24401	50-603468	198	—	530	—	—	—	—	—	19,000	—	—	—	—	—	—
MD50-10-24405	50-603468	233	—	630	330	—	—	—	—	23,000	—	—	—	—	—	—
MD50-10-24403	50-603468	282	—	500	340	—	—	—	—	22,000	—	—	—	—	—	—
MD50-10-24404	50-603468	354	—	520	—	—	—	—	—	25,000	—	—	—	—	—	—
MD50-10-24408	50-603468	403	—	—	—	—	—	—	—	25,000	—	—	—	—	—	—

Table C-4.1-10 (continued)

Sample ID	Location ID	Depth (ft)	Hexanone[2-]	Methylene Chloride	Tetrachloroethylene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethylene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Vinyl Chloride	Xylene (total)	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
MD50-10-24406	50-603468	450	—	200	—	—	—	—	—	15,000	—	—	—	—	—	—
MD50-10-24328	50-603470	30	—	—	680	—	250	—	—	13,000	—	—	—	—	—	—
MD50-10-24333	50-603470	83	—	95	830	—	420	—	—	18,000	—	—	—	—	—	—
MD50-10-24329	50-603470	143	—	260	730	—	620	—	—	29,000	—	—	—	—	—	—
MD50-10-24334	50-603470	203	—	490	—	—	—	—	—	44,000	—	—	—	—	—	—
MD50-10-24330	50-603470	233	—	830	—	—	780	—	—	46,000	—	—	—	—	—	—
MD50-10-24335	50-603470	278	—	1000	—	—	750	—	—	48,000	—	—	—	—	—	—
MD50-10-24331	50-603470	351	—	330	—	—	—	—	—	31,000	—	—	—	—	—	—
MD50-10-24336	50-603470	450	—	190	—	—	—	—	—	17,000	—	—	—	—	—	—
MD50-10-24332	50-603470	600	—	—	—	—	—	—	—	1800	—	—	—	—	—	—
MD50-10-24337	50-603470	650	—	5.1	—	3.5	—	—	—	94	6.2 (J+)	—	—	—	—	—
MD50-10-24339	50-603471	90	—	240	850	—	—	—	—	19,000	—	—	—	—	—	—
MD50-10-24344	50-603471	146	—	1100	840	—	—	—	—	38,000	—	—	—	—	—	—
MD50-10-24340	50-603471	209	—	1800	1100	—	—	—	—	51,000	—	—	—	—	—	—
MD50-10-24345	50-603471	242	—	1800	960	—	—	—	—	52,000	—	—	—	—	—	—
MD50-10-24341	50-603471	288	—	1600	—	—	—	—	—	50,000	—	—	—	—	—	—
MD50-10-24343	50-603471	360	—	870	880	—	—	—	—	51,000	—	—	—	—	—	—
MD50-10-24342	50-603471	410	—	640	800	—	—	—	—	38,000	—	—	—	—	—	—
MD50-10-24346	50-603471	450	—	490	670	—	—	—	—	35,000	—	—	—	—	—	—
MD50-10-24354	50-603472	27	—	—	690	—	—	—	—	4100	—	—	—	—	—	—
MD50-10-24357	50-603472	93	—	43	500	—	—	—	—	4600	—	—	—	—	—	—
MD50-10-24352	50-603472	146	—	190	550	—	—	—	—	9100	—	—	—	—	—	—
MD50-10-24356	50-603472	210	—	470	920	—	—	—	—	17,000	—	—	—	—	—	—
MD50-10-24350	50-603472	247	—	250	450	—	—	—	—	9500	—	—	—	—	—	—
MD50-10-24353	50-603472	292	—	710	1600	—	—	—	—	31,000	—	—	—	—	—	—
MD50-10-24349	50-603472	367	—	210	920	—	—	—	—	19,000	—	—	—	—	—	—
MD50-10-24355	50-603472	414	—	130	750	—	—	—	—	15,000	—	—	—	—	—	—
MD50-10-24351	50-603472	450	—	76	600	—	—	—	—	14,000	—	—	—	—	—	—
MD50-10-24423	50-603503	25	—	9	150	76	17	5.7	—	660	3.3	3.9	—	31	7.2	23
MD50-10-24426	50-603503	80	—	30	260	—	49	—	—	1900	—	—	—	—	—	—

Table C-4.1-10 (continued)

Sample ID	Location ID	Depth (ft)	Hexanone[2-]	Methylene Chloride	Tetrachloroethylene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethylene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Vinyl Chloride	Xylene (total)	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
MD50-10-24422	50-603503	133	—	—	240	—	—	—	—	1500	—	—	—	—	—	—
MD50-10-24425	50-603503	198	—	90	450	—	—	—	—	4500	—	—	—	—	—	—
MD50-10-24421	50-603503	237	—	120	560	—	—	—	—	4700	—	—	—	—	—	—
MD50-10-24427	50-603503	278	—	110	520	—	—	—	—	5900	—	—	—	—	—	—
MD50-10-24424	50-603503	347	—	26	220	—	—	—	—	1600	—	—	—	—	—	—
MD50-10-24428	50-603503	397	—	12	180	—	—	—	—	1300	—	—	—	—	—	—
MD50-10-24429	50-603503	450	—	25	230	19	—	—	—	3200	—	—	—	—	—	—

Note: Results are in µg/m^3. Data qualifiers are defined in Appendix A.

[a] — = Not detected.

[b] NA = Not analyzed.

Table C-4.1-11
VOCs Detected in Vapor Samples at MDA C during October 2010–January 2011 Sampling Event

Sample ID	Location ID	Depth (ft)	Acetone	Benzene	Bromomethane	Butanone[2-]	Carbon Disulfide	Carbon Tetrachloride	Chlorobenzene	Chloroform	Chloromethane	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Ethylbenzene
MD50-10-27179	50-24784	25	—*	—	—	—	—	—	—	250	—	—	—	—	—	—	—
MD50-10-27176	50-24784	96	—	—	—	—	—	110 (J-)	—	470	—	74	—	—	—	45	—
MD50-10-27175	50-24784	155	—	—	—	—	—	190 (J-)	—	180	—	94	—	—	—	46	—
MD50-10-27181	50-24784	215	—	—	—	—	—	290 (J-)	—	85	—	120	—	—	—	—	—
MD50-10-27180	50-24784	244	—	—	—	—	—	290 (J-)	—	73	—	110	—	—	—	—	—
MD50-10-27178	50-24784	289	—	—	—	—	—	420	—	51	—	160	—	—	—	—	—
MD50-10-27182	50-24784	362	—	—	—	—	—	440 (J-)	—	—	—	170	—	—	—	—	—
MD50-10-27177	50-24784	411	—	—	—	—	—	460	—	—	—	180	—	—	—	—	—
MD50-10-27183	50-24784	450	—	—	—	—	—	330	—	—	—	130	—	—	—	—	—
MD50-10-27186	50-24813	25	—	—	—	—	—	2400 (J)	—	1300	—	400 (J)	—	—	—	—	—
MD50-10-27189	50-24813	99	—	—	—	—	—	1700	—	2300	—	—	—	—	360	—	—
MD50-10-27185	50-24813	150	—	—	—	—	—	1300 (J)	—	2200	—	650 (J)	—	—	460	—	—
MD50-10-27190	50-24813	207	—	—	—	—	—	23 (J)	—	20	—	21	—	—	—	—	—
MD50-10-27193	50-24813	241	—	—	—	—	—	280	—	350	—	—	—	—	—	—	—
MD50-10-27194	50-24813	241	—	—	—	—	—	190	—	260	—	170	—	—	—	—	—
MD50-10-27191	50-24813	286	—	—	—	—	—	49 (J)	—	54	—	27	—	—	9.8	—	—
MD50-10-27343	50-24813	358	8.1	—	—	—	11	—	—	—	—	1200	—	—	—	—	—
MD50-10-27192	50-24813	408	—	—	—	—	—	410	—	—	—	—	—	—	—	—	—
MD50-10-27188	50-24813	450	—	77	—	—	—	—	—	—	—	130 (J-)	—	—	—	—	—
MD50-10-27195	50-24813	600	6.9	—	—	3.2	—	2.4	—	—	—	3.2	—	0.82	0.8	—	—
MD50-10-27227	50-24822	25	—	—	—	—	—	—	—	200	—	120	—	—	—	—	—
MD50-10-27232	50-24822	81	—	—	—	—	—	—	—	320	—	180	—	—	—	—	—
MD50-10-27235	50-24822	142	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
MD50-10-27229	50-24822	204	—	—	—	—	—	—	—	400	—	470	—	—	—	—	—
MD50-10-27233	50-24822	235	—	—	—	—	—	—	—	390	—	—	—	—	—	—	—
MD50-10-27231	50-24822	280	—	—	—	—	—	—	—	290	—	540	—	—	—	—	—
MD50-10-27230	50-24822	351	—	—	—	—	—	—	—	—	—	280	—	—	—	—	—
MD50-10-27228	50-24822	450	—	—	—	—	—	—	—	—	—	300	—	—	—	—	—
MD50-10-27249	50-603061	25	—	—	—	—	—	—	—	—	—	580	—	180	—	—	—

Table C-4.1-11 (continued)

Sample ID	Location ID	Depth (ft)	Acetone	Benzene	Bromomethane	Butanone[2-]	Carbon Disulfide	Carbon Tetrachloride	Chlorobenzene	Chloroform	Chloromethane	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Ethylbenzene
MD50-10-27251	50-603061	76	—	—	—	—	—	—	—	—	—	380	—	700	—	—	—
MD50-10-27247	50-603061	128	—	—	—	—	—	—	—	—	—	—	—	1400	—	—	—
MD50-10-27255	50-603061	190	—	—	—	—	—	—	—	—	—	—	—	1600	—	—	—
MD50-10-27248	50-603061	228	—	—	—	—	—	—	—	—	—	—	—	950	—	—	—
MD50-10-27253	50-603061	274	—	—	—	—	—	—	—	—	—	—	—	470	—	—	—
MD50-10-27252	50-603061	347	—	—	—	—	—	110	—	—	—	150	—	170	—	—	—
MD50-10-27254	50-603061	397	—	—	—	—	—	85	—	—	—	150	—	96	—	—	—
MD50-10-27250	50-603061	450	15 (J)	1.6	—	2.9	15	50	—	2	—	100	1.5	34	—	—	—
MD50-10-27262	50-603062	25	—	—	—	—	—	—	—	26	—	45	—	—	—	—	—
MD50-10-27265	50-603062	64	—	—	—	—	—	—	—	49	—	50	—	—	—	—	—
MD50-10-27257	50-603062	122	—	—	—	—	—	51 (J)	—	72 (J)	—	140 (J)	—	—	—	—	—
MD50-10-27263	50-603062	184	—	—	—	—	—	59 (J)	—	50	—	160	—	—	—	—	—
MD50-10-27260	50-603062	217	—	18 (J)	—	—	—	65 (J)	—	44 (J)	—	160 (J)	—	7 (J)	11 (J)	—	—
MD50-10-27264	50-603062	263	—	—	—	—	—	140 (J)	—	52	—	360	—	—	—	—	—
MD50-10-27259	50-603062	337	—	—	—	—	—	—	—	—	—	120 (J-)	—	—	—	—	—
MD50-10-27261	50-603062	387	21	—	—	—	—	49 (J)	—	—	—	120	—	—	—	—	—
MD50-10-27258	50-603062	450	—	—	—	—	—	23	—	—	—	69 (J)	—	—	—	—	—
MD50-10-27267	50-603063	25	—	—	—	—	—	—	—	34	—	180	—	—	—	—	—
MD50-10-27272	50-603063	76	—	—	—	—	—	—	—	150	—	170	—	95	—	—	—
MD50-10-27275	50-603063	128	—	—	—	—	—	190 (J)	—	210	—	320	—	210	—	—	—
MD50-10-27268	50-603063	190	—	—	—	—	—	—	—	350	—	360	—	230	—	—	—
MD50-10-27273	50-603063	228	—	—	—	—	—	—	—	340	—	370	—	210	—	—	790
MD50-10-27269	50-603063	274	—	—	—	—	—	—	—	320	—	—	—	—	—	—	—
MD50-10-27274	50-603063	347	—	—	—	—	—	—	—	120	—	170	—	—	—	—	—
MD50-10-27271	50-603063	450	—	—	—	—	—	230 (J)	—	110	—	—	—	—	—	—	—
MD50-10-27280	50-603064	25	—	—	—	—	—	—	—	200	—	—	—	74	—	—	—
MD50-10-27285	50-603064	66	—	—	—	—	—	—	—	400	—	130	—	210	58	—	—
MD50-10-27279	50-603064	113	—	—	—	—	—	—	—	740	—	—	—	490	—	—	—
MD50-10-27283	50-603064	176	—	—	—	—	—	—	—	570	—	530	—	520	—	—	—
MD50-10-27277	50-603064	214	—	—	—	—	—	—	—	470	—	520	—	450	—	—	—

Table C-4.1-11 (continued)

Sample ID	Location ID	Depth (ft)	Acetone	Benzene	Bromomethane	Butanone[2-]	Carbon Disulfide	Carbon Tetrachloride	Chlorobenzene	Chloroform	Chloromethane	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Ethylbenzene
MD50-10-27281	50-603064	259	—	—	—	—	—	—	—	—	—	460	—	280	—	—	—
MD50-10-27278	50-603064	332	—	—	—	—	—	140	—	—	—	—	—	97	—	—	—
MD50-10-27282	50-603064	400	—	—	—	—	—	120	—	—	—	310	—	—	—	—	—
MD50-10-27284	50-603064	500	—	—	—	—	—	87	—	—	—	240	—	—	—	—	—
MD50-10-27199	50-603383	26	—	—	—	—	—	27	—	24	—	65	—	—	—	16	—
MD50-10-27197	50-603383	85	—	—	—	—	—	65 (J-)	—	98	—	170	—	31	—	110	—
MD50-10-27205	50-603383	139	—	—	—	—	—	99	—	130	—	140	—	—	—	290	—
MD50-10-27204	50-603383	206	—	—	—	—	—	210	—	120	—	190	—	—	62	370	—
MD50-10-27203	50-603383	244	—	—	—	—	—	31	7.3	—	—	23	—	—	—	—	—
MD50-10-27201	50-603383	286	—	—	—	—	—	150 (J-)	—	39	—	100	—	—	—	140	—
MD50-10-27202	50-603383	359	—	—	—	—	—	130	—	60	—	100	—	—	—	220	—
MD50-10-27200	50-603383	408	—	—	—	—	—	190	—	—	—	100	—	—	—	—	—
MD50-10-27214	50-603467	26	—	—	—	—	—	—	—	550	—	220 (J)	—	—	91	—	—
MD50-10-27210	50-603467	91	—	—	—	—	—	—	—	410	—	170 (J)	—	—	72	—	—
MD50-10-27211	50-603467	143	—	—	—	—	—	180 (J-)	—	750	—	370 (J)	—	—	180	—	—
MD50-10-27215	50-603467	206	—	—	—	—	—	—	—	570	—	430 (J)	—	—	170	—	—
MD50-10-27207	50-603467	244	—	—	—	—	—	—	—	680	—	420 (J)	—	—	—	—	—
MD50-10-27213	50-603467	287	—	—	—	—	—	—	—	430	—	340 (J)	—	—	—	—	—
MD50-10-27212	50-603467	360	—	—	—	—	—	430	—	260	—	—	—	—	—	—	—
MD50-10-27208	50-603467	409	—	—	—	—	—	290	—	—	—	—	—	—	—	—	—
MD50-10-27206	50-603467	500	—	—	—	—	—	—	—	—	—	210 (J)	—	—	—	—	—
MD50-10-27209	50-603467	600	83	—	—	120	—	150	—	—	—	—	—	—	—	—	—
MD50-10-27220	50-603468	92	—	—	—	—	—	—	—	300	—	—	—	—	—	—	—
MD50-10-27217	50-603468	142	—	—	—	—	—	—	—	180	—	—	—	—	58	—	—
MD50-10-27218	50-603468	198	—	—	—	—	—	—	—	510	—	350 (J)	—	—	—	—	—
MD50-10-27219	50-603468	233	—	—	—	—	—	—	—	510	—	430 (J)	—	—	190	—	—
MD50-10-27226	50-603468	282	—	—	—	—	—	—	—	430	—	410 (J)	—	—	180	—	—
MD50-10-27223	50-603468	354	—	—	—	—	—	—	—	270	—	400 (J)	—	—	—	—	—
MD50-10-27221	50-603468	403	—	—	—	—	—	—	—	210	—	520 (J)	—	—	—	—	—
MD50-10-27222	50-603468	450	—	—	—	—	—	—	—	—	—	280 (J)	—	—	—	—	—

Table C-4.1-11 (continued)

Sample ID	Location ID	Depth (ft)	Acetone	Benzene	Bromomethane	Butanone[2-]	Carbon Disulfide	Carbon Tetrachloride	Chlorobenzene	Chloroform	Chloromethane	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Ethylbenzene
MD50-10-27145	50-603470	30	—	—	—	—	—	180 (J)	—	800	—	300	—	—	—	—	—
MD50-10-27149	50-603470	83	—	—	—	—	—	—	—	990	—	330	—	—	190	—	—
MD50-10-27144	50-603470	143	—	—	—	—	—	—	—	1400	—	—	—	—	270	—	—
MD50-10-27151	50-603470	203	—	—	—	—	—	—	—	200	—	130	—	—	54	—	—
MD50-10-27147	50-603470	233	—	—	—	—	—	—	—	1000	—	—	—	—	—	—	—
MD50-10-27153	50-603470	278	—	—	—	—	—	—	—	750	—	860	—	—	—	—	—
MD50-10-27146	50-603470	351	—	—	—	—	—	—	—	—	—	670	—	—	—	—	—
MD50-10-27152	50-603470	450	—	—	—	—	—	—	—	—	—	380	—	—	—	—	—
MD50-10-27148	50-603470	600	—	—	—	—	—	86 (J)	—	—	—	200	—	—	—	—	—
MD50-10-27115	50-603470	650	7.1	6.2	—	—	—	—	—	—	—	3.7	—	—	—	—	3.7
MD50-10-27158	50-603471	30	—	—	—	—	—	2600 (J)	—	1400	—	270 (J-)	—	—	140	—	—
MD50-10-27155	50-603471	90	—	—	—	—	—	2300 (J)	—	1900	—	—	—	—	270	—	—
MD50-10-27157	50-603471	146	—	—	—	—	—	110	—	160	—	58	—	—	30	—	—
MD50-10-27162	50-603471	209	—	—	—	—	—	—	—	630	—	—	—	—	—	—	—
MD50-10-27161	50-603471	242	—	—	—	—	—	1700 (J)	—	1600	—	760 (J-)	—	—	360	—	—
MD50-10-27160	50-603471	288	—	—	—	—	—	1100 (J)	—	1300	—	—	—	—	420	—	—
MD50-10-27156	50-603471	360	—	—	—	—	—	700 (J)	—	370	—	460 (J-)	—	—	—	—	—
MD50-10-27163	50-603471	410	—	—	—	—	—	420 (J)	—	300	—	400 (J-)	—	—	—	—	—
MD50-10-27159	50-603471	450	—	—	—	—	—	320 (J)	—	200	—	—	—	—	—	—	—
MD50-10-27165	50-603472	27	—	—	—	—	—	—	—	390	—	—	—	—	27	39	—
MD50-10-27168	50-603472	93	8.5	23	—	—	—	—	—	—	—	2	—	—	—	—	20
MD50-10-27170	50-603472	146	22	11	—	—	33	—	—	1.5	3 (J+)	2.4	—	—	—	—	11
MD50-10-27172	50-603472	210	—	9.2	24	—	—	—	—	—	—	—	—	—	—	—	—
MD50-10-27166	50-603472	247	—	—	—	—	—	—	—	220	—	—	—	—	62	—	—
MD50-10-27174	50-603472	292	—	—	—	—	—	—	—	7.2	—	—	—	—	—	—	—
MD50-10-27169	50-603472	364	—	48	—	—	—	38 (J)	—	18	—	33	—	—	—	—	—
MD50-10-27167	50-603472	414	35	22	—	—	—	—	—	—	—	2.4	—	—	—	—	23
MD50-10-27173	50-603472	450	—	—	—	—	—	2.7 (J)	—	—	—	4.6	—	—	—	—	—
MD50-10-27243	50-603503	25	—	—	—	—	—	—	—	52	—	—	—	—	—	—	—
MD50-10-27237	50-603503	80	75	—	—	55	—	99	—	160	—	46	—	—	18	33	—

Table C-4.1-11 (continued)

Sample ID	Location ID	Depth (ft)	Acetone	Benzene	Bromomethane	Butanone[2-]	Carbon Disulfide	Carbon Tetrachloride	Chlorobenzene	Chloroform	Chloromethane	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Ethylbenzene
MD50-10-27244	50-603503	133	—	—	—	—	—	59	—	98	—	—	—	—	—	24	—
MD50-10-27238	50-603503	198	—	—	—	—	—	—	—	60	—	—	—	—	—	—	—
MD50-10-27245	50-603503	237	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
MD50-10-27239	50-603503	278	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
MD50-10-27241	50-603503	347	—	—	—	—	—	24	—	43	—	—	—	—	—	—	—
MD50-10-27240	50-603503	397	40	100	—	—	—	21	—	24	—	12	—	—	—	4.2	7.5
MD50-10-27242	50-603503	450	—	—	—	—	—	60	—	—	—	—	—	—	—	—	—

Table C-4.1-11 (continued)

Sample ID	Location ID	Depth (ft)	Ethyltoluene[4-]	Hexanone[2-]	Methylene Chloride	Tetrachloroethylene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethylene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Vinyl Chloride	Xylene (total)	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
MD50-10-27179	50-24784	25	—	—	—	2300	—	—	62	990	—	—	—	—	—	—	—
MD50-10-27176	50-24784	96	—	—	—	3000	—	130	70	2800	—	—	—	—	—	—	—
MD50-10-27175	50-24784	155	42	—	23	1600	—	130	57	3700	—	—	—	—	31	31	—
MD50-10-27181	50-24784	215	—	—	37	2800	—	110	55	5400	—	—	—	—	—	—	—
MD50-10-27180	50-24784	244	—	—	37	2600	—	96	—	5100	—	—	—	—	—	—	—
MD50-10-27178	50-24784	289	—	—	41	2400	—	94	—	4800	—	—	—	—	—	—	—
MD50-10-27182	50-24784	362	—	—	—	1500	—	45	—	3000	—	—	—	—	—	—	—
MD50-10-27177	50-24784	411	—	—	—	870	—	—	—	2100	—	—	—	—	—	—	—
MD50-10-27183	50-24784	450	—	—	—	520	—	—	—	1200	—	—	—	—	—	—	—
MD50-10-27186	50-24813	25	—	—	—	500	—	—	—	13,000	—	—	—	—	—	—	—
MD50-10-27189	50-24813	99	—	—	—	—	—	—	—	26,000	—	—	—	—	—	—	—
MD50-10-27185	50-24813	150	—	—	600 (J)	560	—	—	—	31,000	—	—	—	—	—	—	—
MD50-10-27190	50-24813	207	—	—	12	—	—	—	—	1200	—	—	—	—	—	—	—
MD50-10-27193	50-24813	241	—	—	330	—	—	—	—	15,000	—	—	—	—	—	—	—
MD50-10-27194	50-24813	241	—	—	250	—	—	—	—	10,000	—	—	—	—	—	—	—
MD50-10-27191	50-24813	286	—	—	27	—	—	—	—	1300	—	—	—	—	—	—	—
MD50-10-27343	50-24813	358	—	—	32	—	4.6	—	—	120	33	—	—	1.1	—	—	—
MD50-10-27192	50-24813	408	—	—	330	—	—	—	—	32,000	—	—	—	—	—	—	—
MD50-10-27188	50-24813	450	—	—	48 (J)	—	98	—	—	5300	—	—	—	—	—	—	—
MD50-10-27195	50-24813	600	—	—	—	—	1.4	—	—	12	—	—	—	—	—	—	—
MD50-10-27227	50-24822	25	—	—	—	—	—	—	—	7000	—	—	—	—	—	—	—
MD50-10-27232	50-24822	81	—	—	—	—	—	—	—	11,000	—	—	—	—	—	—	—
MD50-10-27235	50-24822	142	—	—	220	—	110	—	—	9000	—	—	—	—	—	—	—
MD50-10-27229	50-24822	204	—	—	300	—	—	—	—	28,000	—	—	—	—	—	—	—
MD50-10-27233	50-24822	235	—	—	350	—	—	—	—	32,000	—	—	—	—	—	—	—
MD50-10-27231	50-24822	280	—	—	280	—	—	—	—	32,000	—	—	—	—	—	—	—
MD50-10-27230	50-24822	351	—	—	91	—	—	—	—	14,000	—	—	—	—	—	—	—
MD50-10-27228	50-24822	450	—	—	—	—	—	—	—	11,000	—	—	—	—	—	—	—
MD50-10-27249	50-603061	25	—	—	—	—	—	11,000	1300	290	—	—	—	—	—	—	—

Table C-4.1-11 (continued)

Sample ID	Location ID	Depth (ft)	Ethyltoluene[4-]	Hexanone[2-]	Methylene Chloride	Tetrachloroethylene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethylene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Vinyl Chloride	Xylene (total)	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
MD50-10-27251	50-603061	76	—	—	—	210	—	25,000	3900	1900	—	—	—	—	—	—	—
MD50-10-27247	50-603061	128	—	—	—	—	—	32,000	5800	2500	—	—	—	—	—	—	—
MD50-10-27255	50-603061	190	—	—	150	—	—	35,000	5800	4000	—	—	—	—	—	—	—
MD50-10-27248	50-603061	228	—	—	—	—	—	23,000	3600	3200	—	—	—	—	—	—	—
MD50-10-27253	50-603061	274	—	—	—	—	—	14,000	1500	2000	—	—	—	—	—	—	—
MD50-10-27252	50-603061	347	—	—	—	86	—	6500	410	1200	—	—	—	—	—	—	—
MD50-10-27254	50-603061	397	—	—	—	48	—	3100	140	960	—	—	—	—	—	—	—
MD50-10-27250	50-603061	450	—	—	—	22	1.3	1500	34	550	10	—	—	—	—	—	—
MD50-10-27262	50-603062	25	—	—	—	—	—	120	29	1200	—	—	—	—	—	—	—
MD50-10-27265	50-603062	64	—	—	—	—	—	180	42	2400	—	—	—	—	—	—	—
MD50-10-27257	50-603062	122	—	—	—	—	—	400 (J)	60 (J)	7200 (J)	—	—	—	—	—	—	—
MD50-10-27263	50-603062	184	—	—	—	—	—	410	50	5900	—	—	—	—	—	—	—
MD50-10-27260	50-603062	217	—	—	11 (J)	24 (J)	16 (J)	380 (J)	47 (J)	5700	14 (J)	—	—	—	—	—	—
MD50-10-27264	50-603062	263	—	—	—	—	—	550	51	6300	—	—	—	—	—	—	—
MD50-10-27259	50-603062	337	—	—	—	—	—	92	—	1900	—	—	—	—	—	—	—
MD50-10-27261	50-603062	387	—	—	—	—	—	71	—	1900	—	—	—	—	—	—	—
MD50-10-27258	50-603062	450	—	—	—	—	—	—	—	700	—	—	—	—	—	—	—
MD50-10-27267	50-603063	25	—	—	—	370	—	3500	450	2100	—	—	—	—	—	—	—
MD50-10-27272	50-603063	76	—	—	—	550	—	3800	560	5400	—	—	—	—	—	—	—
MD50-10-27275	50-603063	128	—	—	—	810	—	5200	830	9600	—	—	—	—	—	—	—
MD50-10-27268	50-603063	190	—	—	—	1400	—	5400	690	22,000	—	—	—	—	—	—	—
MD50-10-27273	50-603063	228	580	—	180	950	820	4800	540	22,000	—	1300	—	—	1600	320	1300
MD50-10-27269	50-603063	274	—	—	—	1000	—	1700	—	25,000	—	—	—	—	—	—	—
MD50-10-27274	50-603063	347	—	—	92	400	—	640	—	9900	—	—	—	—	—	—	—
MD50-10-27271	50-603063	450	—	—	—	350	—	—	—	8200	—	—	—	—	—	—	—
MD50-10-27280	50-603064	25	—	—	—	230	—	3600	700	3600	—	—	—	—	—	—	—
MD50-10-27285	50-603064	66	—	—	—	360	—	8700	1600	7300	—	—	—	—	—	—	—
MD50-10-27279	50-603064	113	—	—	—	520	—	13,000	2700	28,000	—	—	—	—	—	—	—
MD50-10-27283	50-603064	176	—	—	450	530	—	14,000	2400	40,000	—	—	—	—	—	—	—
MD50-10-27277	50-603064	214	—	—	390	460	—	13,000	2000	36,000	—	—	—	—	—	—	—

Table C-4.1-11 (continued)

Sample ID	Location ID	Depth (ft)	Ethyltoluene[4-]	Hexanone[2-]	Methylene Chloride	Tetrachloroethylene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethylene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Vinyl Chloride	Xylene (total)	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
MD50-10-27281	50-603064	259	—	—	270	—	—	8000	860	27,000	—	—	—	—	—	—	—
MD50-10-27278	50-603064	332	—	—	86	170	—	3200	150	13,000	—	—	—	—	—	—	—
MD50-10-27282	50-603064	400	—	—	—	100	—	1300	—	8700	—	—	—	—	—	—	—
MD50-10-27284	50-603064	500	—	—	—	—	—	150	—	1600	—	—	—	—	—	—	—
MD50-10-27199	50-603383	26	—	—	—	260	—	240	53	690	—	—	—	—	—	—	—
MD50-10-27197	50-603383	85	—	—	19	620	—	830	170	2600	—	—	—	—	—	—	—
MD50-10-27205	50-603383	139	—	—	54	1200	—	1000	230	5200	—	—	—	—	—	—	—
MD50-10-27204	50-603383	206	—	—	74	1400	—	780	190	6700	—	—	—	—	—	—	—
MD50-10-27203	50-603383	244	—	—	—	66	—	20	—	510	—	—	—	—	—	—	—
MD50-10-27201	50-603383	286	—	—	42	530	—	210	77	3300	—	—	—	—	—	—	—
MD50-10-27202	50-603383	359	—	—	42	880	—	340	95	4000	—	—	—	—	—	—	—
MD50-10-27200	50-603383	408	—	—	—	220	—	—	—	1400	—	—	—	—	—	—	—
MD50-10-27214	50-603467	26	—	—	110	380	—	—	—	9400	—	—	—	—	—	—	—
MD50-10-27210	50-603467	91	—	—	110	280	—	—	—	7400	—	—	—	—	—	—	—
MD50-10-27211	50-603467	143	—	—	260	580	—	—	—	18,000	—	—	—	—	—	—	—
MD50-10-27215	50-603467	206	—	—	400	860	—	—	—	25,000	—	—	—	—	—	—	—
MD50-10-27207	50-603467	244	—	—	720	840	—	—	—	26,000	—	—	—	—	—	—	—
MD50-10-27213	50-603467	287	—	—	520	700	—	—	—	22,000	—	—	—	—	—	—	—
MD50-10-27212	50-603467	360	—	—	310	650	—	—	—	26,000	—	—	—	—	—	—	—
MD50-10-27208	50-603467	409	—	—	160	400	—	—	—	15,000	—	—	—	—	—	—	—
MD50-10-27206	50-603467	500	—	—	70	280	—	—	—	8100	—	—	—	—	—	—	—
MD50-10-27209	50-603467	600	—	430	27	97	—	—	—	3700	—	—	—	—	—	—	—
MD50-10-27220	50-603468	92	—	—	—	—	—	—	—	5700	—	—	—	—	—	—	—
MD50-10-27217	50-603468	142	—	—	91 (J)	100	—	—	—	5500	—	—	—	—	—	—	—
MD50-10-27218	50-603468	198	—	—	510 (J)	310	—	—	—	20,000	—	—	—	—	—	—	—
MD50-10-27219	50-603468	233	—	—	630 (J)	340	—	—	—	23,000	—	—	—	—	—	—	—
MD50-10-27226	50-603468	282	—	—	510 (J)	360	—	—	—	23,000	—	—	—	—	—	—	—
MD50-10-27223	50-603468	354	—	—	400 (J)	330	—	—	—	20,000	—	—	—	—	—	—	—
MD50-10-27221	50-603468	403	—	—	370 (J)	350	—	—	—	22,000	—	—	—	—	—	—	—
MD50-10-27222	50-603468	450	—	—	130 (J)	200	—	—	—	12,000	—	—	—	—	—	—	—

Table C-4.1-11 (continued)

Sample ID	Location ID	Depth (ft)	Ethyltoluene[4-]	Hexanone[2-]	Methylene Chloride	Tetrachloroethylene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethylene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Vinyl Chloride	Xylene (total)	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
MD50-10-27145	50-603470	30	—	—	—	980	—	240	—	14,000	—	—	—	—	—	—	—
MD50-10-27149	50-603470	83	—	—	92 (J)	730	—	310	—	13,000	—	—	—	—	—	—	—
MD50-10-27144	50-603470	143	—	—	190	720	—	440	—	33,000	—	—	—	—	—	—	—
MD50-10-27151	50-603470	203	—	—	98	100 (J)	—	—	—	9200	—	—	—	—	—	—	—
MD50-10-27147	50-603470	233	—	—	610	—	—	—	—	50,000	—	—	—	—	—	—	—
MD50-10-27153	50-603470	278	—	—	640	—	—	—	—	55,000	—	—	—	—	—	—	—
MD50-10-27146	50-603470	351	—	—	360	—	—	—	—	37,000	—	—	—	—	—	—	—
MD50-10-27152	50-603470	450	—	—	—	—	—	—	—	12,000	—	—	—	—	—	—	—
MD50-10-27148	50-603470	600	—	—	—	—	33	—	—	1700	—	—	—	—	30	—	30
MD50-10-27115	50-603470	650	4.4	—	—	—	15	—	—	12	—	5.3	—	—	14	3.9	10
MD50-10-27158	50-603471	30	—	—	220	910	—	—	—	20,000	—	—	—	—	—	—	—
MD50-10-27155	50-603471	90	—	—	440	1300	—	—	—	28,000	—	—	—	—	—	—	—
MD50-10-27157	50-603471	146	—	—	98	79	—	—	—	4300	—	—	—	—	—	—	—
MD50-10-27162	50-603471	209	—	—	910	860	—	—	—	48,000	—	—	—	—	—	—	—
MD50-10-27161	50-603471	242	—	—	1900	1300	—	—	—	72,000	—	—	—	—	—	—	—
MD50-10-27160	50-603471	288	—	—	1700	1300	—	—	—	70,000	—	—	—	—	—	—	—
MD50-10-27156	50-603471	360	—	—	690	640	—	—	—	34,000	—	—	—	—	—	—	—
MD50-10-27163	50-603471	410	—	—	400	620	—	—	—	34,000	—	—	—	—	—	—	—
MD50-10-27159	50-603471	450	—	—	250	350	—	—	—	23,000	—	—	—	—	—	—	—
MD50-10-27165	50-603472	27	—	—	25 (J)	630	—	46	46	3000	—	—	—	—	—	—	—
MD50-10-27168	50-603472	93	15	—	—	—	78	—	—	19	—	16	4.3	—	74	18	55
MD50-10-27170	50-603472	146	11	—	1.2	—	55	—	—	29	—	12	3.5	—	51	13	38
MD50-10-27172	50-603472	210	—	—	10	—	—	—	—	110	—	—	—	—	—	—	—
MD50-10-27166	50-603472	247	—	—	270 (J)	500	—	—	—	7100	—	—	—	—	—	—	—
MD50-10-27174	50-603472	292	—	—	7.9	13	—	—	—	240	—	—	—	—	—	—	—
MD50-10-27169	50-603472	364	—	—	25	70	42	—	—	910	—	—	—	—	—	—	—
MD50-10-27167	50-603472	414	23	—	—	—	110	—	—	20	—	24	7.6	—	120	28	88
MD50-10-27173	50-603472	450	—	—	—	—	—	—	—	56	—	—	—	—	—	—	—
MD50-10-27243	50-603503	25	—	—	—	240	—	—	—	1300	—	—	—	—	—	—	—
MD50-10-27237	50-603503	80	—	—	34	590	180	77	—	2000	—	—	—	—	—	—	—

Table C-4.1-11 (continued)

Sample ID	Location ID	Depth (ft)	Ethyltoluene[4-]	Hexanone[2-]	Methylene Chloride	Tetrachloroethylene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethylene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Vinyl Chloride	Xylene (total)	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
MD50-10-27244	50-603503	133	—	—	24	360	—	99	—	2300	—	—	—	—	—	—	—
MD50-10-27238	50-603503	198	—	—	—	220	—	—	—	2200	—	—	—	—	—	—	—
MD50-10-27245	50-603503	237	—	—	—	1300	—	—	—	12,000	—	—	—	—	—	—	—
MD50-10-27239	50-603503	278	—	—	—	460	—	—	—	5600	—	—	—	—	—	—	—
MD50-10-27241	50-603503	347	—	—	14	190	—	—	—	1200	—	—	—	—	—	—	—
MD50-10-27240	50-603503	397	—	—	7.5	130	120	—	—	1100	—	—	—	—	23	—	18
MD50-10-27242	50-603503	450	—	—	—	130	—	—	—	2000	—	—	—	—	—	—	—

Notes: Results are in µg/m^3. Data qualifiers are defined in Appendix A.

*— = Not detected.

Table C-4.1-12
VOCs Detected in Vapor Samples at MDA C during January 2011–March 2011 Sampling Event

Sample ID	Location ID	Depth (ft)	Acetone	Benzene	Butanone[2-]	Carbon Disulfide	Carbon Tetrachloride	Chlorobenzene	Chloroform	Dichloro-1,1,2,2-tetrafluoroethane[1,2-]	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Ethylbenzene	Ethyltoluene[4-]
MD50-11-4012	50-24784	25	—*	—	—	—	55 (J-)	—	210	—	39	—	—	—	—	—	—
MD50-11-4010	50-24784	96	—	—	—	—	110	—	530	79	100	—	—	—	34	—	—
MD50-11-4009	50-24784	155	—	—	—	—	190	—	220	72	150	—	—	—	34	—	—
MD50-11-4006	50-24784	215	—	—	—	—	77 (J-)	—	160	—	170	—	—	—	—	—	—
MD50-11-4004	50-24784	244	—	—	—	—	380 (J)	—	99	—	160	—	—	—	—	—	—
MD50-11-4008	50-24784	289	—	—	—	—	510 (J)	—	58	—	—	—	—	—	—	—	—
MD50-11-4007	50-24784	362	—	—	—	—	480 (J-)	—	—	—	180	—	—	—	—	—	—
MD50-11-4005	50-24784	411	—	—	—	—	370	—	—	—	190	—	—	—	—	—	—
MD50-11-4003	50-24784	450	—	—	—	—	—	—	—	—	22	—	—	—	—	—	—
MD50-11-4023	50-24813	25	—	—	—	—	3000	—	3400	—	980	—	—	550	—	—	—
MD50-11-4021	50-24813	99	—	—	—	—	880	—	950	—	1100	—	—	350	—	—	—
MD50-11-4095	50-24813	150	—	—	—	—	1400	—	2300	—	1000 (J)	—	—	550	—	—	—
MD50-11-4019	50-24813	207	—	—	—	—	33	—	41	—	25	—	—	9.3	—	—	—
MD50-11-4018	50-24813	241	—	10	—	—	7.7	—	8.9	—	12	—	—	—	—	5.8	—
MD50-11-4017	50-24813	286	—	—	—	—	190	—	190	—	200	—	—	—	—	—	—
MD50-11-4014	50-24813	358	—	—	—	—	—	—	370	—	920	—	—	—	—	—	—
MD50-11-4013	50-24813	408	—	—	—	—	270	—	130	—	400	—	—	—	—	—	—
MD50-11-4015	50-24813	450	—	—	—	—	270	—	—	—	410	—	—	—	—	—	—
MD50-11-4016	50-24813	600	5.2	—	—	—	11 (J+)	—	—	—	22	—	—	—	—	—	—
MD50-11-4058	50-24822	25	—	—	—	—	—	—	210	—	160	—	—	—	—	—	—
MD50-11-4057	50-24822	142	—	—	—	—	—	—	7.6	—	11	—	—	—	—	—	—
MD50-11-4055	50-24822	204	—	—	—	—	—	—	440	—	870	—	—	—	—	—	—
MD50-11-4060	50-24822	235	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
MD50-11-4061	50-24822	280	—	—	—	—	—	—	250	—	580	—	—	—	—	—	—
MD50-11-4056	50-24822	351	14	2.7	8.9	—	—	—	—	—	2.7	—	—	—	—	1.9	—
MD50-11-4080	50-603061	25	—	—	—	—	—	—	—	—	520	—	220	—	—	—	—
MD50-11-4081	50-603061	76	—	—	—	—	—	—	—	—	480	—	700	—	—	—	—
MD50-11-4083	50-603061	128	—	—	—	—	—	—	—	—	350	—	1500	—	—	—	—
MD50-11-4082	50-603061	190	—	—	—	—	—	—	—	—	280	—	1500	—	—	—	—
MD50-11-4084	50-603061	228	—	—	—	—	170 (J)	—	—	—	180	—	1000	—	—	—	—

Table C-4.1-12 (continued)

Sample ID	Location ID	Depth (ft)	Acetone	Benzene	Butanone[2-]	Carbon Disulfide	Carbon Tetrachloride	Chlorobenzene	Chloroform	Dichloro-1,1,2,2-tetrafluoroethane[1,2-]	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Ethylbenzene	Ethyltoluene[4-]
MD50-11-4076	50-603061	274	—	—	—	—	84	—	—	—	220	—	460	—	—	—	—
MD50-11-4077	50-603061	347	52	—	—	—	110	—	—	—	230	—	230	—	—	—	—
MD50-11-4078	50-603061	397	—	—	—	—	100	—	—	—	180	—	120	—	—	—	—
MD50-11-4079	50-603061	450	—	—	—	—	63 (J)	—	—	—	64	—	29	—	—	—	—
MD50-11-4092	50-603062	25	—	—	—	—	—	—	24	—	62	—	—	—	—	—	—
MD50-11-4091	50-603062	64	—	—	—	—	—	—	50	—	240 (J)	—	—	—	—	—	—
MD50-11-4093	50-603062	122	—	—	—	—	—	—	69	—	—	—	—	—	—	—	—
MD50-11-4090	50-603062	184	—	—	—	—	—	—	45	—	190 (J)	—	—	—	—	—	—
MD50-11-4089	50-603062	217	13	1.2	—	—	11	—	7.8	—	39	—	1.4	2	—	—	—
MD50-11-4087	50-603062	263	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
MD50-11-4086	50-603062	337	—	—	—	—	26	—	—	—	110	—	—	—	—	—	—
MD50-11-4088	50-603062	387	—	—	—	—	39	—	—	—	140	—	—	—	—	—	—
MD50-11-4085	50-603062	450	—	—	—	—	12	—	—	—	45	—	—	—	—	—	—
MD50-11-4103	50-603063	25	—	—	—	—	40	—	36	—	210	—	9.5	—	—	—	—
MD50-11-4102	50-603063	76	—	—	—	—	89	—	180	—	—	—	260	—	—	—	—
MD50-11-4101	50-603063	128	—	—	—	—	—	—	230	—	700 (J)	79	390	—	—	—	—
MD50-11-4100	50-603063	190	—	—	—	—	290	—	460	—	890 (J)	—	450	120	—	—	—
MD50-11-4099	50-603063	228	—	34	—	—	—	—	—	—	2.4	—	—	—	—	3.2	—
MD50-11-4098	50-603063	274	—	—	—	—	350 (J-)	—	430	—	830 (J)	—	—	170	—	—	—
MD50-11-4096	50-603063	347	—	—	—	—	—	—	85	—	210 (J)	—	—	—	—	—	—
MD50-11-4104	50-603063	397	—	11	—	—	12	—	16	—	15	—	—	—	—	—	—
MD50-11-4097	50-603063	450	—	—	—	—	190 (J-)	—	120	—	430 (J)	—	—	—	—	—	—
MD50-11-4113	50-603064	25	—	—	—	—	—	—	220	—	60	—	71	22	—	—	—
MD50-11-4112	50-603064	66	—	—	—	—	—	—	250	—	—	—	210	38	—	—	—
MD50-11-4111	50-603064	113	—	—	—	—	—	—	850	—	470	—	510	220	—	—	—
MD50-11-4109	50-603064	176	—	—	—	—	—	—	670	—	750	—	1000	230	—	—	—
MD50-11-4110	50-603064	214	—	—	—	—	270 (J+)	—	270	—	71	—	160	26	—	—	—
MD50-11-4105	50-603064	259	—	—	—	—	360 (J)	—	—	—	410	—	240	—	—	—	—
MD50-11-4106	50-603064	332	—	—	—	—	300 (J)	—	—	—	400	—	82	—	—	—	—
MD50-11-4107	50-603064	400	—	—	—	—	160 (J)	—	—	—	240	—	—	—	—	—	—
MD50-11-4108	50-603064	500	—	—	—	29	120 (J)	—	—	—	210	—	—	—	—	—	—
MD50-11-4024	50-603383	26	—	—	—	—	98 (J+)	—	83	—	200	—	14	—	49	—	—
MD50-11-4029	50-603383	85	—	—	—	—	120	—	120	—	240	—	29	—	110	—	—

Table C-4.1-12 (continued)

Sample ID	Location ID	Depth (ft)	Acetone	Benzene	Butanone[2-]	Carbon Disulfide	Carbon Tetrachloride	Chlorobenzene	Chloroform	Dichloro-1,1,2,2-tetrafluoroethane[1,2-]	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Ethylbenzene	Ethyltoluene[4-]
MD50-11-4025	50-603383	139	160	—	450	—	—	—	—	—	—	—	—	—	—	—	—
MD50-11-4030	50-603383	206	—	—	—	—	280	—	110	—	220	—	49	62	360	—	—
MD50-11-4026	50-603383	244	—	—	—	—	370	—	120	—	280	—	59	75	370	—	—
MD50-11-4031	50-603383	286	5.6	—	—	—	—	1.7	—	—	—	—	1.2	1.8	8.6	—	—
MD50-11-4027	50-603383	359	10	—	—	43	16	—	3.1	—	9.9 (J)	—	1.2	1.5	2.3	—	—
MD50-11-4032	50-603383	408	—	—	—	—	260	—	—	—	170 (J)	—	—	—	—	—	—
MD50-11-4028	50-603383	450	27	—	—	—	280	—	—	—	200	—	—	—	—	—	—
MD50-11-4038	50-603467	91	—	—	—	—	820 (J+)	—	670	—	200	—	—	110	—	—	—
MD50-11-4039	50-603467	206	—	—	—	—	440 (J+)	—	280	—	—	—	—	77	—	—	—
MD50-11-4042	50-603467	287	—	—	—	—	340 (J-)	—	170 (J-)	—	—	—	—	—	—	—	—
MD50-11-4040	50-603467	409	—	—	—	—	300 (J+)	—	—	—	—	—	—	—	—	—	—
MD50-11-4043	50-603467	500	—	—	—	—	330 (J+)	—	—	—	180	—	—	—	—	—	—
MD50-11-4041	50-603467	600	200 (J-)	—	330 (J-)	—	260 (J-)	—	—	—	78 (J-)	—	—	—	—	—	—
MD50-11-4047	50-603468	92	37	15	8	—	—	—	1.7	—	4.9	—	—	—	—	11	7.5
MD50-11-4046	50-603468	142	37	15	6.4	—	—	—	—	—	3.4	—	—	—	—	9.8	5.3
MD50-11-4045	50-603468	198	—	—	—	—	330 (J)	—	210	—	—	—	—	71	—	—	—
MD50-11-4054	50-603468	233	29	12	6.5	—	—	—	—	—	3	—	—	—	—	7.7	5.4
MD50-11-4050	50-603468	282	—	—	—	—	700 (J)	—	330	—	410	—	—	—	—	—	—
MD50-11-4051	50-603468	354	—	—	—	—	1200 (J)	—	400	—	630	—	—	150	—	—	—
MD50-11-4052	50-603468	403	—	—	—	—	680 (J)	—	—	—	440	—	—	—	—	—	—
MD50-11-4053	50-603468	450	—	—	—	—	550 (J)	—	—	—	350	—	—	—	—	—	—
MD50-11-3980	50-603470	83	—	—	—	—	—	—	390	—	140	—	—	75	—	—	—
MD50-11-3975	50-603470	143	—	—	—	—	—	—	970	—	—	—	—	—	—	—	—
MD50-11-3973	50-603470	203	—	—	—	—	—	—	250	—	240	—	—	—	—	—	—
MD50-11-3972	50-603470	233	—	2.4	—	—	—	—	—	—	2.8	—	—	—	—	—	—
MD50-11-3974	50-603470	278	—	—	—	—	—	—	590	—	—	—	—	—	—	—	—
MD50-11-3979	50-603470	351	4.9	58	—	—	—	—	—	—	2.8	—	—	—	—	10	6.3
MD50-11-3978	50-603470	450	20	15	—	—	2.2	—	—	—	7.6	—	—	—	—	8.1	7.4
MD50-11-3977	50-603470	600	34	14	4.1	—	—	—	—	—	4.8	—	—	—	—	10	15
MD50-11-3976	50-603470	650	—	22	10	—	2.9	—	—	—	18	—	—	—	—	4.9	3.2
MD50-11-3983	50-603471	30	—	—	—	—	—	—	350	—	—	—	—	45	—	—	—
MD50-11-3992	50-603471	90	—	—	—	—	210 (J)	—	400	—	65	—	—	48	—	—	—
MD50-11-3990	50-603471	146	—	—	—	—	—	—	930	—	600	—	—	400	—	—	—

Table C-4.1-12 (continued)

Sample ID	Location ID	Depth (ft)	Acetone	Benzene	Butanone[2-]	Carbon Disulfide	Carbon Tetrachloride	Chlorobenzene	Chloroform	Dichloro-1,1,2,2-tetrafluoroethane[1,2-]	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Ethylbenzene	Ethyltoluene[4-]
MD50-11-3988	50-603471	209	—	—	—	—	150 (J)	—	480	—	160	—	—	110	—	—	—
MD50-11-3989	50-603471	242	—	—	—	—	210 (J)	—	360	—	320	—	—	110	—	—	—
MD50-11-3987	50-603471	288	—	—	—	—	460 (J)	—	1700	—	480	—	—	440	—	—	—
MD50-11-3986	50-603471	360	—	—	—	—	—	—	310	—	370	—	—	—	—	—	—
MD50-11-3984	50-603471	410	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
MD50-11-3985	50-603471	450	—	—	—	—	—	—	280	—	550	—	—	—	—	—	—
MD50-11-4002	50-603472	27	—	—	—	—	—	—	330	—	41	—	—	24	—	—	—
MD50-11-4000	50-603472	93	—	35	—	—	43	—	170	—	45	—	—	20	—	—	—
MD50-11-4001	50-603472	146	—	—	—	—	—	—	450	—	—	—	—	94	—	—	—
MD50-11-3998	50-603472	210	—	—	—	—	—	—	170	—	72	—	—	56	—	—	—
MD50-11-3999	50-603472	247	—	—	—	—	—	—	96	—	—	—	—	27	—	—	—
MD50-11-3993	50-603472	364	10	1.4	3.1	—	11	—	3.8	—	13	—	—	1.1	—	—	—
MD50-11-3994	50-603472	414	—	—	—	—	—	—	—	—	350	—	—	—	—	—	—
MD50-11-3995	50-603472	450	—	—	—	—	190 (J)	—	—	—	270	—	—	—	—	—	—
MD50-11-4071	50-603503	25	—	—	—	—	82 (J)	—	52	—	32	—	—	—	—	—	—
MD50-11-4072	50-603503	80	—	—	—	—	95 (J)	—	61	—	40	—	—	—	—	—	—
MD50-11-4069	50-603503	133	—	—	—	—	120 (J)	—	84	—	41	—	—	—	28	—	—
MD50-11-4073	50-603503	198	—	—	—	—	190 (J)	—	120	—	50	—	—	22	52	—	—
MD50-11-4070	50-603503	237	—	—	—	—	220 (J)	—	120	—	50	—	—	25	36	—	—
MD50-11-4067	50-603503	278	—	—	—	—	140 (J)	—	85	—	—	—	—	—	—	—	—
MD50-11-4066	50-603503	347	—	—	—	—	76 (J)	—	53	—	—	—	—	—	—	—	—
MD50-11-4068	50-603503	397	—	—	—	—	100 (J)	—	34	—	43	—	—	—	—	—	—
MD50-11-4065	50-603503	450	—	—	—	—	140 (J)	—	—	—	63	—	—	—	—	—	—
MD50-11-3943	50-613182	550	9.7	70	—	—	—	—	—	—	5.1	—	—	—	—	40	16
MD50-11-3942	50-613182	600	5.4	29	—	3.3	—	—	—	—	4.2	—	—	—	—	4	2.6
MD50-11-3953	50-613182	620	—	—	—	—	27 (J+)	—	—	—	48	—	—	—	—	—	—
MD50-11-3941	50-613182	632.5	—	1300	—	—	—	—	—	—	—	—	—	—	—	180	100
MD50-11-3947	50-613183	30	—	—	—	—	3900 (J+)	—	2700	—	310	—	—	160	—	—	—
MD50-11-3948	50-613183	500	—	—	—	—	640 (J-)	—	—	—	500 (J-)	—	—	—	—	—	—
MD50-11-3949	50-613183	550	—	—	—	—	220	—	—	—	550 (J)	—	—	—	—	—	—
MD50-11-3950	50-613183	600	—	—	—	—	76	—	—	—	150	—	—	—	—	—	—
MD50-11-3951	50-613183	630	—	—	—	—	110	—	—	—	210	—	—	—	—	—	—
MD50-11-3952	50-613183	642.5	—	—	9.4	110	4.7 (J+)	—	—	—	11	—	—	—	—	2.1	—

Table C-4.1-12 (continued)

Sample ID	Location ID	Depth (ft)	Acetone	Benzene	Butanone[2-]	Carbon Disulfide	Carbon Tetrachloride	Chlorobenzene	Chloroform	Dichloro-1,1,2,2-tetrafluoroethane[1,2-]	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Ethylbenzene	Ethyltoluene[4-]
MD50-11-3959	50-613184	30	—	—	—	64 (J-)	89 (J-)	—	120 (J-)	—	82 (J-)	—	—	19 (J-)	—	—	—
MD50-11-3956	50-613184	500	—	—	—	—	120 (J-)	—	—	—	330 (J)	—	—	—	—	—	—
MD50-11-3958	50-613184	550	—	—	—	66 (J-)	120 (J-)	—	—	—	200 (J-)	—	—	—	—	—	—
MD50-11-3954	50-613184	600	—	—	—	—	58 (J-)	—	—	—	120 (J-)	—	—	—	—	—	—
MD50-11-3957	50-613184	652	68 (J-)	4 (J-)	8.8 (J-)	140 (J-)	18 (J-)	—	—	—	29 (J-)	—	—	—	—	2 (J-)	2.6 (J-)
MD50-11-3955	50-613184	664.5	25 (J-)	5.9 (J-)	7.8 (J-)	94 (J-)	3.8 (J-)	—	—	—	8.6 (J-)	—	—	—	—	2.8 (J-)	—
MD50-11-3962	50-613185	145	—	—	—	—	80	—	85	—	95	—	—	—	—	—	—
MD50-11-3963	50-613185	205	35	14	11	—	—	—	—	—	4.3	—	—	—	—	10	6.6
MD50-11-3964	50-613185	235	—	97	—	—	—	—	—	—	—	—	—	—	—	35	15
MD50-11-3965	50-613185	280	8.8	3.6	—	—	—	—	—	—	3.4	—	—	—	—	3.2	3.2
MD50-11-3966	50-613185	350	7.2	2.5	—	—	—	—	—	—	3.4	—	—	—	—	—	—
MD50-11-3967	50-613185	450	—	—	—	—	40	—	—	—	44	—	—	—	—	—	—
MD50-11-3969	50-613185	600	9.8	1.6	2.9	18	16	—	—	—	34	—	—	—	—	1.9	—
MD50-11-3968	50-613185	675	6.9	—	—	—	—	—	—	—	2.6	—	—	—	—	—	—
MD50-11-3970	50-613185	688	7.9	9.6	—	62	5.8	—	2.2	—	16	—	—	—	—	7.5	6.4

Table C-4.1-12 (continued)

Sample ID	Location ID	Depth (ft)	Hexanone[2-]	Methylene Chloride	Styrene	Tetrachloroethylene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethylene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene (total)	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
MD50-11-4012	50-24784	25	—	14	—	1800	—	43	57	920	—	—	—	—	—	—
MD50-11-4010	50-24784	96	—	—	—	2800	—	150 (J+)	62	2600	—	—	—	—	—	—
MD50-11-4009	50-24784	155	—	—	—	2000	—	150 (J+)	50	3000	—	—	—	—	—	—
MD50-11-4006	50-24784	215	—	120	—	2500	—	140	—	5000	—	—	—	—	—	—
MD50-11-4004	50-24784	244	—	55	—	2400	—	120	—	4600	—	—	—	—	—	—
MD50-11-4008	50-24784	289	—	68	—	2400	—	99	—	5000	—	—	—	—	—	—
MD50-11-4007	50-24784	362	—	26	—	1200	—	43	—	2600	—	—	—	—	—	—
MD50-11-4005	50-24784	411	—	—	—	630	—	—	—	—	—	—	—	—	—	—
MD50-11-4003	50-24784	450	—	—	—	—	—	—	—	—	—	—	—	—	—	—
MD50-11-4023	50-24813	25	—	230 (J+)	—	820	—	—	—	37,000	—	—	—	—	—	—
MD50-11-4021	50-24813	99	—	570 (J+)	—	530	—	—	—	42,000	—	—	—	—	—	—
MD50-11-4095	50-24813	150	—	430	—	590	—	—	—	39,000	—	—	—	—	—	—
MD50-11-4019	50-24813	207	—	330	—	—	—	—	—	1100	—	—	—	—	—	—
MD50-11-4018	50-24813	241	—	77	—	—	32	—	—	360	—	—	—	14	—	14
MD50-11-4017	50-24813	286	—	81 (J+)	—	120	—	—	—	9900	—	—	—	—	—	—
MD50-11-4014	50-24813	358	—	3900 (J)	—	490	—	—	—	43,000	—	—	—	—	—	—
MD50-11-4013	50-24813	408	—	180 (J+)	—	210	—	—	—	15,000	—	—	—	—	—	—
MD50-11-4015	50-24813	450	—	120 (J+)	—	150	—	—	—	13,000	—	—	—	—	—	—
MD50-11-4016	50-24813	600	—	—	—	—	—	—	—	170	2.7	—	—	—	—	—
MD50-11-4058	50-24822	25	—	—	—	—	—	—	—	6100	—	—	—	—	—	—
MD50-11-4057	50-24822	142	—	—	—	—	—	—	—	500	—	—	—	—	—	—
MD50-11-4055	50-24822	204	—	640 (J)	—	—	—	—	—	28,000	—	—	—	—	—	—
MD50-11-4060	50-24822	235	—	470 (J)	—	—	—	—	—	32,000	—	—	—	—	—	—
MD50-11-4061	50-24822	280	—	190	—	—	—	—	—	17,000	—	—	—	—	—	—
MD50-11-4056	50-24822	351	2.9	—	—	—	9.6	—	—	11	—	—	—	4.3	—	4.3
MD50-11-4080	50-603061	25	—	—	—	—	—	15,000	1700	380	—	—	—	—	—	—
MD50-11-4081	50-603061	76	—	—	—	250	—	22,000	3400	1900	—	—	—	—	—	—
MD50-11-4083	50-603061	128	—	—	—	—	—	28,000	5800	2500	—	—	—	—	—	—
MD50-11-4082	50-603061	190	—	—	—	—	—	28,000	4800	3700	—	—	—	—	—	—
MD50-11-4084	50-603061	228	—	—	—	—	160	22,000	3200	2700	—	—	—	—	—	—

Table C-4.1-12 (continued)

Sample ID	Location ID	Depth (ft)	Hexanone[2-]	Methylene Chloride	Styrene	Tetrachloroethylene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethylene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene (total)	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
MD50-11-4076	50-603061	274	—	—	—	72	—	9100	1200	1500	—	—	—	—	—	—
MD50-11-4077	50-603061	347	—	—	—	—	—	6600	430	1000	24	—	—	—	—	—
MD50-11-4078	50-603061	397	—	—	—	55	11	4000	180	1300	—	—	—	—	—	—
MD50-11-4079	50-603061	450	—	—	—	18	—	1100	24	390	—	—	—	—	—	—
MD50-11-4092	50-603062	25	—	—	—	—	—	120	26	1400	—	—	—	—	—	—
MD50-11-4091	50-603062	64	—	—	—	—	—	530	—	7400	—	—	—	—	—	—
MD50-11-4093	50-603062	122	—	—	—	—	—	500	—	6100	—	—	—	—	—	—
MD50-11-4090	50-603062	184	—	—	—	—	—	410	—	6000	—	—	—	—	—	—
MD50-11-4089	50-603062	217	—	2.4	—	3.8	1.5	75	7.8	1100	3.5	—	—	—	—	—
MD50-11-4087	50-603062	263	—	—	—	—	—	280	—	5700	—	—	—	—	—	—
MD50-11-4086	50-603062	337	—	—	—	—	—	61	—	1400	—	—	—	—	—	—
MD50-11-4088	50-603062	387	—	—	—	—	—	—	—	1700	—	—	—	—	—	—
MD50-11-4085	50-603062	450	—	—	—	—	—	8.7	—	320	—	—	—	—	—	—
MD50-11-4103	50-603063	25	—	—	—	360	—	3500	450	1700	—	—	—	—	—	—
MD50-11-4102	50-603063	76	—	41	—	810	—	6100	850	6500	—	—	—	—	—	—
MD50-11-4101	50-603063	128	—	72	—	890	—	6900	920	8700	—	—	—	—	—	—
MD50-11-4100	50-603063	190	—	200	—	1600	—	7300	900	20,000	—	—	—	—	—	—
MD50-11-4099	50-603063	228	—	—	—	—	42	—	—	3.3	3.8	—	—	11	2.6	8.5
MD50-11-4098	50-603063	274	—	270	—	1400	—	3200	—	22,000	—	—	—	—	—	—
MD50-11-4096	50-603063	347	—	60	—	220	—	650	—	4600	—	—	—	—	—	—
MD50-11-4104	50-603063	397	—	9.4	—	38	12	—	—	910	—	—	—	—	—	—
MD50-11-4097	50-603063	450	—	95	—	380	—	150	—	8400	—	—	—	—	—	—
MD50-11-4113	50-603064	25	—	—	—	210	—	2600	630	3900	—	—	—	—	—	—
MD50-11-4112	50-603064	66	—	—	—	190	—	5300	950	3700	—	—	—	—	—	—
MD50-11-4111	50-603064	113	—	—	—	570	—	12,000	2500	31,000	—	—	—	—	—	—
MD50-11-4109	50-603064	176	—	590 (J)	—	500	—	18,000	2600	34,000	—	—	—	—	—	—
MD50-11-4110	50-603064	214	—	—	—	220	—	4200	820	3800	—	—	—	—	—	—
MD50-11-4105	50-603064	259	—	190	—	—	—	5200	620	21,000	—	—	—	—	—	—
MD50-11-4106	50-603064	332	—	—	—	—	—	2400	120	11,000	—	—	—	—	—	—
MD50-11-4107	50-603064	400	—	—	—	—	—	590	—	4800	—	—	—	—	—	—
MD50-11-4108	50-603064	500	—	—	—	—	—	110	—	1500	—	—	—	—	—	—
MD50-11-4024	50-603383	26	—	—	—	690	—	880 (J+)	170	2000	31	—	—	—	—	—
MD50-11-4029	50-603383	85	—	—	—	800	—	1100	210	1900	—	—	—	—	—	—

Table C-4.1-12 (continued)

Sample ID	Location ID	Depth (ft)	Hexanone[2-]	Methylene Chloride	Styrene	Tetrachloroethylene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethylene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene (total)	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
MD50-11-4025	50-603383	139	—	—	—	—	1700	—	—	250	—	—	—	—	—	—
MD50-11-4030	50-603383	206	—	77 (J+)	—	1200	—	720	180	4600	—	—	—	—	—	—
MD50-11-4026	50-603383	244	—	91 (J+)	—	1500	—	750	220	5900	—	—	—	—	—	—
MD50-11-4031	50-603383	286	—	2.3	—	48	1.2	22	5.9	—	2.6	—	—	—	—	—
MD50-11-4027	50-603383	359	—	1.8	—	38	2.8	12 (J+)	4.8	300	—	—	—	—	—	—
MD50-11-4032	50-603383	408	—	—	—	200	—	70 (J+)	—	1500	—	—	—	—	—	—
MD50-11-4028	50-603383	450	—	—	—	280	—	75	—	1500	—	—	—	—	—	—
MD50-11-4038	50-603467	91	—	130	—	390	—	—	—	12,000	—	—	—	—	—	—
MD50-11-4039	50-603467	206	—	140	—	340	—	—	—	11,000	—	—	—	—	—	—
MD50-11-4042	50-603467	287	—	170 (J-)	—	250 (J-)	—	—	—	8800 (J-)	—	—	—	—	—	—
MD50-11-4040	50-603467	409	—	—	—	—	—	—	—	7200	—	—	—	—	—	—
MD50-11-4043	50-603467	500	—	—	—	—	—	—	—	6000	—	—	—	—	—	—
MD50-11-4041	50-603467	600	1500 (J-)	—	—	110 (J-)	—	—	—	3400 (J-)	—	—	—	—	—	—
MD50-11-4047	50-603468	92	—	—	—	—	60	—	—	33	3.4	7.4	—	39	9.5	29
MD50-11-4046	50-603468	142	—	—	—	—	57	—	—	55	3.3	4.1	—	34	8.2	26
MD50-11-4045	50-603468	198	—	210	—	—	—	—	—	11,000	—	—	—	—	—	—
MD50-11-4054	50-603468	233	—	—	—	—	43	—	—	21	2.8	5.4	—	27	6.7	20
MD50-11-4050	50-603468	282	—	380	—	—	—	—	—	23,000	—	—	—	—	—	—
MD50-11-4051	50-603468	354	—	450	—	490	—	—	—	38,000	—	—	—	—	—	—
MD50-11-4052	50-603468	403	—	200	—	—	—	—	—	19,000	—	—	—	—	—	—
MD50-11-4053	50-603468	450	—	—	—	—	—	—	—	15,000	—	—	—	—	—	—
MD50-11-3980	50-603470	83	—	—	—	260	—	130	—	6000	—	—	—	—	—	—
MD50-11-3975	50-603470	143	—	890 (J)	—	—	—	—	—	41,000	—	—	—	—	—	—
MD50-11-3973	50-603470	203	—	—	—	—	—	—	—	12,000	—	—	—	—	—	—
MD50-11-3972	50-603470	233	—	—	—	—	—	—	—	—	—	—	—	—	—	—
MD50-11-3974	50-603470	278	—	770 (J)	—	—	—	580	—	39,000	—	—	—	—	—	—
MD50-11-3979	50-603470	351	—	—	5.5	—	89	—	—	32	—	6.7	—	43	9.9	33
MD50-11-3978	50-603470	450	—	—	—	—	44	—	—	120	4.7	7.9	—	27	7.3	20
MD50-11-3977	50-603470	600	—	—	—	—	38	—	—	19	4.7	17	4.2	38	11	28
MD50-11-3976	50-603470	650	—	—	1.7	—	34	—	—	—	—	3.6	—	18	4.4	14
MD50-11-3983	50-603471	30	—	—	—	330	150	160	—	5900	—	—	—	100	—	100
MD50-11-3992	50-603471	90	—	67	—	190	—	—	—	3700	—	—	—	—	—	—
MD50-11-3990	50-603471	146	—	1400 (J)	—	1000	—	—	—	46,000	—	—	—	—	—	—

Table C-4.1-12 (continued)

Sample ID	Location ID	Depth (ft)	Hexanone[2-]	Methylene Chloride	Styrene	Tetrachloroethylene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethylene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene (total)	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
MD50-11-3988	50-603471	209	—	370	—	240	—	—	—	11,000	—	—	—	—	—	—
MD50-11-3989	50-603471	242	—	530 (J)	—	270	—	—	—	12,000	—	—	—	—	—	—
MD50-11-3987	50-603471	288	—	1000 (J)	—	1000	—	—	—	37,000	—	—	—	—	—	—
MD50-11-3986	50-603471	360	—	570 (J)	—	500	—	—	—	24,000	—	—	—	—	—	—
MD50-11-3984	50-603471	410	—	610 (J)	—	—	—	—	—	23,000	—	—	—	—	—	—
MD50-11-3985	50-603471	450	—	480 (J)	—	670	—	—	—	31,000	—	—	—	—	—	—
MD50-11-4002	50-603472	27	—	23	—	570	—	40	46	3200	—	—	—	—	—	—
MD50-11-4000	50-603472	93	—	36	—	170	36	—	—	2200	—	—	—	—	—	—
MD50-11-4001	50-603472	146	—	360	—	610	—	—	—	11,000	—	—	—	—	—	—
MD50-11-3998	50-603472	210	—	230 (J)	—	410	—	—	—	7100	—	—	—	—	—	—
MD50-11-3999	50-603472	247	—	160	—	180	—	—	—	3700	—	—	—	—	—	—
MD50-11-3993	50-603472	364	—	5.3	—	19	—	—	—	310	2.4	—	—	—	—	—
MD50-11-3994	50-603472	414	—	220 (J)	—	850	—	—	—	15,000	—	—	—	—	—	—
MD50-11-3995	50-603472	450	—	99	—	510	—	—	—	11,000	—	—	—	—	—	—
MD50-11-4071	50-603503	25	—	—	—	200	—	—	—	1900	—	—	—	—	—	—
MD50-11-4072	50-603503	80	—	18	—	210	—	—	—	1900	—	—	—	—	—	—
MD50-11-4069	50-603503	133	—	32	—	290	—	—	—	2600	—	—	—	—	—	—
MD50-11-4073	50-603503	198	—	94	—	440	—	—	—	5600	—	—	—	—	—	—
MD50-11-4070	50-603503	237	—	110	—	480	—	—	—	6600	—	—	—	—	—	—
MD50-11-4067	50-603503	278	—	85	—	390	—	—	—	4000	—	—	—	—	—	—
MD50-11-4066	50-603503	347	—	26	—	220	—	—	—	1800	—	—	—	—	—	—
MD50-11-4068	50-603503	397	—	21	—	200	—	—	—	2100	—	—	—	—	—	—
MD50-11-4065	50-603503	450	—	—	—	190	—	—	—	2400	—	—	—	—	—	—
MD50-11-3943	50-613182	550	—	—	—	—	130	—	—	31	—	11	—	120	28	89
MD50-11-3942	50-613182	600	—	—	2.2	—	38	—	—	2.2	—	2.7	—	17	3.9	13
MD50-11-3953	50-613182	620	—	—	—	15	—	—	—	290	—	—	—	—	—	—
MD50-11-3941	50-613182	632.5	—	—	100	—	1700	—	—	—	—	110	35	750	170	590
MD50-11-3947	50-613183	30	—	—	—	1100	—	—	—	14,000	—	—	—	—	—	—
MD50-11-3948	50-613183	500	—	—	—	270 (J-)	—	—	—	16,000 (J-)	—	—	—	—	—	—
MD50-11-3949	50-613183	550	—	—	—	130	—	—	—	6500	—	—	—	—	—	—
MD50-11-3950	50-613183	600	—	—	—	—	—	—	—	1400	—	—	—	—	—	—
MD50-11-3951	50-613183	630	—	—	—	—	—	—	—	1400	—	—	—	—	—	—
MD50-11-3952	50-613183	642.5	2.3	—	4.3	—	—	—	—	—	—	—	—	1.4	1.4	—

Table C-4.1-12 (continued)

Sample ID	Location ID	Depth (ft)	Hexanone[2-]	Methylene Chloride	Styrene	Tetrachloroethylene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethylene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene (total)	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
MD50-11-3959	50-613184	30	—	—	—	57 (J-)	—	—	—	2700 (J-)	—	—	—	—	—	—
MD50-11-3956	50-613184	500	—	28	—	64	—	—	—	3400	—	—	—	—	—	—
MD50-11-3958	50-613184	550	—	—	—	—	—	—	—	2000 (J-)	—	—	—	—	—	—
MD50-11-3954	50-613184	600	—	—	—	—	—	—	—	680 (J-)	—	—	—	—	—	—
MD50-11-3957	50-613184	652	2.4 (J-)	—	40 (J-)	—	5.2 (J-)	—	—	150 (J-)	2.6 (J-)	2.9 (J-)	—	5.8 (J-)	1.7 (J-)	4.1 (J-)
MD50-11-3955	50-613184	664.5	—	—	—	—	8.1 (J-)	—	—	31 (J-)	—	4.3 (J-)	—	7.7 (J-)	2.1 (J-)	5.6 (J-)
MD50-11-3962	50-613185	145	—	—	—	—	—	—	—	3500	—	—	—	—	—	—
MD50-11-3963	50-613185	205	—	1.5	1.8	—	88	—	—	—	—	7.6	—	49	12	36
MD50-11-3964	50-613185	235	—	—	—	—	300	—	—	—	—	15	—	110	25	87
MD50-11-3965	50-613185	280	—	—	—	—	14	—	—	27	—	3.6	—	11	2.8	7.8
MD50-11-3966	50-613185	350	—	—	—	—	1.1	—	—	29	—	—	—	—	—	—
MD50-11-3967	50-613185	450	—	—	—	—	—	—	—	930	—	—	—	—	—	—
MD50-11-3969	50-613185	600	—	—	—	—	3.1	—	—	110	—	—	—	—	1.3	—
MD50-11-3968	50-613185	675	—	—	—	—	4	—	—	—	—	—	—	—	—	—
MD50-11-3970	50-613185	688	—	—	—	2.8	14	—	—	18	—	7.2	2.9	18	6.9	11

Notes: Results are in µg/m^3. Data qualifiers are defined in Appendix A.

*— = Not detected.

Table C-4.1-13
VOCs Detected in Vapor Samples at MDA C during March 2011–May 2011 Sampling Event

Sample ID	Location ID	Depth (ft)	Acetone	Benzene	Bromomethane	Butanone[2-]	Carbon Disulfide	Carbon Tetrachloride	Chloroform	Chloromethane	Dichloro-1,1,2,2-tetrafluoroethane[1,2-]	Dichlorodifluoromethane	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Ethylbenzene	Ethyltoluene[4-]
MD50-11-6010	50-24784	25	—*	—	—	—	—	37 (J)	270	—	—	38	—	—	—	—	—
MD50-11-6007	50-24784	96	—	—	—	—	—	130 (J)	640	—	—	85	—	—	58	—	—
MD50-11-6011	50-24784	155	—	—	—	—	—	140 (J)	140	—	—	67	—	—	25	—	—
MD50-11-6005	50-24784	215	—	—	—	—	—	250	100	—	—	100	—	—	—	—	—
MD50-11-6009	50-24784	244	—	—	—	—	—	180 (J)	—	—	—	81	—	—	—	—	—
MD50-11-6006	50-24784	289	—	—	—	—	—	520	87	—	—	—	—	—	—	—	—
MD50-11-6008	50-24784	362	16	46	—	—	—	76 (J)	4.9	—	—	8.6	0.96	—	—	23	22
MD50-11-6004	50-24784	411	—	—	—	—	—	300	—	—	—	150	—	—	—	—	—
MD50-11-6003	50-24784	450	—	—	—	—	—	320	—	—	—	170	—	—	—	—	—
MD50-11-6022	50-24813	25	—	—	—	—	—	—	2100	—	—	1900	—	—	—	—	—
MD50-11-6021	50-24813	99	—	—	—	—	—	—	2300	—	—	1900	—	—	—	—	—
MD50-11-6019	50-24813	150	—	—	—	—	—	1900	2500	—	—	890	—	450	—	—	—
MD50-11-6020	50-24813	207	—	—	—	—	—	2600	2700	—	—	670	—	360	—	—	—
MD50-11-6018	50-24813	241	—	—	—	—	—	1500	1000	—	—	500	—	—	—	—	—
MD50-11-6017	50-24813	286	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
MD50-11-6013	50-24813	358	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
MD50-11-6015	50-24813	408	—	—	—	—	—	—	—	—	—	720	—	—	—	—	—
MD50-11-6016	50-24813	450	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
MD50-11-6014	50-24813	600	—	—	—	—	—	—	—	—	—	260	—	—	—	—	—
MD50-11-6062	50-24822	25	—	—	—	—	—	—	62	—	—	43 (J-)	—	—	—	—	—
MD50-11-6059	50-24822	81	—	—	—	—	—	—	100	—	—	—	—	16	—	—	—
MD50-11-6061	50-24822	142	—	10	—	—	—	—	30	—	—	35 (J-)	—	—	—	—	—
MD50-11-6058	50-24822	204	—	—	—	—	—	—	540	—	—	1200 (J)	—	—	—	—	—
MD50-11-6060	50-24822	235	—	—	—	—	—	—	110	—	—	170 (J-)	—	—	—	—	—
MD50-11-6055	50-24822	280	—	—	—	—	—	—	270	—	—	1200 (J)	—	—	—	—	—
MD50-11-6056	50-24822	351	—	—	—	—	—	130 (J-)	110	—	—	870 (J)	—	—	—	—	—
MD50-11-6063	50-24822	402	9.8	—	—	—	3.2	—	—	—	—	2.4	—	—	—	—	—
MD50-11-6057	50-24822	450	—	—	—	—	—	61 (J-)	—	—	—	—	—	—	—	—	—
MD50-11-6083	50-603061	25	—	—	—	—	—	—	—	—	—	690	230	—	—	—	—
MD50-11-6080	50-603061	76	5.8	5.9	—	—	—	—	—	—	—	3.2	—	—	—	3.6	2.8
MD50-11-6079	50-603061	128	—	—	—	—	—	—	12	—	—	65	330	—	—	—	—

Table C-4.1-13 (continued)

Sample ID	Location ID	Depth (ft)	Acetone	Benzene	Bromomethane	Butanone[2-]	Carbon Disulfide	Carbon Tetrachloride	Chloroform	Chloromethane	Dichloro-1,1,2,2-tetrafluoroethane[1,2-]	Dichlorodifluoromethane	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Ethylbenzene	Ethyltoluene[4-]
MD50-11-6078	50-603061	190	7.7 (J)	5	—	—	—	—	—	—	—	5.8	18	—	—	—	—
MD50-11-6081	50-603061	228	—	—	—	—	—	—	—	—	—	290	1400	—	—	—	—
MD50-11-6077	50-603061	274	—	—	—	—	—	93 (J)	—	—	—	130	400	—	—	—	—
MD50-11-6082	50-603061	347	—	—	—	—	—	—	—	—	—	320	1400	—	—	—	—
MD50-11-6076	50-603061	397	—	14	—	—	—	66 (J)	—	—	—	95	75	—	—	—	—
MD50-11-6075	50-603061	450	6.6 (J)	—	—	—	—	73 (J)	—	—	—	120	51	—	—	—	—
MD50-11-6088	50-603062	25	14	—	—	—	—	—	24	—	—	45	—	—	—	—	—
MD50-11-6085	50-603062	64	—	—	—	—	—	—	41	—	—	78	—	—	—	—	—
MD50-11-6087	50-603062	122	—	—	—	—	—	—	44	—	—	250 (J)	—	—	—	—	—
MD50-11-6092	50-603062	184	—	—	—	—	—	—	—	—	—	200	—	—	—	—	—
MD50-11-6086	50-603062	217	—	—	—	—	—	—	—	—	—	250 (J)	—	—	—	—	—
MD50-11-6090	50-603062	263	—	—	—	—	—	—	—	—	—	200	—	—	—	—	—
MD50-11-6094	50-603062	337	—	—	—	—	—	30	—	—	—	110	—	—	—	—	—
MD50-11-6091	50-603062	387	—	—	—	—	—	20 (J)	—	—	—	80	—	—	—	—	—
MD50-11-6089	50-603062	450	—	—	—	—	—	20 (J)	—	—	—	79	—	—	—	—	—
MD50-11-6102	50-603063	25	—	—	—	—	—	—	190	—	—	290	170	—	—	—	—
MD50-11-6100	50-603063	76	—	—	—	—	—	220 (J+)	210	—	—	340	210	—	—	—	—
MD50-11-6099	50-603063	128	—	—	—	—	—	—	260	—	—	440	280	—	—	—	—
MD50-11-6097	50-603063	190	5	—	—	—	—	3.9 (J)	4.5	—	—	7.8	2.7	—	—	—	—
MD50-11-6098	50-603063	228	—	—	—	—	—	—	230	—	—	—	—	—	—	—	—
MD50-11-6103	50-603063	274	—	—	—	—	—	480 (J+)	200	—	—	300	—	—	—	—	—
MD50-11-6095	50-603063	347	—	—	—	—	—	—	120	—	—	170 (J)	—	—	—	—	—
MD50-11-6101	50-603063	397	—	—	—	—	—	160 (J+)	79	—	—	130	—	—	—	—	—
MD50-11-6096	50-603063	450	—	—	—	—	—	200	130	—	—	210	—	—	—	—	—
MD50-11-6108	50-603064	25	—	—	—	—	—	—	150	—	—	41	—	—	—	—	—
MD50-11-6107	50-603064	66	—	—	—	—	—	—	350	—	—	240	250	—	—	—	—
MD50-11-6105	50-603064	113	—	—	—	—	—	—	880	—	—	600	—	—	—	—	—
MD50-11-6110	50-603064	176	—	—	—	—	—	—	580	—	—	970	560	—	—	—	—
MD50-11-6111	50-603064	214	—	—	—	—	—	—	500	—	—	970	—	—	—	—	—
MD50-11-6112	50-603064	259	—	—	—	—	—	—	280	—	—	800	—	—	—	—	—
MD50-11-6113	50-603064	332	—	—	—	—	—	—	—	—	—	470	—	—	—	—	—
MD50-11-6109	50-603064	482	—	—	—	—	—	—	—	—	—	310	—	—	—	—	—
MD50-11-6106	50-603064	500	9.7	8.9	—	—	—	29	—	—	—	100	—	—	—	—	—

Table C-4.1-13 (continued)

Sample ID	Location ID	Depth (ft)	Acetone	Benzene	Bromomethane	Butanone[2-]	Carbon Disulfide	Carbon Tetrachloride	Chloroform	Chloromethane	Dichloro-1,1,2,2-tetrafluoroethane[1,2-]	Dichlorodifluoromethane	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Ethylbenzene	Ethyltoluene[4-]
MD50-11-6027	50-603383	26	—	—	—	—	—	100 (J)	88	—	—	90	21	—	72	—	—
MD50-11-6025	50-603383	85	—	—	—	—	—	110 (J)	100	—	—	—	37	11	120	—	—
MD50-11-6024	50-603383	139	—	—	—	—	—	44 (J)	38	—	—	60	12	—	66	—	—
MD50-11-6032	50-603383	206	5.1	—	—	—	—	—	—	—	—	2.6	—	—	—	—	—
MD50-11-6026	50-603383	244	—	—	—	—	—	440 (J+)	110	—	—	250 (J)	—	72	350	—	—
MD50-11-6029	50-603383	286	—	—	—	—	—	87 (J)	23	—	—	60	—	—	53	—	—
MD50-11-6028	50-603383	359	—	—	—	—	—	170 (J)	—	—	—	160	16	—	—	—	—
MD50-11-6030	50-603383	408	—	—	—	—	—	230 (J)	—	—	—	140	—	—	—	—	—
MD50-11-6031	50-603383	450	—	—	—	—	—	170 (J)	43	—	—	91	—	15	97	—	—
MD50-11-6041	50-603467	26	—	—	—	—	—	360 (J)	360	—	—	—	—	—	—	—	—
MD50-11-6043	50-603467	91	—	—	—	—	—	—	660	—	—	—	—	—	—	—	—
MD50-11-6038	50-603467	143	—	—	—	—	—	670 (J)	570	—	—	210	—	—	—	—	—
MD50-11-6042	50-603467	206	—	—	—	—	—	—	630	—	—	—	—	—	—	—	—
MD50-11-6037	50-603467	244	—	—	—	—	—	930 (J)	640	—	—	330	—	—	—	—	—
MD50-11-6039	50-603467	287	—	—	—	—	—	—	360	—	—	—	—	—	—	—	—
MD50-11-6040	50-603467	360	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
MD50-11-6036	50-603467	409	—	—	—	—	—	140 (J)	—	—	—	220	—	—	—	—	—
MD50-11-6035	50-603467	500	—	—	—	—	—	110 (J+)	—	—	—	92 (J)	—	—	—	—	—
MD50-11-6034	50-603467	600	98	—	—	200	—	200 (J)	—	—	—	170	—	—	—	—	—
MD50-11-6051	50-603468	92	—	—	90	—	—	240	260	31	—	93	—	60	—	—	—
MD50-11-6050	50-603468	142	—	—	—	—	—	—	270	—	—	—	—	88	—	—	—
MD50-11-6052	50-603468	198	—	—	—	—	—	—	540	—	—	340	—	200	—	—	—
MD50-11-6049	50-603468	233	—	—	—	—	—	400 (J)	510	—	—	410	—	—	—	—	—
MD50-11-6047	50-603468	282	—	—	—	—	—	—	570	—	—	680 (J)	—	210	—	—	—
MD50-11-6046	50-603468	354	—	—	—	—	—	400 (J)	400	—	—	1100 (J)	—	180	—	—	—
MD50-11-6045	50-603468	403	—	—	—	—	—	220 (J)	—	—	—	770 (J)	—	—	—	—	—
MD50-11-6048	50-603468	450	—	—	—	—	—	130 (J)	—	—	—	320 (J)	—	—	—	—	—
MD50-11-5978	50-603470	30	—	—	—	—	—	—	760	—	—	350	—	—	—	—	—
MD50-11-5980	50-603470	83	—	—	—	—	—	—	820	—	—	160	—	110	—	—	—
MD50-11-5982	50-603470	143	—	—	—	—	—	—	1300	—	—	700	—	—	—	—	—
MD50-11-5977	50-603470	203	—	—	—	—	—	—	1100	—	—	1100	—	—	—	—	—
MD50-11-5976	50-603470	233	—	—	—	—	—	—	630	—	—	590	—	—	—	—	—
MD50-11-5979	50-603470	278	—	—	—	—	—	—	840	—	—	1100	—	—	—	—	—

Table C-4.1-13 (continued)

Sample ID	Location ID	Depth (ft)	Acetone	Benzene	Bromomethane	Butanone[2-]	Carbon Disulfide	Carbon Tetrachloride	Chloroform	Chloromethane	Dichloro-1,1,2,2-tetrafluoroethane[1,2-]	Dichlorodifluoromethane	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Ethylbenzene	Ethyltoluene[4-]
MD50-11-5973	50-603470	351	—	—	—	—	—	280	190	—	—	590	—	70	—	—	—
MD50-11-5972	50-603470	450	—	—	—	—	—	—	—	—	—	520	—	—	—	—	—
MD50-11-5975	50-603470	600	—	—	—	—	—	84	—	—	—	250	—	—	—	—	—
MD50-11-5974	50-603470	650	9.1	2.3	—	—	—	11	—	—	—	52	—	—	—	—	—
MD50-11-5990	50-603471	90	—	—	—	—	—	1400	1600	—	—	—	—	—	—	—	—
MD50-11-5989	50-603471	146	—	—	—	—	—	—	1300	—	—	—	—	—	—	—	—
MD50-11-5988	50-603471	209	—	—	—	—	—	—	72	—	—	—	—	—	—	—	—
MD50-11-5987	50-603471	242	18	6.9	—	—	—	—	26	—	—	17	—	—	—	—	—
MD50-11-6156	50-603471	288	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
MD50-11-5986	50-603471	360	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
MD50-11-5983	50-603471	410	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
MD50-11-5985	50-603471	450	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
MD50-11-6000	50-603472	27	—	—	—	—	—	—	320	—	—	—	—	—	—	—	—
MD50-11-5998	50-603472	93	—	—	—	—	—	—	340	—	—	62	—	40	47	—	—
MD50-11-6001	50-603472	146	—	—	—	—	—	—	380	—	—	—	—	—	—	—	—
MD50-11-5997	50-603472	210	—	—	—	—	—	—	370	—	—	—	—	—	—	—	—
MD50-11-5999	50-603472	247	—	—	—	—	—	—	250	—	—	—	—	—	—	—	—
MD50-11-5995	50-603472	292	—	—	—	—	—	—	360	—	—	—	—	—	—	—	—
MD50-11-5994	50-603472	364	—	—	—	—	—	—	82	—	—	200	—	—	—	—	—
MD50-11-5993	50-603472	414	—	—	—	—	—	—	—	—	—	220	—	—	—	—	—
MD50-11-5996	50-603472	450	—	—	—	—	—	—	—	—	—	310	—	—	—	—	—
MD50-11-6072	50-603503	25	15	1.6	—	5.8	—	41 (J)	58	1.9	—	31	—	5.9	7.1	—	—
MD50-11-5992	50-603503	80	—	—	—	—	—	—	86	—	—	—	—	—	—	—	—
MD50-11-6073	50-603503	133	—	—	—	—	—	64	86	—	39	45	—	—	22	—	—
MD50-11-6069	50-603503	198	—	—	—	—	—	74 (J)	99	—	—	46	—	19	34	—	—
MD50-11-6068	50-603503	237	—	—	—	—	—	120 (J)	140	—	—	74	—	28	41	—	—
MD50-11-6070	50-603503	278	—	—	—	—	—	110	110	—	—	—	—	—	—	—	—
MD50-11-6065	50-603503	347	—	—	—	—	—	42	42	—	—	29	—	—	—	—	—
MD50-11-6066	50-603503	397	—	—	—	—	—	38	21	—	—	25	—	—	—	—	—
MD50-11-6067	50-603503	450	—	—	—	—	—	100	—	—	—	69	—	—	—	—	—
MD50-11-5933	50-613182	500	—	—	—	—	—	230	—	—	—	—	—	—	—	—	—
MD50-11-5934	50-613182	550	—	—	—	—	—	180	—	—	—	82	—	—	—	—	—
MD50-11-5936	50-613182	600	5	27	—	—	—	—	—	—	—	4.2	—	—	—	3.3	2.6

Table C-4.1-13 (continued)

Sample ID	Location ID	Depth (ft)	Acetone	Benzene	Bromomethane	Butanone[2-]	Carbon Disulfide	Carbon Tetrachloride	Chloroform	Chloromethane	Dichloro-1,1,2,2-tetrafluoroethane[1,2-]	Dichlorodifluoromethane	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Ethylbenzene	Ethyltoluene[4-]
MD50-11-5937	50-613182	620	4.4	—	—	—	—	—	—	—	—	—	—	—	—	—	—
MD50-11-5935	50-613182	632.5	13	—	—	—	—	2.8	—	—	—	4	—	—	—	—	—
MD50-11-5942	50-613183	30	—	—	—	—	—	250 (J-)	—	—	—	780 (J)	—	—	—	—	—
MD50-11-5939	50-613183	500	—	—	—	—	—	80	—	—	—	150	—	—	—	—	—
MD50-11-5943	50-613183	550	—	—	—	—	—	3000 (J-)	3200	—	—	630 (J)	200	180	—	—	—
MD50-11-5941	50-613183	600	—	—	—	—	—	220 (J-)	—	—	—	660 (J)	—	—	—	—	—
MD50-11-5944	50-613183	630	—	—	—	—	—	230 (J-)	—	—	—	660 (J)	—	—	—	—	—
MD50-11-5940	50-613183	642.5	—	21	—	—	110	2.8	—	—	—	7	—	—	—	5.9	5.6
MD50-11-5948	50-613184	30	—	—	—	—	—	100 (J+)	110	—	—	61	—	—	—	—	—
MD50-11-5951	50-613184	500	—	—	—	—	—	260 (J+)	—	—	—	180	—	—	—	—	—
MD50-11-5946	50-613184	550	—	—	—	—	—	180 (J+)	—	—	—	180	—	—	—	—	—
MD50-11-5947	50-613184	600	10	4.2	—	—	—	49	—	—	—	90	—	—	—	—	—
MD50-11-5950	50-613184	652	73	—	—	—	250	19	—	—	—	47	—	—	—	—	—
MD50-11-5949	50-613184	664.5	12	1.5	—	3.7	52	7.2	—	—	—	13	—	—	—	2.1	—
MD50-11-5960	50-613185	85	—	—	—	—	—	19	11	—	—	16 (J-)	—	—	—	—	—
MD50-11-5961	50-613185	145	—	—	—	—	—	98 (J)	73	—	—	120	—	—	—	—	—
MD50-11-5957	50-613185	205	—	—	—	—	—	65 (J)	38	—	—	91	—	—	—	—	—
MD50-11-5962	50-613185	235	—	—	—	—	—	250 (J)	65	—	—	230	—	—	—	—	—
MD50-11-5959	50-613185	280	—	—	—	—	—	94 (J)	—	—	—	—	—	—	—	—	—
MD50-11-5955	50-613185	350	—	—	—	—	—	86	—	—	—	100	—	—	—	—	—
MD50-11-5954	50-613185	450	—	—	—	—	200	66	—	—	—	96	—	—	—	—	—
MD50-11-5953	50-613185	600	17	3.4	—	—	12	18	—	—	5.4	40	—	—	—	2	—
MD50-11-5958	50-613185	675	—	1.6	—	—	35	7.8	—	—	—	5.8	—	—	—	1.8	—
MD50-11-5956	50-613185	688	15	1.5	—	4.3	50	5.3	—	—	—	17	—	—	—	2.5	—

Table C-4.1-13 (continued)

Sample ID	Location ID	Depth (ft)	Hexanone[2-]	Methylene Chloride	Styrene	Tetrachloroethylene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethylene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene (total)	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
MD50-11-6010	50-24784	25	—	—	—	2600	—	43	61	1100	—	—	—	—	—	—
MD50-11-6007	50-24784	96	—	—	—	3400	—	140	73	3200	—	—	—	—	—	—
MD50-11-6011	50-24784	155	—	—	—	1400	—	80	32	2300	—	—	—	—	—	—
MD50-11-6005	50-24784	215	—	—	—	2000	—	89	40	3600	—	—	—	—	—	—
MD50-11-6009	50-24784	244	—	—	—	280	5	—	—	630	7.2	—	—	—	—	—
MD50-11-6006	50-24784	289	—	—	—	3200	—	110	47	5000	—	—	—	—	—	—
MD50-11-6008	50-24784	362	—	1.2	4.8	240	120	13	3.9	510	6.4	25	7.5	91	23	68
MD50-11-6004	50-24784	411	—	—	—	630	—	—	—	1400	—	—	—	—	—	—
MD50-11-6003	50-24784	450	—	—	—	530	—	—	—	1200	—	—	—	—	—	—
MD50-11-6022	50-24813	25	—	1600	—	—	—	—	—	93,000	—	—	—	—	—	—
MD50-11-6021	50-24813	99	—	1200	—	—	—	—	—	93,000	—	—	—	—	—	—
MD50-11-6019	50-24813	150	—	540	—	—	—	—	—	48,000	—	—	—	—	—	—
MD50-11-6020	50-24813	207	—	—	—	580	—	—	—	39,000	—	—	—	—	—	—
MD50-11-6018	50-24813	241	—	—	—	370	—	—	—	15,000	—	—	—	—	—	—
MD50-11-6017	50-24813	286	—	—	—	—	—	—	—	79,000	—	—	—	—	—	—
MD50-11-6013	50-24813	358	—	—	—	—	—	—	—	52,000	—	—	—	—	—	—
MD50-11-6015	50-24813	408	—	—	—	—	—	—	—	36,000	—	—	—	—	—	—
MD50-11-6016	50-24813	450	—	—	—	—	—	—	—	16,000	—	—	—	—	—	—
MD50-11-6014	50-24813	600	—	—	—	—	—	—	—	3100	—	—	—	—	—	—
MD50-11-6062	50-24822	25	—	—	—	15	—	—	—	1500	—	—	—	—	—	—
MD50-11-6059	50-24822	81	—	—	—	—	—	—	—	2400	—	—	—	—	—	—
MD50-11-6061	50-24822	142	—	—	—	—	13	—	—	1100	—	—	—	—	—	—
MD50-11-6058	50-24822	204	—	440	—	—	—	—	—	33,000	—	—	—	—	—	—
MD50-11-6060	50-24822	235	—	—	—	—	—	—	—	6900	—	—	—	—	—	—
MD50-11-6055	50-24822	280	—	360	—	—	—	—	—	28,000	—	—	—	—	—	—
MD50-11-6056	50-24822	351	—	190	—	—	—	—	—	18,000	—	—	—	—	—	—
MD50-11-6063	50-24822	402	—	1.7	—	—	—	—	—	—	—	—	—	—	—	—
MD50-11-6057	50-24822	450	—	—	—	—	—	—	—	4300	—	—	—	—	—	—
MD50-11-6083	50-603061	25	—	—	—	—	—	19,000	1900	390	—	—	—	—	—	—
MD50-11-6080	50-603061	76	—	—	—	—	21	20	—	5.1	3.7	—	—	14	3.3	11
MD50-11-6079	50-603061	128	—	—	—	48	—	5400	1000	580	—	—	—	—	—	—

Table C-4.1-13 (continued)

Sample ID	Location ID	Depth (ft)	Hexanone[2-]	Methylene Chloride	Styrene	Tetrachloroethylene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethylene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene (total)	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
MD50-11-6078	50-603061	190	—	—	—	—	18	330	48	38	7.2	—	—	8.6	—	8.6
MD50-11-6081	50-603061	228	—	—	—	200	—	19,000	5200	3600	—	—	—	—	—	—
MD50-11-6077	50-603061	274	—	—	—	81	—	11,000	1100	1600	—	—	—	—	—	—
MD50-11-6082	50-603061	347	—	—	—	180	—	25,000	5500	2100	—	—	—	—	—	—
MD50-11-6076	50-603061	397	—	—	—	32	30	2500	90	760	11	—	—	—	—	—
MD50-11-6075	50-603061	450	—	—	—	26	—	1800	41	650	12	—	—	—	—	—
MD50-11-6088	50-603062	25	—	—	—	—	—	110	25	1500	—	—	—	—	—	—
MD50-11-6085	50-603062	64	—	—	—	—	—	150	32	2400	—	—	—	—	—	—
MD50-11-6087	50-603062	122	—	—	—	—	—	470	—	5700	—	—	—	—	—	—
MD50-11-6092	50-603062	184	—	—	—	—	—	460	—	—	—	—	—	—	—	—
MD50-11-6086	50-603062	217	—	42	—	—	—	440	—	5800	—	—	—	—	—	—
MD50-11-6090	50-603062	263	—	—	—	—	—	270	—	4700	—	—	—	—	—	—
MD50-11-6094	50-603062	337	—	—	—	—	—	75	—	2000	—	—	—	—	—	—
MD50-11-6091	50-603062	387	—	—	—	—	—	34	—	1000	—	—	—	—	—	—
MD50-11-6089	50-603062	450	—	—	—	—	—	15	—	580	—	—	—	—	—	—
MD50-11-6102	50-603063	25	—	—	—	720	—	5300	830	6300	—	—	—	—	—	—
MD50-11-6100	50-603063	76	—	—	—	840	—	6200	950	7400	—	—	—	—	—	—
MD50-11-6099	50-603063	128	—	—	—	960	—	6400	1000	11,000	—	—	—	—	—	—
MD50-11-6097	50-603063	190	—	—	—	13	—	63	8.1	220	—	—	—	—	—	—
MD50-11-6098	50-603063	228	—	82	—	610	—	2600	300	9700	—	—	—	—	—	—
MD50-11-6103	50-603063	274	—	86 (J-)	—	840	—	2000	240	14,000	—	—	—	—	—	—
MD50-11-6095	50-603063	347	—	91	—	330	—	860	—	7500	—	—	—	—	—	—
MD50-11-6101	50-603063	397	—	67 (J-)	—	260	—	640	—	5800	—	—	—	—	—	—
MD50-11-6096	50-603063	450	—	68	—	310	—	—	—	7900	—	—	—	—	—	—
MD50-11-6108	50-603064	25	—	—	—	150	—	1500	380	2600	—	—	—	—	—	—
MD50-11-6107	50-603064	66	—	—	—	320	—	8100	1300	7000	—	—	—	—	—	—
MD50-11-6105	50-603064	113	—	—	—	560	—	13,000	2800	32,000	—	—	—	—	—	—
MD50-11-6110	50-603064	176	—	350	—	460	—	13,000	2300	39,000	—	—	—	—	—	—
MD50-11-6111	50-603064	214	—	350	—	—	—	13,000	1900	37,000	—	—	—	—	—	—
MD50-11-6112	50-603064	259	—	—	—	—	—	10,000	940	30,000	—	—	—	—	—	—
MD50-11-6113	50-603064	332	—	—	—	150	—	3700	160	7200	—	—	—	—	—	—
MD50-11-6109	50-603064	482	—	—	—	91	—	960	—	6500	—	—	—	—	—	—
MD50-11-6106	50-603064	500	—	—	—	—	15	51	—	600	—	—	—	—	—	—

Table C-4.1-13 (continued)

Sample ID	Location ID	Depth (ft)	Hexanone[2-]	Methylene Chloride	Styrene	Tetrachloroethylene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethylene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene (total)	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
MD50-11-6027	50-603383	26	—	—	—	750	—	960	180	2400	—	—	—	—	—	—
MD50-11-6025	50-603383	85	—	—	—	730	—	1100	190	2800	—	—	—	—	—	—
MD50-11-6024	50-603383	139	—	—	—	240	—	340	53	1100	—	—	—	—	—	—
MD50-11-6032	50-603383	206	—	—	—	—	—	—	—	—	—	—	—	—	—	—
MD50-11-6026	50-603383	244	—	100	—	1400	—	790	200	6400	—	—	—	—	—	—
MD50-11-6029	50-603383	286	—	—	—	260	—	120	34	1300	—	—	—	—	—	—
MD50-11-6028	50-603383	359	—	—	—	230	—	220	32	1500	—	—	—	—	—	—
MD50-11-6030	50-603383	408	—	—	—	260	—	52	—	1600	—	—	—	—	—	—
MD50-11-6031	50-603383	450	—	22	—	500	—	230	62	2700	—	—	—	—	—	—
MD50-11-6041	50-603467	26	—	—	—	190	—	—	—	6300	—	—	—	—	—	—
MD50-11-6043	50-603467	91	—	—	—	—	—	—	—	12,000	—	—	—	—	—	—
MD50-11-6038	50-603467	143	—	140	—	370	—	—	—	16,000	—	—	—	—	—	—
MD50-11-6042	50-603467	206	—	290	—	670	—	—	—	25,000	—	—	—	—	—	—
MD50-11-6037	50-603467	244	—	560	—	660	—	—	—	29,000	—	—	—	—	—	—
MD50-11-6039	50-603467	287	—	390	—	500	—	—	—	21,000	—	—	—	—	—	—
MD50-11-6040	50-603467	360	—	—	—	—	—	—	—	11,000	—	—	—	—	—	—
MD50-11-6036	50-603467	409	—	120	—	290	—	—	—	11,000	—	—	—	—	—	—
MD50-11-6035	50-603467	500	—	—	—	79	—	—	—	3300	—	—	—	—	—	—
MD50-11-6034	50-603467	600	1200	—	—	95	—	—	—	4300	—	—	—	—	—	—
MD50-11-6051	50-603468	92	—	—	—	81	—	—	—	5300	—	—	—	—	—	—
MD50-11-6050	50-603468	142	—	—	—	160	—	—	—	12,000	—	—	—	—	—	—
MD50-11-6052	50-603468	198	—	—	—	310	—	—	—	24,000	—	—	—	—	—	—
MD50-11-6049	50-603468	233	—	—	—	—	—	—	—	26,000	—	—	—	—	—	—
MD50-11-6047	50-603468	282	—	730	—	450	—	—	—	29,000	—	—	—	—	—	—
MD50-11-6046	50-603468	354	—	—	—	530	—	—	—	34,000	—	—	—	—	—	—
MD50-11-6045	50-603468	403	—	320	—	330	—	—	—	20,000	—	—	—	—	—	—
MD50-11-6048	50-603468	450	—	99	—	140	—	—	—	10,000	—	—	—	—	—	—
MD50-11-5978	50-603470	30	—	—	—	680	—	260	—	13,000	—	—	—	—	—	—
MD50-11-5980	50-603470	83	—	—	—	430	—	—	—	13,000	—	—	—	—	—	—
MD50-11-5982	50-603470	143	—	—	—	570	—	—	—	34,000	—	—	—	—	—	—
MD50-11-5977	50-603470	203	—	550	—	—	—	—	—	55,000	—	—	—	—	—	—
MD50-11-5976	50-603470	233	—	350	—	—	—	—	—	32,000	—	—	—	—	—	—
MD50-11-5979	50-603470	278	—	690	—	—	—	—	—	58,000	—	—	—	—	—	—

Table C-4.1-13 (continued)

Sample ID	Location ID	Depth (ft)	Hexanone[2-]	Methylene Chloride	Styrene	Tetrachloroethylene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethylene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene (total)	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
MD50-11-5973	50-603470	351	—	190	—	160	—	280	—	25,000	—	—	—	—	—	—
MD50-11-5972	50-603470	450	—	—	—	—	—	—	—	16,000	—	—	—	—	—	—
MD50-11-5975	50-603470	600	—	—	—	—	—	—	—	1800	—	—	—	—	—	—
MD50-11-5974	50-603470	650	—	4.5	—	—	36	—	—	35	3.6	—	—	—	—	—
MD50-11-5990	50-603471	90	—	—	—	820	—	—	—	20,000	—	—	—	—	—	—
MD50-11-5989	50-603471	146	—	1500	—	—	—	—	—	63,000	—	—	—	—	—	—
MD50-11-5988	50-603471	209	—	50	—	—	58	—	—	1800	—	—	—	—	—	—
MD50-11-5987	50-603471	242	—	31	—	16	29	—	—	890	—	—	—	—	—	—
MD50-11-6156	50-603471	288	—	2000	—	—	—	—	—	67,000	—	—	—	—	—	—
MD50-11-5986	50-603471	360	—	300	—	—	—	—	—	15,000	—	—	—	—	—	—
MD50-11-5983	50-603471	410	—	—	—	—	—	—	—	21,000	—	—	—	—	—	—
MD50-11-5985	50-603471	450	—	—	—	—	—	—	—	31,000	—	—	—	—	—	—
MD50-11-6000	50-603472	27	—	—	—	550	—	—	51	3200	—	—	—	—	—	—
MD50-11-5998	50-603472	93	—	48	—	450	—	—	—	3800	—	—	—	—	—	—
MD50-11-6001	50-603472	146	—	250	—	510	—	—	—	6900	—	—	—	—	—	—
MD50-11-5997	50-603472	210	—	410	—	680	—	—	—	14,000	—	—	—	—	—	—
MD50-11-5999	50-603472	247	—	310	—	510	—	—	—	10,000	—	—	—	—	—	—
MD50-11-5995	50-603472	292	—	590	—	850	—	—	—	18,000	—	—	—	—	—	—
MD50-11-5994	50-603472	364	—	120	—	470	—	—	—	10,000	—	—	—	—	—	—
MD50-11-5993	50-603472	414	—	100	—	570	—	—	—	12,000	—	—	—	—	—	—
MD50-11-5996	50-603472	450	—	—	—	610	—	—	—	14,000	—	—	—	—	—	—
MD50-11-6072	50-603503	25	—	9.1	—	250	2.2	38	9.8	1300	4.1	—	—	—	—	—
MD50-11-5992	50-603503	80	—	—	—	280	—	93	—	2300	—	—	—	—	—	—
MD50-11-6073	50-603503	133	—	28	—	280	—	61	—	2500	—	—	—	—	—	—
MD50-11-6069	50-603503	198	—	66	—	370	—	—	—	3400	—	—	—	—	—	—
MD50-11-6068	50-603503	237	—	110	—	600	—	—	—	5700	—	—	—	—	—	—
MD50-11-6070	50-603503	278	—	110	—	480	—	—	—	6300	—	—	—	—	—	—
MD50-11-6065	50-603503	347	—	20	—	160	—	—	—	1800	—	—	—	—	—	—
MD50-11-6066	50-603503	397	—	12	—	120	—	—	—	1600	—	—	—	—	—	—
MD50-11-6067	50-603503	450	—	17	—	210	—	—	—	3400	—	—	—	—	—	—
MD50-11-5933	50-613182	500	—	—	—	200	—	—	—	4500	—	—	—	—	—	—
MD50-11-5934	50-613182	550	—	—	—	150	—	—	—	3600	—	—	—	—	—	—
MD50-11-5936	50-613182	600	—	—	2.1	—	31	—	—	5.2	—	2.7	—	—	—	—

Table C-4.1-13 (continued)

Sample ID	Location ID	Depth (ft)	Hexanone[2-]	Methylene Chloride	Styrene	Tetrachloroethylene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethylene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene (total)	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
MD50-11-5937	50-613182	620	—	—	—	—	—	—	—	—	—	—	—	—	—	—
MD50-11-5935	50-613182	632.5	—	—	—	—	—	—	—	4.6	—	—	—	—	—	—
MD50-11-5942	50-613183	30	—	120	—	110	—	—	—	11,000	—	—	—	—	—	—
MD50-11-5939	50-613183	500	—	—	—	27	—	—	—	1500	—	—	—	—	—	—
MD50-11-5943	50-613183	550	—	130	—	1200	—	310	—	15,000	—	—	—	—	—	—
MD50-11-5941	50-613183	600	—	45	—	150	—	—	—	7000	—	—	—	—	—	—
MD50-11-5944	50-613183	630	—	—	—	170	—	—	—	7500	—	—	—	—	—	—
MD50-11-5940	50-613183	642.5	—	—	3.9	—	31	—	—	39	—	5.8	—	21	5.5	15
MD50-11-5948	50-613184	30	—	—	—	42	—	—	—	2100	—	—	—	—	—	—
MD50-11-5951	50-613184	500	—	—	—	38	—	—	—	3000	—	—	—	—	—	—
MD50-11-5946	50-613184	550	—	—	—	—	—	—	—	1800	—	—	—	—	—	—
MD50-11-5947	50-613184	600	—	—	—	—	5.9	—	—	580	—	—	—	—	—	—
MD50-11-5950	50-613184	652	—	—	10	—	—	—	—	160	—	—	—	—	—	—
MD50-11-5949	50-613184	664.5	—	—	—	—	3	—	—	61	—	—	—	—	—	—
MD50-11-5960	50-613185	85	—	—	—	7.5	—	—	—	460	—	—	—	—	—	—
MD50-11-5961	50-613185	145	—	100 (J)	—	—	—	—	—	3700	—	—	—	—	—	—
MD50-11-5957	50-613185	205	—	130 (J)	—	—	—	—	—	2900	—	—	—	—	—	—
MD50-11-5962	50-613185	235	—	120 (J)	—	100	—	—	—	7100	—	—	—	—	—	—
MD50-11-5959	50-613185	280	—	—	—	—	—	—	—	4500	—	—	—	—	—	—
MD50-11-5955	50-613185	350	—	—	—	—	—	—	—	3100	—	—	—	—	—	—
MD50-11-5954	50-613185	450	—	—	—	—	—	—	—	1400	—	—	—	—	—	—
MD50-11-5953	50-613185	600	2	—	—	2.7	4.9	—	—	120	—	—	—	4.7	1.5	3.1
MD50-11-5958	50-613185	675	—	—	—	—	3.3	—	—	26	—	—	—	1.3	1.3	—
MD50-11-5956	50-613185	688	—	8.9	—	—	3.4	—	—	16	—	—	—	2	2	—

Notes: Results are in µg/m^3. Data qualifiers are defined in Appendix A.

*— = Not detected.

Table C-4.1-14
Tritium Detected in Vapor Samples at MDA C
during January 2010–April 2010 Sampling Event

Sample ID	Location ID	Depth (ft)	Analytical Result
MD50-10-8677	50-24784	25	3413.92
MD50-10-8680	50-24784	96	2882.38
MD50-10-8681	50-24784	155	2970.67
MD50-10-8679	50-24784	215	4528.12
MD50-10-8685	50-24784	244	3110.35
MD50-10-8683	50-24784	289	3605.46
MD50-10-8684	50-24784	362	1299.08
MD50-10-8682	50-24784	411	908.698
MD50-10-8678	50-24784	450	1799.63
MD50-10-8697	50-24813	25	739.433
MD50-10-8696	50-24813	99	21,617.4
MD50-10-8693	50-24813	150	147992
MD50-10-8702	50-24813	207	5173.99
MD50-10-8699	50-24813	241	3325.24
MD50-10-8694	50-24813	286	1439.37
MD50-10-8700	50-24813	358	2121.74
MD50-10-8695	50-24813	408	674.658
MD50-10-8701	50-24813	450	2992.26
MD50-10-8698	50-24813	600	2011.76
MD50-10-8703	50-24822	25	881.043
MD50-10-8704	50-24822	81	891.68
MD50-10-8705	50-24822	142	892.977
MD50-10-8706	50-24822	204	1279.38
MD50-10-8707	50-24822	235	934.264
MD50-10-8708	50-24822	280	556.108
MD50-10-8709	50-24822	351	703.431
MD50-10-8710	50-24822	402	591.561
MD50-10-8711	50-24822	450	537.685
MD50-10-8716	50-603061	76	1261.59
MD50-10-8717	50-603061	128	1846.54
MD50-10-8718	50-603061	190	2744.4
MD50-10-8719	50-603061	228	2878.75
MD50-10-8720	50-603061	274	2958.58
MD50-10-8721	50-603061	347	727.406
MD50-10-8722	50-603061	397	1072.9
MD50-10-8724	50-603061	450	344.844
MD50-10-8728	50-603062	64	883.372

Table C-4-1-14 (continued)

Sample ID	Location ID	Depth (ft)	Analytical Result
MD50-10-8755	50-603063	25	1280.25
MD50-10-8754	50-603063	76	3139.59
MD50-10-8753	50-603063	128	3346.91
MD50-10-8752	50-603063	190	6384.08
MD50-10-8751	50-603063	228	5796.61
MD50-10-8749	50-603063	274	4699.57
MD50-10-8750	50-603063	347	2994.43
MD50-10-8748	50-603063	397	2649.04
MD50-10-8747	50-603063	450	1513.08
MD50-10-8759	50-603064	25	857.69
MD50-10-8760	50-603064	66	946.6
MD50-10-8761	50-603064	113	2332.13
MD50-10-8762	50-603064	176	1841.68
MD50-10-8763	50-603064	214	2209.67
MD50-10-8764	50-603064	259	978.864
MD50-10-8765	50-603064	332	640.585
MD50-10-8766	50-603064	400	1107.09
MD50-10-8767	50-603064	500	641.273
MD50-10-8771	50-603383	26	271,227
MD50-10-8772	50-603383	85	1,071,870
MD50-10-8773	50-603383	139	975,749
MD50-10-8774	50-603383	206	190,809
MD50-10-8775	50-603383	244	121,865
MD50-10-8776	50-603383	286	163,640
MD50-10-8777	50-603383	359	288,105
MD50-10-8778	50-603383	408	93,553
MD50-10-8779	50-603383	450	742,303
MD50-10-8783	50-603467	91	861.219
MD50-10-8784	50-603467	91	729.879
MD50-10-8786	50-603467	143	1062.23
MD50-10-8787	50-603467	206	701.597
MD50-10-8788	50-603467	244	1149.74
MD50-10-8793	50-603467	287	846.848
MD50-10-8790	50-603467	360	557.354
MD50-10-8795	50-603468	30	539.438
MD50-10-8796	50-603468	92	798.1
MD50-10-8797	50-603468	142	441.855
MD50-10-8798	50-603468	198	1039.21
MD50-10-8799	50-603468	233	705.943

Table C-4-1-14 (continued)

Sample ID	Location ID	Depth (ft)	Analytical Result
MD50-10-8800	50-603468	282	1024.01
MD50-10-8801	50-603468	354	670.351
MD50-10-8802	50-603468	403	508.821
MD50-10-8807	50-603470	30	43,866.4
MD50-10-8809	50-603470	83	2,920,220
MD50-10-8811	50-603470	143	14,233.9
MD50-10-8810	50-603470	203	2008.19
MD50-10-8813	50-603470	233	1622.02
MD50-10-8808	50-603470	278	1867.56
MD50-10-8814	50-603470	351	866.655
MD50-10-8815	50-603470	600	694.592
MD50-10-8812	50-603470	650	933.968
MD50-10-8826	50-603471	30	4390.82
MD50-10-8822	50-603471	90	48744.9
MD50-10-8823	50-603471	146	3972.93
MD50-10-8825	50-603471	209	3668.15
MD50-10-8819	50-603471	242	2180.59
MD50-10-8821	50-603471	288	2982.84
MD50-10-8827	50-603471	360	2200.64
MD50-10-8824	50-603471	410	2500.71
MD50-10-8820	50-603471	450	2775.99
MD50-10-8834	50-603472	27	161,836
MD50-10-8833	50-603472	93	10,356.8
MD50-10-8837	50-603472	93	5989.77
MD50-10-8838	50-603472	146	4012.92
MD50-10-8831	50-603472	210	19,800.7
MD50-10-8835	50-603472	247	6174.24
MD50-10-8840	50-603472	292	3597.1
MD50-10-8839	50-603472	364	1294.59
MD50-10-8836	50-603472	414	1777.75
MD50-10-8832	50-603472	450	954.058
MD50-10-8843	50-603503	25	2362.64
MD50-10-8844	50-603503	80	2861.2
MD50-10-8845	50-603503	133	2471.27
MD50-10-8846	50-603503	198	2554.8
MD50-10-8847	50-603503	237	3268.24
MD50-10-8848	50-603503	278	2632.5
MD50-10-8849	50-603503	347	1003.58
MD50-10-8850	50-603503	397	1021.83

Note: Results are in pCi/L.

Table C-4.1-15
Tritium Detected in Vapor Samples at MDA C during April 2010–July 2010 Sampling Event

Sample ID	Location ID	Depth (ft)	Analytical Result
MD50-10-15760	50-603470	83	2,675,700
MD50-10-15873	50-603383	139	1,058,670
MD50-10-15866	50-603383	85	913,258
MD50-10-15874	50-603383	244	447,327
MD50-10-15869	50-603383	286	445,718
MD50-10-15867	50-603383	206	385,358
MD50-10-15872	50-603383	359	360,249
MD50-10-15870	50-603383	408	353,883
MD50-10-15875	50-603383	450	322,214
MD50-10-15779	50-603472	27	310,290
MD50-10-15903	50-24813	150	219,728
MD50-10-15871	50-603383	26	190,110
MD50-10-15752	50-603470	30	73,252.2
MD50-10-15776	50-603472	247	43,787.5
MD50-10-15769	50-603471	90	42,368.1
MD50-10-15783	50-603472	210	32,039.2
MD50-10-15906	50-24813	99	29,952.9
MD50-10-15753	50-603470	143	10,685.3
MD50-10-15780	50-603472	146	9809.85
MD50-10-15784	50-603472	450	9466.29
MD50-10-15782	50-603472	93	9139.35
MD50-10-15907	50-24813	207	5757.71
MD50-10-15766	50-603471	209	4922.22
MD50-10-15904	50-24813	241	3991.23
MD50-10-15768	50-603471	146	3918.26
MD50-10-15819	50-603064	214	3917.06
MD50-10-15771	50-603471	242	3828.08
MD50-10-15778	50-603472	292	3765.53
MD50-10-15742	50-24784	25	3764.65
MD50-10-15765	50-603471	288	3688.75
MD50-10-15748	50-24784	289	3545.48
MD50-10-15741	50-24784	244	3393.56
MD50-10-15770	50-603471	450	3383.5
MD50-10-15744	50-24784	215	3360.45
MD50-10-15829	50-603063	274	3320.82

Table C-4.1-15 (continued)

Sample ID	Location ID	Depth (ft)	Analytical Result
MD50-10-15764	50-603471	410	2969.11
MD50-10-15747	50-24784	155	2962.82
MD50-10-15814	50-603064	113	2771.77
MD50-10-15824	50-603063	228	2622.81
MD50-10-15772	50-603471	360	2582.09
MD50-10-15777	50-603472	364	2519.06
MD50-10-15745	50-24784	96	2475.55
MD50-10-15844	50-603061	274	2328.91
MD50-10-15781	50-603472	414	2220.2
MD50-10-15756	50-603470	233	2210.48
MD50-10-15842	50-603061	347	2150.47
MD50-10-15758	50-603470	278	1764.75
MD50-10-15830	50-603063	190	1748.91
MD50-10-15788	50-603503	198	1731.95
MD50-10-15743	50-24784	362	1698.46
MD50-10-15910	50-24813	408	1574.73
MD50-10-15794	50-603503	237	1470.72
MD50-10-15820	50-603064	259	1464.48
MD50-10-15791	50-603503	80	1364.72
MD50-10-15817	50-603064	66	1328.17
MD50-10-15793	50-603503	25	1249.95
MD50-10-15831	50-603063	450	1245.91
MD50-10-15746	50-24784	411	1237.12
MD50-10-15807	50-603467	143	1231.16
MD50-10-15832	50-603063	76	1219.12
MD50-10-15891	50-603062	122	1203.28
MD50-10-15905	50-24813	358	1190.91
MD50-10-15812	50-603064	176	1151.75
MD50-10-15843	50-603061	190	1135.27
MD50-10-15826	50-603063	397	1119.44
MD50-10-15833	50-603063	347	1116.01
MD50-10-15755	50-603470	600	1078.57
MD50-10-15740	50-24784	450	1070.5
MD50-10-15816	50-603064	25	1066.59
MD50-10-15761	50-603470	203	1010.81
MD50-10-15808	50-603467	360	992.175
MD50-10-15839	50-603061	228	981.272
MD50-10-15754	50-603470	351	979.648
MD50-10-15837	50-603061	76	971.678

Table C-4.1-15 (continued)

Sample ID	Location ID	Depth (ft)	Analytical Result
MD50-10-15902	50-24813	25	936.928
MD50-10-15894	50-603062	64	883.901
MD50-10-15789	50-603503	450	881.392
MD50-10-15800	50-603467	287	877.304
MD50-10-15801	50-603467	91	827.762
MD50-10-15878	50-603468	233	815.777
MD50-10-15884	50-603468	198	806.555
MD50-10-15841	50-603061	128	798.725
MD50-10-15854	50-24822	81	791.945
MD50-10-15827	50-603063	25	752.139
MD50-10-15809	50-603467	206	685.236
MD50-10-15909	50-24813	286	663.914
MD50-10-15790	50-603503	347	660.954
MD50-10-15856	50-24822	204	655.605
MD50-10-15757	50-603470	450	631.799
MD50-10-15813	50-603064	332	597.171
MD50-10-15890	50-603062	263	578.892
MD50-10-15851	50-24822	402	559.206
MD50-10-15908	50-24813	450	532.831
MD50-10-15802	50-603467	409	528.116
MD50-10-15838	50-603061	397	513.967
MD50-10-15885	50-603468	282	496.725
MD50-10-15849	50-24822	235	477.997
MD50-10-15805	50-603467	26	362.886

Note: Results are in pCi/L.

Table C-4.1-16
Tritium Detected in Vapor Samples at MDA C
during July 2010–September 2010 Sampling Event

Sample ID	Location ID	Depth (ft)	Analytical Result
MD50-10-24333	50-603470	83	3,417,920
MD50-10-24388	50-603383	139	847,514
MD50-10-24385	50-603383	286	638,249
MD50-10-24384	50-603383	85	623,832
MD50-10-24383	50-603383	450	445,698
MD50-10-24382	50-603383	206	411,937
MD50-10-24354	50-603472	27	393,217
MD50-10-24387	50-603383	244	314,516
MD50-10-24381	50-603383	359	285,660
MD50-10-24370	50-24813	150	264,844
MD50-10-24380	50-603383	26	192,102
MD50-10-24350	50-603472	247	89,300.9
MD50-10-24328	50-603470	30	57,621.7
MD50-10-24339	50-603471	90	47,123.1
MD50-10-24375	50-24813	99	46,402.7
MD50-10-24386	50-603383	408	37,651.4
MD50-10-24352	50-603472	146	37,130.5
MD50-10-24357	50-603472	93	35,557
MD50-10-24356	50-603472	210	34,469
MD50-10-24376	50-24813	207	19,656.9
MD50-10-24351	50-603472	450	14,755.2
MD50-10-24329	50-603470	143	11,481.6
MD50-10-24374	50-24813	450	10,075.6
MD50-10-24353	50-603472	292	8092.06
MD50-10-24371	50-24813	241	7621.74
MD50-10-24361	50-24784	215	7129.08
MD50-10-24349	50-603472	367	6119.3
MD50-10-24341	50-603471	288	5754.39
MD50-10-24366	50-24784	289	5168.45
MD50-10-24343	50-603471	360	4875.38
MD50-10-24345	50-603471	242	4826.24
MD50-10-24367	50-24784	411	4743.38
MD50-10-24340	50-603471	209	4739.53
MD50-10-24469	50-603064	482	4192.96
MD50-10-24344	50-603471	146	4169.12
MD50-10-24342	50-603471	410	4077.15

Table C-4.1-16 (continued)

Sample ID	Location ID	Depth (ft)	Analytical Result
MD50-10-24331	50-603470	351	3810.13
MD50-10-24334	50-603470	203	3622
MD50-10-24365	50-24784	155	3572.22
MD50-10-24443	50-603062	122	3565.39
MD50-10-24377	50-24813	286	3329.36
MD50-10-24360	50-24784	362	3307.05
MD50-10-24359	50-24784	244	3292.81
MD50-10-24433	50-603061	190	3286.56
MD50-10-24362	50-24784	25	3219.85
MD50-10-24432	50-603061	76	3217.63
MD50-10-24364	50-24784	96	3185.58
MD50-10-24456	50-603063	228	3074.86
MD50-10-24372	50-24813	358	3046.49
MD50-10-24403	50-603468	282	2997.11
MD50-10-24346	50-603471	450	2996.96
MD50-10-24355	50-603472	414	2653.9
MD50-10-24455	50-603063	450	2648.4
MD50-10-24438	50-603061	347	2594.94
MD50-10-24330	50-603470	233	2478.02
MD50-10-24457	50-603063	76	2458.27
MD50-10-24407	50-603468	142	2438.71
MD50-10-24363	50-24784	450	2303.1
MD50-10-24332	50-603470	600	2220.85
MD50-10-24337	50-603470	650	2211.73
MD50-10-24465	50-603064	176	2159.8
MD50-10-24462	50-603064	113	2047.61
MD50-10-24452	50-603063	347	1966.42
MD50-10-24335	50-603470	278	1925.93
MD50-10-24426	50-603503	80	1881.49
MD50-10-24434	50-603061	274	1869.35
MD50-10-24437	50-603061	128	1734.72
MD50-10-24421	50-603503	237	1501.24
MD50-10-24423	50-603503	25	1414.06
MD50-10-24458	50-603063	274	1336.8
MD50-10-24373	50-24813	600	1328.82
MD50-10-24454	50-603063	190	1300.78
MD50-10-24378	50-24813	408	1292.16
MD50-10-24444	50-603062	387	1286.86
MD50-10-24422	50-603503	133	1262.32

Table C-4.1-16 (continued)

Sample ID	Location ID	Depth (ft)	Analytical Result
MD50-10-24427	50-603503	278	1259.8
MD50-10-24369	50-24813	25	1240.01
MD50-10-24446	50-603062	64	1109.41
MD50-10-24467	50-603064	66	1070.76
MD50-10-24414	50-24822	204	1060.88
MD50-10-24436	50-603061	228	1048.97
MD50-10-24396	50-603467	206	976.308
MD50-10-24463	50-603064	214	975.676
MD50-10-24424	50-603503	347	968.564
MD50-10-24419	50-24822	81	944.627
MD50-10-24411	50-24822	402	938.747
MD50-10-24425	50-603503	198	935.445
MD50-10-24468	50-603064	259	934.53
MD50-10-24431	50-603061	397	915.021
MD50-10-24412	50-24822	280	907.234
MD50-10-24461	50-603064	25	868.096
MD50-10-24393	50-603467	287	839.743
MD50-10-24418	50-24822	235	812.479
MD50-10-24416	50-24822	142	780.527
MD50-10-24336	50-603470	450	769.462
MD50-10-24401	50-603468	198	741.918
MD50-10-24413	50-24822	25	736.749
MD50-10-24442	50-603062	263	718.044
MD50-10-24399	50-603467	244	698.227
MD50-10-24448	50-603062	337	692.259
MD50-10-24464	50-603064	332	690.308
MD50-10-24449	50-603062	450	629.448
MD50-10-24447	50-603062	217	589.846
MD50-10-24453	50-603063	128	538.263
MD50-10-24415	50-24822	351	500.505
MD50-10-24417	50-24822	450	484.494
MD50-10-24441	50-603062	25	468.336
MD50-10-24445	50-603062	184	409.331

Note: Results are in pCi/L.

Table C-4.1-17
Tritium Detected in Vapor Samples at MDA C
during October 2010–January 2011 Sampling Event

Sample ID	Location ID	Depth (ft)	Analytical Result
MD50-10-27179	50-24784	25	3424.39
MD50-10-27176	50-24784	96	26,930.3
MD50-10-27175	50-24784	155	4811.13
MD50-10-27181	50-24784	215	4376.64
MD50-10-27180	50-24784	244	3410.01
MD50-10-27178	50-24784	289	2637.69
MD50-10-27182	50-24784	362	1527.11
MD50-10-27177	50-24784	411	2133.35
MD50-10-27183	50-24784	450	1295.11
MD50-10-27186	50-24813	25	1461.9
MD50-10-27189	50-24813	99	15,322.2
MD50-10-27185	50-24813	150	150,165
MD50-10-27190	50-24813	207	6088.51
MD50-10-27193	50-24813	241	3376.21
MD50-10-27194	50-24813	241	4271.92
MD50-10-27191	50-24813	286	3649.94
MD50-10-27343	50-24813	358	2722
MD50-10-27192	50-24813	408	2592.53
MD50-10-27188	50-24813	450	1793.02
MD50-10-27195	50-24813	600	932.357
MD50-10-27227	50-24822	25	661.459
MD50-10-27229	50-24822	204	702.357
MD50-10-27233	50-24822	235	2341.01
MD50-10-27231	50-24822	280	587.23
MD50-10-27230	50-24822	351	1058.96
MD50-10-27249	50-603061	25	1149.9
MD50-10-27251	50-603061	76	2314.69
MD50-10-27247	50-603061	128	2606.74
MD50-10-27255	50-603061	190	1941.01
MD50-10-27248	50-603061	228	1504.95
MD50-10-27253	50-603061	274	3534.92
MD50-10-27252	50-603061	347	2654.12
MD50-10-27254	50-603061	397	839.172
MD50-10-27265	50-603062	64	914.559
MD50-10-27257	50-603062	122	5527.48

Table C-4.1-17 (continued)

Sample ID	Location ID	Depth (ft)	Analytical Result
MD50-10-27259	50-603062	337	1850.9
MD50-10-27267	50-603063	25	2260.32
MD50-10-27272	50-603063	76	2094.8
MD50-10-27275	50-603063	128	1262.6
MD50-10-27268	50-603063	190	2335.43
MD50-10-27273	50-603063	228	1491.42
MD50-10-27269	50-603063	274	4126.76
MD50-10-27274	50-603063	347	1338.88
MD50-10-27271	50-603063	450	1640.14
MD50-10-27280	50-603064	25	761.357
MD50-10-27285	50-603064	66	733.386
MD50-10-27279	50-603064	113	2930.26
MD50-10-27283	50-603064	176	906.704
MD50-10-27277	50-603064	214	3015.69
MD50-10-27281	50-603064	259	2794.56
MD50-10-27278	50-603064	332	938.64
MD50-10-27282	50-603064	400	1691.06
MD50-10-27284	50-603064	500	620.463
MD50-10-27199	50-603383	26	260,604
MD50-10-27197	50-603383	85	686,091
MD50-10-27205	50-603383	139	949,038
MD50-10-27204	50-603383	206	111,487
MD50-10-27203	50-603383	244	307,955
MD50-10-27201	50-603383	286	269,984
MD50-10-27202	50-603383	359	228,848
MD50-10-27200	50-603383	408	587,105
MD50-10-27196	50-603383	450	455,279
MD50-10-27210	50-603467	91	1308.37
MD50-10-27211	50-603467	143	837.86
MD50-10-27215	50-603467	206	553.942
MD50-10-27213	50-603467	287	718.525
MD50-10-27212	50-603467	360	1515.59
MD50-10-27218	50-603468	198	821.823
MD50-10-27219	50-603468	233	966.29
MD50-10-27226	50-603468	282	788.433
MD50-10-27223	50-603468	354	676.651
MD50-10-27222	50-603468	450	1056.93
MD50-10-27145	50-603470	30	56,635.6
MD50-10-27149	50-603470	83	2,948,440

Table C-4.1-17 (continued)

Sample ID	Location ID	Depth (ft)	Analytical Result
MD50-10-27144	50-603470	143	9032.82
MD50-10-27151	50-603470	203	15,685.5
MD50-10-27147	50-603470	233	2004.08
MD50-10-27153	50-603470	278	2597.51
MD50-10-27146	50-603470	351	2016.49
MD50-10-27152	50-603470	450	802.788
MD50-10-27158	50-603471	30	18,442.4
MD50-10-27155	50-603471	90	26,565.2
MD50-10-27157	50-603471	146	6009.75
MD50-10-27162	50-603471	209	13,236.6
MD50-10-27161	50-603471	242	7222.64
MD50-10-27160	50-603471	288	9746.33
MD50-10-27156	50-603471	360	7716.89
MD50-10-27163	50-603471	410	4170.76
MD50-10-27159	50-603471	450	5956.37
MD50-10-27165	50-603472	27	299,759
MD50-10-27168	50-603472	93	6351.23
MD50-10-27170	50-603472	146	2794.7
MD50-10-27172	50-603472	210	13,209.7
MD50-10-27166	50-603472	247	2747.59
MD50-10-27174	50-603472	292	9694.81
MD50-10-27167	50-603472	414	2046.2
MD50-10-27173	50-603472	450	5655.52
MD50-10-27243	50-603503	25	769.383
MD50-10-27237	50-603503	80	1015.89
MD50-10-27244	50-603503	133	1486.69
MD50-10-27238	50-603503	198	2338.17
MD50-10-27245	50-603503	237	1326.68
MD50-10-27239	50-603503	278	980.152
MD50-10-27242	50-603503	450	1326.62

Note: Results are in pCi/L.

Table C-4.1-18
Tritium Detected in Vapor Samples at MDA C
during January 2011–March 2011 Sampling Event

Sample ID	Location ID	Depth (ft)	Analytical Result
MD50-11-4012	50-24784	25	3568.8
MD50-11-4010	50-24784	96	4038.74
MD50-11-4009	50-24784	155	6174.87
MD50-11-4006	50-24784	215	7007.02
MD50-11-4004	50-24784	244	3074.5
MD50-11-4008	50-24784	289	1871.12
MD50-11-4007	50-24784	362	3507.55
MD50-11-4005	50-24784	411	1516.3
MD50-11-4003	50-24784	450	1725.77
MD50-11-4023	50-24813	25	30,450.9
MD50-11-4021	50-24813	99	40,040.7
MD50-11-4020	50-24813	150	187,502
MD50-11-4019	50-24813	207	4343.06
MD50-11-4018	50-24813	241	2738.5
MD50-11-4017	50-24813	286	4468.2
MD50-11-4014	50-24813	358	686.167
MD50-11-4013	50-24813	408	720.983
MD50-11-4015	50-24813	450	3375.43
MD50-11-4058	50-24822	25	873.3
MD50-11-4059	50-24822	81	1078.76
MD50-11-4057	50-24822	142	1510.41
MD50-11-4055	50-24822	204	938.98
MD50-11-4060	50-24822	235	1362.39
MD50-11-4061	50-24822	280	734.991
MD50-11-4056	50-24822	351	645.717
MD50-11-4064	50-24822	450	663.654
MD50-11-4080	50-603061	25	480.376
MD50-11-4081	50-603061	76	1890.98
MD50-11-4083	50-603061	128	972.27
MD50-11-4082	50-603061	190	2034.15
MD50-11-4084	50-603061	228	1536.53
MD50-11-4076	50-603061	274	3698.88
MD50-11-4077	50-603061	347	3038.69
MD50-11-4078	50-603061	397	1269.1
MD50-11-4092	50-603062	25	310.845
MD50-11-4091	50-603062	64	619.661
MD50-11-4090	50-603062	184	492.612

Table C-4.1-18 (continued)

Sample ID	Location ID	Depth (ft)	Analytical Result
MD50-11-4103	50-603063	25	789.72
MD50-11-4102	50-603063	76	1669.9
MD50-11-4101	50-603063	128	1050.58
MD50-11-4100	50-603063	190	2965.12
MD50-11-4099	50-603063	228	3672.71
MD50-11-4098	50-603063	274	2331.5
MD50-11-4096	50-603063	347	1785.02
MD50-11-4104	50-603063	397	1438.22
MD50-11-4097	50-603063	450	1488.64
MD50-11-4113	50-603064	25	1124.85
MD50-11-4112	50-603064	66	1514.99
MD50-11-4111	50-603064	113	2126.53
MD50-11-4109	50-603064	176	2070.25
MD50-11-4110	50-603064	214	1795.68
MD50-11-4105	50-603064	259	3051.3
MD50-11-4106	50-603064	332	722.173
MD50-11-4107	50-603064	400	620.817
MD50-11-4024	50-603383	26	170,258
MD50-11-4029	50-603383	85	655,179
MD50-11-4025	50-603383	139	945,513
MD50-11-4030	50-603383	206	317,623
MD50-11-4026	50-603383	244	368,727
MD50-11-4031	50-603383	286	59,677.4
MD50-11-4027	50-603383	359	69,096.1
MD50-11-4032	50-603383	408	559,319
MD50-11-4028	50-603383	450	471,537
MD50-11-4034	50-603467	26	1200.31
MD50-11-4038	50-603467	91	1439.81
MD50-11-4035	50-603467	143	1637.15
MD50-11-4039	50-603467	206	1620.96
MD50-11-4036	50-603467	244	822.644
MD50-11-4042	50-603467	287	1818.76
MD50-11-4037	50-603467	360	2881.15
MD50-11-4040	50-603467	409	1354.94
MD50-11-4041	50-603467	600	5444.75
MD50-11-4045	50-603468	198	1866.98
MD50-11-4050	50-603468	282	798.412
MD50-11-4051	50-603468	354	5156.85
MD50-11-4052	50-603468	403	7,596,950

Table C-4.1-18 (continued)

Sample ID	Location ID	Depth (ft)	Analytical Result
MD50-11-3980	50-603470	83	2,079,590
MD50-11-3975	50-603470	143	3086.77 (J)
MD50-11-3973	50-603470	203	5540.36 (J)
MD50-11-3972	50-603470	233	9826.54
MD50-11-3974	50-603470	278	6310.42 (J)
MD50-11-3978	50-603470	450	3167.54 (J)
MD50-11-3983	50-603471	30	48,419.2
MD50-11-3992	50-603471	90	38,944.5
MD50-11-3990	50-603471	146	563,784
MD50-11-3988	50-603471	209	885.424
MD50-11-3989	50-603471	242	10,224.1
MD50-11-3987	50-603471	288	13,906.1
MD50-11-3986	50-603471	360	598,709
MD50-11-3984	50-603471	410	836,701
MD50-11-3985	50-603471	450	73,835
MD50-11-3947	50-613183	30	2,092,660
MD50-11-3948	50-613183	500	3082.7
MD50-11-3949	50-613183	550	917.003
MD50-11-3950	50-613183	600	2402.05
MD50-11-3951	50-613183	630	2702.14
MD50-11-4002	50-603472	27	375,685
MD50-11-4000	50-603472	93	6535.31
MD50-11-4001	50-603472	146	5783.15
MD50-11-3998	50-603472	210	14,784.1
MD50-11-3999	50-603472	247	10,880.1
MD50-11-3996	50-603472	292	10,481.8
MD50-11-3993	50-603472	364	1204.52
MD50-11-3994	50-603472	414	6132.84
MD50-11-3995	50-603472	450	1283.42
MD50-11-3944	50-613182	500	3407.76
MD50-11-3942	50-613182	600	1549.87
MD50-11-4071	50-603503	25	3187.04
MD50-11-4072	50-603503	80	1799.89
MD50-11-4069	50-603503	133	2876.99
MD50-11-4073	50-603503	198	2567.89
MD50-11-4070	50-603503	237	1914.86
MD50-11-4067	50-603503	278	1834.19
MD50-11-4066	50-603503	347	1553.13
MD50-11-4068	50-603503	397	2823.19

Table C-4.1-18 (continued)

Sample ID	Location ID	Depth (ft)	Analytical Result
MD50-11-4065	50-603503	450	2377.86
MD50-11-3963	50-613185	205	885.976
MD50-11-3964	50-613185	235	4551.9
MD50-11-3969	50-613185	600	1468.83

Notes: Results are in pCi/L. Data qualifiers are defined in Appendix A.

Table C-4.1-19
Tritium Detected in Vapor Samples at MDA C
during March 2011–May 2011 Sampling Event

Sample ID	Location ID	Depth (ft)	Analytical Result
MD50-11-6010	50-24784	25	4015.08
MD50-11-6007	50-24784	96	2759.61
MD50-11-6011	50-24784	155	1096.21
MD50-11-6005	50-24784	215	3507.57
MD50-11-6009	50-24784	244	3346.95
MD50-11-6006	50-24784	289	2628.94
MD50-11-6008	50-24784	362	1352.25
MD50-11-6004	50-24784	411	1407.69
MD50-11-6022	50-24813	25	3587.27
MD50-11-6021	50-24813	99	48,049.3
MD50-11-6019	50-24813	150	195,977
MD50-11-6020	50-24813	207	4138.01
MD50-11-6018	50-24813	241	2289.83
MD50-11-6017	50-24813	286	1081.82
MD50-11-6013	50-24813	358	463.481
MD50-11-6015	50-24813	408	623.879
MD50-11-6062	50-24822	25	1816.19
MD50-11-6059	50-24822	81	4098.9
MD50-11-6061	50-24822	142	896.287
MD50-11-6058	50-24822	204	3233.39
MD50-11-6060	50-24822	235	1491.71
MD50-11-6055	50-24822	280	535.226
MD50-11-6056	50-24822	351	286,691
MD50-11-6080	50-603061	76	936.944
MD50-11-6079	50-603061	128	929.158
MD50-11-6078	50-603061	190	3186.9
MD50-11-6081	50-603061	228	1013.65

Table C-4.1-19 (continued)

Sample ID	Location ID	Depth (ft)	Analytical Result
MD50-11-6077	50-603061	274	3994.15
MD50-11-6082	50-603061	347	2192.69
MD50-11-6076	50-603061	397	1094.76
MD50-11-6075	50-603061	450	1833.15
MD50-11-6085	50-603062	64	3661.06
MD50-11-6087	50-603062	122	1046.93
MD50-11-6092	50-603062	184	2461.43
MD50-11-6086	50-603062	217	591.543
MD50-11-6090	50-603062	263	1154.53
MD50-11-6094	50-603062	337	729.532
MD50-11-6091	50-603062	387	2412.41
MD50-11-6089	50-603062	450	5192.59
MD50-11-6102	50-603063	25	3219.01
MD50-11-6100	50-603063	76	8294.67
MD50-11-6099	50-603063	128	1158.67
MD50-11-6097	50-603063	190	4292.39
MD50-11-6098	50-603063	228	3825.28
MD50-11-6103	50-603063	274	5154.91
MD50-11-6095	50-603063	347	5913.95
MD50-11-6101	50-603063	397	3133.2
MD50-11-6096	50-603063	450	2119.51
MD50-11-6108	50-603064	25	676.519
MD50-11-6107	50-603064	66	1192.13
MD50-11-6105	50-603064	113	1443.41
MD50-11-6110	50-603064	176	1094.69
MD50-11-6111	50-603064	214	2587.17
MD50-11-6109	50-603064	482	1428.95
MD50-11-6027	50-603383	26	254,478
MD50-11-6025	50-603383	85	761,943
MD50-11-6024	50-603383	139	971,640
MD50-11-6032	50-603383	206	113,930
MD50-11-6026	50-603383	244	219,669
MD50-11-6029	50-603383	286	80,416.5
MD50-11-6028	50-603383	359	518,598
MD50-11-6030	50-603383	408	439,230
MD50-11-6031	50-603383	450	350,433
MD50-11-6041	50-603467	26	411.024
MD50-11-6043	50-603467	91	1005.32

Table C-4.1-19 (continued)

Sample ID	Location ID	Depth (ft)	Analytical Result
MD50-11-6038	50-603467	143	1192.99
MD50-11-6042	50-603467	206	1372.98
MD50-11-6037	50-603467	244	1670.36
MD50-11-6039	50-603467	287	647.931
MD50-11-6040	50-603467	360	550.912
MD50-11-6035	50-603467	500	573.867
MD50-11-6034	50-603467	600	547.748
MD50-11-6051	50-603468	92	3980.49
MD50-11-6050	50-603468	142	900.385
MD50-11-6052	50-603468	198	1420.04
MD50-11-6049	50-603468	233	853.235
MD50-11-6047	50-603468	282	604.306
MD50-11-6046	50-603468	354	2795.39
MD50-11-6048	50-603468	450	793.816
MD50-11-5978	50-603470	30	64,701.4
MD50-11-5980	50-603470	83	2,502,750
MD50-11-5982	50-603470	143	9259.65
MD50-11-5977	50-603470	203	2180.77
MD50-11-5976	50-603470	233	3224.03
MD50-11-5979	50-603470	278	1137.7
MD50-11-5973	50-603470	351	1039.58
MD50-11-5990	50-603471	90	53,054.6
MD50-11-5989	50-603471	146	6877.24
MD50-11-5988	50-603471	209	5606.71
MD50-11-5987	50-603471	242	4053.82
MD50-11-6156	50-603471	288	5846.41
MD50-11-5986	50-603471	360	4461.89
MD50-11-5983	50-603471	410	2093.01
MD50-11-5985	50-603471	450	4506.41
MD50-11-6000	50-603472	27	420,066
MD50-11-5998	50-603472	93	6523.26
MD50-11-6001	50-603472	146	4411.23
MD50-11-5997	50-603472	210	3990.94
MD50-11-5999	50-603472	247	6414.21
MD50-11-5995	50-603472	292	5292.12
MD50-11-5994	50-603472	364	681.137
MD50-11-5993	50-603472	414	2371.69
MD50-11-5996	50-603472	450	568.81

Table C-4.1-19 (continued)

Sample ID	Location ID	Depth (ft)	Analytical Result
MD50-11-6072	50-603503	25	934.732
MD50-11-6071	50-603503	80	1136.84
MD50-11-6073	50-603503	133	1512.3
MD50-11-6069	50-603503	198	1746.6
MD50-11-6068	50-603503	237	1922.34
MD50-11-6070	50-603503	278	1418.69
MD50-11-6066	50-603503	397	625.523
MD50-11-5933	50-613182	500	555.9
MD50-11-5934	50-613182	550	555.569
MD50-11-5937	50-613182	620	669.695
MD50-11-5942	50-613183	30	2,525,710
MD50-11-5941	50-613183	600	431.214
MD50-11-5944	50-613183	630	2524.53
MD50-11-5946	50-613184	550	4429.21

Note: Results are in pCi/L.

Table C-4.2-1
Samples Collected in and Analyses
Requested for Tschicoma Formation Dacite

Sample ID	Location ID	Depth (ft)	Media	TAL Metals
RE50-11-4142	50-613184	654–654.2	Tvt 2	11-1114*
RE50-11-4143	50-613184	675.8–676	Tvt 2	11-1114
RE50-11-4144	50-613185	677.5–677.7	Tvt 2	11-1114
RE50-11-4145	50-613185	697.3–697.5	Tvt 2	11-1114

*Analytical request number.

Table C-4.2-2
TAL Metals Detected in Tschicoma Formation Dacite during MDA C Phase III Investigation

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium
RE50-11-4142	50-613184	654–654.2	Tvt2	956	—*	—	15.6 (J)	0.0327 (J)
RE50-11-4143	50-613184	675.8–676	Tvt2	935	—	—	18.9 (J+)	0.0255 (J)
RE50-11-4144	50-613185	677.5–677.7	Tvt2	2710	0.35 (J)	0.278 (J)	92.6 (J+)	0.516
RE50-11-4145	50-613185	697.3–697.5	Tvt2	2940	0.312 (J)	0.313 (J)	71.1 (J+)	0.255
RE50-11-4142	50-613184	654–654.2	Tvt2	0.121 (J)	2550	—	1.85	4.19
RE50-11-4143	50-613184	675.8–676	Tvt2	—	2890	—	1.43	2.11
RE50-11-4144	50-613185	677.5–677.7	Tvt2	0.417 (J)	5260	5.71 (J)	3.93	3.83
RE50-11-4145	50-613185	697.3–697.5	Tvt2	0.248 (J)	18,700	2.86 (J)	2.08	2.85
RE50-11-4142	50-613184	654–654.2	Tvt2	5340	—	217 (J+)	42.9	1.88 (J)
RE50-11-4143	50-613184	675.8–676	Tvt2	4100	—	194 (J+)	33.4	1.51 (J)
RE50-11-4144	50-613185	677.5–677.7	Tvt2	10400	9.26	1160 (J+)	118	7.2 (J)
RE50-11-4145	50-613185	697.3–697.5	Tvt2	6430	6.91	9820 (J+)	79.5	5.01 (J)
RE50-11-4142	50-613184	654–654.2	Tvt2	160 (J)	687 (J-)	—	24	7.35
RE50-11-4143	50-613184	675.8–676	Tvt2	129 (J)	865 (J-)	—	16.7	3.74
RE50-11-4144	50-613185	677.5–677.7	Tvt2	872 (J-)	954 (J-)	0.0605 (J)	42.4	16.4
RE50-11-4145	50-613185	697.3–697.5	Tvt2	393 (J)	602 (J-)	—	20.4	11.3

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

* — = Not detected.

Table C-5.0-1
VOCs Detected in Vapor Samples at MDA C during August 2011 Sampling Event

Sample ID	Location ID	Media	Acetone	Benzene	Butanone[2-]	Carbon Disulfide	Carbon Tetrachloride	Chlorobenzene	Chloroform	Dichloro-1,1,2,2-tetrafluoroethane[1,2-]	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Ethylbenzene
MD50-11-23296	50-24813	358	—*	—	—	—	—	—	270	—	550	—	—	—	—	—
MD50-11-23297	50-24813	408	—	—	—	—	—	—	—	—	660	—	—	—	—	—
MD50-11-23298	50-24813	450	—	29	—	—	—	—	—	100	78	—	—	—	—	—
MD50-11-23299	50-24813	600	—	4100	—	—	—	—	—	—	—	—	—	—	—	5900
MD50-11-23287	50-603383	26	—	74	—	—	43 (J)	—	37	—	100	—	—	—	25	26
MD50-11-23288	50-603383	85	—	—	—	—	—	—	100	—	230	—	—	—	120	—
MD50-11-23289	50-603383	139	—	360	—	—	170	—	180	—	230	31	63	40	290	500
MD50-11-23290	50-603383	206	—	—	—	—	160	—	91	—	130	—	—	34	230	—
MD50-11-23291	50-603383	244	—	—	—	—	240	—	120	—	180	—	—	51	310	—
MD50-11-23292	50-603383	286	—	—	—	—	230	—	91	—	150	—	—	46	240	—
MD50-11-23295	50-603383	359	—	—	4	—	—	2.1	2.1	—	6.6	—	—	—	3.3	—
MD50-11-23294	50-603383	408	—	170	4.9	—	19	1.6	—	—	15	—	—	—	—	56
MD50-11-23293	50-603383	450	53	—	13	—	110	—	11	—	100	—	—	7	14	—
MD50-11-23278	50-603468	354	6.8	—	—	3.1	33	—	43	—	150	—	—	16	—	—
MD50-11-23279	50-603468	403	—	100	—	—	—	—	—	—	60	—	—	—	—	110
MD50-11-23280	50-603468	450	—	—	—	—	—	—	—	—	390	—	—	—	—	—
MD50-11-23311	50-603470	351	—	—	—	—	—	—	—	—	900	—	—	—	—	—
MD50-11-23312	50-603470	450	—	—	—	—	—	—	—	—	500	—	—	—	—	—
MD50-11-23313	50-603470	600	—	—	—	—	76	—	—	—	220	—	—	—	—	—
MD50-11-23314	50-603470	650	—	—	—	—	30	—	2.4	—	140	—	—	—	—	—
MD50-11-23308	50-603471	360	—	—	—	—	—	—	800	—	780	—	—	—	—	—
MD50-11-23310	50-603471	410	—	—	—	—	—	—	810	—	560	—	—	—	—	—
MD50-11-23309	50-603471	450	—	—	—	—	—	—	530	—	310	—	—	—	—	—
MD50-11-23307	50-603472	364	—	—	—	—	—	—	—	—	190	—	—	—	—	—
MD50-11-23306	50-603472	414	—	—	—	—	—	—	—	—	360	—	—	—	—	—
MD50-11-23305	50-603472	450	—	—	—	—	—	—	—	—	140	—	—	—	—	—
MD50-11-23273	50-613182	500	—	—	—	—	210 (J)	—	—	—	210	—	—	—	—	—
MD50-11-23276	50-613182	550	—	—	—	—	190 (J)	—	—	—	190	—	—	—	—	—
MD50-11-23275	50-613182	600	—	92	—	—	14 (J)	—	—	—	23	—	—	—	—	24
MD50-11-23274	50-613182	620	—	—	—	—	88 (J)	—	—	—	130	—	—	—	—	—
MD50-11-23277	50-613182	632.5	—	1.8	—	—	—	—	—	—	3.9	—	—	—	—	—

Table C-5.0-1 (continued)

Sample ID	Location ID	Media	Acetone	Benzene	Butanone[2-]	Carbon Disulfide	Carbon Tetrachloride	Chlorobenzene	Chloroform	Dichloro-1,1,2,2-tetrafluoroethane[1,2-]	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Ethylbenzene
MD50-11-23282	50-613183	500	—	—	—	—	—	—	—	—	510	—	—	—	—	—
MD50-11-23283	50-613183	550	—	—	—	—	120	—	—	—	190	—	—	—	—	—
MD50-11-23284	50-613183	600	—	—	—	—	270	—	—	—	—	—	—	—	—	—
MD50-11-23285	50-613183	630	—	—	—	—	170	—	—	—	330	—	—	—	—	—
MD50-11-23286	50-613183	642.5	41	3.9	10	84	8.3	—	—	—	16	—	—	—	—	—
MD50-11-23300	50-613184	500	—	—	—	—	26	—	—	—	34	—	—	—	—	—
MD50-11-23302	50-613184	550	—	—	—	—	17	—	—	—	30	—	—	—	—	—
MD50-11-23301	50-613184	600	—	—	—	—	50	—	—	—	76	—	—	—	—	—
MD50-11-23303	50-613184	652	—	—	—	17	—	—	—	—	6.8	—	—	—	—	—
MD50-11-23304	50-613184	664.5	—	—	—	9.5	—	—	—	—	9.8	—	—	—	—	—
MD50-11-23268	50-613185	350	—	—	—	—	—	—	—	—	130	—	—	—	—	—
MD50-11-23269	50-613185	450	—	—	—	—	—	—	—	—	88	—	—	—	—	—
MD50-11-23271	50-613185	600	—	—	—	10	17 (J)	—	—	—	34	—	—	—	—	—
MD50-11-23270	50-613185	675	—	—	—	18	13 (J)	—	—	—	34	—	—	—	—	—
MD50-11-23272	50-613185	688	9.9	—	—	7.2	5.1 (J)	—	—	—	16	—	—	—	—	—

Table C-5.0-1 (continued)

Sample ID	Location ID	Media	Ethyltoluene[4-]	Methylene Chloride	Styrene	Tetrachloroethylene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethylene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene (total)	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
MD50-11-23296	50-24813	358	—	—	—	—	—	—	—	32,000	—	—	—	—	—	—
MD50-11-23297	50-24813	408	—	270	—	—	—	—	—	31,000	—	—	—	—	—	—
MD50-11-23298	50-24813	450	—	—	—	—	66	—	—	3800	—	—	—	—	—	—
MD50-11-23299	50-24813	600	5100	—	—	—	26,000	—	—	2100	—	5500	1500	16,000	5300	22,000
MD50-11-23287	50-603383	26	24	—	—	320	140	460	79	1100	14	—	—	70	24	94
MD50-11-23288	50-603383	85	—	—	—	710	—	1200	180	2700	—	—	—	—	—	—
MD50-11-23289	50-603383	139	370	—	—	920	2300	1400	260	3700	30	340	120	1200	460	1700
MD50-11-23290	50-603383	206	—	110	—	690	—	480	110	3100	—	—	—	—	—	—
MD50-11-23291	50-603383	244	—	—	—	1000	—	560	140	4800	—	—	—	—	—	—
MD50-11-23292	50-603383	286	—	—	—	950	—	410	110	4600	—	—	—	—	—	—
MD50-11-23295	50-603383	359	—	—	—	20	—	11	1.7	91	—	—	—	—	—	—
MD50-11-23294	50-603383	408	36	—	13	25	410	6.9	1.7	140	2.4	36	11	160	53	210
MD50-11-23293	50-603383	450	—	—	—	220	6.9	62	14	1200	—	—	—	—	—	—
MD50-11-23278	50-603468	354	—	87	—	—	—	—	—	900	4.5	—	—	—	—	—
MD50-11-23279	50-603468	403	—	—	—	86	740	—	—	3700	—	—	—	170	42	210
MD50-11-23280	50-603468	450	—	—	—	—	—	—	—	21,000	—	—	—	—	—	—
MD50-11-23311	50-603470	351	—	350	—	—	—	—	—	42,000	—	—	—	—	—	—
MD50-11-23312	50-603470	450	—	—	—	—	—	—	—	18,000	—	—	—	—	—	—
MD50-11-23313	50-603470	600	—	—	—	—	—	—	—	1800	—	—	—	—	—	—
MD50-11-23314	50-603470	650	—	—	—	—	—	—	—	120	6.7	—	—	—	—	—
MD50-11-23308	50-603471	360	—	1200	—	1100	—	—	—	57,000	—	—	—	—	—	—
MD50-11-23310	50-603471	410	—	710	—	790	—	—	—	44,000	—	—	—	—	—	—
MD50-11-23309	50-603471	450	—	370	—	510	—	—	—	26,000	—	—	—	—	—	—
MD50-11-23307	50-603472	364	—	130	—	460	—	—	—	10,000	—	—	—	—	—	—
MD50-11-23306	50-603472	414	—	170	—	860	—	—	—	21,000	—	—	—	—	—	—
MD50-11-23305	50-603472	450	—	—	—	250	—	—	—	5900	—	—	—	—	—	—
MD50-11-23273	50-613182	500	—	—	—	240	—	—	—	6100	—	—	—	—	—	—
MD50-11-23276	50-613182	550	—	—	—	240	—	—	—	4700	—	—	—	—	—	—
MD50-11-23275	50-613182	600	11	—	4.9	6.3	200	—	—	110	—	—	3.4	70	17	53
MD50-11-23274	50-613182	620	—	—	—	57	—	—	—	1200	—	—	—	—	—	—
MD50-11-23277	50-613182	632.5	—	—	—	—	8.3	—	—	—	—	—	—	—	—	—

Table C-5.0-1 (continued)

Sample ID	Location ID	Media	Ethyltoluene[4-]	Methylene Chloride	Styrene	Tetrachloroethylene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethylene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene (total)	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
MD50-11-23282	50-613183	500	—	—	—	—	—	—	—	19,000	—	—	—	—	—	—
MD50-11-23283	50-613183	550	—	—	—	44	—	—	—	2600	—	—	—	—	—	—
MD50-11-23284	50-613183	600	—	—	—	140	—	—	—	8300	—	—	—	—	—	—
MD50-11-23285	50-613183	630	—	—	—	55	—	—	—	2800	—	—	—	—	—	—
MD50-11-23286	50-613183	642.5	—	—	—	—	1.9	—	—	93	2.5 (J)	—	—	—	—	—
MD50-11-23300	50-613184	500	—	—	—	—	9.9	—	—	720	—	—	—	—	—	—
MD50-11-23302	50-613184	550	—	4.3	—	—	—	—	—	220	5	—	—	—	—	—
MD50-11-23301	50-613184	600	—	—	—	—	—	—	—	1100	—	—	—	—	—	—
MD50-11-23303	50-613184	652	—	—	—	—	2	—	—	17	—	—	—	—	—	—
MD50-11-23304	50-613184	664.5	—	—	—	—	—	—	—	33	—	—	—	—	—	—
MD50-11-23268	50-613185	350	—	—	—	—	—	—	—	3900	—	—	—	—	—	—
MD50-11-23269	50-613185	450	—	—	—	—	—	—	—	1300	—	—	—	—	—	—
MD50-11-23271	50-613185	600	—	—	—	—	—	—	—	110	3.2	—	—	—	—	—
MD50-11-23270	50-613185	675	—	—	—	—	—	—	—	37	—	—	—	—	—	—
MD50-11-23272	50-613185	688	—	26	—	—	2	—	—	10	—	—	—	—	—	—

Notes: Results are in μg/m^3. Data qualifiers are defined in Appendix A.
*— = Not detected.

Table C-5.0-2
VOCs Detected in Vapor Samples at MDA C during October 2011–November 2011 Sampling Event

Location ID	Sample ID	Depth (ft)	Acetone	Benzene	Butanone[2-]	Carbon Disulfide	Carbon Tetrachloride	Chloroform	Chloromethane	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Ethylbenzene	Ethyltoluene[4-]
50-24784	MD50-12-936	25	—*	—	—	—	37.7 (J+)	317	—	41.5	—	—	—	—	—	—
50-24784	MD50-12-935	96	—	—	—	—	176 (J+)	781	—	119	—	—	—	55.4	—	—
50-24784	MD50-12-934	155	—	—	—	—	308 (J+)	346	—	138	—	—	—	55.4	—	—
50-24784	MD50-12-933	215	23	4.79	4.13	6.22	31.4 (J+)	9.76	2.04	12.8	—	—	—	2.72	—	—
50-24784	MD50-12-932	244	—	—	—	—	484 (J+)	132	—	168	—	—	—	—	—	—
50-24784	MD50-12-931	289	—	—	—	—	692 (J+)	97.6	—	227	—	—	—	—	—	—
50-24784	MD50-12-930	362	—	—	—	—	754 (J+)	—	—	262	—	—	—	—	—	—
50-24784	MD50-12-929	411	—	—	—	—	578 (J+)	—	—	237	—	—	—	—	—	—
50-24784	MD50-12-928	450	—	—	—	—	415 (J+)	—	—	188	—	—	—	—	—	—
50-24813	MD50-12-946	25	—	—	—	—	2390 (J+)	1560	—	494	—	—	—	—	—	—
50-24813	MD50-12-945	99	—	—	—	—	5030	3950	—	988	—	—	515	—	—	—
50-24813	MD50-12-944	150	—	—	—	—	4090	3950	—	1140	—	—	674	—	—	—
50-24813	MD50-12-943	207	—	—	—	—	3520 (J+)	3220	—	2030	—	—	753	—	—	—
50-24813	MD50-12-942	241	—	—	—	—	3400 (J+)	3120	—	2420	—	—	—	—	—	—
50-24813	MD50-12-941	286	—	—	—	—	—	2100	—	2320	—	—	—	—	—	—
50-24813	MD50-12-940	358	—	—	—	—	1380 (J+)	732	—	1480	—	—	—	—	—	—
50-24813	MD50-12-939	408	—	—	—	—	—	—	—	1190	—	—	—	—	—	—
50-24813	MD50-12-938	450	—	—	—	—	610 (J+)	—	—	692	—	—	—	—	—	—
50-24813	MD50-12-937	600	—	—	—	—	214 (J+)	—	—	366	—	—	—	—	—	—
50-24822	MD50-12-947	25	—	—	—	—	—	322	—	217	—	—	—	—	—	—
50-24822	MD50-12-948	81	—	—	—	—	126	337	—	217	—	—	47.5	—	—	—
50-24822	MD50-12-949	142	—	—	—	—	239	537	—	470	—	—	115	—	—	—
50-24822	MD50-12-951	204	—	—	—	—	384	537	—	741	—	—	151	—	—	—
50-24822	MD50-12-952	235	—	—	—	—	—	683	—	1140	—	—	—	—	—	—
50-24822	MD50-12-950	280	—	—	—	—	—	444	—	890	—	—	—	—	—	—
50-24822	MD50-12-953	351	—	—	—	—	340	156	—	642	—	—	—	—	—	—
50-24822	MD50-12-954	402	—	—	—	—	—	—	—	173	—	—	—	—	—	—
50-24822	MD50-12-955	450	—	—	—	—	—	—	—	494	—	—	—	—	—	—
50-603064	MD50-12-956	25	—	—	—	—	—	288	—	74.1	—	—	—	—	—	—
50-603064	MD50-12-957	66	—	—	—	—	—	488	—	188	—	269	—	—	—	—
50-603064	MD50-12-958	113	—	—	—	—	—	927	—	489	—	594	—	—	—	—

Table C-5.0-2 (continued)

Location ID	Sample ID	Depth (ft)	Acetone	Benzene	Butanone[2-]	Carbon Disulfide	Carbon Tetrachloride	Chloroform	Chloromethane	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Ethylbenzene	Ethyltoluene[4-]
50-603064	MD50-12-959	176	—	—	—	—	—	878	—	939	—	872	309	—	—	—
50-603064	MD50-12-960	214	—	—	—	—	—	537	—	692	—	—	—	—	—	—
50-603064	MD50-12-961	259	—	—	—	—	—	381	—	791	—	—	—	—	—	—
50-603064	MD50-12-962	332	—	—	—	—	—	—	—	593	—	—	—	—	—	—
50-603064	MD50-12-963	482	—	—	—	—	264 (J+)	—	—	415	—	—	—	—	—	—
50-603064	MD50-12-964	500	—	—	—	—	107 (J+)	—	—	227	—	—	—	—	—	—
50-603383	MD50-12-982	26	—	—	—	24.9	94.3	73.2	—	203	—	—	—	36.9	—	—
50-603383	MD50-12-978	85	—	—	—	—	145	137	—	262	—	—	—	125	—	—
50-603383	MD50-12-979	139	—	—	—	—	220	195	—	272	—	—	—	277	—	—
50-603383	MD50-12-980	206	—	—	—	—	522	244	—	361	—	—	—	508	—	—
50-603383	MD50-12-981	244	—	—	—	—	560	220	—	351	—	—	79.2	508	—	—
50-603383	MD50-12-977	286	164	—	—	—	327 (J+)	97.6	—	183	—	—	—	217	—	—
50-603383	MD50-12-976	359	6.41	—	2.36	—	—	2	—	4.3	—	—	—	2.49	—	—
50-603383	MD50-12-975	408	—	—	—	—	207 (J+)	—	—	119	—	—	—	—	—	—
50-603383	MD50-12-974	450	—	—	—	—	207 (J+)	—	—	93.9	—	—	—	—	—	—
50-603468	MD49-12-967	92	—	—	—	—	516	488	—	247	—	—	99.1	—	—	—
50-603468	MD49-12-965	142	—	—	—	—	314	420	—	124	—	—	95.1	—	—	—
50-603468	MD49-12-966	198	—	—	—	—	754	732	—	474	—	—	250	—	—	—
50-603468	MD49-12-971	233	—	—	—	—	754	683	—	494	—	—	242	—	—	—
50-603468	MD49-12-969	282	—	—	—	—	817	634	—	593	—	—	250	—	—	—
50-603468	MD49-12-970	354	—	—	—	—	—	537	—	791	—	—	—	—	—	—
50-603468	MD49-12-972	403	—	—	—	—	—	—	—	791	—	—	—	—	—	—
50-603468	MD49-12-973	450	—	—	—	—	578	—	—	544	—	—	—	—	—	—
50-603470	MD50-12-983	30	—	—	—	—	484	1070	—	371	—	—	87.2	—	—	—
50-603470	MD50-12-984	83	—	—	—	—	754	1560	—	544	—	—	230	—	—	—
50-603470	MD50-12-985	143	—	—	—	—	—	1760	—	791	—	—	—	—	—	—
50-603470	MD50-12-986	203	—	—	—	—	—	1510	—	1140	—	—	—	—	—	—
50-603470	MD50-12-987	233	—	—	—	—	—	1760	—	1530	—	—	—	—	—	—
50-603470	MD50-12-988	278	—	—	—	—	—	1270	—	1480	—	—	353	—	—	—
50-603470	MD50-12-989	351	—	—	—	—	943	464	—	1330	—	—	—	—	—	—
50-603470	MD50-12-990	450	—	—	—	—	—	—	—	840	—	—	—	—	—	—
50-603470	MD50-12-991	600	—	—	—	—	94.3	—	—	217	—	—	—	—	—	35.9
50-603470	MD50-12-992	650	14.2 (J)	60.7	10	11.2	37.1	2.68	—	109	—	—	—	—	113	10.8

Table C-5.0-2 (continued)

Location ID	Sample ID	Depth (ft)	Acetone	Benzene	Butanone[2-]	Carbon Disulfide	Carbon Tetrachloride	Chloroform	Chloromethane	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Ethylbenzene	Ethyltoluene[4-]
50-603471	MD50-12-1000	90	—	—	—	—	3270 (J+)	2680	—	494	—	—	361	—	—	—
50-603471	MD50-12-999	146	—	—	—	—	2580 (J+)	2930	—	—	—	—	—	—	—	—
50-603471	MD50-12-998	209	—	—	—	—	—	1220	—	840	—	—	—	—	—	—
50-603471	MD50-12-997	242	—	—	—	—	2640 (J+)	2730	—	1430	—	—	—	—	—	—
50-603471	MD50-12-996	288	—	—	—	—	—	976	—	1090	—	—	—	—	—	—
50-603471	MD50-12-994	410	—	—	—	—	—	586	—	890	—	—	—	—	—	—
50-603471	MD50-12-993	450	—	—	—	—	—	537	—	741	—	—	—	—	—	—
50-603472	MD50-12-1010	27	—	—	—	—	—	215	—	27.2	—	—	—	—	—	—
50-603472	MD50-12-1007	93	—	—	—	—	390 (J+)	732	—	168	—	—	127	—	—	—
50-603472	MD50-12-1008	146	207 (J)	—	—	—	—	303	—	—	—	—	—	—	—	—
50-603472	MD50-12-1006	210	138 (J)	—	—	—	—	454	—	—	—	—	—	—	—	—
50-603472	MD50-12-1009	247	—	—	—	—	—	878	—	—	—	—	—	—	—	—
50-603472	MD50-12-1005	292	—	—	—	—	497 (J+)	415	—	232	—	—	—	—	—	—
50-603472	MD50-12-1004	364	—	—	—	—	528 (J+)	146	—	341	—	—	—	—	—	—
50-603472	MD50-12-1003	414	—	—	—	—	817 (J+)	—	—	470	—	—	—	—	—	—
50-603472	MD50-12-1002	450	—	—	—	—	629 (J+)	—	—	405	—	—	—	—	—	—
50-613182	MD50-12-1015	500	—	—	—	—	415 (J+)	—	—	311	—	—	—	—	—	—
50-613182	MD50-12-1014	550	—	—	—	—	296 (J+)	—	—	252	—	—	—	—	—	—
50-613182	MD50-12-1013	600	—	—	—	—	12.6 (J+)	—	—	13.8	—	—	—	—	—	—
50-613182	MD50-12-1012	620	—	—	—	—	157 (J+)	—	—	173	—	—	—	—	—	—
50-613182	MD50-12-1011	632	—	—	—	—	—	—	—	6.42	—	—	—	—	—	—
50-613183	MD50-12-1020	30	—	—	—	—	3400 (J+)	3220	—	—	—	—	—	—	—	—
50-613183	MD50-12-1021	500	—	—	—	—	604 (J+)	—	—	544	—	—	—	—	—	—
50-613183	MD50-12-1022	550	—	—	—	—	296 (J+)	—	—	371	—	—	—	—	—	—
50-613183	MD50-12-1017	600	—	—	—	—	453 (J+)	—	—	489	—	—	—	—	—	—
50-613183	MD50-12-1018	630	—	—	—	—	264 (J+)	—	—	356	—	—	—	—	—	—
50-613183	MD50-12-1019	642.5	23.7 (J)	—	3.83	37.3	12.6 (J+)	1.81	—	14.8	—	—	—	—	—	—
50-613184	MD50-12-1023	30	—	—	—	—	289	259	—	183	—	—	—	—	—	—
50-613184	MD50-12-1024	500	—	—	—	—	195	—	—	242	—	—	—	—	—	—
50-613184	MD50-12-1025	550	—	—	—	—	138	—	—	178	—	—	—	—	—	—
50-613184	MD50-12-1026	600	8.07	—	—	—	81.7	—	—	128	—	—	—	—	—	—
50-613184	MD50-12-1027	652	10.9	2.01	—	177	48.4	—	—	84	—	—	—	—	—	—
50-613184	MD50-12-1028	664.5	11.2	1.21	3.54	30.2	12.6 (J+)	—	—	31.1	—	—	—	—	—	—

Table C-5.0-2 (continued)

Location ID	Sample ID	Depth (ft)	Acetone	Benzene	Butanone[2-]	Carbon Disulfide	Carbon Tetrachloride	Chloroform	Chloromethane	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Ethylbenzene	Ethyltoluene[4-]
50-613185	MD50-12-1038	85	—	—	—	—	126	122	—	114	—	—	—	—	—	—
50-613185	MD50-12-1035	145	—	—	—	—	—	127	—	128	—	—	—	—	—	—
50-613185	MD50-12-1036	205	—	—	—	—	—	132	—	198	—	—	—	—	—	—
50-613185	MD50-12-1037	235	—	—	—	—	—	127	—	213	—	—	—	—	—	—
50-613185	MD50-12-1034	280	—	—	—	—	—	92.7	—	208	—	—	—	—	—	—
50-613185	MD50-12-1033	350	—	—	—	—	—	—	—	173	—	—	—	—	—	—
50-613185	MD50-12-1032	450	9.73	1.15	2.45	—	—	—	—	5.93	—	—	—	—	—	—
50-613185	MD50-12-1031	600	7.12	—	—	4.36	27	—	—	49.4	—	—	—	—	—	—
50-613185	MD50-12-1030	675	7.6	—	—	13.4	17.6	—	—	42	12.5	—	—	—	—	—
50-613185	MD50-12-1029	688	4.27	—	—	16.5	12.6 (J+)	—	—	42	—	—	—	—	—	—

Table C-5.0-2 (continued)

Location ID	Sample ID	Depth (ft)	Hexanone[2-]	Methylene Chloride	Styrene	Tetrachloroethylene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethylene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene (total)	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
50-24784	MD50-12-936	25	—	—	—	2370	—	53.6 (J+)	60	1070	—	—	—	—	—	—
50-24784	MD50-12-935	96	—	—	—	3520	—	176 (J+)	87.2	3330	—	—	—	—	—	—
50-24784	MD50-12-934	155	—	—	—	2850	—	176 (J+)	76.3	4400	—	—	—	—	—	—
50-24784	MD50-12-933	215	—	1.91	—	176	9.04	7.66 (J+)	3.76	322	2.7	—	—	3.47	—	3.47
50-24784	MD50-12-932	244	—	—	—	2580	—	107 (J+)	52.9	4990	—	—	—	—	—	—
50-24784	MD50-12-931	289	—	—	—	2850	—	—	—	5370	—	—	—	—	—	—
50-24784	MD50-12-930	362	—	—	—	1690	—	—	—	3600	—	—	—	—	—	—
50-24784	MD50-12-929	411	—	—	—	881	—	—	—	1880	—	—	—	—	—	—
50-24784	MD50-12-928	450	—	—	—	502	—	—	—	1130	15.7	—	—	—	—	—
50-24813	MD50-12-946	25	—	—	—	563	—	—	—	18,800	—	—	—	—	—	—
50-24813	MD50-12-945	99	—	—	—	813	—	—	—	52,100	—	—	—	—	—	—
50-24813	MD50-12-944	150	—	798	—	813	—	—	—	69,800	—	—	—	—	—	—
50-24813	MD50-12-943	207	—	1180	—	1630	—	—	—	129,000	—	—	—	—	—	—
50-24813	MD50-12-942	241	—	1940	—	—	—	—	—	118,000	—	—	—	—	—	—
50-24813	MD50-12-941	286	—	833	—	—	—	—	—	113,000	—	—	—	—	—	—
50-24813	MD50-12-940	358	—	—	—	—	—	—	—	69,800	—	—	—	—	—	—
50-24813	MD50-12-939	408	—	—	—	—	—	—	—	49,900	—	—	—	—	—	—
50-24813	MD50-12-938	450	—	—	—	—	—	—	—	26,900	—	—	—	—	—	—
50-24813	MD50-12-937	600	—	—	—	—	—	—	—	3650	—	—	—	—	—	—
50-24822	MD50-12-947	25	—	—	—	—	—	—	—	9130	—	—	—	—	—	—
50-24822	MD50-12-948	81	—	—	—	94.9	—	—	—	10,200	—	—	—	—	—	—
50-24822	MD50-12-949	142	—	347	—	156	—	—	—	27,900	—	—	—	—	—	—
50-24822	MD50-12-951	204	—	278	—	190	—	—	—	36,000	—	—	—	—	—	—
50-24822	MD50-12-952	235	—	417	—	—	—	—	—	50,500	—	—	—	—	—	—
50-24822	MD50-12-950	280	—	—	—	—	—	—	—	42,400	—	—	—	—	—	—
50-24822	MD50-12-953	351	—	111	—	—	—	—	—	25,800	—	—	—	—	—	—
50-24822	MD50-12-954	402	—	—	—	—	—	—	—	6980	—	—	—	—	—	—
50-24822	MD50-12-955	450	—	—	—	—	—	—	—	12,900	—	—	—	—	—	—
50-603064	MD50-12-956	25	—	—	—	264	—	2910	872	4140	—	—	—	—	—	—
50-603064	MD50-12-957	66	—	—	—	427	—	8420	2070	8590	—	—	—	—	—	—
50-603064	MD50-12-958	113	—	—	—	610	—	13,800	3220	29,000	—	—	—	—	—	—

Table C-5.0-2 (continued)

Location ID	Sample ID	Depth (ft)	Hexanone[2-]	Methylene Chloride	Styrene	Tetrachloroethylene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethylene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene (total)	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
50-603064	MD50-12-959	176	—	521	—	671	—	19,100	3870	52,600	—	—	—	—	—	—
50-603064	MD50-12-960	214	—	486	—	—	—	12,300	2450	33,800	—	—	—	—	—	—
50-603064	MD50-12-961	259	—	323	—	—	—	11,500	1420	35,400	—	—	—	—	—	—
50-603064	MD50-12-962	332	—	1810	—	—	—	3680	234	16,100	—	—	—	—	—	—
50-603064	MD50-12-963	482	—	—	—	—	—	1380	—	9130	—	—	—	—	—	—
50-603064	MD50-12-964	500	—	18.7	—	—	—	153	—	1560	—	—	—	—	—	—
50-603383	MD50-12-982	26	—	—	—	630	—	996 (J+)	158	1770	33.1	—	—	—	—	—
50-603383	MD50-12-978	85	—	—	—	881	—	1460 (J+)	240	3060	—	—	—	—	—	—
50-603383	MD50-12-979	139	—	—	—	1150	—	1840 (J+)	278	4890	—	—	—	—	—	—
50-603383	MD50-12-980	206	—	90.3	—	1830	—	1380 (J+)	305	8590	—	—	—	—	—	—
50-603383	MD50-12-981	244	—	93.7	—	1970	—	1150 (J+)	273	9130	—	—	—	—	—	—
50-603383	MD50-12-977	286	—	—	—	1080	—	551	131	5050	—	—	—	—	—	—
50-603383	MD50-12-976	359	—	—	—	10.2	—	4.75	—	53.7	—	—	—	—	—	—
50-603383	MD50-12-975	408	—	—	—	217	—	52.8	—	1240	—	—	—	—	—	—
50-603383	MD50-12-974	450	—	—	—	278	—	—	—	1560	—	—	—	—	—	—
50-603468	MD49-12-967	92	—	—	—	197	—	—	—	11,800	—	—	—	—	—	—
50-603468	MD49-12-965	142	—	93.7	—	210	—	—	—	37,100	—	—	—	—	—	—
50-603468	MD49-12-966	198	—	625	—	420	—	—	—	34,900	—	—	—	—	—	—
50-603468	MD49-12-971	233	—	625	—	434	—	—	—	37,100	—	—	—	—	—	—
50-603468	MD49-12-969	282	—	625	—	454	—	—	—	53,700	—	—	—	—	—	—
50-603468	MD49-12-970	354	—	555	—	—	—	—	—	43,000	—	—	—	—	—	—
50-603468	MD49-12-972	403	—	382	—	—	—	—	—	38,700	—	—	—	—	—	—
50-603468	MD49-12-973	450	—	—	—	—	—	—	—	23,100	—	—	—	—	—	—
50-603470	MD50-12-983	30	—	—	—	949	—	337	—	16,600	—	—	—	—	—	—
50-603470	MD50-12-984	83	—	—	—	1080	—	505	—	25,800	—	—	—	—	—	—
50-603470	MD50-12-985	143	—	—	—	746	—	682	—	40,300	—	—	—	—	—	—
50-603470	MD50-12-986	203	—	729	—	—	—	—	—	59,100	—	—	—	—	—	—
50-603470	MD50-12-987	233	—	1010	—	—	—	1230	—	80,600	—	—	—	—	—	—
50-603470	MD50-12-988	278	—	972	—	—	—	996	—	80,600	—	—	—	—	—	—
50-603470	MD50-12-989	351	—	451	—	—	—	620	—	59,100	—	—	—	—	—	—
50-603470	MD50-12-990	450	—	—	—	—	—	—	—	27,400	—	—	—	—	—	—
50-603470	MD50-12-991	600	—	—	—	—	—	—	—	1660	—	—	20.1	42.1	—	42.1
50-603470	MD50-12-992	650	2.13	—	—	—	2.18	—	—	188	7.3	27	4.13	31.7	5.21	37.3

Table C-5.0-2 (continued)

Location ID	Sample ID	Depth (ft)	Hexanone[2-]	Methylene Chloride	Styrene	Tetrachloroethylene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethylene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene (total)	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
50-603471	MD50-12-1000	90	—	451	—	1290	—	—	—	33,300	—	—	—	—	—	—
50-603471	MD50-12-999	146	—	1770	—	1420	—	—	—	69,800	—	—	—	—	—	—
50-603471	MD50-12-998	209	—	1250	—	1150	—	—	—	69,800	—	—	—	—	—	—
50-603471	MD50-12-997	242	—	3230	—	1760	—	—	—	102,000	—	—	—	—	—	—
50-603471	MD50-12-996	288	—	1420	—	—	—	—	—	75,200	—	—	—	—	—	—
50-603471	MD50-12-994	410	—	729	—	949	—	—	—	59,100	—	—	—	—	—	—
50-603471	MD50-12-993	450	—	555	—	813	—	—	—	49,900	—	—	—	—	—	—
50-603472	MD50-12-1010	27	—	—	—	352	—	—	36.5	2310	—	—	—	—	—	—
50-603472	MD50-12-1007	93	—	451	—	881	—	—	—	9670	—	—	—	—	—	—
50-603472	MD50-12-1008	146	—	660	—	407	—	—	—	7520	—	—	—	—	—	—
50-603472	MD50-12-1006	210	—	—	—	535	—	—	—	6440	—	—	—	—	—	—
50-603472	MD50-12-1009	247	—	1180	—	1690	—	—	—	40,800	—	—	—	—	—	—
50-603472	MD50-12-1005	292	—	590	—	949	—	—	—	20,900	—	—	—	—	—	—
50-603472	MD50-12-1004	364	—	219	—	746	—	—	—	17,200	—	—	—	—	—	—
50-603472	MD50-12-1003	414	—	240	—	1080	—	—	—	26,900	—	—	—	—	—	—
50-603472	MD50-12-1002	450	—	—	—	678	—	—	—	16,600	—	—	—	—	—	—
50-613182	MD50-12-1015	500	—	—	—	346	—	—	—	8590	—	—	—	—	—	—
50-613182	MD50-12-1014	550	—	—	—	203	—	—	—	4140	—	—	—	—	—	—
50-613182	MD50-12-1013	600	—	—	—	4.2	—	—	—	48.3	—	—	—	—	—	—
50-613182	MD50-12-1012	620	—	—	—	74.6	—	—	—	1500	14	—	—	—	—	—
50-613182	MD50-12-1011	632	—	—	—	—	—	—	—	4.83	—	—	—	—	—	3.51
50-613183	MD50-12-1020	30	—	—	—	1020	—	—	—	13,400	—	—	—	—	—	—
50-613183	MD50-12-1021	500	—	—	—	312	—	—	—	20,400	—	—	—	—	—	—
50-613183	MD50-12-1022	550	—	—	—	74.6	—	—	—	4510	—	—	—	—	—	—
50-613183	MD50-12-1017	600	—	—	—	156	—	—	—	10,200	—	—	—	—	—	—
50-613183	MD50-12-1018	630	—	—	—	55.6	—	—	—	3220	—	—	—	—	—	—
50-613183	MD50-12-1019	642.5	—	—	—	—	—	—	—	96.7	—	—	—	—	—	—
50-613184	MD50-12-1023	30	—	—	—	129	—	—	—	6440	—	—	—	—	—	—
50-613184	MD50-12-1024	500	—	—	—	—	—	—	—	4830	—	—	—	—	—	—
50-613184	MD50-12-1025	550	—	—	—	26.4	—	—	—	2200	—	—	—	—	—	—
50-613184	MD50-12-1026	600	—	—	—	12.2	—	—	—	859	—	—	—	—	—	—
50-613184	MD50-12-1027	652	—	—	2.13	5.35	2	—	—	322	4.04	—	—	—	—	—
50-613184	MD50-12-1028	664.5	—	—	—	—	1.66	—	—	113	—	—	—	—	—	—

Table C-5.0-2 (continued)

Location ID	Sample ID	Depth (ft)	Hexanone[2-]	Methylene Chloride	Styrene	Tetrachloroethylene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethylene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene (total)	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
50-613185	MD50-12-1038	85	—	—	—	74.6	—	—	—	4080	—	—	—	—	—	—
50-613185	MD50-12-1035	145	—	—	—	—	—	—	—	5370	—	—	—	—	—	—
50-613185	MD50-12-1036	205	—	—	—	—	—	—	—	9670	—	—	—	—	—	—
50-613185	MD50-12-1037	235	—	—	—	—	—	—	—	10,200	—	—	—	—	—	—
50-613185	MD50-12-1034	280	—	—	—	237	—	—	—	15,000	—	—	—	—	—	—
50-613185	MD50-12-1033	350	—	—	—	—	—	—	—	4510	—	—	—	—	—	—
50-613185	MD50-12-1032	450	—	—	—	—	—	—	—	52.1	—	—	—	—	—	—
50-613185	MD50-12-1031	600	—	—	—	2.85	—	—	—	140	2.25	—	—	—	—	—
50-613185	MD50-12-1030	675	—	—	—	—	—	—	9.27	41.9	—	—	—	—	—	—
50-613185	MD50-12-1029	688	—	—	—	—	—	—	—	38.1	—	—	—	—	—	—

Notes: Results are in µg/m^3. Data qualifiers are defined in Appendix A.

*— = Not detected.

Table C-5.0-3
Samples Collected and Analyses Requested for MDA C Vapor-Monitoring Wells, March 2012–April 2012 Sampling Event

Location ID	Sample ID	Depth (ft)	Tritium	VOC
50-24784	MD50-12-12060	155	12-1155*	12-1156
50-24784	MD50-12-12061	244	12-1142	12-1143
50-24784	MD50-12-12062	362	12-1142	12-1143
50-24784	MD50-12-12063	450	12-1142	12-1143
50-24813	MD50-12-12067	25	12-1153	12-1154
50-24813	MD50-12-12066	150	12-1153	12-1154
50-24813	MD50-12-12065	241	12-1153	12-1154
50-24813	MD50-12-12064	358	12-1168	12-1169
50-24813	MD50-12-12068	450	12-1167	12-1166
50-24813	MD50-12-12069	600	12-1167	12-1166
50-24822	MD50-12-12074	25	12-1093	12-1094
50-24822	MD50-12-12073	142	12-1083	12-1084
50-24822	MD50-12-12072	235	12-1093	12-1094
50-24822	MD50-12-12071	351	12-1083	12-1084
50-24822	MD50-12-12070	450	12-1083	12-1084
50-603061	MD50-12-12079	25	12-1139	12-1140
50-603061	MD50-12-12078	128	12-1134	12-1135
50-603061	MD50-12-12077	228	12-1134	12-1135
50-603061	MD50-12-12076	347	12-1134	12-1135
50-603061	MD50-12-12075	450	12-1134	12-1135
50-603062	MD50-12-12087	122	12-1130	12-1132
50-603062	MD50-12-12086	217	12-1122	12-1123
50-603062	MD50-12-12085	337	12-1122	12-1123
50-603062	MD50-12-12084	450	12-1122	12-1123
50-603063	MD50-12-12088	25	12-1187	12-1188
50-603063	MD50-12-12089	128	12-1189	12-1190
50-603063	MD50-12-12090	228	12-1189	12-1190
50-603063	MD50-12-12091	347	12-1189	12-1190
50-603063	MD50-12-12092	450	12-1187	12-1188
50-603064	MD50-12-12096	113	12-1220	12-1221
50-603064	MD50-12-12095	214	12-1220	12-1221
50-603064	MD50-12-12094	332	12-1220	12-1221
50-603064	MD50-12-12093	500	12-1220	12-1221
50-603383	MD50-12-12101	26	12-1198	12-1199
50-603383	MD50-12-12097	139	12-1200	12-1201
50-603383	MD50-12-12098	244	12-1200	12-1201
50-603383	MD50-12-12099	359	12-1200	12-1201
50-603383	MD50-12-12100	450	12-1200	12-1201
50-603467	MD50-12-12106	143	12-1118	12-1119

Table C-5.0-3 (continued)

Location ID	Sample ID	Depth (ft)	Tritium	VOC
50-603467	MD50-12-12102	244	12-1118	12-1119
50-603467	MD50-12-12103	360	12-1103	12-1104
50-603467	MD50-12-12104	500	12-1118	12-1119
50-603467	MD50-12-12105	600	12-1103	12-1104
50-603468	MD50-12-12108	142	12-1073	12-1072
50-603468	MD50-12-12109	233	12-1073	12-1072
50-603468	MD50-12-12110	354	12-1073	12-1072
50-603468	MD50-12-12107	403	12-1070	12-1071
50-603470	MD50-12-12114	83	12-1171	12-1172
50-603470	MD50-12-12120	203	12-1178	12-1179
50-603470	MD50-12-12119	278	12-1178	12-1179
50-603470	MD50-12-12118	351	12-1178	12-1179
50-603470	MD50-12-12115	450	12-1171	12-1172
50-603470	MD50-12-12116	600	12-1171	12-1172
50-603470	MD50-12-12117	650	12-1171	12-1172
50-603471	MD50-12-12124	90	12-1176	12-1177
50-603471	MD50-12-12125	209	12-1176	12-1177
50-603471	MD50-12-12122	288	12-1176	12-1177
50-603471	MD50-12-12123	360	12-1176	12-1177
50-603471	MD50-12-12121	450	12-1176	12-1177
50-603472	MD50-12-12128	27	12-1182	12-1183
50-603472	MD50-12-12129	146	12-1182	12-1183
50-603472	MD50-12-12132	292	12-1182	12-1183
50-603472	MD50-12-12131	364	12-1182	12-1183
50-603472	MD50-12-12130	450	12-1182	12-1183
50-603503	MD50-12-12136	133	12-1116	12-1117
50-603503	MD50-12-12135	237	12-1116	12-1117
50-603503	MD50-12-12137	347	12-1116	12-1117
50-603503	MD50-12-12138	450	12-1116	12-1117
50-613182	MD50-12-12133	550	12-1182	12-1183
50-613182	MD50-12-12134	632.5	12-1182	12-1183
50-613183	MD50-12-12127	550	12-1176	12-1177
50-613183	MD50-12-12126	642.5	12-1176	12-1177
50-613184	MD50-12-12113	500	12-1070	12-1071
50-613184	MD50-12-12112	600	12-1070	12-1071
50-613184	MD50-12-12111	664.5	12-1070	12-1071
50-613185	MD50-12-12143	145	12-1060	12-1059
50-613185	MD50-12-12139	235	12-1055	12-1056_1
50-613185	MD50-12-12140	350	12-1055	12-1056_1
50-613185	MD50-12-12141	450	12-1055	12-1056_1
50-613185	MD50-12-12142	600	12-1055	12-1056_1

*Analytical request number.

Table C-5.0-4
VOCs Detected in Vapor Samples at MDA C during March 2012–April 2012 Sampling Event

Location ID	Field Sample ID	Depth (ft)	Benzene	Butadiene[1,3-]	Butanol[1-]	Carbon Tetrachloride	Chlorodifluoromethane	Chloroform	Cyclohexane	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Ethanol
50-24784	MD50-12-12060	155	—*	—	—	189	—	288	—	143	—	—	—	—	64.7	—
50-24784	MD50-12-12061	244	—	—	—	289	—	112	—	193	—	—	—	—	—	—
50-24784	MD50-12-12062	362	—	—	—	371	—	—	—	267	—	—	—	—	—	—
50-24784	MD50-12-12063	450	—	—	—	277	—	—	—	227	—	—	—	—	—	—
50-24813	MD50-12-12067	25	—	—	—	1320	—	1120	—	484	—	—	—	63.4	—	—
50-24813	MD50-12-12066	150	—	—	—	1760	—	2730	—	988	—	97.1	—	555	—	—
50-24813	MD50-12-12065	241	—	—	—	1890	—	2290	—	2220	—	—	—	713	—	—
50-24813	MD50-12-12064	358	—	—	—	817	—	586	—	1480	—	—	—	214	—	—
50-24813	MD50-12-12068	450	—	—	—	428	—	122	—	890	—	—	—	47.5	—	—
50-24813	MD50-12-12069	600	—	—	—	107	—	—	—	321	—	—	—	—	—	—
50-24822	MD50-12-12074	25	—	—	—	81.7	—	288	—	257	—	—	—	—	—	—
50-24822	MD50-12-12073	142	—	—	—	226	—	586	—	692	—	—	—	115	—	—
50-24822	MD50-12-12072	235	—	—	—	327	—	586	—	1190	—	—	—	155	—	—
50-24822	MD50-12-12071	351	—	—	—	207	—	137	—	692	—	—	—	47.5	—	—
50-24822	MD50-12-12070	450	—	—	—	151	—	—	—	494	—	—	—	—	—	—
50-603061	MD50-12-12079	25	—	—	—	—	—	—	—	840	—	—	325	—	—	—
50-603061	MD50-12-12078	128	—	—	—	—	—	—	—	425	—	—	1620	—	—	—
50-603061	MD50-12-12077	228	—	—	—	—	—	—	—	64.2	—	—	210	—	—	—
50-603061	MD50-12-12076	347	—	—	—	88	—	—	—	257	—	—	246	—	—	—
50-603061	MD50-12-12075	450	—	—	—	—	—	—	—	138	—	—	—	—	—	—
50-603062	MD50-12-12087	122	—	—	—	—	—	73.2	—	237	—	—	—	—	—	—
50-603062	MD50-12-12086	217	—	—	—	56	—	48.8	—	306	—	—	—	—	—	—
50-603062	MD50-12-12085	337	—	—	—	—	—	—	—	188	—	—	—	—	—	—
50-603062	MD50-12-12084	450	—	—	—	—	—	—	—	114	—	—	—	—	—	—
50-603063	MD50-12-12088	25	—	—	245	—	—	—	—	257	—	—	—	—	—	—
50-603063	MD50-12-12089	128	—	—	—	176	262	332	—	593	84.9	—	321	47.5	—	—
50-603063	MD50-12-12090	228	—	—	—	409	353	586	—	840	48.5	—	372	151	45.3	—
50-603063	MD50-12-12091	347	—	—	—	226	—	220	—	425	—	—	55.5	43.6	—	—
50-603063	MD50-12-12092	450	—	—	—	195	—	156	—	306	—	—	—	—	—	—
50-603064	MD50-12-12096	113	—	—	—	151	—	781	—	544	—	—	555	214	46.2	—
50-603064	MD50-12-12095	214	—	—	—	289	—	586	—	988	—	—	674	226	—	—

Table C-5.0-4 (continued)

Location ID	Field Sample ID	Depth (ft)	Benzene	Butadiene[1,3-]	Butanol[1-]	Carbon Tetrachloride	Chlorodifluoromethane	Chloroform	Cyclohexane	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Ethanol
50-603064	MD50-12-12094	332	—	—	—	176	—	58.6	—	642	—	—	147	—	—	—
50-603064	MD50-12-12093	500	—	—	—	—	—	—	—	267	—	—	—	—	—	—
50-603383	MD50-12-12101	26	—	—	—	—	—	—	—	109	—	—	—	—	—	—
50-603383	MD50-12-12097	139	—	—	—	176	—	171	—	336	—	—	79.2	43.6	342	—
50-603383	MD50-12-12098	244	—	—	—	264	—	122	—	292	—	—	47.5	51.5	351	—
50-603383	MD50-12-12099	359	—	—	—	113	—	—	—	148	—	—	—	—	—	—
50-603383	MD50-12-12100	450	—	—	—	214	—	—	—	232	—	—	—	—	—	—
50-603467	MD50-12-12106	143	—	—	—	440	—	683	—	292	—	—	—	131	—	—
50-603467	MD50-12-12102	244	—	—	—	459	—	356	—	400	—	—	—	103	—	—
50-603467	MD50-12-12103	360	—	—	—	692	—	781	—	489	—	—	—	206	—	—
50-603467	MD50-12-12104	500	—	—	—	132	—	78.1	—	198	—	—	—	—	—	—
50-603467	MD50-12-12105	600	—	—	—	138	—	—	—	188	—	—	—	—	—	—
50-603468	MD50-12-12108	142	—	—	—	176	—	263	—	178	—	—	—	71.3	—	—
50-603468	MD50-12-12109	233	—	—	—	478	—	586	—	544	—	—	—	198	—	—
50-603468	MD50-12-12110	354	—	—	—	591	—	390	—	791	—	—	—	147	—	—
50-603468	MD50-12-12107	403	—	—	—	516	—	239	—	741	—	—	—	95.1	—	—
50-603470	MD50-12-12114	83	—	—	—	321	—	1170	—	425	—	—	—	186	45.3	—
50-603470	MD50-12-12120	203	—	—	—	371	—	1070	—	1090	—	—	—	293	—	—
50-603470	MD50-12-12119	278	—	—	—	629	—	1070	—	1780	—	—	—	353	—	—
50-603470	MD50-12-12118	351	—	—	—	409	—	337	—	1280	—	—	—	131	—	—
50-603470	MD50-12-12115	450	—	—	—	239	—	73.2	—	741	—	—	—	—	—	—
50-603470	MD50-12-12116	600	—	—	—	—	—	—	—	356	—	—	—	—	—	—
50-603470	MD50-12-12117	650	—	—	—	—	—	—	—	133	—	—	—	—	—	—
50-603471	MD50-12-12124	90	—	—	—	1570	—	1900	—	470	—	150	—	246	102	—
50-603471	MD50-12-12125	209	—	—	—	1070	—	2100	—	1240	—	138	—	555	111	—
50-603471	MD50-12-12122	288	—	—	—	1320	—	1850	—	1480	—	—	—	555	—	—
50-603471	MD50-12-12123	360	—	—	—	817	—	781	—	1240	—	—	—	262	—	—
50-603471	MD50-12-12121	450	—	—	—	604	—	537	—	692	—	—	—	158	—	—
50-603472	MD50-12-12128	27	—	—	—	—	—	312	—	69.2	—	—	—	—	—	—
50-603472	MD50-12-12129	146	—	—	—	289	—	683	—	272	—	56.6	—	135	120	—
50-603472	MD50-12-12132	292	—	—	—	453	194	537	—	460	—	—	—	147	50.8	—
50-603472	MD50-12-12131	364	—	—	—	340	152	132	—	455	—	—	—	39.6	—	—
50-603472	MD50-12-12130	450	—	—	—	352	141	68.3	—	465	—	—	—	—	—	—

Table C-5.0-4 (continued)

Location ID	Field Sample ID	Depth (ft)	Benzene	Butadiene[1,3-]	Butanol[1-]	Carbon Tetrachloride	Chlorodifluoromethane	Chloroform	Cyclohexane	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Ethanol
50-603503	MD50-12-12136	133	182	46.4	—	—	—	—	61.9	—	—	—	—	—	—	527
50-603503	MD50-12-12135	237	—	—	—	107	—	146	—	114	—	—	—	—	46.2	—
50-603503	MD50-12-12137	347	—	—	—	62.9	—	53.7	—	79.1	—	—	—	—	—	—
50-603503	MD50-12-12138	450	—	—	—	88	—	—	—	98.8	—	—	—	—	—	—
50-613182	MD50-12-12133	550	—	—	—	176	—	—	—	321	—	—	—	—	—	—
50-613182	MD50-12-12134	632	—	—	—	—	—	—	—	6.92	—	—	—	—	—	9.42 (J)
50-613183	MD50-12-12127	550	—	—	—	176	—	—	—	479	—	—	—	—	—	—
50-613183	MD50-12-12126	642.5	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-613184	MD50-12-12113	500	—	—	—	138	—	—	—	292	—	—	—	—	—	—
50-613184	MD50-12-12112	600	—	—	—	—	—	—	—	143	—	—	—	—	—	—
50-613184	MD50-12-12111	664.5	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50-613185	MD50-12-12143	145	—	—	—	113	—	112	—	158	—	—	—	—	—	—
50-613185	MD50-12-12139	235	—	—	—	163	—	107	—	222	—	—	—	39.2	—	—
50-613185	MD50-12-12140	350	—	—	—	113	—	—	—	203	—	—	—	—	—	—
50-613185	MD50-12-12141	450	—	—	—	69.2	—	—	—	138	—	—	—	—	—	—
50-613185	MD50-12-12142	600	—	—	—	—	—	—	—	79.1	—	—	—	—	—	—

Table C-5.0-4 (continued)

Location ID	Field Sample ID	Depth (ft)	Ethylbenzene	Hexane	Hexanone[2-]	Methylene Chloride	n-Heptane	Propylene	Tetrachloroethylene	Tetrahydrofuran	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethylene	Trichlorofluoromethane	Xylene[1,3-]+Xylene[1,4-]
50-24784	MD50-12-12060	155	—	—	—	48.6	—	—	2300	—	—	168	54.5	3600	—	—
50-24784	MD50-12-12061	244	—	—	—	66	—	—	2100	—	—	115	—	4080	—	—
50-24784	MD50-12-12062	362	—	—	—	41.7	—	—	1360	—	—	—	—	2630	—	—
50-24784	MD50-12-12063	450	—	—	—	32.6	—	—	488	—	—	—	—	1020	—	—
50-24813	MD50-12-12067	25	—	—	—	—	—	—	481	—	—	—	—	14,000	—	—
50-24813	MD50-12-12066	150	—	—	—	590	—	—	678	—	—	—	—	42,400	—	—
50-24813	MD50-12-12065	241	—	—	—	1670	—	—	1080	—	—	—	—	85,900	—	—
50-24813	MD50-12-12064	358	—	—	—	181	—	—	603	—	—	—	—	53,700	—	—
50-24813	MD50-12-12068	450	—	—	—	160	—	—	258	—	—	—	—	24,700	—	—
50-24813	MD50-12-12069	600	—	—	—	—	—	—	—	—	—	—	—	2630	—	—
50-24822	MD50-12-12074	25	—	—	—	—	—	—	163	—	—	72	—	8060	—	—
50-24822	MD50-12-12073	142	—	—	—	156	—	—	190	—	—	146	—	25,200	—	—
50-24822	MD50-12-12072	235	—	—	—	337	—	—	230	—	—	199	—	40,800	—	—
50-24822	MD50-12-12071	351	—	—	—	111	—	—	108	—	—	—	—	22,000	—	—
50-24822	MD50-12-12070	450	—	—	—	—	—	—	—	—	—	—	—	10,700	—	—
50-603061	MD50-12-12079	25	—	—	—	—	—	—	108	—	—	15,300	1800	526	—	—
50-603061	MD50-12-12078	128	—	—	—	—	—	—	312	—	—	29,100	5450	2790	—	—
50-603061	MD50-12-12077	228	—	—	—	—	—	—	—	—	—	3680	545	591	—	—
50-603061	MD50-12-12076	347	—	—	—	—	—	—	81.3	—	—	6740	409	1340	—	—
50-603061	MD50-12-12075	450	—	—	—	—	—	—	—	—	—	1460	—	483	—	—
50-603062	MD50-12-12087	122	—	—	—	—	—	—	—	—	—	429	54.5	6440	—	—
50-603062	MD50-12-12086	217	—	—	—	—	—	—	—	—	—	521	48	8060	—	—
50-603062	MD50-12-12085	337	—	—	—	—	—	—	—	—	—	123	—	2040	—	—
50-603062	MD50-12-12084	450	—	—	—	—	—	—	—	—	—	—	—	591	—	—
50-603063	MD50-12-12088	25	—	—	—	—	—	—	359	—	—	2680	354	1610	—	—
50-603063	MD50-12-12089	128	—	—	—	—	—	—	1080	—	—	5280	872	10,700	—	—
50-603063	MD50-12-12090	228	—	—	—	93.7	—	—	1690	—	—	5510	763	25,200	78.6	—
50-603063	MD50-12-12091	347	—	—	—	90.3	—	—	617	—	—	1300	52.3	12,900	—	—
50-603063	MD50-12-12092	450	—	—	—	—	—	—	373	—	—	115	—	8590	—	—
50-603064	MD50-12-12096	113	—	—	—	104	—	—	596	—	—	9960	2290	24,700	—	—
50-603064	MD50-12-12095	214	—	—	—	417	—	—	576	—	—	12,300	2240	34,900	56.1	—

Table C-5.0-4 (continued)

Location ID	Field Sample ID	Depth (ft)	Ethylbenzene	Hexane	Hexanone[2-]	Methylene Chloride	n-Heptane	Propylene	Tetrachloroethylene	Tetrahydrofuran	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethylene	Trichlorofluoromethane	Xylene[1,3-]+Xylene[1,4-]
50-603064	MD50-12-12094	332	—	—	—	62.5	—	—	197	—	—	3370	174	12,900	—	—
50-603064	MD50-12-12093	500	—	—	—	—	—	—	—	—	—	146	—	1400	—	—
50-603383	MD50-12-12101	26	—	—	—	—	—	—	278	—	—	268	48.5	698	—	—
50-603383	MD50-12-12097	139	—	—	—	48.6	—	—	1220	—	—	1300	224	4990	—	—
50-603383	MD50-12-12098	244	—	—	—	69.4	—	—	1220	—	—	551	153	5370	—	—
50-603383	MD50-12-12099	359	—	—	—	—	—	—	210	—	—	115	—	1400	—	—
50-603383	MD50-12-12100	450	—	—	—	—	—	—	271	38.3	—	—	—	1340	—	—
50-603467	MD50-12-12106	143	—	—	—	181	—	—	434	—	—	—	—	15,000	—	—
50-603467	MD50-12-12102	244	—	—	—	132	—	—	678	—	—	—	—	25,200	—	—
50-603467	MD50-12-12103	360	—	—	—	625	—	—	881	—	—	—	—	30,600	—	—
50-603467	MD50-12-12104	500	—	—	—	—	—	—	176	—	—	—	—	6980	—	—
50-603467	MD50-12-12105	600	—	—	737	—	—	—	108	56	—	—	—	3380	—	—
50-603468	MD50-12-12108	142	—	—	—	97.2	—	—	197	—	—	—	—	10,200	—	—
50-603468	MD50-12-12109	233	—	—	—	521	—	—	420	—	—	—	—	29,000	—	—
50-603468	MD50-12-12110	354	—	—	—	382	—	—	420	—	—	—	—	32,800	—	—
50-603468	MD50-12-12107	403	—	—	—	267	—	—	339	—	—	—	—	27,900	—	—
50-603470	MD50-12-12114	83	—	—	—	59	—	—	813	—	—	329	70.9	15,600	—	—
50-603470	MD50-12-12120	203	—	—	—	555	—	—	515	—	—	689	104	40,800	—	—
50-603470	MD50-12-12119	278	—	—	—	937	—	—	617	—	—	919	104	64,400	—	—
50-603470	MD50-12-12118	351	—	—	—	382	—	—	332	—	—	521	—	40,300	51.7	—
50-603470	MD50-12-12115	450	—	—	—	83.3	—	—	136	—	—	161	—	17,200	—	—
50-603470	MD50-12-12116	600	—	—	—	—	—	—	—	—	—	—	—	1720	—	—
50-603470	MD50-12-12117	650	—	—	—	—	—	—	—	—	—	—	—	80.6	—	—
50-603471	MD50-12-12124	90	—	—	—	295	—	—	1020	—	—	299	60	19,900	—	—
50-603471	MD50-12-12125	209	—	—	—	2080	—	—	1290	—	—	505	—	53,700	—	—
50-603471	MD50-12-12122	288	—	—	—	2430	—	—	1490	—	—	513	—	69,800	—	—
50-603471	MD50-12-12123	360	—	—	—	1110	—	—	1080	—	—	322	—	53,200	73	—
50-603471	MD50-12-12121	450	—	—	—	382	—	—	813	—	—	146	—	39,700	—	—
50-603472	MD50-12-12128	27	—	—	—	—	—	—	596	—	—	—	52.9	3330	—	—
50-603472	MD50-12-12129	146	—	—	—	521	—	—	1080	—	—	123	—	17,200	—	—
50-603472	MD50-12-12132	292	—	—	—	868	—	—	1560	—	—	99.6	—	28,500	—	—
50-603472	MD50-12-12131	364	—	—	—	222	—	—	813	—	—	—	—	15,600	—	—
50-603472	MD50-12-12130	450	—	—	—	86.8	—	—	671	—	—	—	—	12,900	—	—

Table C-5.0-4 (continued)

Location ID	Field Sample ID	Depth (ft)	Ethylbenzene	Hexane	Hexanone[2-]	Methylene Chloride	n-Heptane	Propylene	Tetrachloroethylene	Tetrahydrofuran	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethylene	Trichlorofluoromethane	Xylene[1,3-]+Xylene[1,4-]
50-603503	MD50-12-12136	133	43.4	137	—	—	—	224	74.6	—	313	—	—	435	—	117
50-603503	MD50-12-12135	237	—	—	—	125	—	—	603	—	—	74.3	—	5370	—	—
50-603503	MD50-12-12137	347	—	—	—	38.2	—	—	291	—	—	—	—	2630	—	—
50-603503	MD50-12-12138	450	—	—	—	—	—	—	264	—	—	—	—	3110	—	—
50-613182	MD50-12-12133	550	—	—	—	—	—	—	190	—	—	—	—	3490	—	—
50-613182	MD50-12-12134	632	—	—	—	—	—	18.9	—	—	—	—	—	6.98	—	—
50-613183	MD50-12-12127	550	—	—	—	—	—	—	88.1	—	—	—	—	3810	—	—
50-613183	MD50-12-12126	642.5	—	59.9	—	—	49.1	—	—	—	—	—	—	96.7	—	—
50-613184	MD50-12-12113	500	—	—	—	—	—	—	65.1	—	—	—	—	4300	—	—
50-613184	MD50-12-12112	600	—	—	—	—	—	—	—	—	—	—	—	698	—	—
50-613184	MD50-12-12111	664.5	—	—	—	—	—	—	—	—	—	—	—	102	—	—
50-613185	MD50-12-12143	145	—	—	—	41.7	—	—	81.3	—	—	—	—	5320	—	—
50-613185	MD50-12-12139	235	—	—	—	83.3	—	—	115	—	—	—	—	8590	—	—
50-613185	MD50-12-12140	350	—	—	—	—	—	—	66.4	—	—	—	—	4240	—	—
50-613185	MD50-12-12141	450	—	—	—	—	—	—	—	—	—	—	—	1720	—	—
50-613185	MD50-12-12142	600	—	—	—	—	—	—	—	—	—	—	—	145	—	—

Notes: Results are in µg/m^3. Data qualifiers are defined in Appendix A.

*— = Not detected.

Table C-5.0-5
VOC Pore-Gas Results at MDA C for Fiscal Year 2012

Sampling Plan 2012	Field Sample ID	Location ID	Depth (ft)	Date	Benzene	Butadiene[1,3-]	Butanol[1-]	Carbon Tetrachloride	Chlorodifluoromethane	Chloroform	Cyclohexane	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Ethanol
Groundwater Tier 1 Screening Level					**1140**	**547**	**720**	**5650**	**129,000**	**12,000**	**79,300,000**	**2,780,000**	**5750**	**242**	**7490**	**11,700**	**580**	**na[a]**
4028	MD50-13-24157	50-603383	26	11/16/2012	—[b]	—	—	—	—	—	—	163.09	—	—	—	—	—	—
4028	MD50-13-24153	50-603383	139	11/15/2012	—	—	—	169.76	—	156.15	—	380.54	—	—	67.36	—	249.39	—
4028	MD50-13-24154	50-603383	244	11/15/2012	—	—	—	289.21	—	126.87	—	321.24	—	—	59.44	47.55	309.43	—
4028	MD50-13-24155	50-603383	359	11/15/2012	—	—	—	138.32	—	—	—	192.74	—	—	—	—	—	—
4028	MD50-13-24156	50-603383	450	11/15/2012	—	—	—	207.48	—	—	—	222.39	—	—	—	—	—	—
4028	MD50-13-24060	50-603063	25	11/14/2012	—	—	—	—	—	—	—	197.68	—	—	—	—	—	—
4028	MD50-13-24056	50-603063	128	11/13/2012	—	—	—	125.75	—	229.34	—	385.48	56.63	—	213.97	—	—	—
4028	MD50-13-24057	50-603063	228	11/13/2012	—	—	—	364.66	—	487.95	—	691.89	—	—	348.69	126.80	—	—
4028	MD50-13-24058	50-603063	347	11/13/2012	—	—	—	213.77	—	195.18	—	380.54	—	—	—	—	—	—
4028	MD50-13-24059	50-603063	450	11/13/2012	—	—	—	169.76	—	131.75	—	266.87	—	—	—	—	—	—
4028	MD50-13-24051	50-603061	25	11/09/2012	—	—	—	—	—	—	—	741.31	—	—	245.66	—	—	—
4028	MD50-13-24047	50-603061	128	11/08/2012	—	—	—	—	—	—	—	464.56	—	—	1703.80	—	—	—
4028	MD50-13-24048	50-603061	228	11/08/2012	—	—	—	—	—	—	—	316.29	—	—	1267.95	—	—	—
4028	MD50-13-24049	50-603061	347	11/08/2012	—	—	—	88.02	—	—	—	252.05	—	—	221.89	—	—	—
4028	MD50-13-24050	50-603061	450	11/08/2012	—	—	—	—	—	—	—	158.15	—	—	59.44	—	—	—
4028	MD50-13-24032	50-24784	155	11/06/2012	—	—	—	182.33	—	292.78	—	138.38	—	—	—	—	69.28	—
4028	MD50-13-24033	50-24784	244	11/06/2012	—	—	—	270.35	—	107.35	—	177.92	—	—	—	—	—	—
4028	MD50-13-24034	50-24784	362	11/06/2012	—	—	—	377.24	—	—	—	242.16	—	—	—	—	—	—
4028	MD50-13-24035	50-24784	450	11/06/2012	—	—	—	245.21	—	—	—	207.57	—	—	—	—	—	—
4028	MD50-13-24089	50-613182	550	11/06/2012	—	—	—	157.18	—	—	—	281.70	—	—	—	—	—	—
4028	MD50-13-24090	50-613182	632.5	11/06/2012	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4028	MD50-13-24143	50-603472	27	11/02/2012	—	—	—	—	—	263.50	—	49.42	—	—	—	—	—	—
4028	MD50-13-24144	50-603472	146	11/02/2012	—	—	—	213.77	—	585.55	—	187.80	—	—	—	122.83	106.22	—
4028	MD50-13-24145	50-603472	364	11/02/2012	—	—	—	345.80	—	156.15	—	454.67	—	—	—	—	—	—
4028	MD50-13-24146	50-603472	450	11/02/2012	—	—	—	308.08	—	—	—	380.54	—	—	—	—	—	—

Table C-5.0-5 (continued)

Sampling Plan 2012	Field Sample ID	Location ID	Depth (ft)	Date	Benzene	Butadiene[1,3-]	Butanol[1-]	Carbon Tetrachloride	Chlorodifluoromethane	Chloroform	Cyclohexane	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Ethanol
Groundwater Tier 1 Screening Level					**1140**	**547**	**720**	**5650**	**129,000**	**12,000**	**79,7300,000**	**2,780,000**	**5750**	**242**	**7490**	**11,700**	**580**	**na[a]**
4028	MD50-13-24147	50-603472	292	11/02/2012	—	—	—	471.54	—	585.55	—	464.56	—	—	—	174.34	—	—
4028	MD50-13-24086	50-603471	450	10/31/2012	—	—	—	616.15	—	444.04	—	642.47	—	—	—	146.61	—	—
4028	MD50-13-24087	50-613183	550	10/31/2012	—	—	—	163.47	—	—	—	434.90	—	—	—	—	—	—
4028	MD50-13-24088	50-613183	642.5	10/31/2012	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4028	MD50-13-24082	50-603471	90	10/30/2012	—	—	—	1634.68	—	1854.23	—	405.25	—	133.48	—	241.70	—	—
4028	MD50-13-24083	50-603471	209	10/30/2012	—	—	—	628.73	—	1463.86	—	385.48	—	—	—	328.87	—	—
4028	MD50-13-24084	50-603471	288	10/30/2012	—	—	—	1068.83	—	1366.27	—	1037.84	—	—	—	396.23	—	—
4028	MD50-13-24085	50-603471	360	10/30/2012	—	—	—	754.47	—	634.34	—	1037.84	—	—	—	—	—	—
4028	MD50-13-24081	50-603470	450	10/29/2012	—	—	—	251.49	—	—	—	790.73	—	—	—	—	—	—
4028	MD50-13-24077	50-603470	83	10/26/2012	—	—	—	546.99	—	1659.04	—	642.47	—	—	—	261.51	—	—
4028	MD50-13-24078	50-603470	203	10/26/2012	—	—	—	—	—	1122.30	—	1136.68	—	—	—	—	—	—
4028	MD50-13-24079	50-603470	278	10/26/2012	—	—	—	—	—	829.52	—	1235.52	—	—	—	—	—	—
4028	MD50-13-24080	50-603470	351	10/26/2012	—	—	—	—	—	—	—	741.31	—	—	—	—	—	—
4028	MD50-13-24075	50-603470	600	10/25/2012	—	—	—	—	—	—	—	296.53	—	—	—	—	—	—
4028	MD50-13-24076	50-603470	650	10/25/2012	—	—	—	—	—	—	—	69.19	—	—	—	—	—	—
4028	MD50-13-24036	50-24813	358	10/23/2012	—	—	—	396.10	—	283.01	—	741.31	—	—	—	—	—	—
4028	MD50-13-24037	50-24813	450	10/23/2012	—	—	—	446.39	—	—	—	889.58	—	—	—	—	—	—
4028	MD50-13-24038	50-24813	25	10/23/2012	—	—	—	1257.45	—	1122.30	—	385.48	—	—	—	—	—	—
4028	MD50-13-24039	50-24813	600	10/23/2012	—	—	—	132.03	—	—	—	385.48	—	—	—	—	—	—
4028	MD50-13-24040	50-24813	150	10/23/2012	—	—	—	1005.96	—	1659.04	—	593.05	—	—	—	324.91	—	—
4028	MD50-13-24041	50-24813	241	10/23/2012	—	—	—	1446.07	—	1805.43	—	1680.31	—	—	—	515.10	—	—
4028	MD50-13-24095	50-613185	350	10/22/2012	—	—	—	113.17	—	—	—	192.74	—	—	—	—	—	—
4028	MD50-13-24096	50-613185	450	10/22/2012	—	—	—	69.16	—	—	—	133.44	—	—	—	—	—	—
4028	MD50-13-24097	50-613185	600	10/22/2012	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4028	MD50-13-24098	50-613185	235	10/22/2012	—	—	—	138.32	—	92.71	—	212.51	—	—	—	—	—	—
4028	MD50-13-24099	50-613185	145	10/22/2012	—	—	—	94.31	—	107.35	—	148.26	—	—	—	—	—	—
4028	MD50-13-24158	50-603468	233	10/19/2012	—	—	—	572.14	—	585.55	—	691.89	—	—	—	210.00	—	—
4028	MD50-13-24159	50-603468	142	10/19/2012	—	—	—	364.66	—	478.20	—	425.02	—	—	—	150.57	—	—

Table C-5.0-5 (continued)

Sampling Plan 2012	Field Sample ID	Location ID	Depth (ft)	Date	Benzene	Butadiene[1,3-]	Butanol[1-]	Carbon Tetrachloride	Chlorodifluoromethane	Chloroform	Cyclohexane	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Ethanol
Groundwater Tier 1 Screening Level					**1140**	**547**	**720**	**5650**	**129,000**	**12,000**	**79,7300,000**	**2,780,000**	**5750**	**242**	**7490**	**11,700**	**580**	**na[a]**
4028	MD50-13-24160	50-603468	354	10/19/2012	—	—	—	377.24	—	248.86	—	543.63	—	—	—	95.10	—	—
4028	MD50-13-24161	50-603468	403	10/19/2012	—	—	—	440.11	—	204.94	—	691.89	—	—	—	—	—	—
4028	MD50-13-24072	50-613184	664.5	10/18/2012	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4028	MD50-13-24073	50-613184	600	10/18/2012	—	—	—	—	—	—	—	138.38	—	—	—	—	—	—
4028	MD50-13-24074	50-613184	500	10/18/2012	—	—	—	138.32	—	—	—	296.53	—	—	—	—	—	—
4028	MD50-13-24091	50-603503	450	10/17/2012	—	—	—	88.02	—	—	—	98.84	—	—	—	—	—	—
4028	MD50-13-24092	50-603503	347	10/17/2012	—	—	—	75.45	—	53.68	—	88.96	—	—	—	—	—	—
4028	MD50-13-24093	50-603503	237	10/17/2012	—	—	—	106.88	—	126.87	—	98.84	—	—	—	—	—	—
4028	MD50-13-24094	50-603503	133	10/17/2012	—	—	—	56.59	—	102.47	—	74.13	—	—	—	—	—	—
4028	MD50-13-24046	50-24822	142	10/16/2012	—	—	—	226.34	—	585.55	—	741.31	—	—	—	134.72	—	—
4028	MD50-13-24070	50-603467	244	10/16/2012	—	—	—	628.73	—	731.93	—	489.27	—	—	—	202.08	—	—
4028	MD50-13-24066	50-603467	143	10/15/2012	—	—	—	345.80	—	487.95	—	207.57	—	—	—	95.10	—	—
4028	MD50-13-24067	50-603467	600	10/15/2012	—	—	—	125.75	—	—	—	168.03	—	—	—	—	—	—
4028	MD50-13-24068	50-603467	360	10/15/2012	—	—	—	534.42	—	400.12	—	410.19	—	—	—	—	—	—
4028	MD50-13-24069	50-603467	500	10/15/2012	—	—	—	213.77	—	—	—	256.99	—	—	—	—	—	—
4028	MD50-13-24042	50-24822	25	10/11/2012	—	—	—	75.45	—	273.25	—	222.39	—	—	—	—	—	—
4028	MD50-13-24043	50-24822	450	10/11/2012	—	—	—	144.61	—	—	—	454.67	—	—	—	—	—	—
4028	MD50-13-24044	50-24822	235	10/11/2012	—	—	—	295.50	—	585.55	—	1087.26	—	—	—	158.49	—	—
4028	MD50-13-24045	50-24822	351	10/11/2012	—	—	—	125.75	—	82.95	—	439.85	—	—	—	—	—	—
4028	MD50-13-24052	50-603062	122	10/10/2012	—	—	—	—	—	68.31	—	222.39	—	—	—	—	—	—
4028	MD50-13-24053	50-603062	217	10/10/2012	—	—	—	—	—	—	—	281.70	—	—	—	—	—	—
4028	MD50-13-24054	50-603062	337	10/10/2012	—	—	—	—	—	—	—	177.92	—	—	—	—	—	—
4028	MD50-13-24055	50-603062	450	10/10/2012	—	—	—	—	—	—	—	113.67	—	—	—	—	—	—
4028	MD50-13-24061	50-603064	113	10/09/2012	—	—	—	—	—	927.11	—	593.05	—	—	673.60	269.44	—	—
4028	MD50-13-24062	50-603064	214	10/09/2012	—	—	—	—	—	487.95	—	840.15	—	—	633.97	202.08	—	—
4028	MD50-13-24063	50-603064	332	10/09/2012	—	—	—	182.33	—	—	—	593.05	—	—	142.64	—	—	—
4028	MD50-13-24064	50-603064	500	10/09/2012	—	—	—	—	—	—	—	281.70	—	—	—	—	—	—
3799	MD50-12-12093	50-603064	500.0	04/12/2012	—	—	—	—	—	—	—	266.88	—	—	—	—	—	—

Table C-5.0-5 (continued)

Sampling Plan 2012	Field Sample ID	Location ID	Depth (ft)	Date	Benzene	Butadiene[1,3-]	Butanol[1-]	Carbon Tetrachloride	Chlorodifluoromethane	Chloroform	Cyclohexane	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Ethanol
Groundwater Tier 1 Screening Level					**1140**	**547**	**720**	**5650**	**129,000**	**12,000**	**79,7300,000**	**2,780,000**	**5750**	**242**	**7490**	**11,700**	**580**	**na[a]**
3799	MD50-12-12094	50-603064	332.0–	04/12/2012	—	—	—	176.04	—	58.56	—	642.48	—	—	146.61	—	—	—
3799	MD50-12-12095	50-603064	214.0	04/12/2012	—	—	—	289.22	—	585.55	—	988.43	—	—	673.60	225.86	—	—
3799	MD50-12-12096	50-603064	113.0	04/12/2012	—	—	—	150.90	—	780.73	—	543.63	—	—	554.73	213.97	46.18	—
3799	MD50-12-12101	50-603383	26.0	04/06/2012	—	—	—	—	—	—	—	108.73	—	—	—	—	—	—
3799	MD50-12-12097	50-603383	139.0	04/05/2012	—	—	—	176.04	—	170.79	—	336.06	—	—	79.25	43.59	341.76	—
3799	MD50-12-12098	50-603383	244.0	04/05/2012	—	—	—	264.07	—	121.99	—	291.59	—	—	47.55	51.51	351.00	—
3799	MD50-12-12099	50-603383	359.0	04/05/2012	—	—	—	113.17	—	—	—	148.26	—	—	—	—	—	—
3799	MD50-12-12100	50-603383	450.0	04/05/2012	—	—	—	213.77	—	—	—	232.28	—	—	—	—	—	—
3799	MD50-12-12088	50-603063	25.0	04/04/2012	—	—	245.40	—	—	—	—	256.99	—	—	—	—	—	—
3799	MD50-12-12092	50-603063	450.0	04/04/2012	—	—	—	194.91	—	156.15	—	306.41	—	—	—	—	—	—
3799	MD50-12-12089	50-603063	128.0	04/03/2012	—	—	—	176.04	261.55	331.81	—	593.06	84.94	—	320.95	47.55	—	—
3799	MD50-12-12090	50-603063	228.0	04/03/2012	—	—	—	408.68	353.44	585.55	—	840.16	48.54	—	372.46	150.57	45.26	—
3799	MD50-12-12091	50-603063	347.0	04/03/2012	—	—	—	226.34	—	219.58	—	425.02	—	—	55.47	43.59	—	—
3799	MD50-12-12128	50-603472	27.0	04/02/2012	—	—	—	—	—	312.29	—	69.19	—	—	—	—	—	—
3799	MD50-12-12129	50-603472	146.0	04/02/2012	—	—	—	289.22	—	683.14	—	271.82	—	56.63	—	134.72	120.08	—
3799	MD50-12-12130	50-603472	450.0	04/02/2012	—	—	—	352.09	141.38	68.31	—	464.56	—	—	—	—	—	—
3799	MD50-12-12131	50-603472	364.0	04/02/2012	—	—	—	339.51	151.98	131.75	—	454.68	—	—	—	39.62	—	—
3799	MD50-12-12132	50-603472	292.0	04/02/2012	—	—	—	452.69	194.39	536.75	—	459.62	—	—	—	146.61	50.80	—
3799	MD50-12-12133	50-613182	550.0	04/02/2012	—	—	—	176.04	—	—	—	321.24	—	—	—	—	—	—
3799	MD50-12-12134	50-613182	632.0	04/02/2012	—	—	—	—	—	—	—	6.92	—	—	—	—	—	9.04 (J)
3799	MD50-12-12121	50-603471	450.0	03/30/2012	—	—	—	603.58	—	536.75	—	691.90	—	—	—	158.50	-	—
3799	MD50-12-12122	50-603471	288.0	03/30/2012	—	—	—	1320.33	—	1854.24	—	1482.64	—	—	—	554.73	-	—
3799	MD50-12-12123	50-603471	360.0	03/30/2012	—	—	—	817.35	—	780.73	—	1235.53	—	—	—	261.52	-	—
3799	MD50-12-12124	50-603471	90.0	03/30/2012	—	—	—	1571.83	—	1903.04	—	469.50	—	149.66	—	245.67	101.61	—
3799	MD50-12-12125	50-603471	209.0	03/30/2012	—	—	—	1068.84	—	2098.22	—	1235.53	—	137.53	—	554.73	110.84	—
3799	MD50-12-12126	50-613183	642.5	03/30/2012	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3799	MD50-12-12127	50-613183	550.0	03/30/2012	—	—	—	176.04	—	—	—	479.39	—	—	—	—	—	—
3799	MD50-12-12118	50-603470	351.0	03/29/2012	—	—	—	408.68	—	336.69	—	1284.95	—	—	—	130.76	—	—

Table C-5.0-5 (continued)

Sampling Plan 2012	Field Sample ID	Location ID	Depth (ft)	Date	Benzene	Butadiene[1,3-]	Butanol[1-]	Carbon Tetrachloride	Chlorodifluoromethane	Chloroform	Cyclohexane	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Ethanol
Groundwater Tier 1 Screening Level					**1140**	**547**	**720**	**5650**	**129,000**	**12,000**	**79,7300,000**	**2,780,000**	**5750**	**242**	**7490**	**11,700**	**580**	**na[a]**
3799	MD50-12-12119	50-603470	278.0	03/29/2012	—	—	—	628.73	—	1073.51	—	1779.16	—	—	—	352.65	—	—
3799	MD50-12-12120	50-603470	203.0	03/29/2012	—	—	—	370.95	—	1073.51	—	1087.27	—	—	—	293.22	—	—
3799	MD50-12-12114	50-603470	83.0	03/28/2012	—	—	—	320.65	—	1171.10	—	425.02	—	—	—	186.23	45.26	—
3799	MD50-12-12115	50-603470	450.0	03/28/2012	—	—	—	238.92	—	73.19	—	741.32	—	—	—	—	—	—
3799	MD50-12-12116	50-603470	600.0	03/28/2012	—	—	—	—	—	—	—	355.83	—	—	—	—	—	—
3799	MD50-12-12117	50-603470	650.0	03/28/2012	—	—	—	—	—	—	—	133.44	—	—	—	—	—	—
3799	MD50-12-12068	50-24813	450.0	03/27/2012	—	—	—	427.54	—	121.99	—	889.58	—	—	—	47.55	—	—
3799	MD50-12-12069	50-24813	600.0	03/27/2012	—	—	—	106.88	—	—	—	321.24	—	—	—	—	—	—
3799	MD50-12-12064	50-24813	358.0	03/26/2012	—	—	—	817.35	—	585.55	—	1482.64	—	—	—	213.97	—	—
3799	MD50-12-12065	50-24813	241.0	03/26/2012	—	—	—	1886.19	—	2293.41	—	2223.96	—	—	—	713.23	—	—
3799	MD50-12-12066	50-24813	150.0	03/26/2012	—	—	—	1760.44	—	2732.57	—	988.43	—	97.08	—	554.73	—	—
3799	MD50-12-12067	50-24813	25.0	03/26/2012	—	—	—	1320.33	—	1122.30	—	484.33	—	—	—	63.40	—	—
3799	MD50-12-12060	50-24784	155.0	03/23/2012	—	—	—	188.62	—	287.90	—	143.32	—	—	—	—	64.66	—
3799	MD50-12-12061	50-24784	244.0	03/23/2012	—	—	—	289.22	—	112.23	—	192.74	—	—	—	—	—	—
3799	MD50-12-12062	50-24784	362.0	03/23/2012	—	—	—	370.95	—	—	—	266.88	—	—	—	—	—	—
3799	MD50-12-12063	50-24784	450.0	03/23/2012	—	—	—	276.64	—	—	—	227.34	—	—	—	—	—	—
3799	MD50-12-12079	50-603061	25	03/22/2012	—	—	—	—	—	—	—	840.16	—	—	324.91	—	—	—
3799	MD50-12-12075	50-603061	450	03/21/2012	—	—	—	—	—	—	—	138.38	—	—	—	—	—	—
3799	MD50-12-12076	50-603061	347	03/21/2012	—	—	—	80.02	—	—	—	256.99	—	—	245.67	—	—	—
3799	MD50-12-12077	50-603061	228	03/21/2012	—	—	—	—	—	—	—	64.25	—	—	210.01	—	—	—
3799	MD50-12-12078	50-603061	128	03/21/2012	—	—	—	—	—	—	—	425.02	—	—	1624.57	—	—	—
3799	MD50-12-12087	50-603062	122	03/20/2012	—	—	—	—	—	73.19	—	237.22	—	—	—	—	—	—
3799	MD50-12-12084	50-603062	450.0	03/19/2012	—	—	—	—	—	—	—	113.67	—	—	—	—	—	—
3799	MD50-12-12085	50-603062	337.0	03/19/2012	—	—	—	—	—	—	—	187.80	—	—	—	—	—	—
3799	MD50-12-12086	50-603062	217.0	03/19/2012	—	—	—	55.96	—	48.80	—	306.41	—	—	—	—	—	—
3799	MD50-12-12102	50-603467	244.0	03/16/2012	—	—	—	458.97	—	356.21	—	400.31	—	—	—	103.02	—	—
3799	MD50-12-12104	50-603467	500.0	03/16/2012	—	—	—	132.03	—	78.07	—	197.69	—	—	—	—	—	—
3799	MD50-12-12106	50-603467	143.0	03/16/2012	—	—	—	440.11	—	683.14	—	291.59	—	—	—	130.76	—	—

Table C-5.0-5 (continued)

Sampling Plan 2012	Field Sample ID	Location ID	Depth (ft)	Date	Benzene	Butadiene[1,3-]	Butanol[1-]	Carbon Tetrachloride	Chlorodifluoromethane	Chloroform	Cyclohexane	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Ethanol
Groundwater Tier 1 Screening Level					**1140**	**547**	**720**	**5650**	**129,000**	**12,000**	**79,7300,000**	**2,780,000**	**5750**	**242**	**7490**	**11,700**	**580**	**na[a]**
3799	MD50-12-12135	50-603503	237.0	03/15/2012	—	—	—	106.88	—	146.39	—	113.67	—	—	—	—	46.18	—
3799	MD50-12-12136	50-603503	133.0	03/15/2012	181.98	46.43	—	—	—	—	61.92	—	—	—	—	—	—	527.26
3799	MD50-12-12137	50-603503	347.0	03/15/2012	—	—	—	62.87	—	53.68	—	79.07	—	—	—	—	—	—
3799	MD50-12-12138	50-603503	450.0	03/15/2012	—	—	—	88.02	—	—	—	98.84	—	—	—	—	—	—
3799	MD50-12-12103	50-603467	360.0	03/14/2012	—	—	—	691.60	—	780.73	—	489.27	—	—	—	206.04	—	—
3799	MD50-12-12105	50-603467	600.0	03/14/2012	—	—	—	138.32	—	—	—	187.80	—	—	—	—	—	—
3799	MD50-12-12072	50-24822	235.0	03/13/2012	—	—	—	326.94	—	585.55	—	1186.11	—	—	—	154.53	—	—
3799	MD50-12-12074	50-24822	25	03/13/2012	—	—	—	81.73	—	287.90	—	256.99	—	—	—	—	—	—
3799	MD50-12-12070	50-24822	450.0	03/12/2012	—	—	—	150.90	—	—	—	494.21	—	—	—	—	—	—
3799	MD50-12-12071	50-24822	351.0	03/12/2012	—	—	—	207.48	—	136.63	—	691.90	—	—	—	47.55	—	—
3799	MD50-12-12073	50-24822	142.0	03/12/2012	—	—	—	226.34	—	585.55	—	691.90	—	—	—	114.91	—	—
3799	MD50-12-12108	50-603468	142	03/09/2012	—	—	—	176.04	—	263.50	—	177.92	—	—	—	71.32	—	—
3799	MD50-12-12109	50-603468	233	03/09/2012	—	—	—	477.84	—	585.55	—	543.63	—	—	—	198.12	—	—
3799	MD50-12-12110	50-603468	354	03/09/2012	—	—	—	591.01	—	390.37	—	790.74	—	—	—	146.61	—	—
3799	MD50-12-12107	50-603468	403	03/08/2012	—	—	—	515.56	—	239.10	—	741.32	—	—	—	95.10	—	—
3799	MD50-12-12111	50-613184	664.5	03/08/2012	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3799	MD50-12-12112	50-613184	600	03/08/2012	—	—	—	—	—	—	—	143.32	—	—	—	—	—	—
3799	MD50-12-12113	50-613184	500	03/08/2012	—	—	—	138.32	—	—	—	291.59	—	—	—	—	—	—
3799	MD50-12-12143	50-613185	145	03/07/2012	—	—	—	113.17	—	112.23	—	158.15	—	—	—	—	—	—
3799	MD50-12-12139	50-613185	235	03/06/2012	—	—	—	163.47	—	107.35	—	222.40	—	—	—	39.23	—	—
3799	MD50-12-12140	50-613185	350	03/06/2012	—	—	—	113.17	—	—	—	202.63	—	—	—	—	—	—
3799	MD50-12-12141	50-613185	450	03/06/2012	—	—	—	69.16	—	—	—	138.38	—	—	—	—	—	—
3799	MD50-12-12142	50-613185	600	03/06/2012	—	—	—	—	—	—	—	79.07	—	—	—	—	—	—

Table C-5.0-5 (continued)

Sampling Plan 2012	Field Sample ID	Location ID	Depth (ft)	Date	Ethylbenzene	Hexane	Hexanone [2-]	Methylene Chloride	n-Heptane	Propylene	Tetrachloroethylene	Tetrahydrofuran	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethylene	Trichlorofluoromethane	Xylene[1,3-]+Xylene[1,4-]
Groundwater Tier 1 Screening Level					**226,000**	**23,500,000**	**145**	**665**	**491,000**	**50,500,000**	**3630**	**9,790**	**272,000**	**1,190,000,000**	**141,000**	**2020**	**4,540,000**	**131,000**
4028	MD50-13-24157	50-603383	26	11/16/2012	—	—	—	—	—	—	332.13	—	—	375.28	70.88	751.86	—	—
4028	MD50-13-24153	50-603383	139	11/15/2012	—	—	—	38.19	—	—	1152.28	—	—	1225.41	207.20	4296.35	—	—
4028	MD50-13-24154	50-603383	244	11/15/2012	—	—	—	55.54	—	—	1220.07	—	—	758.22	163.58	5370.44	—	—
4028	MD50-13-24155	50-603383	359	11/15/2012	—	—	—	—	—	—	257.57	—	—	275.72	—	1450.02	—	—
4028	MD50-13-24156	50-603383	450	11/15/2012	—	—	—	—	—	—	257.57	—	—	84.25	—	1342.61	—	—
4028	MD50-13-24060	50-603063	25	11/14/2012	—	—	—	—	—	—	345.69	—	—	2297.64	305.35	1396.31	—	—
4028	MD50-13-24056	50-603063	128	11/13/2012	—	—	—	—	—	—	745.60	—	—	3676.23	599.79	6981.57	—	—
4028	MD50-13-24057	50-603063	228	11/13/2012	—	—	—	-	—	—	1491.19	—	—	5131.41	654.31	22,555.9	—	—
4028	MD50-13-24058	50-603063	347	11/13/2012	—	—	—	55.54	—	—	576.14	—	—	1148.82	—	11,277.9	—	—
4028	MD50-13-24059	50-603063	450	11/13/2012	—	—	—	—	—	—	325.35	—	—	137.86	—	7518.62	—	—
4028	MD50-13-24051	50-603061	25	11/09/2012	—	—	—	—	—	—	101.67	—	—	11,488.20	1526.73	461.86	—	—
4028	MD50-13-24047	50-603061	128	11/08/2012	—	—	—	—	—	—	298.24	—	—	27,571.70	5179.97	2738.92	—	—
4028	MD50-13-24048	50-603061	228	11/08/2012	—	—	—	—	—	—	210.12	—	—	19,147.00	3435.14	3437.08	—	—
4028	MD50-13-24049	50-603061	347	11/08/2012	—	—	—	—	—	—	81.34	—	—	5820.70	403.49	1181.50	—	—
4028	MD50-13-24050	50-603061	450	11/08/2012	—	—	—	—	—	—	—	—	—	1531.76	—	531.67	—	—
4028	MD50-13-24032	50-24784	155	11/06/2012	—	—	—	—	—	—	2304.59	—	—	137.86	54.53	3705.64	—	—
4028	MD50-13-24033	50-24784	244	11/06/2012	—	—	—	—	—	—	1897.90	—	—	99.57	—	3974.16	—	—
4028	MD50-13-24034	50-24784	362	11/06/2012	—	—	—	—	—	—	1355.64	—	—	—	—	2792.65	—	—
4028	MD50-13-24035	50-24784	450	11/06/2012	—	—	—	—	—	—	454.14	—	—	—	—	966.69	—	—
4028	MD50-13-24089	50-613182	550	11/06/2012	—	—	—	—	—	—	169.46	—	—	—	—	3222.29	—	—
4028	MD50-13-24090	50-613182	632.5	11/06/2012	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4028	MD50-13-24143	50-603472	27	11/02/2012	—	—	—	—	—	—	494.80	—	—	—	—	2685.22	—	—
4028	MD50-13-24144	50-603472	146	11/02/2012	—	—	—	416.57	—	—	813.38	—	—	—	—	13,426.1	—	—
4028	MD50-13-24145	50-603472	364	11/02/2012	—	—	—	229.12	—	—	813.38	—	—	—	—	17,185.4	—	—
4028	MD50-13-24146	50-603472	450	11/02/2012	—	—	—	79.84	—	—	576.14	—	—	—	—	11,815.0	—	—

Table C-5.0-5 (continued)

Sampling Plan 2012	Field Sample ID	Location ID	Depth (ft)	Date	Ethylbenzene	Hexane	Hexanone [2-]	Methylene Chloride	n-Heptane	Propylene	Tetrachloroethylene	Tetrahydrofuran	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethylene	Trichlorofluoromethane	Xylene[1,3-]+Xylene[1,4-]
Groundwater Tier 1 Screening Level					226,000	23,500,000	145	665	491,000	50,500,000	3630	9,790	272,000	1,190,000,000	141,000	2020	4,540,000	131,000
4028	MD50-13-24147	50-603472	292	11/02/2012	—	—	—	867.86	—	—	1558.97	—	—	—	—	31,148.6	—	—
4028	MD50-13-24086	50-603471	450	10/31/2012	—	—	—	347.14	—	—	745.60	—	—	—	—	38,667.2	—	—
4028	MD50-13-24087	50-613183	550	10/31/2012	—	—	—	—	—	—	74.56	—	—	—	—	3813.01	—	—
4028	MD50-13-24088	50-613183	642.5	10/31/2012	—	42.27	—	—	—	—	—	—	—	—	—	75.19	—	—
4028	MD50-13-24082	50-603471	90	10/30/2012	—	—	—	256.89	—	—	1016.72	—	—	314.01	—	19,870.6	—	—
4028	MD50-13-24083	50-603471	209	10/30/2012	—	—	—	902.57	—	—	948.94	—	—	—	—	35,444.9	—	—
4028	MD50-13-24084	50-603471	288	10/30/2012	—	—	—	1735.72	—	—	948.94	—	—	—	—	53,167.4	—	—
4028	MD50-13-24085	50-603471	360	10/30/2012	—	—	—	833.14	—	—	881.16	—	—	—	—	44,574.7	—	—
4028	MD50-13-24081	50-603470	450	10/29/2012	—	—	—	79.84	—	—	149.12	—	—	183.81	—	19,333.6	—	—
4028	MD50-13-24077	50-603470	83	10/26/2012	—	—	—	—	—	—	1220.07	—	—	528.46	—	25,778.1	—	—
4028	MD50-13-24078	50-603470	203	10/26/2012	—	—	—	590.14	—	—	—	—	—	765.88	—	40,278.3	—	—
4028	MD50-13-24079	50-603470	278	10/26/2012	—	—	—	659.57	—	—	—	—	—	842.47	—	45,111.7	—	—
4028	MD50-13-24080	50-603470	351	10/26/2012	—	—	—	225.64	—	—	—	—	—	—	—	22,555.9	—	—
4028	MD50-13-24075	50-603470	600	10/25/2012	—	—	—	—	—	—	—	—	—	—	—	1557.43	—	—
4028	MD50-13-24076	50-603470	650	10/25/2012	—	—	—	—	—	—	—	—	—	—	—	85.93	—	—
4028	MD50-13-24036	50-24813	358	10/23/2012	—	—	—	—	—	—	—	—	—	—	—	26,315.2	—	—
4028	MD50-13-24037	50-24813	450	10/23/2012	—	—	—	159.69	—	—	271.13	—	—	—	—	26,315.2	—	—
4028	MD50-13-24038	50-24813	25	10/23/2012	—	—	—	—	—	—	454.14	—	—	—	—	13,426.1	—	—
4028	MD50-13-24039	50-24813	600	10/23/2012	—	—	—	—	—	—	—	—	—	—	—	3329.67	—	—
4028	MD50-13-24040	50-24813	150	10/23/2012	—	—	—	347.14	—	—	386.35	—	—	—	—	26,852.2	—	—
4028	MD50-13-24041	50-24813	241	10/23/2012	—	—	—	1006.72	—	—	813.38	—	—	—	—	69,815.7	—	—
4028	MD50-13-24095	50-613185	350	10/22/2012	—	—	—	—	—	—	—	—	—	—	—	4081.54	—	—
4028	MD50-13-24096	50-613185	450	10/22/2012	—	—	—	—	—	—	—	—	—	—	—	1557.43	—	—
4028	MD50-13-24097	50-613185	600	10/22/2012	—	—	—	—	—	—	—	—	—	—	—	96.67	—	—
4028	MD50-13-24098	50-613185	235	10/22/2012	—	—	—	62.49	—	—	122.01	—	—	—	—	7518.62	—	—
4028	MD50-13-24099	50-613185	145	10/22/2012	—	—	—	—	—	—	81.34	—	—	—	—	4618.58	—	—
4028	MD50-13-24158	50-603468	233	10/19/2012	—	—	—	555.43	—	—	433.80	—	—	—	—	29,537.4	—	—
4028	MD50-13-24159	50-603468	142	10/19/2012	—	—	—	208.29	—	—	372.80	—	—	—	—	24,167.0	—	—

Table C-5.0-5 (continued)

Sampling Plan 2012	Field Sample ID	Location ID	Depth (ft)	Date	Ethylbenzene	Hexane	Hexanone [2-]	Methylene Chloride	n-Heptane	Propylene	Tetrachloroethylene	Tetrahydrofuran	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethylene	Trichlorofluoromethane	Xylene[1,3-]+Xylene[1,4-]
Groundwater Tier 1 Screening Level					**226,000**	**23,500,000**	**145**	**665**	**491,000**	**50,500,000**	**3630**	**9,790**	**272,000**	**1,190,000,000**	**141,000**	**2020**	**4,540,000**	**131,000**
4028	MD50-13-24160	50-603468	354	10/19/2012	—	—	—	243.00	—	—	257.57	—	—	—	—	20,407.7	—	—
4028	MD50-13-24161	50-603468	403	10/19/2012	—	—	—	211.76	—	—	305.02	—	—	—	—	22,555.9	—	—
4028	MD50-13-24072	50-613184	664.5	10/18/2012	—	—	—	—	—	—	—	—	—	—	—	107.41	—	—
4028	MD50-13-24073	50-613184	600	10/18/2012	—	—	—	—	—	—	—	—	—	—	—	698.16	—	—
4028	MD50-13-24074	50-613184	500	10/18/2012	—	—	—	—	—	—	—	—	—	—	—	4135.24	—	—
4028	MD50-13-24091	50-603503	450	10/17/2012	—	—	—	—	—	—	244.01	—	—	—	—	2953.74	—	—
4028	MD50-13-24092	50-603503	347	10/17/2012	—	—	—	38.19	—	—	311.80	—	—	—	—	2900.04	—	—
4028	MD50-13-24093	50-603503	237	10/17/2012	—	—	—	111.09	—	—	528.70	—	—	—	—	4887.10	—	—
4028	MD50-13-24094	50-603503	133	10/17/2012	—	—	—	—	—	—	474.47	—	—	122.54	—	2148.18	—	—
4028	MD50-13-24046	50-24822	142	10/16/2012	—	—	—	166.63	—	—	210.12	—	—	—	—	24,704.0	—	—
4028	MD50-13-24070	50-603467	244	10/16/2012	—	—	—	590.14	—	—	881.16	—	—	—	—	30,074.5	—	—
4028	MD50-13-24066	50-603467	143	10/15/2012	—	—	—	104.14	—	—	—	—	—	—	—	10,740.9	—	—
4028	MD50-13-24067	50-603467	600	10/15/2012	—	—	—	—	—	—	115.23	100.21	—	—	—	3651.90	—	—
4028	MD50-13-24068	50-603467	360	10/15/2012	—	—	—	145.80	—	—	745.60	—	—	—	—	29,000.4	—	—
4028	MD50-13-24069	50-603467	500	10/15/2012	—	—	—	—	—	—	257.57	—	—	—	—	8592.71	—	—
4028	MD50-13-24042	50-24822	25	10/11/2012	—	—	—	—	—	—	183.01	—	—	—	—	6981.57	—	—
4028	MD50-13-24043	50-24822	450	10/11/2012	—	—	—	—	—	—	—	—	—	—	—	9129.75	—	—
4028	MD50-13-24044	50-24822	235	10/11/2012	—	—	—	329.79	—	—	—	—	—	—	—	36,519.0	—	—
4028	MD50-13-24045	50-24822	351	10/11/2012	—	—	—	62.49	—	—	—	—	—	—	—	11.815.0	—	—
4028	MD50-13-24052	50-603062	122	10/10/2012	—	—	—	—	—	—	—	—	—	367.62	—	6444.53	—	—
4028	MD50-13-24053	50-603062	217	10/10/2012	—	—	—	—	—	—	—	—	—	444.21	—	6981.57	—	—
4028	MD50-13-24054	50-603062	337	10/10/2012	—	—	—	—	—	—	—	—	—	114.88	—	2040.77	—	—
4028	MD50-13-24055	50-603062	450	10/10/2012	—	—	—	—	—	—	—	—	—	—	—	590.75	—	—
4028	MD50-13-24061	50-603064	113	10/09/2012	—	—	—	—	—	—	657.48	—	—	12,254.10	2671.77	28,463.3	—	—
4028	MD50-13-24062	50-603064	214	10/09/2012	—	—	—	381.86	—	—	467.69	—	—	11,488.20	1853.88	29,537.4	—	—
4028	MD50-13-24063	50-603064	332	10/09/2012	—	—	—	65.96	—	—	203.34	—	—	3293.29	169.03	13,963.1	—	—
4028	MD50-13-24064	50-603064	500	10/09/2012	—	—	—	—	—	—	—	—	—	183.81	—	1503.72	—	—
3799	MD50-12-12093	50-603064	500.0	04/12/2012	—	—	—	—	—	—	—	—	—	145.52	—	1396.33	—	—

Table C-5.0-5 (continued)

Sampling Plan 2012	Field Sample ID	Location ID	Depth (ft)	Date	Ethylbenzene	Hexane	Hexanone [2-]	Methylene Chloride	n-Heptane	Propylene	Tetrachloroethylene	Tetrahydrofuran	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethylene	Trichlorofluoromethane	Xylene[1,3-]+Xylene[1,4-]
Groundwater Tier 1 Screening Level					**226,000**	**23,500,000**	**145**	**665**	**491,000**	**50,500,000**	**3630**	**9,790**	**272,000**	**1,190,000,000**	**141,000**	**2020**	**4,540,000**	**131,000**
3799	MD50-12-12094	50-603064	332.0	04/12/2012	—	—	—	62.49	—	—	196.57	—	—	3369.91	174.49	12,889.2	—	—
3799	MD50-12-12095	50-603064	214.0	04/12/2012	—	—	—	416.58	—	—	576.15	—	—	12,254.20	2235.58	34,908.2	56.15	—
3799	MD50-12-12096	50-603064	113.0	04/12/2012	—	—	—	104.14	—	—	596.48	—	—	9956.55	2290.11	24,704.2	—	—
3799	MD50-12-12101	50-603383	26.0	04/06/2012	—	—	—	-	—	—	277.91	—	—	268.06	48.53	698.16	—	—
3799	MD50-12-12097	50-603383	139.0	04/05/2012	—	—	—	48.60	—	—	1220.08	—	—	1302.01	223.56	4994.55	—	—
3799	MD50-12-12098	50-603383	244.0	04/05/2012	—	—	—	69.43	—	—	1220.08	—	—	551.44	152.67	5370.49	—	—
3799	MD50-12-12099	50-603383	359.0	04/05/2012	—	—	—	—	—	—	210.12	—	—	114.88	—	1396.33	—	—
3799	MD50-12-12100	50-603383	450.0	04/05/2012	—	—	—	—	—	—	271.13	38.32	—	—	—	1342.62	—	—
3799	MD50-12-12088	50-603063	25.0	04/04/2012	—	—	—	—	—	—	359.25	—	—	2680.61	354.42	1611.15	—	—
3799	MD50-12-12092	50-603063	450.0	04/04/2012	—	—	—	—	—	—	372.80	—	—	114.88	—	8592.78	—	—
3799	MD50-12-12089	50-603063	128.0	04/03/2012	—	—	—	—	—	—	1084.51	—	—	5284.63	872.42	10,741.0	—	—
3799	MD50-12-12090	50-603063	228.0	04/03/2012	—	—	—	93.73	—	—	1694.55	—	—	5514.39	763.37	25,241.3	78.61	—
3799	MD50-12-12091	50-603063	347.0	04/03/2012	—	—	—	90.26	—	—	616.82	—	—	1302.01	52.35	12,889.2	—	—
3799	MD50-12-12128	50-603472	27.0	04/02/2012	—	—	—	—	—	—	596.48	—	—	—	52.89	3329.70	—	—
3799	MD50-12-12129	50-603472	146.0	04/02/2012	—	—	—	520.72	—	—	1084.51	—	—	122.54	—	17,185.6	—	—
3799	MD50-12-12130	50-603472	450.0	04/02/2012	—	—	—	86.79	—	—	671.04	—	—	—	—	12,889.2	—	—
3799	MD50-12-12131	50-603472	364.0	04/02/2012	—	—	—	222.17	—	—	813.38	—	—	—	—	15,574.4	—	—
3799	MD50-12-12132	50-603472	292.0–292.0	04/02/2012	—	—	—	867.87	—	—	1558.99	—	—	99.57	—	28,463.6	—	—
3799	MD50-12-12133	50-613182	550.0	04/02/2012	—	—	—	—	—	—	189.79	—	—	—	—	3490.82	—	—
3799	MD50-12-12134	50-613182	632.0	04/02/2012	—	—	—	—	—	18.92	—	—	—	—	—	6.98	—	—
3799	MD50-12-12121	50-603471	450.0	03/30/2012	—	—	—	381.86	—	—	813.38	—	—	145.52	—	39,741.6	—	—
3799	MD50-12-12122	50-603471	288.0	03/30/2012	—	—	—	2430.02	—	—	1491.20	—	—	513.15	—	69,816.3	—	—
3799	MD50-12-12123	50-603471	360.0	03/30/2012	—	—	—	1110.87	—	—	1084.51	—	—	321.67	—	53,167.8	72.99	—
3799	MD50-12-12124	50-603471	90.0	03/30/2012	—	—	—	295.07	—	—	1016.73	—	—	298.70	59.98	19,870.8	—	—
3799	MD50-12-12125	50-603471	209.0	03/30/2012	—	—	—	2082.88	—	—	1287.86	—	—	505.49	—	53,704.9	—	—
3799	MD50-12-12126	50-613183	642.5	03/30/2012	—	59.88	—	—	49.15	—	—	—	—	—	—	96.67	—	—
3799	MD50-12-12127	50-613183	550.0	03/30/2012	—	—	—	—	—	—	88.12	—	—	—	—	3813.05	—	—
3799	MD50-12-12118	50-603470	351.0	03/29/2012	—	—	—	381.86	—	—	332.13	—	—	520.80	—	40,278.7	51.66	—

Table C-5.0-5 (continued)

Sampling Plan 2012	Field Sample ID	Location ID	Depth (ft)	Date	Ethylbenzene	Hexane	Hexanone [2-]	Methylene Chloride	n-Heptane	Propylene	Tetrachloroethylene	Tetrahydrofuran	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethylene	Trichlorofluoromethane	Xylene[1,3-]+Xylene[1,4-]
Groundwater Tier 1 Screening Level					**226,000**	**23,500,000**	**145**	**665**	**491,000**	**50,500,000**	**3630**	**9,790**	**272,000**	**1,190,000,000**	**141,000**	**2020**	**4,540,000**	**131,000**
3799	MD50-12-12119	50-603470	278.0	03/29/2012	—	—	—	937.30	—	—	616.82	—	—	919.07	103.60	64,445.8	—	—
3799	MD50-12-12120	50-603470	203.0	03/29/2012	—	—	—	555.43	—	—	515.14	—	—	689.30	103.60	40,815.7	—	—
3799	MD50-12-12114	50-603470	83.0	03/28/2012	—	—	—	59.01	—	—	813.38	—	—	329.33	70.88	15,574.4	—	—
3799	MD50-12-12115	50-603470	450.0	03/28/2012	—	—	—	83.32	—	—	135.56	—	—	160.84	—	17,185.6	—	—
3799	MD50-12-12116	50-603470	600.0	03/28/2012	—	—	—	—	—	—	—	—	—	—	—	1718.56	—	—
3799	MD50-12-12117	50-603470	650.0	03/28/2012	—	—	—	—	—	—	—	—	—	—	—	80.56	—	—
3799	MD50-12-12068	50-24813	450.0	03/27/2012	—	—	—	159.69	—	—	257.57	—	—	—	—	24,704.2	—	—
3799	MD50-12-12069	50-24813	600.0	03/27/2012	—	—	—	—	—	—	—	—	—	—	—	2631.54	—	—
3799	MD50-12-12064	50-24813	358.0	03/26/2012	—	—	—	180.52	—	—	603.26	—	—	—	—	53,704.9	—	—
3799	MD50-12-12065	50-24813	241.0	03/26/2012	—	—	—	1666.30	—	—	1084.51	—	—	—	—	85,927.8	—	—
3799	MD50-12-12066	50-24813	150.0	03/26/2012	—	—	—	590.15	—	—	677.82	—	—	—	—	42,426.9	—	—
3799	MD50-12-12067	50-24813	25.0	03/26/2012	—	—	—	—	—	—	481.25	—	—	—	—	13,963.3	—	—
3799	MD50-12-12060	50-24784	155.0	03/23/2012	—	—	—	48.60	—	—	2304.59	—	—	168.50	54.53	3598.23	—	—
3799	MD50-12-12061	50-24784	244.0	03/23/2012	—	—	—	65.96	—	—	2101.24	—	—	114.88	—	4081.57	—	—
3799	MD50-12-12062	50-24784	362.0	03/23/2012	—	—	—	41.66	—	—	1355.64	—	—	—	—	2631.54	—	—
3799	MD50-12-12063	50-24784	450.0	03/23/2012	—	—	—	32.63	—	—	488.03	—	—	—	—	1020.39	—	—
3799	MD50-12-12079	50-603061	25	03/22/2012	—	—	—	—	—	—	108.45	—	—	15,317.80	1799.37	526.31	—	—
3799	MD50-12-12075	50-603061	450	03/21/2012	—	—	—	—	—	—	—	—	—	1455.19	—	483.34	—	—
3799	MD50-12-12076	50-603061	347	03/21/2012	—	—	—	—	—	—	81.34	—	—	6739.82	408.95	1342.62	—	—
3799	MD50-12-12077	50-603061	228	03/21/2012	—	—	—	—	—	—	—	—	—	3676.26	545.26	590.75	—	—
3799	MD50-12-12078	50-603061	128	03/21/2012	—	—	—	—	—	—	311.80	—	—	29,103.70	5452.64	2792.65	—	—
3799	MD50-12-12087	50-603062	122	03/20/2012	—	—	—	—	—	—	—	—	—	428.90	54.53	6444.58	—	—
3799	MD50-12-12084	50-603062	450.0	03/19/2012	—	—	—	—	—	—	—	—	—	—	—	590.75	—	—
3799	MD50-12-12085	50-603062	337.0	03/19/2012	—	—	—	—	—	—	—	—	—	122.54	—	2040.79	—	—
3799	MD50-12-12086	50-603062	217.0	03/19/2012	—	—	—	—	—	—	—	—	—	520.80	47.98	8055.73	—	—
3799	MD50-12-12102	50-603467	244.0	03/16/2012	—	—	—	131.92	—	—	677.82	—	—	—	—	25241.30	—	—
3799	MD50-12-12104	50-603467	500.0	03/16/2012	—	—	—	—	—	—	176.23	—	—	—	—	6981.63	—	—
3799	MD50-12-12106	50-603467	143.0	03/16/2012	—	—	—	180.52	—	—	433.81	—	—	—	—	15,037.4	—	—

Table C-5.0-5 (continued)

Sampling Plan 2012	Field Sample ID	Location ID	Depth (ft)	Date	Ethylbenzene	Hexane	Hexanone [2-]	Methylene Chloride	n-Heptane	Propylene	Tetrachloroethylene	Tetrahydrofuran	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethylene	Trichlorofluoromethane	Xylene[1,3-]+Xylene[1,4-]
Groundwater Tier 1 Screening Level					**226,000**	**23,500,000**	**145**	**665**	**491,000**	**50,500,000**	**3630**	**9,790**	**272,000**	**1,190,000,000**	**141,000**	**2020**	**4,540,000**	**131,000**
3799	MD50-12-12135	50-603503	237.0	03/15/2012	—	—	—	124.97	—	—	603.26	—	—	74.29	—	5370.49	—	—
3799	MD50-12-12136	50-603503	133.0	03/15/2012	43.40	137.38	—	—	—	223.60	74.56	—	312.59	—	—	435.01	—	117.16
3799	MD50-12-12137	50-603503	347.0	03/15/2012	—	—	—	38.19	—	—	291.46	—	—	—	—	2631.54	—	—
3799	MD50-12-12138	50-603503	450.0	03/15/2012	—	—	—	—	—	—	264.35	—	—	—	—	3114.88	—	—
3799	MD50-12-12103	50-603467	360.0	03/14/2012	—	—	—	624.86	—	—	881.17	—	—	—	—	30,611.8	—	—
3799	MD50-12-12105	50-603467	600.0	03/14/2012	—	—	736.92	—	—	—	108.45	55.00	—	—	—	3383.41	—	—
3799	MD50-12-12072	50-24822	235.0	03/13/2012	—	—	—	336.73	—	—	230.46	—	—	199.13	—	40,815.7	—	—
3799	MD50-12-12074	50-24822	25	03/13/2012	—	—	—	—	—	—	162.68	—	—	71.99	—	8055.73	—	—
3799	MD50-12-12070	50-24822	450.0	03/12/2012	—	—	—	—	—	—	—	—	—	—	—	10,741.0	—	—
3799	MD50-12-12071	50-24822	351.0	03/12/2012	—	—	—	111.09	—	—	108.45	—	—	—	—	22,019.0	—	—
3799	MD50-12-12073	50-24822	142.0	03/12/2012	—	—	—	156.22	—	—	189.79	—	—	145.52	—	25,241.3	—	—
3799	MD50-12-12108	50-603468	142	03/09/2012	—	—	—	97.20	—	—	196.57	—	—	—	—	10,203.9	—	—
3799	MD50-12-12109	50-603468	233	03/09/2012	—	—	—	520.72	—	—	420.25	—	—	—	—	29,000.6	—	—
3799	MD50-12-12110	50-603468	354	03/09/2012	—	—	—	381.86	—	—	420.25	—	—	—	—	32,760.0	—	—
3799	MD50-12-12107	50-603468	403	03/08/2012	—	—	—	267.30	—	—	338.91	—	—	—	—	27,926.5	—	—
3799	MD50-12-12111	50-613184	664.5	03/08/2012	—	—	—	—	—	—	—	—	—	—	—	102.04	—	—
3799	MD50-12-12112	50-613184	600	03/08/2012	—	—	—	—	—	—	—	—	—	—	—	698.16	—	—
3799	MD50-12-12113	50-613184	500	03/08/2012	—	—	—	—	—	—	65.07	—	—	—	—	4296.39	—	—
3799	MD50-12-12143	50-613185	145	03/07/2012	—	—	—	41.66	—	—	81.34	—	—	—	—	5316.78	—	—
3799	MD50-12-12139	50-613185	235	03/06/2012	—	—	—	83.32	—	—	115.23	—	—	—	—	8592.78	—	—
3799	MD50-12-12140	50-613185	350	03/06/2012	—	—	—	—	—	—	66.43	—	—	—	—	4242.69	—	—
3799	MD50-12-12141	50-613185	450	03/06/2012	—	—	—	—	—	—	—	—	—	—	—	1718.56	—	—
3799	MD50-12-12142	50-613185	600	03/06/2012	—	—	—	—	—	—	—	—	—	—	—	145.00	—	—

Notes: Concentrations are in $\mu g/m^3$. Data qualifiers are defined in Appendix A. Purple shading means the value exceeds Tier 1 groundwater screening level for the analyte listed.

[a] na = Not available.

[b] — = Not detected.

Table C-5.0-6
VOC Pore-Gas Results at MDA C for Fiscal Year 2013

Sampling Plan 2013	Field Sample ID	Location ID	Depth (ft)	Date	Acetone	Carbon Disulfide	Carbon Tetrachloride	Chlorodifluoromethane	Chloroform	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Ethanol	Ethyltoluene[4-]	Hexane
Groundwater Tier 1 Screening Level					**20,300**	**478,000**	**5650**	**129,000**	**12,000**	**2,780,000**	**5750**	**242**	**7490**	**11,700**	**580**	**na[a]**	**na**	**23,500,000**
4463	MD50-14-45813	50-603063	128	12/20/2013	—[b]	—	150.90	180.26	307.41	375.60	68.76	—	261.52	—	—	—	—	—
4463	MD50-14-45810	50-603063	450	12/19/2013	—	—	157.18	—	146.39	217.45	—	—	—	—	—	—	—	—
4463	MD50-14-45811	50-603063	347	12/19/2013	—	—	201.19	—	224.46	286.64	—	—	55.47	43.59	—	—	—	—
4463	MD50-14-45812	50-603063	228	12/19/2013	130.57	—	345.80	261.55	536.75	543.63	52.58	—	344.73	126.80	—	—	—	—
4463	MD50-14-45814	50-603063	25	12/19/2013	—	—	—	—	—	153.21	—	—	—	—	—	—	—	—
4463	MD50-14-45805	50-603061	450	12/17/2013	—	—	—	—	—	74.13	—	—	35.66	—	—	—	—	—
4463	MD50-14-45801	50-603061	25	12/16/2013	—	—	—	—	—	494.21	—	—	198.12	—	—	—	—	—
4463	MD50-14-45802	50-603061	128	12/16/2013	—	—	—	—	63.43	350.89	—	—	1466.07	—	—	—	—	—
4463	MD50-14-45803	50-603061	228	12/16/2013	—	—	—	—	—	123.55	—	—	594.36	—	—	—	—	—
4463	MD50-14-45804	50-603061	347	12/16/2013	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4463	MD50-14-45819	50-603383	26	12/13/2013	—	—	94.31	—	97.59	247.11	—	—	43.59	—	87.75	—	—	—
4463	MD50-14-45823	50-603383	450	12/13/2013	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4463	MD50-14-45820	50-603383	139	12/12/2013	—	—	138.32	—	126.87	222.40	—	—	51.51	—	203.21	—	—	—
4463	MD50-14-45821	50-603383	244	12/12/2013	—	—	289.22	—	146.39	271.82	—	—	67.36	51.51	346.38	—	—	—
4463	MD50-14-45822	50-603383	359	12/12/2013	—	—	163.47	—	—	153.21	—	—	—	—	—	—	—	—
4463	MD50-14-45786	50-24784	450	12/11/2013	—	—	169.76	—	—	123.55	—	—	—	—	—	—	—	—
4463	MD50-14-45787	50-24784	362	12/11/2013	—	—	232.63	—	—	138.38	—	—	—	—	—	—	—	—
4463	MD50-14-45788	50-24784	244	12/11/2013	—	—	182.33	—	92.71	93.90	—	—	—	—	—	—	—	—
4463	MD50-14-45789	50-24784	155	12/11/2013	—	—	150.90	—	297.66	98.84	—	—	—	—	64.66	—	—	—
4463	MD50-14-45858	50-603472	450	12/10/2013	90.21	—	176.04	—	121.99	197.69	—	—	—	—	—	—	—	—
4463	MD50-14-45859	50-603472	27	12/10/2013	—	—	—	—	229.34	—	—	—	—	—	—	—	—	—
4463	MD50-14-45860	50-613182	550	12/10/2013	—	—	119.46	—	—	197.69	—	—	—	—	—	—	—	—
4463	MD50-14-45861	50-613182	632	12/10/2013	—	—	—	—	—	—	—	—	—	—	—	22.60	—	—
4463	MD50-14-45855	50-603472	146	12/09/2013	—	—	188.62	—	585.55	143.32	—	44.49	—	118.87	92.37	—	—	—
4463	MD50-14-45856	50-603472	292	12/09/2013	—	—	396.10	166.12	536.75	331.12	—	—	—	154.53	45.26	—	—	—
4463	MD50-14-45857	50-603472	364	12/09/2013	—	—	138.32	—	68.31	148.26	—	—	—	—	—	—	—	—
4463	MD50-14-45853	50-613183	550	12/06/2013	—	—	144.61	—	—	326.18	—	—	—	—	—	—	—	—

Table C-5.0-6 (continued)

Sampling Plan 2013	Field Sample ID	Location ID	Depth (ft)	Date	Acetone	Carbon Disulfide	Carbon Tetrachloride	Chlorodifluoromethane	Chloroform	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Ethanol	Ethyltoluene[4-]	Hexane
Groundwater Tier 1 Screening Level					**20,300**	**478,000**	**5650**	**129,000**	**12,000**	**2,780,000**	**5750**	**242**	**7490**	**11,700**	**580**	**na[a]**	**na**	**23,500,000**
4463	MD50-14-45854	50-613183	642.5	12/06/2013	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4463	MD50-14-45852	50-603471	90.0	12/05/2013	—	—	1446.08	—	1805.45	336.06	—	117.30	—	245.67	87.75	—	—	—
4463	MD50-14-45848	50-603471	450	12/04/2013	—	—	389.81	—	361.09	425.02	—	—	—	106.98	—	—	—	—
4463	MD50-14-45849	50-603471	360	12/04/2013	—	—	817.35	—	829.53	889.58	—	—	—	285.29	—	—	—	—
4463	MD50-14-45850	50-603471	288	12/04/2013	—	—	817.35	—	1268.69	691.90	—	—	—	368.50	—	—	—	—
4463	MD50-14-45851	50-603471	209	12/04/2013	—	—	691.60	—	1073.51	642.48	—	—	—	313.03	—	—	—	—
4463	MD50-14-45845	50-603470	278	12/03/2013	—	—	458.97	—	878.33	988.43	—	—	—	285.29	—	—	—	—
4463	MD50-14-45846	50-603470	203	12/03/2013	—	—	276.64	—	878.33	593.06	—	—	—	249.63	—	—	—	—
4463	MD50-14-45847	50-603470	83	12/03/2013	—	—	257.78	—	927.12	252.05	—	—	—	130.76	—	—	—	—
4463	MD50-14-45841	50-603470	650	12/02/2013	—	—	6.92	—	—	28.66	—	—	—	—	—	—	—	—
4463	MD50-14-45842	50-603470	600	12/02/2013	—	—	69.16	—	—	266.88	—	—	—	—	—	—	—	—
4463	MD50-14-45843	50-603470	450	12/02/2013	—	—	201.19	—	78.07	494.21	—	—	—	—	—	—	—	—
4463	MD50-14-45844	50-603470	351	12/02/2013	—	—	396.10	—	341.57	889.58	—	—	—	126.80	—	—	—	—
4463	MD50-14-45790	50-24813	600	11/26/2013	—	—	—	—	—	88.96	—	—	—	—	—	—	—	—
4463	MD50-14-45791	50-24813	450	11/26/2013	—	—	414.96	—	136.63	691.90	—	—	—	47.55	—	—	—	—
4463	MD50-14-45792	50-24813	358	11/26/2013	—	—	754.48	—	536.75	1037.85	—	—	—	190.19	—	—	—	—
4463	MD50-14-45793	50-24813	241	11/26/2013	—	—	1257.46	—	1707.85	1136.69	—	—	—	475.48	—	—	—	—
4463	MD50-14-45794	50-24813	150	11/26/2013	—	—	1508.95	—	2732.57	593.06	—	93.03	—	515.11	—	—	—	—
4463	MD50-14-45795	50-24813	25	11/26/2013	—	—	1005.97	—	975.92	247.11	—	—	—	51.51	—	—	—	—
4463	MD50-14-45870	50-613185	145	11/22/2013	379.84	—	75.45	—	97.59	98.84	—	—	—	—	—	—	—	—
4463	MD50-14-45866	50-613185	600	11/21/2013	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4463	MD50-14-45867	50-613185	450	11/21/2013	—	—	62.87	—	—	118.61	—	—	—	—	—	—	—	—
4463	MD50-14-45868	50-613185	350	11/21/2013	—	—	100.60	—	—	143.32	—	—	—	—	—	—	—	—
4463	MD50-14-45869	50-613185	235	11/21/2013	—	—	138.32	—	97.59	168.03	—	—	—	—	—	—	—	—
4463	MD50-14-45829	50-603468	354	11/20/2013	—	—	509.27	—	375.73	593.06	—	—	—	138.68	—	—	—	—
4463	MD50-14-45830	50-603468	233	11/20/2013	—	—	484.12	—	536.75	484.33	—	—	—	174.34	—	—	—	—
4463	MD50-14-45831	50-603468	142	11/20/2013	—	—	289.22	—	380.61	306.41	—	—	—	110.95	—	—	—	—
4463	MD50-14-45832	50-603468	403	11/20/2013	—	—	396.10	—	204.94	494.21	—	—	—	71.32	—	—	—	—
4463	MD50-14-45833	50-613184	500	11/19/2013	—	—	144.61	—	—	242.16	—	—	—	—	—	—	—	—

Table C-5.0-6 (continued)

Sampling Plan 2013	Field Sample ID	Location ID	Depth (ft)	Date	Acetone	Carbon Disulfide	Carbon Tetrachloride	Chlorodifluoromethane	Chloroform	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Ethanol	Ethyltoluene[4-]	Hexane
Groundwater Tier 1 Screening Level					**20,300**	**478,000**	**5650**	**129,000**	**12,000**	**2,780,000**	**5750**	**242**	**7490**	**11,700**	**580**	**na[a]**	**na**	**23,500,000**
4463	MD50-14-45834	50-613184	600	11/19/2013	—	—	—	—	—	118.61	—	—	—	—	—	—	—	—
4463	MD50-14-45835	50-613184	664.5	11/19/2013	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4463	MD50-14-45824	50-603467	143	11/18/2013	—	—	389.81	—	536.75	207.57	—	—	—	110.95	—	—	—	—
4463	MD50-14-45827	50-603467	500	11/18/2013	—	—	238.92	—	—	242.16	—	—	—	—	—	—	—	—
4463	MD50-14-45825	50-603467	244	11/15/2013	—	—	534.42	—	634.35	331.12	—	—	—	174.34	—	—	—	—
4463	MD50-14-45826	50-603467	360	11/15/2013	—	—	383.53	—	341.57	276.76	—	—	—	—	—	—	—	—
4463	MD50-14-45828	50-603467	600	11/15/2013	—	—	—	—	—	44.97	—	—	—	—	—	—	—	—
4463	MD50-14-45862	50-603503	133	11/14/2013	—	—	—	—	102.47	54.36	—	—	—	—	—	—	—	—
4463	MD50-14-45863	50-603503	237	11/14/2013	—	—	100.60	—	136.63	74.13	—	—	—	—	42.03	—	—	—
4463	MD50-14-45864	50-603503	347	11/14/2013	—	—	88.02	—	63.43	79.07	—	—	—	—	—	—	—	—
4463	MD50-14-45865	50-603503	450	11/14/2013	—	—	88.02	—	—	84.02	—	—	—	—	—	—	—	—
4463	MD50-14-45815	50-603064	113	11/13/2013	—	—	—	—	731.94	395.37	—	—	554.73	213.97	—	—	—	—
4463	MD50-14-45816	50-603064	214	11/13/2013	—	—	—	—	439.16	593.06	—	—	515.11	174.34	—	—	—	—
4463	MD50-14-45817	50-603064	332	11/12/2013	—	—	201.19	—	—	543.63	—	—	166.42	—	—	—	—	—
4463	MD50-14-45818	50-603064	500	11/12/2013	—	—	57.21	—	—	237.22	—	—	—	—	—	—	—	—
4463	MD50-14-45800	50-24822	25	11/08/2013	—	—	69.16	—	273.26	172.97	—	—	—	—	—	—	—	—
4463	MD50-14-45796	50-24822	142	11/07/2013	—	—	264.07	—	683.14	593.06	—	—	—	138.68	—	—	—	—
4463	MD50-14-45797	50-24822	235	11/07/2013	—	—	245.21	—	409.89	691.90	—	—	—	91.13	—	—	—	—
4463	MD50-14-45798	50-24822	351	11/07/2013	—	—	251.49	—	151.27	691.90	—	—	—	38.43	—	—	—	—
4463	MD50-14-45799	50-24822	450	11/07/2013	—	—	157.18	—	—	454.68	—	—	—	—	—	—	—	—
4463	MD50-14-45806	50-603062	122	11/06/2013	—	—	—	—	73.19	227.34	—	—	—	—	—	—	—	—
4463	MD50-14-45807	50-603062	217	11/06/2013	—	—	56.59	—	58.56	286.64	—	—	—	—	—	—	—	—
4463	MD50-14-45808	50-603062	450	11/06/2013	—	—	—	—	—	113.67	—	—	—	—	—	—	—	—
4463	MD50-14-45809	50-603062	337	11/06/2013	—	—	—	—	—	163.09	—	—	—	—	—	—	—	—
4152	MD50-13-28951	50-603063	25	04/11/2013	—	—	—	—	—	192.74	—	—	—	—	—	—	—	—
4152	MD50-13-28952	50-603063	128	04/11/2013	—	—	163.47	—	317.17	444.79	76.85	—	277.37	39.62	—	—	—	—
4152	MD50-13-28953	50-603063	228	04/11/2013	—	—	339.51	208.53	536.75	543.63	48.54	—	320.95	126.80	—	—	—	—
4152	MD50-13-28954	50-603063	347	04/11/2013	—	—	232.63	—	234.22	341.01	—	—	67.36	43.59	—	—	—	—
4152	MD50-13-28955	50-603063	450	04/11/2013	—	68.47	176.04	—	161.03	247.11	—	—	—	—	—	—	—	—

Table C-5.0-6 (continued)

Sampling Plan 2013	Field Sample ID	Location ID	Depth (ft)	Date	Acetone	Carbon Disulfide	Carbon Tetrachloride	Chlorodifluoromethane	Chloroform	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Ethanol	Ethyltoluene[4-]	Hexane
Groundwater Tier 1 Screening Level					**20,300**	**478,000**	**5650**	**129,000**	**12,000**	**2,780,000**	**5750**	**242**	**7490**	**11,700**	**580**	**na[a]**	**na**	**23,500,000**
4152	MD50-13-28942	50-603061	25	04/10/2013	—	—	—	—	—	642.48	—	—	277.37	—	—	—	—	—
4152	MD50-13-28943	50-603061	128	04/09/2013	—	—	62.87	—	63.43	400.31	—	—	1584.95	—	—	—	—	—
4152	MD50-13-28944	50-603061	228	04/09/2013	—	—	106.88	—	—	271.82	—	—	1109.46	—	—	—	—	—
4152	MD50-13-28945	50-603061	347	04/09/2013	—	—	88.02	—	—	217.45	—	—	221.89	—	—	—	—	—
4152	MD50-13-28946	50-603061	450	04/09/2013	—	—	—	—	—	103.79	—	—	51.51	—	—	—	—	—
4152	MD50-13-28960	50-603383	26	04/08/2013	—	—	125.75	—	117.11	316.30	—	—	51.51	—	106.22	—	—	—
4152	MD50-13-28961	50-603383	139	04/05/2013	—	—	163.47	—	165.91	291.59	—	—	71.32	36.45	267.87	—	—	—
4152	MD50-13-28962	50-603383	244	04/05/2013	—	—	282.93	—	131.75	281.70	—	—	55.47	55.47	323.29	—	—	—
4152	MD50-13-28963	50-603383	359	04/05/2013	—	—	138.32	—	—	158.15	—	—	—	—	—	—	—	—
4152	MD50-13-28964	50-603383	450	04/05/2013	—	—	194.91	—	—	197.69	—	—	—	—	—	—	—	—
4152	MD50-13-28927	50-24784	155	04/04/2013	—	—	163.47	—	278.14	108.73	—	—	—	—	64.66	—	—	—
4152	MD50-13-28928	50-24784	244	04/04/2013	—	—	201.19	—	92.71	113.67	—	—	—	—	—	—	—	—
4152	MD50-13-28929	50-24784	362	04/04/2013	—	—	345.80	—	—	192.74	—	—	—	—	—	—	—	—
4152	MD50-13-28930	50-24784	450	04/04/2013	—	—	251.49	—	—	172.97	—	—	—	—	—	—	—	—
4152	MD50-13-28991	50-603472	27	04/03/2013	—	—	—	268.62	—	—	—	—	—	—	—	64.02	—	—
4152	MD50-13-28996	50-613182	550	04/02/2013	—	—	138.32	—	—	227.34	—	—	—	—	—	—	—	—
4152	MD50-13-28997	50-613182	632.5	04/02/2013	—	—	—	—	—	5.93	—	—	—	—	—	—	—	—
4152	MD50-13-28992	50-603472	146	04/01/2013	—	—	213.77	—	585.55	153.21	—	48.54	—	114.91	101.61	—	—	—
4152	MD50-13-28993	50-603472	292	04/01/2013	—	—	421.25	148.45	585.55	355.83	—	—	—	166.42	50.80	—	—	—
4152	MD50-13-28994	50-603472	364	04/01/2013	—	—	345.80	—	156.15	360.78	—	—	—	47.55	—	—	—	—
4152	MD50-13-28995	50-603472	450	04/01/2013	—	—	308.08	—	63.43	345.95	—	—	—	—	—	—	—	—
4152	MD50-13-28984	50-603471	90	03/29/2013	—	—	1508.95	—	1903.04	296.53	—	133.48	—	241.70	92.37	—	—	—
4152	MD50-13-28989	50-613183	550	03/28/2013	—	—	144.61	—	—	360.78	—	—	—	—	—	—	—	—
4152	MD50-13-28990	50-613183	642.5	03/28/2013	—	—	—	—	—	—	—	—	—	—	—	—	—	38.75
4152	MD50-13-28985	50-603471	209	03/27/2013	—	—	754.48	—	1512.67	494.21	—	84.94	—	384.35	—	—	—	—
4152	MD50-13-28986	50-603471	288	03/27/2013	—	—	1131.71	—	1659.06	1037.85	—	—	—	475.48	—	—	—	—
4152	MD50-13-28987	50-603471	360	03/27/2013	—	—	754.48	—	731.94	939.00	—	—	—	253.59	—	—	—	—
4152	MD50-13-28988	50-603471	450	03/27/2013	—	—	521.85	—	458.68	494.21	—	—	—	138.68	—	—	—	—
4152	MD50-13-28977	50-603470	83	03/25/2013	—	—	282.93	—	1073.51	281.70	—	—	—	154.53	—	—	—	—

Table C-5.0-6 (continued)

Sampling Plan 2013	Field Sample ID	Location ID	Depth (ft)	Date	Acetone	Carbon Disulfide	Carbon Tetrachloride	Chlorodifluoromethane	Chloroform	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Ethanol	Ethyltoluene[4-]	Hexane
Groundwater Tier 1 Screening Level					**20,300**	**478,000**	**5650**	**129,000**	**12,000**	**2,780,000**	**5750**	**242**	**7490**	**11,700**	**580**	**na[a]**	**na**	**23,500,000**
4152	MD50-13-28978	50-603470	203	03/25/2013	—	—	370.95	—	1122.30	840.16	—	—	—	305.10	—	—	—	—
4152	MD50-13-28979	50-603470	278	03/25/2013	—	—	540.71	—	1024.71	1186.11	—	—	—	328.88	—	—	—	—
4152	MD50-13-28980	50-603470	351	03/22/2013	—	—	364.66	—	326.93	840.16	—	—	—	126.80	—	—	—	—
4152	MD50-13-28981	50-603470	450	03/22/2013	—	—	194.91	—	63.43	494.21	—	—	—	—	—	—	—	—
4152	MD50-13-28982	50-603470	600	03/22/2013	—	—	69.16	—	—	271.82	—	—	—	—	—	—	—	—
4152	MD50-13-28983	50-603470	650	03/22/2013	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4152	MD50-13-28931	50-24813	25	03/20/2013	—	—	1068.84	—	1024.71	296.53	—	—	—	59.44	—	—	—	—
4152	MD50-13-28932	50-24813	150	03/20/2013	—	—	1634.70	—	2830.16	691.90	—	101.12	—	554.73	73.89	—	—	—
4152	MD50-13-28933	50-24813	241	03/19/2013	—	—	1697.57	—	2244.61	1581.48	—	—	—	673.60	—	—	—	—
4152	MD50-13-28934	50-24813	358	03/19/2013	—	—	691.60	—	536.75	1037.85	—	—	—	190.19	—	—	—	—
4152	MD50-13-28935	50-24813	450	03/19/2013	—	—	427.54	—	136.63	741.32	—	—	—	51.51	—	—	—	—
4152	MD50-13-28936	50-24813	600	03/19/2013	—	—	119.46	—	—	291.59	—	—	—	—	—	—	—	—
4152	MD50-13-29002	50-613185	145	03/18/2013	—	—	88.02	—	102.47	108.73	—	—	—	—	—	—	—	—
4152	MD50-13-29003	50-613185	235	03/18/2013	—	—	144.61	—	107.35	187.80	—	—	—	—	—	—	—	—
4152	MD50-13-29004	50-613185	350	03/18/2013	—	—	100.60	—	—	158.15	—	—	—	—	—	—	—	—
4152	MD50-13-29005	50-613185	450	03/18/2013	—	—	69.16	—	—	118.61	—	—	—	—	—	—	—	—
4152	MD50-13-29006	50-613185	600	03/18/2013	—	—	—	—	—	54.36	—	—	—	—	—	—	—	—
4152	MD50-13-28970	50-603468	142	03/15/2013	—	—	201.19	—	258.62	138.38	—	—	—	63.40	—	—	—	—
4152	MD50-13-28971	50-603468	233	03/15/2013	—	—	509.27	—	536.75	425.02	—	—	—	158.50	—	—	—	—
4152	MD50-13-28972	50-603468	354	03/15/2013	—	—	502.98	—	390.37	543.63	—	—	—	138.68	—	—	—	—
4152	MD50-13-28973	50-603468	403	03/15/2013	—	—	446.40	—	234.22	593.06	—	—	—	91.13	—	—	—	—
4152	MD50-13-28974	50-613184	500	03/14/2013	—	—	125.75	—	—	222.40	—	—	—	—	—	—	—	—
4152	MD50-13-28975	50-613184	600	03/14/2013	—	—	—	—	—	118.61	—	—	—	—	—	—	—	—
4152	MD50-13-28976	50-613184	664.5	03/14/2013	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4152	MD50-13-28965	50-603467	143	03/13/2013	—	—	421.25	—	585.55	207.57	—	—	—	99.06	—	—	—	—
4152	MD50-13-28966	50-603467	244	03/12/2013	—	—	691.60	—	731.94	390.43	—	—	—	186.23	—	—	171.94	—
4152	MD50-13-28967	50-603467	360	03/12/2013	—	—	515.56	—	351.33	301.47	—	—	—	99.06	—	—	—	—
4152	MD50-13-28968	50-603467	500	03/12/2013	—	—	232.63	—	42.45	227.34	—	—	—	—	—	—	—	—
4152	MD50-13-28969	50-603467	600	03/12/2013	109.20	—	125.75	—	—	133.44	—	—	—	—	—	—	—	—

Table C-5.0-6 (continued)

Sampling Plan 2013	Field Sample ID	Location ID	Depth (ft)	Date	Acetone	Carbon Disulfide	Carbon Tetrachloride	Chlorodifluoromethane	Chloroform	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Ethanol	Ethyltoluene[4-]	Hexane
Groundwater Tier 1 Screening Level					**20,300**	**478,000**	**5650**	**129,000**	**12,000**	**2,780,000**	**5750**	**242**	**7490**	**11,700**	**580**	**na[a]**	**na**	**23,500,000**
4152	MD50-13-28998	50-603503	133	03/11/2013	—	—	69.16	—	107.35	49.42	—	—	—	—	—	—	—	—
4152	MD50-13-28999	50-603503	237	03/11/2013	—	—	119.46	—	141.51	84.02	—	—	—	—	50.80	—	—	—
4152	MD50-13-29000	50-603503	347	03/11/2013	—	—	94.31	—	58.56	84.02	—	—	—	—	—	—	—	—
4152	MD50-13-29001	50-603503	450	03/11/2013	—	—	94.31	—	—	84.02	—	—	—	—	—	—	—	—
4152	MD50-13-28937	50-24822	25	03/08/2013	—	—	81.73	—	297.66	192.74	—	—	—	—	—	—	—	—
4152	MD50-13-28938	50-24822	142	03/07/2013	—	—	238.92	—	585.55	593.06	—	—	—	122.83	—	—	—	—
4152	MD50-13-28939	50-24822	235	03/07/2013	—	—	345.80	—	585.55	939.00	—	—	—	162.46	—	—	—	—
4152	MD50-13-28940	50-24822	351	03/07/2013	—	—	245.21	—	161.03	642.48	—	—	—	43.59	—	—	—	—
4152	MD50-13-28941	50-24822	450	03/07/2013	—	—	163.47	—	—	454.68	—	—	—	—	—	—	—	—
4152	MD50-13-28956	50-603064	113	03/06/2013	—	—	207.48	—	1024.71	543.63	—	—	713.23	265.48	46.18	—	—	—
4152	MD50-13-28957	50-603064	214	03/06/2013	—	—	364.66	—	731.94	939.00	—	—	832.10	277.37	—	—	—	—
4152	MD50-13-28958	50-603064	332	03/06/2013	—	—	188.62	—	68.31	543.63	—	—	170.38	37.64	—	—	—	—
4152	MD50-13-28959	50-603064	500	03/06/2013	—	—	62.87	—	—	266.88	—	—	—	—	—	—	—	—
4152	MD50-13-28947	50-603062	122	03/05/2013	—	—	—	—	82.95	227.34	—	—	—	—	—	—	—	—
4152	MD50-13-28948	50-603062	217	03/05/2013	—	—	62.87	—	63.43	286.64	—	—	—	—	—	—	—	—
4152	MD50-13-28949	50-603062	337	03/05/2013	—	—	—	—	—	172.97	—	—	—	—	—	—	—	—
4152	MD50-13-28950	50-603062	450	03/05/2013	—	—	—	—	—	118.61	—	—	—	—	—	—	—	—

Table C-5.0-6 (continued)

Sampling Plan 2013	Field Sample ID	Location ID	Depth (ft)	Date	Hexanone[2-]	Methylene Chloride	n-Heptane	Propanol[2-]	Tetrachloroethene	Tetrahydrofuran	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene[1,3-]+Xylene[1,4-]
Groundwater Tier 1 Screening Level					**145**	**665**	**na**	**136**	**3630**	**9790**	**272,000**	**1,190,000,000**	**141,000**	**2020**	**4,540,000**	**14,100**	**21,500**	**131,000**
4463	MD50-14-45813	50-603063	128	12/20/2013	—	—	—	—	1016.73	—	—	5054.86	708.84	9666.88	—	—	—	—
4463	MD50-14-45810	50-603063	450	12/19/2013	—	—	—	—	338.91	—	—	206.79	—	8055.73	—	—	—	—
4463	MD50-14-45811	50-603063	347	12/19/2013	—	59.01	—	—	637.15	—	—	1378.60	51.80	12,352.10	—	—	—	—
4463	MD50-14-45812	50-603063	228	12/19/2013	—	—	—	—	1626.77	—	—	5973.93	654.32	23,630.10	56.15	—	—	—
4463	MD50-14-45814	50-603063	25	12/19/2013	—	—	—	—	332.13	—	—	2450.84	267.18	1396.33	—	—	—	—
4463	MD50-14-45805	50-603061	450	12/17/2013	—	—	—	—	—	—	—	995.66	—	343.71	—	—	—	—
4463	MD50-14-45801	50-603061	25	12/16/2013	—	—	—	—	108.45	—	—	9190.66	1254.11	472.60	—	—	—	—
4463	MD50-14-45802	50-603061	128	12/16/2013	—	—	—	—	291.46	—	—	27,572.00	4362.12	2685.24	—	—	—	—
4463	MD50-14-45803	50-603061	228	12/16/2013	—	32.63	—	—	101.67	—	—	9190.66	1417.69	1718.56	—	—	—	—
4463	MD50-14-45804	50-603061	347	12/16/2013	—	—	—	—	—	—	—	919.07	52.89	177.23	—	—	—	—
4463	MD50-14-45819	50-603383	26	12/13/2013	—	-	—	—	813.38	—	—	1072.24	147.22	2524.13	—	—	—	—
4463	MD50-14-45823	50-603383	450	12/13/2013	—	—	—	—	—	—	79.09	—	—	—	—	—	—	—
4463	MD50-14-45820	50-603383	139	12/12/2013	—	—	—	—	1016.73	—	—	995.66	147.22	3759.34	—	—	—	—
4463	MD50-14-45821	50-603383	244	12/12/2013	—	62.49	—	—	1355.64	—	—	765.89	163.58	5907.54	—	—	—	—
4463	MD50-14-45822	50-603383	359	12/12/2013	—	—	—	—	332.13	—	—	336.99	—	1825.97	—	—	—	—
4463	MD50-14-45786	50-24784	450	12/11/2013	—	—	—	—	359.25	—	—	—	—	751.87	—	—	—	—
4463	MD50-14-45787	50-24784	362	12/11/2013	—	—	—	—	948.95	—	—	—	—	1933.38	—	—	—	—
4463	MD50-14-45788	50-24784	244	12/11/2013	—	—	—	—	1558.99	—	—	91.91	—	3061.18	—	—	—	—
4463	MD50-14-45789	50-24784	155	12/11/2013	—	—	—	—	2169.02	—	—	145.52	—	3329.70	—	—	—	—
4463	MD50-14-45858	50-603472	450	12/10/2013	—	52.07	—	—	521.92	—	—	—	—	8055.73	—	—	—	—
4463	MD50-14-45859	50-603472	27	12/10/2013	—	—	—	—	420.25	—	—	—	—	2363.01	—	—	—	—
4463	MD50-14-45860	50-613182	550	12/10/2013	—	—	—	7.86 (J)	155.90	—	—	—	—	2900.06	—	—	—	—
4463	MD50-14-45861	50-613182	632	12/10/2013	—	—	—	—	—	—	21.09	—	—	10.74	—	—	—	3.99
4463	MD50-14-45855	50-603472	146	12/09/2013	—	381.86	—	—	813.38	—	—	107.22	—	12,889.20	—	—	—	—
4463	MD50-14-45856	50-603472	292	12/09/2013	—	763.72	—	—	1423.42	—	—	114.88	—	26,315.40	—	—	—	—
4463	MD50-14-45857	50-603472	364	12/09/2013	—	104.14	—	—	372.80	—	25.61	—	—	7518.68	—	—	—	—
4463	MD50-14-45853	50-613183	550	12/06/2013	—	—	—	—	81.34	—	—	—	—	3544.52	—	—	—	—

Table C-5.0-6 (continued)

Sampling Plan 2013	Field Sample ID	Location ID	Depth (ft)	Date	Hexanone[2-]	Methylene Chloride	n-Heptane	Propanol[2-]	Tetrachloroethene	Tetrahydrofuran	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene[1,3-]+Xylene[1,4-]
Groundwater Tier 1 Screening Level					**145**	**665**	**na**	**136**	**3630**	**9790**	**272,000**	**1,190,000,000**	**141,000**	**2020**	**4,540,000**	**14,100**	**21,500**	**131,000**
4463	MD50-14-45854	50-613183	642.5	12/06/2013	—	—	—	—	—	—	—	—	—	64.45	—	—	—	—
4463	MD50-14-45852	50-603471	90.0	12/05/2013	—	249.95	—	—	1084.51	—	—	352.31	53.44	20,944.90	—	—	—	—
4463	MD50-14-45848	50-603471	450	12/04/2013	—	232.59	—	—	603.26	—	—	114.88	—	27,389.50	—	—	—	—
4463	MD50-14-45849	50-603471	360	12/04/2013	—	972.01	—	—	1084.51	—	—	367.63	—	51,556.70	—	—	—	—
4463	MD50-14-45850	50-603471	288	12/04/2013	—	1388.59	—	—	1084.51	—	—	398.26	—	48,334.40	—	—	—	—
4463	MD50-14-45851	50-603471	209	12/04/2013	—	729.01	—	—	1016.73	—	—	283.38	—	45,112.10	—	—	—	—
4463	MD50-14-45845	50-603470	278	12/03/2013	—	729.01	—	—	474.47	—	—	765.89	—	51,019.60	—	—	—	—
4463	MD50-14-45846	50-603470	203	12/03/2013	—	416.58	—	—	420.25	—	—	651.01	76.34	32,760.00	—	—	—	—
4463	MD50-14-45847	50-603470	83	12/03/2013	—	38.19	—	—	677.82	—	—	306.36	59.98	13,426.20	—	—	—	—
4463	MD50-14-45841	50-603470	650	12/02/2013	—	—	—	—	—	—	—	—	—	40.82	—	—	—	—
4463	MD50-14-45842	50-603470	600	12/02/2013	—	—	—	—	—	—	—	—	—	1772.26	—	—	—	—
4463	MD50-14-45843	50-603470	450	12/02/2013	—	72.90	—	—	122.01	—	—	168.50	—	16,111.50	—	—	—	—
4463	MD50-14-45844	50-603470	351	12/02/2013	—	347.15	—	—	311.80	—	—	582.08	—	37,056.40	—	—	—	—
4463	MD50-14-45790	50-24813	600	11/26/2013	—	—	—	—	—	—	—	—	—	1074.10	—	—	—	—
4463	MD50-14-45791	50-24813	450	11/26/2013	—	149.27	—	—	271.13	—	—	—	—	26,852.40	—	—	—	—
4463	MD50-14-45792	50-24813	358	11/26/2013	—	79.84	—	—	542.26	—	—	—	—	52,093.70	—	—	—	—
4463	MD50-14-45793	50-24813	241	11/26/2013	—	902.58	—	—	813.38	—	—	—	—	64,445.80	—	—	—	—
4463	MD50-14-45794	50-24813	150	11/26/2013	—	555.43	—	—	650.71	—	—	—	—	42,426.90	—	—	—	—
4463	MD50-14-45795	50-24813	25	11/26/2013	—	—	—	—	393.14	—	—	—	—	11,815.10	—	—	—	—
4463	MD50-14-45870	50-613185	145	11/22/2013	—	—	—	—	81.34	—	—	—	—	4296.39	—	—	—	—
4463	MD50-14-45866	50-613185	600	11/21/2013	—	—	—	—	—	—	—	—	—	112.78	—	—	—	—
4463	MD50-14-45867	50-613185	450	11/21/2013	—	—	—	—	—	—	—	—	—	1772.26	—	—	—	—
4463	MD50-14-45868	50-613185	350	11/21/2013	—	—	—	—	61.00	—	—	—	—	3759.34	—	—	—	—
4463	MD50-14-45869	50-613185	235	11/21/2013	—	69.43	—	—	122.01	—	—	—	—	7518.68	—	—	—	—
4463	MD50-14-45829	50-603468	354	11/20/2013	—	336.73	—	—	393.14	—	—	—	—	29,000.60	—	—	—	—
4463	MD50-14-45830	50-603468	233	11/20/2013	—	486.01	—	—	379.58	—	—	—	—	26,852.40	—	—	—	—
4463	MD50-14-45831	50-603468	142	11/20/2013	—	145.80	—	—	271.13	—	—	—	—	18,796.70	—	—	—	—
4463	MD50-14-45832	50-603468	403	11/20/2013	—	201.35	—	—	291.46	—	—	—	—	22,019.00	—	—	—	—
4463	MD50-14-45833	50-613184	500	11/19/2013	—	—	—	—	65.75	—	—	—	—	4403.80	—	—	—	—

Table C-5.0-6 (continued)

Sampling Plan 2013	Field Sample ID	Location ID	Depth (ft)	Date	Hexanone[2-]	Methylene Chloride	n-Heptane	Propanol[2-]	Tetrachloroethene	Tetrahydrofuran	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene[1,3-]+Xylene[1,4-]
Groundwater Tier 1 Screening Level					**145**	**665**	**na**	**136**	**3630**	**9790**	**272,000**	**1,190,000,000**	**141,000**	**2020**	**4,540,000**	**14,100**	**21,500**	**131,000**
4463	MD50-14-45834	50-613184	600	11/19/2013	—	—	—	—	—	—	—	—	—	751.87	—	—	—	—
4463	MD50-14-45835	50-613184	664.5	11/19/2013	—	—	—	—	—	—	—	—	—	134.26	—	—	—	—
4463	MD50-14-45824	50-603467	143	11/18/2013	—	104.14	—	—	413.47	—	—	—	—	15,574.40	—	—	—	—
4463	MD50-14-45827	50-603467	500	11/18/2013	—	—	—	—	271.13	—	—	—	—	9666.88	—	—	—	—
4463	MD50-14-45825	50-603467	244	11/15/2013	—	347.15	—	—	745.60	—	—	—	—	24,167.20	—	—	—	—
4463	MD50-14-45826	50-603467	360	11/15/2013	—	—	—	—	596.48	—	—	—	—	20,407.90	—	—	—	—
4463	MD50-14-45828	50-603467	600	11/15/2013	—	—	—	—	—	—	—	—	—	1020.39	—	—	—	—
4463	MD50-14-45862	50-603503	133	11/14/2013	—	30.90	—	—	406.69	—	—	99.57	—	2148.19	—	—	—	—
4463	MD50-14-45863	50-603503	237	11/14/2013	—	118.03	—	—	542.26	—	—	68.93	—	4994.55	—	—	—	—
4463	MD50-14-45864	50-603503	347	11/14/2013	—	48.60	—	—	366.02	—	—	—	—	3490.82	—	—	—	—
4463	MD50-14-45865	50-603503	450	11/14/2013	—	—	—	—	244.02	—	—	—	—	2953.77	—	—	—	—
4463	MD50-14-45815	50-603064	113	11/13/2013	—	—	—	—	562.59	—	—	10,722.40	2017.48	21,481.90	—	—	—	—
4463	MD50-14-45816	50-603064	214	11/13/2013	—	416.58	—	—	413.47	—	—	10,722.40	1526.74	25,241.30	—	—	—	—
4463	MD50-14-45817	50-603064	332	11/12/2013	—	69.43	—	—	216.90	—	—	3829.44	190.84	13,426.20	—	—	—	—
4463	MD50-14-45818	50-603064	500	11/12/2013	—	—	—	—	—	—	—	214.45	—	1611.15	—	—	—	—
4463	MD50-14-45800	50-24822	25	11/08/2013	—	—	—	—	183.01	—	—	—	—	8055.73	—	—	—	—
4463	MD50-14-45796	50-24822	142	11/07/2013	—	—	—	—	244.02	—	—	145.52	—	29,000.60	—	—	—	—
4463	MD50-14-45797	50-24822	235	11/07/2013	184.23	218.7	—	110.5	155.9	32.4	41.4	153.2	59.98	31,685.9	61.7	54.04	54.04	47.73
4463	MD50-14-45798	50-24822	351	11/07/2013	—	111.09	—	—	115.23	—	—	76.59	—	24,704.20	—	—	—	—
4463	MD50-14-45799	50-24822	450	11/07/2013	—	—	—	—	—	—	—	—	—	11,815.10	—	—	—	—
4463	MD50-14-45806	50-603062	122	11/06/2013	—	—	—	—	—	—	—	474.85	53.98	7518.68	—	—	—	—
4463	MD50-14-45807	50-603062	217	11/06/2013	—	—	—	—	—	—	—	620.37	51.25	9129.83	—	—	—	—
4463	MD50-14-45808	50-603062	450	11/06/2013	—	—	—	—	—	—	—	—	—	698.16	—	—	—	—
4463	MD50-14-45809	50-603062	337	11/06/2013	—	—	—	—	—	—	—	137.86	—	2040.79	—	—	—	—
4152	MD50-13-28951	50-603063	25	04/11/2013	—	—	—	—	338.91	—	—	2374.25	299.90	1503.74	—	—	—	—
4152	MD50-13-28952	50-603063	128	04/11/2013	—	—	—	—	948.95	—	—	4595.33	763.37	9666.88	—	—	—	—
4152	MD50-13-28953	50-603063	228	04/11/2013	—	—	—	—	1491.20	—	—	4748.51	654.32	22,556.00	56.15	—	—	—
4152	MD50-13-28954	50-603063	347	04/11/2013	—	55.54	—	—	671.04	—	—	1302.01	59.98	13,426.20	—	—	—	—
4152	MD50-13-28955	50-603063	450	04/11/2013	—	—	—	—	372.80	—	—	137.86	—	8592.78	—	—	—	—

Table C-5.0-6 (continued)

Sampling Plan 2013	Field Sample ID	Location ID	Depth (ft)	Date	Hexanone[2-]	Methylene Chloride	n-Heptane	Propanol[2-]	Tetrachloroethene	Tetrahydrofuran	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene[1,3-]+Xylene[1,4-]
Groundwater Tier 1 Screening Level					**145**	**665**	**na**	**136**	**3630**	**9790**	**272,000**	**1,190,000,000**	**141,000**	**2020**	**4,540,000**	**14,100**	**21,500**	**131,000**
4152	MD50-13-28942	50-603061	25	04/10/2013	—	—	—	—	115.23	—	—	12,254.20	1581.27	537.05	—	—	—	—
4152	MD50-13-28943	50-603061	128	04/09/2013	—	34.71	—	—	311.80	—	—	24,508.40	5125.49	2846.36	—	—	—	—
4152	MD50-13-28944	50-603061	228	04/09/2013	—	55.54	—	—	230.46	—	—	17,615.40	3380.64	3598.23	—	—	—	—
4152	MD50-13-28945	50-603061	347	04/09/2013	—	—	—	—	88.12	—	—	6050.52	398.04	1288.92	—	—	—	—
4152	MD50-13-28946	50-603061	450	04/09/2013	—	—	—	—	—	—	—	1148.83	—	451.12	—	—	—	—
4152	MD50-13-28960	50-603383	26	04/08/2013	—	—	—	—	948.95	—	—	1072.24	196.30	3061.18	—	—	—	—
4152	MD50-13-28961	50-603383	139	04/05/2013	—	38.19	—	—	1220.08	—	—	1148.83	207.20	4779.73	—	—	—	—
4152	MD50-13-28962	50-603383	244	04/05/2013	—	55.54	—	—	1220.08	—	—	696.96	158.13	5370.49	—	—	—	—
4152	MD50-13-28963	50-603383	359	04/05/2013	—	—	—	—	271.13	—	—	229.77	—	1557.44	—	—	—	—
4152	MD50-13-28964	50-603383	450	04/05/2013	—	—	—	—	271.13	29.47	—	153.18	—	1396.33	—	—	—	—
4152	MD50-13-28927	50-24784	155	04/04/2013	—	—	—	—	2169.02	—	—	122.54	50.71	3437.11	—	—	—	—
4152	MD50-13-28928	50-24784	244	04/04/2013	—	—	—	—	1626.77	—	—	75.06	—	3114.88	—	—	—	—
4152	MD50-13-28929	50-24784	362	04/04/2013	—	—	—	—	1287.86	—	—	—	—	2631.54	—	—	—	—
4152	MD50-13-28930	50-24784	450	04/04/2013	—	—	—	—	494.81	—	—	—	—	1020.39	—	—	—	—
4152	MD50-13-28991	50-603472	27	04/03/2013	—	—	—	—	52.87	—	86.62	—	—	263.15	—	—	—	—
4152	MD50-13-28996	50-613182	550	04/02/2013	—	—	—	—	169.46	—	—	—	—	3114.88	—	—	—	—
4152	MD50-13-28997	50-613182	632.5	04/02/2013	—	—	—	—	—	—	—	—	—	13.96	—	—	—	—
4152	MD50-13-28992	50-603472	146	04/01/2013	—	381.86	—	—	881.17	—	—	114.88	—	13,426.20	—	—	—	—
4152	MD50-13-28993	50-603472	292	04/01/2013	—	729.01	—	—	1491.20	—	—	99.57	—	27,389.50	—	—	—	—
4152	MD50-13-28994	50-603472	364	04/01/2013	—	215.23	—	—	881.17	—	—	—	—	16,648.50	—	—	—	—
4152	MD50-13-28995	50-603472	450	04/01/2013	—	83.32	—	—	623.60	—	—	—	—	12,352.10	—	—	—	—
4152	MD50-13-28984	50-603471	90	03/29/2013	—	222.17	—	—	948.95	—	—	260.40	52.89	18,259.70	—	—	—	—
4152	MD50-13-28989	50-613183	550	03/28/2013	—	—	—	—	81.34	—	—	—	—	3813.05	—	—	—	—
4152	MD50-13-28990	50-613183	642.5	03/28/2013	—	—	39.32	—	—	—	—	—	—	80.56	—	—	—	—
4152	MD50-13-28985	50-603471	209	03/27/2013	—	1041.44	—	—	1084.51	—	—	291.04	—	41,889.80	—	—	—	—
4152	MD50-13-28986	50-603471	288	03/27/2013	—	1805.16	—	—	1287.86	—	—	474.85	—	64,445.80	—	—	—	—
4152	MD50-13-28987	50-603471	360	03/27/2013	—	833.15	—	—	1016.73	—	—	306.36	—	49,408.50	—	—	—	—
4152	MD50-13-28988	50-603471	450	03/27/2013	—	302.02	—	—	745.60	—	—	107.22	—	34,908.20	—	—	—	—
4152	MD50-13-28977	50-603470	83	03/25/2013	—	45.13	—	—	813.38	—	—	268.06	65.43	15,574.40	—	—	—	—

Table C-5.0-6 (continued)

Sampling Plan 2013	Field Sample ID	Location ID	Depth (ft)	Date	Hexanone[2-]	Methylene Chloride	n-Heptane	Propanol[2-]	Tetrachloroethene	Tetrahydrofuran	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene[1,3-]+Xylene[1,4-]
Groundwater Tier 1 Screening Level					**145**	**665**	**na**	**136**	**3630**	**9790**	**272,000**	**1,190,000,000**	**141,000**	**2020**	**4,540,000**	**14,100**	**21,500**	**131,000**
4152	MD50-13-28978	50-603470	203	03/25/2013	—	486.01	—	—	542.26	—	—	735.25	98.15	42,426.90	—	—	—	—
4152	MD50-13-28979	50-603470	278	03/25/2013	—	798.44	—	—	542.26	—	—	842.48	—	59,075.40	—	—	—	—
4152	MD50-13-28980	50-603470	351	03/22/2013	—	326.32	—	—	311.80	—	—	536.12	—	37,056.40	48.85	—	—	—
4152	MD50-13-28981	50-603470	450	03/22/2013	—	69.43	—	—	115.23	—	—	137.86	—	15,574.40	—	—	—	—
4152	MD50-13-28982	50-603470	600	03/22/2013	—	—	—	—	—	—	—	—	—	1825.97	—	—	—	—
4152	MD50-13-28983	50-603470	650	03/22/2013	—	—	—	—	—	—	—	—	—	50.48	—	—	—	—
4152	MD50-13-28931	50-24813	25	03/20/2013	—	—	—	—	440.58	—	—	—	—	12,889.20	—	—	—	—
4152	MD50-13-28932	50-24813	150	03/20/2013	—	520.72	—	—	677.82	—	—	—	—	44,038.00	—	—	—	—
4152	MD50-13-28933	50-24813	241	03/19/2013	—	1076.15	—	—	1016.73	—	—	—	—	85,927.80	—	—	—	—
4152	MD50-13-28934	50-24813	358	03/19/2013	—	69.43	—	—	542.26	—	—	—	—	52,093.70	—	—	—	—
4152	MD50-13-28935	50-24813	450	03/19/2013	—	149.27	—	—	277.91	—	—	—	—	27,926.50	—	—	—	—
4152	MD50-13-28936	50-24813	600	03/19/2013	—	—	—	—	—	—	—	—	—	3276.00	—	—	—	—
4152	MD50-13-29002	50-613185	145	03/18/2013	—	31.94	—	—	88.12	—	—	—	—	4618.62	—	—	—	—
4152	MD50-13-29003	50-613185	235	03/18/2013	—	69.43	—	—	142.34	—	—	—	—	8055.73	—	—	—	—
4152	MD50-13-29004	50-613185	350	03/18/2013	—	—	—	—	74.56	—	—	—	—	3974.16	—	—	—	—
4152	MD50-13-29005	50-613185	450	03/18/2013	—	—	—	—	—	—	—	—	—	1772.26	—	—	—	—
4152	MD50-13-29006	50-613185	600	03/18/2013	—	—	—	—	—	—	—	—	—	145.00	—	—	—	—
4152	MD50-13-28970	50-603468	142	03/15/2013	—	76.37	—	—	162.68	—	—	—	—	8592.78	—	—	—	—
4152	MD50-13-28971	50-603468	233	03/15/2013	—	486.01	—	—	338.91	—	—	—	—	23,630.10	—	—	—	—
4152	MD50-13-28972	50-603468	354	03/15/2013	—	326.32	—	—	393.14	—	—	—	—	27,926.50	—	—	—	—
4152	MD50-13-28973	50-603468	403	03/15/2013	—	229.12	—	—	332.13	—	—	—	—	23,630.10	—	—	—	—
4152	MD50-13-28974	50-613184	500	03/14/2013	—	—	—	—	65.07	—	—	—	—	4135.27	—	—	—	—
4152	MD50-13-28975	50-613184	600	03/14/2013	—	—	—	—	—	—	—	—	—	751.87	—	—	—	—
4152	MD50-13-28976	50-613184	664.5	03/14/2013	—	—	—	—	—	—	—	—	—	80.56	—	—	—	—
4152	MD50-13-28965	50-603467	143	03/13/2013	—	135.39	—	—	372.80	32.42	—	—	—	12,889.20	—	—	—	—
4152	MD50-13-28966	50-603467	244	03/12/2013	—	555.43	—	—	813.38	—	—	—	—	27,926.50	—	225.98	58.95	—
4152	MD50-13-28967	50-603467	360	03/12/2013	—	76.37	—	—	677.82	—	—	—	—	24,167.20	—	—	—	—
4152	MD50-13-28968	50-603467	500	03/12/2013	—	31.24	—	—	216.90	—	—	—	—	8055.73	—	46.18	—	—
4152	MD50-13-28969	50-603467	600	03/12/2013	695.98	—	—	—	122.01	112.00	—	—	—	3974.16	—	—	—	—

Table C-5.0-6 (continued)

Sampling Plan 2013	Field Sample ID	Location ID	Depth (ft)	Date	Hexanone[2-]	Methylene Chloride	n-Heptane	Propanol[2-]	Tetrachloroethene	Tetrahydrofuran	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene[1,3-]+Xylene[1,4-]
Groundwater Tier 1 Screening Level					**145**	**665**	**na**	**136**	**3630**	**9790**	**272,000**	**1,190,000,000**	**141,000**	**2020**	**4,540,000**	**14,100**	**21,500**	**131,000**
4152	MD50-13-28998	50-603503	133	03/11/2013	—	41.66	—	—	393.14	—	—	91.91	—	2416.72	—	—	—	—
4152	MD50-13-28999	50-603503	237	03/11/2013	—	124.97	—	—	582.93	—	—	69.70	—	5370.49	—	—	—	—
4152	MD50-13-29000	50-603503	347	03/11/2013	—	45.13	—	—	325.35	—	—	—	—	3222.29	—	—	—	—
4152	MD50-13-29001	50-603503	450	03/11/2013	—	—	—	—	250.79	—	—	—	—	3114.88	—	—	—	—
4152	MD50-13-28937	50-24822	25	03/08/2013	—	—	—	—	183.01	—	—	65.10	—	7518.68	—	—	—	—
4152	MD50-13-28938	50-24822	142	03/07/2013	—	173.57	—	—	176.23	—	—	137.86	—	23,093.10	—	—	—	—
4152	MD50-13-28939	50-24822	235	03/07/2013	—	347.15	—	—	210.12	—	—	191.47	—	36,519.30	—	—	—	—
4152	MD50-13-28940	50-24822	351	03/07/2013	—	128.44	—	—	101.67	—	—	68.93	—	22,019.00	—	—	—	—
4152	MD50-13-28941	50-24822	450	03/07/2013	—	34.71	—	—	—	—	—	—	—	10,741.00	—	—	—	—
4152	MD50-13-28956	50-603064	113	03/06/2013	—	124.97	—	—	643.93	—	—	11,488.30	2889.90	29,537.70	—	—	—	—
4152	MD50-13-28957	50-603064	214	03/06/2013	—	520.72	—	—	637.15	—	—	13,786.00	2617.27	40,815.70	67.38	—	—	—
4152	MD50-13-28958	50-603064	332	03/06/2013	—	76.37	—	—	189.79	—	—	3523.09	201.75	13,426.20	49.97	—	—	—
4152	MD50-13-28959	50-603064	500	03/06/2013	—	—	—	—	—	—	—	168.50	—	1664.85	—	—	—	—
4152	MD50-13-28947	50-603062	122	03/05/2013	—	—	—	—	—	—	—	428.90	54.53	6981.63	—	—	—	—
4152	MD50-13-28948	50-603062	217	03/05/2013	—	—	—	—	—	—	—	543.78	59.98	8592.78	—	—	—	—
4152	MD50-13-28949	50-603062	337	03/05/2013	—	—	—	—	—	—	—	122.54	—	2040.79	—	—	—	—
4152	MD50-13-28950	50-603062	450	03/05/2013	—	—	—	—	—	—	—	—	—	698.16	—	—	—	—

Notes: Concentrations are in µg/m^3. Data qualifiers are defined in Appendix A. Purple shading means the value exceeds Tier 1 groundwater screening level for the analyte listed.

[a] na = Not available.

[b] — = Not detected.

Table C-5.0-7
VOC Pore-Gas Results at MDA C for Fiscal Year 2014

Sampling Plan 2014	Field Sample ID	Location ID	Depth (ft)	Date	Acetone	Carbon Disulfide	Carbon Tetrachloride	Chlorodifluoromethane	Chloroform	Dichlorobenzene[1,2-]	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]
Groundwater Tier 1 Screening Level					**20,300**	**478,000**	**5650**	**129,000**	**12,000**	**47,200**	**2,780,000**	**5750**	**242**	**7490**	**11,700**	**580**
6945	MD50-14-87706	50-603064	113	11/10/2014	—[a]	—	138.32	—	731.94	—	410.20	—	—	554.73	182.27	—
6945	MD50-14-87707	50-603064	214	11/10/2014	—	—	276.64	—	536.75	—	642.48	—	—	713.23	190.19	—
6945	MD50-14-87708	50-603064	332	11/10/2014	—	—	176.04	—	68.31	—	444.79	—	—	154.53	—	—
6945	MD50-14-87709	50-603064	500	11/10/2014	—	—	—	—	—	—	187.80	—	—	—	—	—
6945	MD50-14-87752	50-613185	145	11/07/2014	—	—	75.45	—	87.83	—	93.90	—	—	—	—	—
6945	MD50-14-87753	50-613185	235	11/07/2014	—	—	113.17	—	97.59	—	143.32	—	—	—	—	—
6945	MD50-14-87754	50-613185	350	11/07/2014	—	—	81.73	—	—	—	108.73	—	—	—	—	—
6945	MD50-14-87755	50-613185	450	11/07/2014	—	—	—	—	—	—	69.19	—	—	—	—	—
6945	MD50-14-87756	50-613185	600	11/07/2014	—	—	—	—	—	—	49.42	—	—	—	—	—
6945	MD50-14-87748	50-603503	133	11/06/2014	—	—	—	—	87.83	—	—	—	—	—	—	—
6945	MD50-14-87749	50-603503	237	11/06/2014	—	—	100.60	—	141.51	—	69.19	—	—	—	—	—
6945	MD50-14-87750	50-603503	347	11/06/2014	—	—	—	—	—	—	—	—	—	—	—	—
6945	MD50-14-87751	50-603503	450	11/06/2014	—	—	81.73	—	—	—	74.13	—	—	—	—	—
6945	MD50-14-87720	50-603468	142	11/05/2014	—	—	194.91	—	341.57	—	113.67	—	—	—	87.17	—
6945	MD50-14-87721	50-603468	233	11/05/2014	—	—	477.84	—	487.96	—	390.43	—	—	—	166.42	—
6945	MD50-14-87722	50-603468	354	11/05/2014	—	—	496.70	—	326.93	—	494.21	—	—	—	118.87	—
6945	MD50-14-87723	50-603468	403	11/05/2014	—	—	414.96	—	195.18	—	474.44	—	—	—	79.25	—
6945	MD50-14-87724	50-613184	500	11/05/2014	—	—	125.75	—	—	—	217.45	—	—	—	—	—
6945	MD50-14-87725	50-613184	600	11/05/2014	—	—	—	—	—	—	113.67	—	—	—	—	—
6945	MD50-14-87726	50-613184	664.5	11/05/2014	—	—	—	—	—	—	—	—	—	—	—	—
6945	MD50-14-87715	50-603467	143	11/04/2014	—	—	389.81	—	585.55	—	217.45	—	—	—	122.83	—
6945	MD50-14-87716	50-603467	244	11/04/2014	—	—	572.14	—	683.14	—	326.18	—	—	—	166.42	—
6945	MD50-14-87717	50-603467	360	11/04/2014	—	—	421.25	—	370.85	—	301.47	—	—	—	95.10	—
6945	MD50-14-87718	50-603467	500	11/04/2014	—	—	201.19	—	—	—	202.63	—	—	—	—	—
6945	MD50-14-87719	50-603467	600	11/04/2014	—	—	119.46	—	—	—	153.21	—	—	—	—	—
6945	MD50-14-87687	50-24822	25	11/03/2014	—	—	75.45	—	273.26	—	158.15	—	—	—	—	—

Table C-5.0-7 (continued)

Sampling Plan 2014	Field Sample ID	Location ID	Depth (ft)	Date	Acetone	Carbon Disulfide	Carbon Tetrachloride	Chlorodifluoromethane	Chloroform	Dichlorobenzene[1,2-]	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]
Groundwater Tier 1 Screening Level					**20,300**	**478,000**	**5650**	**129,000**	**12,000**	**47,200**	**2,780,000**	**5750**	**242**	**7490**	**11,700**	**580**
6945	MD50-14-87688	50-24822	142	11/03/2014	—	—	251.49	—	585.55	—	543.63	—	—	—	114.91	—
6945	MD50-14-87689	50-24822	235	11/03/2014	—	—	301.79	—	487.96	—	691.90	—	—	—	118.87	—
6945	MD50-14-87690	50-24822	351	11/03/2014	—	—	213.77	—	141.51	—	593.06	—	—	—	43.59	—
6945	MD50-14-87691	50-24822	450	11/03/2014	—	—	138.32	—	—	—	400.31	—	—	—	—	—
6945	MD50-14-87692	50-603061	25	10/30/2014	—	—	—	—	—	—	360.78	—	—	166.42	—	—
6945	MD50-14-87693	50-603061	128	10/30/2014	—	—	—	—	—	—	296.53	—	—	1267.96	—	—
6945	MD50-14-87694	50-603061	228	10/30/2014	—	—	—	—	—	—	128.50	—	—	713.23	—	—
6945	MD50-14-87695	50-603061	347	10/30/2014	—	—	88.02	—	—	—	182.86	—	—	221.89	—	—
6945	MD50-14-87696	50-603061	450	10/30/2014	—	—	—	—	—	—	93.90	—	—	—	—	—
6945	MD50-14-87701	50-603063	25	10/29/2014	—	—	—	—	—	—	163.09	—	—	—	—	—
6945	MD50-14-87702	50-603063	128	10/29/2014	—	—	144.61	—	292.78	—	370.66	64.72	—	245.67	—	—
6945	MD50-14-87703	50-603063	228	10/29/2014	—	—	333.23	—	536.75	—	543.63	52.58	—	348.69	118.87	—
6945	MD50-14-87704	50-603063	347	10/29/2014	—	—	251.49	—	253.74	—	331.12	—	—	67.36	43.59	—
6945	MD50-14-87705	50-603063	450	10/29/2014	—	—	176.04	—	156.15	—	266.88	—	—	—	—	—
6945	MD50-14-87697	50-603062	122	10/28/2014	—	—	—	—	58.56	—	163.09	—	—	—	—	—
6945	MD50-14-87698	50-603062	217	10/28/2014	—	—	—	—	—	—	222.40	—	—	—	—	—
6945	MD50-14-87699	50-603062	337	10/28/2014	—	—	—	—	—	—	148.26	—	—	—	—	—
6945	MD50-14-87700	50-603062	450	10/28/2014	—	—	—	—	—	—	84.02	—	—	—	—	—
6945	MD50-14-87710	50-603383	26	10/27/2014	—	—	75.45	—	63.43	—	163.09	—	—	-	-	55.42
6945	MD50-14-87711	50-603383	139	10/27/2014	—	—	169.76	—	175.67	—	261.93	—	—	63.40	-	254.01
6945	MD50-14-87712	50-603383	244	10/27/2014	—	—	333.23	—	146.39	—	271.82	—	—	59.44	51.51	318.67
6945	MD50-14-87713	50-603383	359	10/27/2014	—	—	194.91	—	—	—	177.92	—	—	—	—	—
6945	MD50-14-87714	50-603383	450	10/27/2014	—	—	176.04	—	—	—	163.09	—	—	—	—	—
6945	MD50-14-87681	50-24813	25	10/24/2014	—	—	880.22	—	829.53	—	177.92	—	—	—	43.59	—
6945	MD50-14-87682	50-24813	150	10/24/2014	—	—	1320.33	—	2293.41	—	474.44	—	—	—	435.86	—
6945	MD50-14-87683	50-24813	241	10/24/2014	—	—	1634.70	—	1951.83	—	1136.69	—	—	—	554.73	—
6945	MD50-14-87684	50-24813	358	10/24/2014	—	—	754.48	—	536.75	—	939.00	—	—	—	194.16	—
6945	MD50-14-87685	50-24813	450	10/24/2014	—	—	339.51	—	92.71	—	543.63	—	—	—	-	—

Table C-5.0-7 (continued)

Sampling Plan 2014	Field Sample ID	Location ID	Depth (ft)	Date	Acetone	Carbon Disulfide	Carbon Tetrachloride	Chlorodifluoromethane	Chloroform	Dichlorobenzene[1,2-]	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]
Groundwater Tier 1 Screening Level					**20,300**	**478,000**	**5650**	**129,000**	**12,000**	**47,200**	**2,780,000**	**5750**	**242**	**7490**	**11,700**	**580**
6945	MD50-14-87686	50-24813	600	10/24/2014	—	—	106.88	—	—	—	247.11	—	—	—	—	—
6945	MD50-14-87734	50-603471	90	10/23/2014	—	—	691.60	—	1024.71	—	118.61	—	44.49	—	75.28	—
6945	MD50-14-87735	50-603471	209	10/23/2014	—	—	691.60	—	1707.85	—	69.19	—	101.12	—	368.50	78.51
6945	MD50-14-87736	50-603471	288	10/23/2014	—	—	1068.84	—	1659.06	—	889.58	—	—	—	475.48	—
6945	MD50-14-87737	50-603471	360	10/23/2014	—	—	754.48	—	683.14	—	790.74	—	—	—	210.01	—
6945	MD50-14-87738	50-603471	450	10/23/2014	—	—	408.68	—	351.33	—	459.62	—	—	—	95.10	—
6945	MD50-14-87739	50-613183	550	10/23/2014	—	—	150.90	—	—	—	355.83	—	—	—	—	—
6945	MD50-14-87740	50-613183	642.5	10/23/2014	—	—	—	—	—	—	—	—	—	—	—	—
6945	MD50-14-90318	50-603471	Unknown[b]	10/23/2014	—	—	1257.46	—	1659.06	—	242.16	—	109.21	-	198.12	83.13
6945	MD50-14-87727	50-603470	83	10/22/2014	—	—	270.35	—	878.33	—	227.34	—	—	—	130.76	—
6945	MD50-14-87728	50-603470	203	10/22/2014	—	—	477.84	—	1317.49	—	840.16	—	—	—	372.46	—
6945	MD50-14-87729	50-603470	278	10/22/2014	—	—	540.71	—	1024.71	—	988.43	—	—	—	320.95	—
6945	MD50-14-87730	50-603470	351	10/22/2014	—	—	465.26	—	370.85	—	939.00	—	—	—	150.57	—
6945	MD50-14-87731	50-603470	450	10/22/2014	—	—	257.78	—	82.95	—	593.06	—	—	—	—	—
6945	MD50-14-87733	50-603470	650	10/22/2014	—	—	—	—	—	—	—	—	—	—	—	—
6945	MD50-14-87741	50-603472	27	10/21/2014	—	—	—	—	204.94	—	—	—	—	—	—	—
6945	MD50-14-87742	50-603472	146	10/21/2014	—	—	176.04	—	487.96	—	113.67	—	—	—	95.10	78.51
6945	MD50-14-87743	50-603472	292	10/21/2014	—	—	226.34	—	292.78	—	177.92	—	—	—	83.21	—
6945	MD50-14-87744	50-603472	364	10/21/2014	—	—	377.24	—	170.79	—	355.83	—	—	—	47.55	—
6945	MD50-14-87745	50-603472	450	10/21/2014	—	—	132.03	—	—	—	138.38	—	—	—	—	—
6945	MD50-14-87746	50-613182	550	10/21/2014	—	—	75.45	—	—	—	103.79	—	—	—	—	—
6945	MD50-14-87747	50-613182	632.5	10/21/2014	—	—	—	—	—	—	—	—	—	—	—	—
6945	MD50-14-87677	50-24784	155	10/20/2014	—	—	169.76	—	297.66	—	98.84	—	—	—	—	60.04
6945	MD50-14-87678	50-24784	244	10/20/2014	—	—	232.63	—	97.59	—	108.73	—	—	—	—	—
6945	MD50-14-87679	50-24784	362	10/20/2014	—	—	339.51	—	—	—	172.97	—	—	—	—	—
6945	MD50-14-87680	50-24784	450	10/20/2014	—	—	232.63	—	—	—	148.26	—	—	—	—	—
4639	MD50-14-75362	50-603061	25	05/12/2014	—	—	—	—	—	—	494.21 (J+)	—	—	221.89	—	—
4639	MD50-14-75363	50-603061	128	05/12/2014	—	—	—	—	53.68	—	405.25 (J+)	—	—	1347.20	—	—

Table C-5.0-7 (continued)

Sampling Plan 2014	Field Sample ID	Location ID	Depth (ft)	Date	Acetone	Carbon Disulfide	Carbon Tetrachloride	Chlorodifluoromethane	Chloroform	Dichlorobenzene[1,2-]	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]
Groundwater Tier 1 Screening Level					**20,300**	**478,000**	**5650**	**129,000**	**12,000**	**47,200**	**2,780,000**	**5750**	**242**	**7490**	**11,700**	**580**
4639	MD50-14-75364	50-603061	228	05/12/2014	—	—	81.73	—	—	—	301.47 (J+)	—	—	1109.46	—	—
4639	MD50-14-75365	50-603061	347	05/12/2014	—	—	100.60	—	—	—	237.22 (J+)	—	—	249.63	—	—
4639	MD50-14-75366	50-603061	450	05/12/2014	—	—	—	—	—	—	123.55 (J+)	—	—	55.47	—	—
4639	MD50-14-75380	50-603383	26	05/09/2014	—	—	—	—	—	—	64.25	—	—	—	—	—
4639	MD50-14-75381	50-603383	139	05/09/2014	—	—	220.06	—	185.42	—	296.53	—	—	67.36	43.59	230.92
4639	MD50-14-75382	50-603383	244	05/09/2014	—	—	370.95	—	156.15	—	326.18	—	—	71.32	59.44	295.58
4639	MD50-14-75383	50-603383	359	05/09/2014	—	—	220.06	—	—	—	222.40	—	—	—	—	—
4639	MD50-14-75384	50-603383	450	05/09/2014	—	—	201.19	—	—	—	192.74	—	—	—	—	—
4639	MD50-14-75371	50-603063	450	05/08/2014	—	—	138.32	—	156.15	—	232.28	—	—	—	—	—
4639	MD50-14-75372	50-603063	347	05/08/2014	—	—	232.63	—	219.58	—	296.53	—	—	67.36	39.62	-
4639	MD50-14-75373	50-603063	228	05/08/2014	—	56.02	389.81	—	536.75	—	543.63	48.54	—	324.91	154.53	—
4639	MD50-14-75374	50-603063	128	05/08/2014	—	—	169.76	—	302.53	—	415.14	68.76	—	233.78	—	—
4639	MD50-14-75375	50-603063	25	05/08/2014	—	—	—	—	—	—	172.97	—	—	—	—	—
4639	MD50-14-75376	50-603064	113	05/07/2014	—	—	169.76	—	829.53	—	464.56	—	—	554.73	249.63	—
4639	MD50-14-75377	50-603064	214	05/07/2014	—	—	295.50	—	585.55	—	691.90	—	—	713.23	253.59	—
4639	MD50-14-75378	50-603064	332	05/07/2014	—	—	213.77	—	78.07	—	494.21	—	—	162.46	—	—
4639	MD50-14-75379	50-603064	500	05/07/2014	—	—	—	—	—	—	207.57	—	—	—	—	—
4639	MD50-14-75367	50-603062	122	05/06/2014	—	—	—	—	73.19	—	202.63	—	—	—	—	—
4639	MD50-14-75368	50-603062	217	05/06/2014	—	—	—	—	48.80	—	237.22	—	—	—	—	—
4639	MD50-14-75369	50-603062	450	05/06/2014	—	—	—	—	—	—	98.84	—	—	—	—	—
4639	MD50-14-75370	50-603062	337	05/06/2014	—	—	—	—	—	—	172.97	—	—	—	—	—
4639	MD50-14-75357	50-24822	142	05/05/2014	—	—	238.92	—	536.75	—	494.21	—	—	—	103.02	—
4639	MD50-14-75358	50-24822	235	05/05/2014	—	—	289.22	—	429.40	56.48	642.48	—	—	—	106.98	—
4639	MD50-14-75359	50-24822	351	05/05/2014	—	—	201.19	—	131.75	—	494.21	—	—	—	—	—
4639	MD50-14-75360	50-24822	450	05/05/2014	—	—	144.61	—	—	—	365.72	—	—	—	—	—
4639	MD50-14-75361	50-24822	25	05/05/2014	—	—	62.87	—	224.46	—	123.55	—	—	—	—	—
4639	MD50-14-75418	50-603503	133	05/02/2014	—	—	—	—	97.59	—	—	—	—	—	—	—
4639	MD50-14-75419	50-603503	237	05/02/2014	—	—	88.02	—	107.35	—	64.25	—	—	—	—	—

Table C-5.0-7 (continued)

Sampling Plan 2014	Field Sample ID	Location ID	Depth (ft)	Date	Acetone	Carbon Disulfide	Carbon Tetrachloride	Chlorodifluoromethane	Chloroform	Dichlorobenzene[1,2-]	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]
Groundwater Tier 1 Screening Level					**20,300**	**478,000**	**5650**	**129,000**	**12,000**	**47,200**	**2,780,000**	**5750**	**242**	**7490**	**11,700**	**580**
4639	MD50-14-75420	50-603503	347	05/02/2014	—	—	94.31	—	53.68	—	69.19	—	—	—	—	—
4639	MD50-14-75421	50-603503	450	05/02/2014	—	—	94.31	—	—	—	74.13	—	—	—	—	—
4639	MD50-14-75385	50-603467	143	05/01/2014	—	—	383.53	—	536.75	—	192.74	—	—	—	99.06	—
4639	MD50-14-75386	50-603467	244	05/01/2014	—	—	490.41	—	536.75	—	276.76	—	—	—	146.61	—
4639	MD50-14-75387	50-603467	360	05/01/2014	—	—	433.82	—	361.09	—	237.22	—	—	—	99.06	—
4639	MD50-14-75388	50-603467	500	05/01/2014	—	—	226.34	—	—	—	202.63	—	—	—	-	—
4639	MD50-14-75389	50-603467	600	05/01/2014	—	—	113.17	—	—	—	133.44	—	—	—	—	—
4639	MD50-14-75422	50-613185	600	04/30/2014	—	—	21.38	—	—	—	48.93	—	—	—	—	—
4639	MD50-14-75423	50-613185	450	04/30/2014	—	—	—	—	—	—	98.84	—	—	—	—	—
4639	MD50-14-75424	50-613185	350	04/30/2014	—	—	106.88	—	—	—	138.38	—	—	—	—	—
4639	MD50-14-75425	50-613185	235	04/30/2014	—	—	138.32	—	87.83	—	158.15	—	—	—	—	—
4639	MD50-14-75426	50-613185	145	04/30/2014	—	—	81.73	—	87.83	—	84.02	—	—	—	—	—
4639	MD50-14-75390	50-603468	354	04/29/2014	—	—	591.01	—	370.85	—	593.06	—	—	—	118.87	—
4639	MD50-14-75391	50-603468	233	04/29/2014	—	—	597.29	—	585.55	—	494.21	—	—	—	166.42	—
4639	MD50-14-75392	50-603468	142	04/29/2014	—	—	251.49	—	361.09	—	93.90	—	—	—	83.21	—
4639	MD50-14-75393	50-603468	403	04/29/2014	—	—	490.41	—	214.70	—	593.06	—	—	—	79.25	—
4639	MD50-14-75394	50-613184	500	04/29/2014	—	—	157.18	—	—	—	237.22	—	—	—	—	—
4639	MD50-14-75395	50-613184	600	04/29/2014	—	—	—	—	—	—	128.50	—	—	—	—	—
4639	MD50-14-75396	50-613184	664.5	04/29/2014	—	—	—	—	—	—	—	—	—	—	—	—
4639	MD50-14-75351	50-24813	600	04/28/2014	—	—	138.32	—	—	—	301.47	—	—	—	—	—
4639	MD50-14-75352	50-24813	450	04/28/2014	—	—	440.11	—	136.63	—	691.90	—	—	—	43.59	—
4639	MD50-14-75353	50-24813	358	04/28/2014	—	—	817.35	—	536.75	—	1037.85	—	—	—	182.27	—
4639	MD50-14-75354	50-24813	241	04/28/2014	—	—	1760.44	—	2098.22	—	1383.79	—	—	—	554.73	—
4639	MD50-14-75355	50-24813	150	04/28/2014	—	—	1508.95	—	2634.98	—	642.48	—	97.08	—	475.48	64.66
4639	MD50-14-75356	50-24813	25	04/28/2014	—	—	1194.59	—	975.92	—	271.82	—	—	—	47.55	—
4639	MD50-14-75397	50-603470	650	04/25/2014	23.74	—	6.92	—	—	—	36.08	—	—	—	—	—
4639	MD50-14-75398	50-603470	600	04/25/2014	—	—	—	—	—	—	227.34	—	—	—	—	—
4639	MD50-14-75399	50-603470	450	04/25/2014	—	—	257.78	—	78.07	—	593.06	—	-	—	—	—
4639	MD50-14-75400	50-603470	351	04/25/2014	—	—	421.25	—	346.45	—	889.58	—	-	—	114.91	—

Table C-5.0-7 (continued)

Sampling Plan 2014	Field Sample ID	Location ID	Depth (ft)	Date	Acetone	Carbon Disulfide	Carbon Tetrachloride	Chlorodifluoromethane	Chloroform	Dichlorobenzene[1,2-]	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]
Groundwater Tier 1 Screening Level					**20,300**	**478,000**	**5650**	**129,000**	**12,000**	**47,200**	**2,780,000**	**5750**	**242**	**7490**	**11,700**	**580**
4639	MD50-14-75401	50-603470	278	04/25/2014	—	—	528.13	—	927.12	—	988.43	—	—	38.43	257.55	—
4639	MD50-14-75402	50-603470	203	04/25/2014	—	—	440.11	—	1268.69	—	889.58	—	—	—	320.95	—
4639	MD50-14-75403	50-603470	83	04/25/2014	—	—	282.93	—	975.92	—	242.16	—	—	—	118.87	—
4639	MD50-14-75404	50-603471	450	04/24/2014	—	—	377.24	—	331.81	—	365.72	—	—	—	91.13	—
4639	MD50-14-75405	50-603471	360	04/24/2014	—	—	754.48	—	683.14	—	790.74	—	—	—	202.08	—
4639	MD50-14-75406	50-603471	288	04/24/2014	—	—	1068.84	151.98	1463.88	—	840.16	—	44.49	—	396.24	55.42
4639	MD50-14-75407	50-603471	209	04/24/2014	—	—	597.29	—	1219.90	—	494.21	—	72.81	—	285.29	60.04
4639	MD50-14-75408	50-603471	90.0	04/24/2014	—	—	754.48	—	1073.51	—	128.50	—	56.63	—	103.02	—
4639	MD50-14-75409	50-613183	550	04/24/2014	—	—	163.47	—	—	—	341.01	—	—	—	—	—
4639	MD50-14-75410	50-613183	642.5	04/24/2014	—	—	—	—	—	—	—	—	—	—	—	—
4639	MD50-14-75754	50-603471	Unknown[b]	04/24/2014	—	—	1320.33	—	1610.26	—	232.28	—	125.39	—	194.16	73.89
4639	MD50-14-75411	50-603472	146	04/23/2014	—	—	220.06	—	536.75	—	148.26	—	44.49	—	99.06	83.13
4639	MD50-14-75412	50-603472	292	04/23/2014	—	—	477.84	173.19	585.55	—	375.60	—	—	—	154.53	50.80
4639	MD50-14-75413	50-603472	364	04/23/2014	—	—	389.81	—	170.79	—	370.66	—	—	—	43.59	—
4639	MD50-14-75414	50-603472	450	04/23/2014	—	—	276.64	—	58.56 (J)	—	291.59	—	—	—	—	—
4639	MD50-14-75415	50-603472	27	04/23/2014	—	—	—	—	243.98	—	—	—	—	—	—	—
4639	MD50-14-75416	50-613182	550	04/23/2014	—	—	88.02	—	—	—	138.38	—	—	—	—	—
4639	MD50-14-75417	50-613182	632.5	04/23/2014	—	—	—	—	—	—	6.42	—	—	—	—	—
4639	MD50-14-75347	50-24784	450	04/22/2014	—	—	232.63	—	—	—	158.15	—	—	—	—	—
4639	MD50-14-75348	50-24784	362	04/22/2014	—	—	352.09	—	—	—	168.03	—	—	—	—	—
4639	MD50-14-75349	50-24784	244	04/22/2014	—	—	220.06	—	97.59	—	108.73	—	—	—	—	—
4639	MD50-14-75350	50-24784	155	04/22/2014	—	—	176.04	—	287.90	—	108.73	—	—	—	—	60.04

Table C-5.0-7 (continued)

Sampling Plan 2014	Field Sample ID	Location ID	Depth (ft)	Date	Ethanol	Hexanone[2-]	Methylene Chloride	Tetrachloroethylene	Tetrahydrofuran	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethylene	Trichlorofluoromethane
Groundwater Tier 1 Screening Level					**na**[c]	**145**	**665**	**3630**	**9790**	**272,000**	**1,190,000,000**	**141,000**	**169**	**2020**	**4,540,000**
6945	MD50-14-87706	50-603064	113	11/10/2014	—	—	86.79	549.03	—	—	9956.55	1962.95	—	22,556.0	—
6945	MD50-14-87707	50-603064	214	11/10/2014	—	—	347.15	555.81	—	—	13,020.10	2017.48	—	33,834.1	56.15
6945	MD50-14-87708	50-603064	332	11/10/2014	—	—	55.54	216.90	—	—	3676.26	169.03	—	13,426.2	—
6945	MD50-14-87709	50-603064	500	11/10/2014	—	—	—	—	—	—	199.13	—	—	1342.62	—
6945	MD50-14-87752	50-613185	145	11/07/2014	—	—	33.33	81.34	—	—	—	—	—	3759.34	—
6945	MD50-14-87753	50-613185	235	11/07/2014	—	—	62.49	108.45	—	—	—	—	—	6981.63	—
6945	MD50-14-87754	50-613185	350	11/07/2014	—	—	—	65.07	—	—	—	—	—	3651.93	—
6945	MD50-14-87755	50-613185	450	11/07/2014	—	—	—	—	—	—	—	—	—	1235.21	—
6945	MD50-14-87756	50-613185	600	11/07/2014	—	—	—	—	—	—	—	—	—	155.74	—
6945	MD50-14-87748	50-603503	133	11/06/2014	—	—	38.19	264.35	—	—	—	—	—	1450.03	—
6945	MD50-14-87749	50-603503	237	11/06/2014	—	—	104.14	474.47	—	—	—	—	—	4511.21	—
6945	MD50-14-87750	50-603503	347	11/06/2014	—	—	—	149.12	—	—	—	—	—	1503.74	—
6945	MD50-14-87751	50-603503	450	11/06/2014	—	—	—	237.24	—	—	—	—	—	2577.83	—
6945	MD50-14-87720	50-603468	142	11/05/2014	—	—	48.60	216.90	—	—	—	—	—	13,426.2	—
6945	MD50-14-87721	50-603468	233	11/05/2014	—	—	451.29	332.13	—	—	—	—	—	25,241.3	—
6945	MD50-14-87722	50-603468	354	11/05/2014	—	—	288.13	338.91	—	—	—	—	—	25,778.3	—
6945	MD50-14-87723	50-603468	403	11/05/2014	—	—	190.93	271.13	—	—	—	—	—	22,556.0	—
6945	MD50-14-87724	50-613184	500	11/05/2014	—	—	—	—	—	—	—	—	—	3651.93	—
6945	MD50-14-87725	50-613184	600	11/05/2014	—	—	—	—	—	—	—	—	—	698.16	—
6945	MD50-14-87726	50-613184	664.5	11/05/2014	—	—	—	—	—	—	—	—	—	112.78	—
6945	MD50-14-87715	50-603467	143	11/04/2014	—	—	52.07	393.14	—	—	—	—	—	14,500.3	—
6945	MD50-14-87716	50-603467	244	11/04/2014	—	—	253.42	745.60	—	—	—	—	—	24,167.2	—
6945	MD50-14-87717	50-603467	360	11/04/2014	—	—	—	677.82	—	—	—	—	—	22,019.0	—
6945	MD50-14-87718	50-603467	500	11/04/2014	—	—	—	237.24	—	—	—	—	—	8592.78	—
6945	MD50-14-87719	50-603467	600	11/04/2014	—	—	—	155.90	58.95	—	—	—	—	4135.27	—
6945	MD50-14-87687	50-24822	25	11/03/2014	—	—	—	149.12	—	—	71.23	—	—	6444.58	—

Table C-5.0-7 (continued)

Sampling Plan 2014	Field Sample ID	Location ID	Depth (ft)	Date	Ethanol	Hexanone[2-]	Methylene Chloride	Tetrachloroethylene	Tetrahydrofuran	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethylene	Trichlorofluoromethane
Groundwater Tier 1 Screening Level					**na[c]**	**145**	**665**	**3630**	**9790**	**272,000**	**1,190,000,000**	**141,000**	**169**	**2020**	**4,540,000**
6945	MD50-14-87688	50-24822	142	11/03/2014	—	—	170.10	189.79	—	—	153.18	—	—	22,556.0	—
6945	MD50-14-87689	50-24822	235	11/03/2014	—	—	263.83	216.90	—	—	183.81	—	—	30,611.8	—
6945	MD50-14-87690	50-24822	351	11/03/2014	—	—	107.62	122.01	—	—	—	—	—	19,870.8	—
6945	MD50-14-87691	50-24822	450	11/03/2014	—	—	—	—	—	—	—	—	—	9129.83	—
6945	MD50-14-87692	50-603061	25	10/30/2014	—	—	—	81.34	—	37.66	8424.77	926.95	—	370.56	—
6945	MD50-14-87693	50-603061	128	10/30/2014	—	—	—	244.02	—	—	24,508.40	3435.17	—	1987.08	—
6945	MD50-14-87694	50-603061	228	10/30/2014	—	—	—	108.45	—	—	9956.55	1690.32	—	1879.67	—
6945	MD50-14-87695	50-603061	347	10/30/2014	—	—	—	88.12	—	—	6586.64	447.12	—	1181.51	—
6945	MD50-14-87696	50-603061	450	10/30/2014	—	—	—	—	—	—	1378.60	—	—	408.16	—
6945	MD50-14-87701	50-603063	25	10/29/2014	320.12 (J+)	—	—	325.35	—	—	2374.25	299.90	—	1288.92	—
6945	MD50-14-87702	50-603063	128	10/29/2014	—	—	—	881.17	—	—	4901.68	654.32	—	7518.68	—
6945	MD50-14-87703	50-603063	228	10/29/2014	—	—	—	1558.99	—	—	5820.75	708.84	—	22,556.0	61.76
6945	MD50-14-87704	50-603063	347	10/29/2014	—	—	38.19	671.04	—	—	1378.60	81.79	—	13,426.2	—
6945	MD50-14-87705	50-603063	450	10/29/2014	—	—	—	338.91	—	—	214.45	—	—	8055.73	—
6945	MD50-14-87697	50-603062	122	10/28/2014	—	—	—	—	—	—	413.58	—	—	5263.08	—
6945	MD50-14-87698	50-603062	217	10/28/2014	—	—	—	—	—	—	482.51	—	—	6444.58	—
6945	MD50-14-87699	50-603062	337	10/28/2014	—	—	—	—	—	—	130.20	—	—	1825.97	—
6945	MD50-14-87700	50-603062	450	10/28/2014	—	—	—	—	—	—	—	—	—	590.75	—
6945	MD50-14-87710	50-603383	26	10/27/2014	—	—	—	528.70	—	—	681.64	109.05	—	1611.15	—
6945	MD50-14-87711	50-603383	139	10/27/2014	—	—	—	1084.51	—	—	1148.83	190.84	—	4188.98	—
6945	MD50-14-87712	50-603383	244	10/27/2014	—	—	65.96	1355.64	—	—	842.48	174.49	—	5907.54	—
6945	MD50-14-87713	50-603383	359	10/27/2014	—	—	—	338.91	—	—	252.74	—	—	1879.67	—
6945	MD50-14-87714	50-603383	450	10/27/2014	—	—	—	230.46	—	—	130.20	—	—	1074.10	—
6945	MD50-14-87681	50-24813	25	10/24/2014	—	—	—	332.13	—	—	—	—	—	9129.83	—
6945	MD50-14-87682	50-24813	150	10/24/2014	—	—	343.68	521.92	—	—	—	—	174.49	37,056.4	—
6945	MD50-14-87683	50-24813	241	10/24/2014	—	—	902.58	813.38	—	—	—	—	—	75,186.8	—
6945	MD50-14-87684	50-24813	358	10/24/2014	—	—	—-	481.25	—	—	—	—	—	48,334.4	—
6945	MD50-14-87685	50-24813	450	10/24/2014	—	—	107.62	176.23	—	—	—	—	—	19,870.8	—

Table C-5.0-7 (continued)

Sampling Plan 2014	Field Sample ID	Location ID	Depth (ft)	Date	Ethanol	Hexanone[2-]	Methylene Chloride	Tetrachloroethylene	Tetrahydrofuran	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethylene	Trichlorofluoromethane
Groundwater Tier 1 Screening Level					**na[c]**	**145**	**665**	**3630**	**9790**	**272,000**	**1,190,000,000**	**141,000**	**169**	**2020**	**4,540,000**
6945	MD50-14-87686	50-24813	600	10/24/2014	—	—	—	—	—	—	—	—	—	2631.54	—
6945	MD50-14-87734	50-603471	90	10/23/2014	—	—	—	474.47	—	—	122.54	—	—	5907.54	—
6945	MD50-14-87735	50-603471	209	10/23/2014	—	—	763.72	948.95	—	—	—	—	—	34,371.1	—
6945	MD50-14-87736	50-603471	288	10/23/2014	—	—	1666.30	1220.08	—	—	528.46	—	—	59,075.4	—
6945	MD50-14-87737	50-603471	360	10/23/2014	—	—	763.72	948.95	—	—	321.67	—	—	42,963.9	—
6945	MD50-14-87738	50-603471	450	10/23/2014	—	—	232.59	528.70	—	—	137.86	—	—	24,167.2	—
6945	MD50-14-87739	50-613183	550	10/23/2014	—	—	—	—	—	—	—	—	—	3329.70	—
6945	MD50-14-87740	50-613183	642.5	10/23/2014	—	—	—	—	—	—	—	—	—	75.19	—
6945	MD50-14-90318	50-603471	Unknown[b]	10/23/2014	—	—	194.40	813.38	—	—	260.40	—	—	13,963.3	—
6945	MD50-14-87727	50-603470	83	10/22/2014	—	—	41.66	657.49	—	—	245.08	59.98	—	12,352.1	—
6945	MD50-14-87728	50-603470	203	10/22/2014	—	—	694.29	562.59	—	—	919.07	—	—	43,500.9	—
6945	MD50-14-87729	50-603470	278	10/22/2014	—	—	833.15	508.37	—	—	842.48	—	—	53,704.9	—
6945	MD50-14-87730	50-603470	351	10/22/2014	—	—	451.29	366.02	—	—	597.39	—	—	39,741.6	—
6945	MD50-14-87731	50-603470	450	10/22/2014	—	—	93.73	128.79	—	—	206.79	—	—	17,722.6	—
6945	MD50-14-87733	50-603470	650	10/22/2014	—	—	—	—	—	—	—	—	—	91.30	—
6945	MD50-14-87741	50-603472	27	10/21/2014	—	—	—	372.80	—	—	—	—	—	2094.49	—
6945	MD50-14-87742	50-603472	146	10/21/2014	—	—	347.15	637.15	—	—	91.91	—	—	9666.88	—
6945	MD50-14-87743	50-603472	292	10/21/2014	—	—	451.29	813.38	—	—	—	—	—	15,037.4	—
6945	MD50-14-87744	50-603472	364	10/21/2014	—	—	270.77	881.17	—	—	—	—	—	18,259.7	—
6945	MD50-14-87745	50-603472	450	10/21/2014	—	—	—	244.02	—	—	—	—	—	5048.26	—
6945	MD50-14-87746	50-613182	550	10/21/2014	—	—	—	81.34	—	—	—	—	—	1342.62	—
6945	MD50-14-87747	50-613182	632.5	10/21/2014	—	—	—	—	—	—	—	—	—	—	—
6945	MD50-14-87677	50-24784	155	10/20/2014	—	—	—	2033.46	—	—	122.54	—	—	3061.18	—
6945	MD50-14-87678	50-24784	244	10/20/2014	—	—	—	1694.55	—	—	76.59	—	—	3114.88	—
6945	MD50-14-87679	50-24784	362	10/20/2014	—	—	—	1220.08	—	—	—	—	—	2255.60	—
6945	MD50-14-87680	50-24784	450	10/20/2014	—	—	—	427.03	—	—	—	—	—	859.28	—
4639	MD50-14-75362	50-603061	25	05/12/2014	—	—	—	94.89	—	—	9956.55	1145.06	—	440.38	—
4639	MD50-14-75363	50-603061	128	05/12/2014	—	—	—	250.79	—	—	26,040.20	3816.85	—	2363.01	—

Table C-5.0-7 (continued)

Sampling Plan 2014	Field Sample ID	Location ID	Depth (ft)	Date	Ethanol	Hexanone[2-]	Methylene Chloride	Tetrachloroethylene	Tetrahydrofuran	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethylene	Trichlorofluoromethane
Groundwater Tier 1 Screening Level					**na**[c]	**145**	**665**	**3630**	**9790**	**272,000**	**1,190,000,000**	**141,000**	**169**	**2020**	**4,540,000**
4639	MD50-14-75364	50-603061	228	05/12/2014	—	—	41.66	196.57	—	—	18,381.30	2944.43	—	3168.59	—
4639	MD50-14-75365	50-603061	347	05/12/2014	—	—	—	94.89	—	—	7046.17	447.12	—	1342.62	—
4639	MD50-14-75366	50-603061	450	05/12/2014	—	—	—	81.34	—	—	1225.42	—	—	445.75	—
4639	MD50-14-75380	50-603383	26	05/09/2014	—	—	—	250.79	—	—	160.84	—	—	590.75	—
4639	MD50-14-75381	50-603383	139	05/09/2014	—	—	41.66	1355.64	—	—	1302.01	218.11	—	5101.96	—
4639	MD50-14-75382	50-603383	244	05/09/2014	—	—	65.96	1355.64	—	—	842.48	163.58	—	5907.54	—
4639	MD50-14-75383	50-603383	359	05/09/2014	—	—	—	406.69	—	—	283.38	—	—	1987.08	—
4639	MD50-14-75384	50-603383	450	05/09/2014	—	—	—	237.24	—	—	107.22	—	—	1396.33	—
4639	MD50-14-75371	50-603063	450	05/08/2014	—	—	—	372.80	—	—	176.15	—	—	8055.73	—
4639	MD50-14-75372	50-603063	347	05/08/2014	—	—	38.19	623.60	—	—	1225.42	59.98	—	12,352.0	—
4639	MD50-14-75373	50-603063	228	05/08/2014	—	—	—	1694.55	—	—	5744.16	654.32	—	23,630.1	61.76
4639	MD50-14-75374	50-603063	128	05/08/2014	—	—	—	948.95	—	—	4901.68	708.84	—	9129.83	—
4639	MD50-14-75375	50-603063	25	05/08/2014	—	—	—	311.80	—	—	2374.25	294.44	—	1342.62	—
4639	MD50-14-75376	50-603064	113	05/07/2014	—	—	100.67	610.04	—	—	11,488.30	2126.53	—	25,241.3	—
4639	MD50-14-75377	50-603064	214	05/07/2014	—	—	416.58	582.93	—	—	13,020.10	2181.06	—	35,445.2	—
4639	MD50-14-75378	50-603064	332	05/07/2014	—	—	59.01	183.01	—	—	4135.80	218.11	—	13,426.2	—
4639	MD50-14-75379	50-603064	500	05/07/2014	—	—	—	—	—	—	245.08	—	—	1503.74	—
4639	MD50-14-75367	50-603062	122	05/06/2014	301.29	—	—	—	—	—	459.53	—	—	6444.58	—
4639	MD50-14-75368	50-603062	217	05/06/2014	—	—	—	—	—	—	536.12	54.53	—	6981.63	—
4639	MD50-14-75369	50-603062	450	05/06/2014	—	—	—	—	—	—	—	—	—	644.46	—
4639	MD50-14-75370	50-603062	337	05/06/2014	—	—	—	—	—	—	160.84	—	—	2309.31	—
4639	MD50-14-75357	50-24822	142	05/05/2014	—	—	135.39	196.57	—	—	191.47	—	—	22,556.0	—
4639	MD50-14-75358	50-24822	235	05/05/2014	—	—	218.70	189.79	—	—	191.47	—	—	29,000.6	—
4639	MD50-14-75359	50-24822	351	05/05/2014	—	—	90.26	101.67	—	—	84.25	—	—	19,333.8	—
4639	MD50-14-75360	50-24822	450	05/05/2014	—	—	—	—	—	—	—	—	—	9666.88	—
4639	MD50-14-75361	50-24822	25	05/05/2014	—	—	—	135.56	—	—	—	—	—	5907.54	—
4639	MD50-14-75418	50-603503	133	05/02/2014	—	—	—	352.47	—	—	84.25	—	—	2040.79	—
4639	MD50-14-75419	50-603503	237	05/02/2014	—	—	83.32	460.92	—	—	—	—	—	4296.39	—

Table C-5.0-7 (continued)

Sampling Plan 2014	Field Sample ID	Location ID	Depth (ft)	Date	Ethanol	Hexanone[2-]	Methylene Chloride	Tetrachloroethylene	Tetrahydrofuran	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethylene	Trichlorofluoromethane
Groundwater Tier 1 Screening Level					**na[c]**	**145**	**665**	**3630**	**9790**	**272,000**	**1,190,000,000**	**141,000**	**169**	**2020**	**4,540,000**
4639	MD50-14-75420	50-603503	347	05/02/2014	—	—	38.19	352.47	—	—	—	—	—	3437.11	—
4639	MD50-14-75421	50-603503	450	05/02/2014	—	—	—	244.02	—	—	—	—	—	2846.36	—
4639	MD50-14-75385	50-603467	143	05/01/2014	—	—	97.20	386.36	—	—	—	—	—	12,889.2	—
4639	MD50-14-75386	50-603467	244	05/01/2014	—	—	249.95	637.15	—	—	—	—	—	21,481.9	—
4639	MD50-14-75387	50-603467	360	05/01/2014	—	—	—	610.04	—	—	—	—	—	21,481.9	—
4639	MD50-14-75388	50-603467	500	05/01/2014	—	—	—	237.24	—	—	—	—	—	7518.68	—
4639	MD50-14-75389	50-603467	600	05/01/2014	—	319.33	—	135.56	64.84	—	—	—	—	3974.16	—
4639	MD50-14-75422	50-613185	600	04/30/2014	—	—	—	—	—	—	—	—	—	150.37	—
4639	MD50-14-75423	50-613185	450	04/30/2014	—	—	—	—	—	—	—	—	—	1557.44	—
4639	MD50-14-75424	50-613185	350	04/30/2014	—	—	—	—	—	—	—	—	—	3813.05	—
4639	MD50-14-75425	50-613185	235	04/30/2014	—	—	52.07	122.01	—	—	—	—	—	6981.63	—
4639	MD50-14-75426	50-613185	145	04/30/2014	—	—	—	67.78	—	—	—	—	—	3866.75	—
4639	MD50-14-75390	50-603468	354	04/29/2014	—	—	298.55	393.14	—	—	—	—	—	29,537.7	—
4639	MD50-14-75391	50-603468	233	04/29/2014	—	—	451.29	406.69	—	—	—	—	—	30,074.7	—
4639	MD50-14-75392	50-603468	142	04/29/2014	—	—	62.49	325.35	—	—	—	—	—	21,481.9	—
4639	MD50-14-75393	50-603468	403	04/29/2014	—	—	187.46	318.58	—	—	—	—	—	25,241.3	—
4639	MD50-14-75394	50-613184	500	04/29/2014	—	—	—	67.78	—	—	—	—	—	4779.73	—
4639	MD50-14-75395	50-613184	600	04/29/2014	—	—	—	—	—	—	—	—	—	859.28	—
4639	MD50-14-75396	50-613184	664.5	04/29/2014	—	—	—	—	—	—	—	—	—	166.49	—
4639	MD50-14-75351	50-24813	600	04/28/2014	—	—	—	—	—	—	—	—	—	3383.41	—
4639	MD50-14-75352	50-24813	450	04/28/2014	—	—	121.50	264.35	—	—	—	—	—	25,778.3	—
4639	MD50-14-75353	50-24813	358	04/28/2014	—	—	48.60	515.14	—	—	—	—	—	51,019.6	—
4639	MD50-14-75354	50-24813	241	04/28/2014	—	—	763.72	948.95	—	—	—	—	—	80,557.3	—
4639	MD50-14-75355	50-24813	150	04/28/2014	—	—	347.15	603.26	—	—	—	—	—	41,352.8	—
4639	MD50-14-75356	50-24813	25	04/28/2014	—	—	—	393.14	—	—	—	—	—	12,889.2	—
4639	MD50-14-75397	50-603470	650	04/25/2014	—	—	—	—	—	—	—	—	—	49.95	—
4639	MD50-14-75398	50-603470	600	04/25/2014	—	—	—	—	—	—	—	—	—	1611.15	—
4639	MD50-14-75399	50-603470	450	04/25/2014	—	—	79.84	135.56	—	—	214.45	—	—	18,796.7	—
4639	MD50-14-75400	50-603470	351	04/25/2014	—	—	347.15	305.02	—	—	651.01	—	—	38,667.5	—

Table C-5.0-7 (continued)

Sampling Plan 2014	Field Sample ID	Location ID	Depth (ft)	Date	Ethanol	Hexanone[2-]	Methylene Chloride	Tetrachloroethylene	Tetrahydrofuran	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethylene	Trichlorofluoromethane
Groundwater Tier 1 Screening Level					**na[c]**	**145**	**665**	**3630**	**9790**	**272,000**	**1,190,000,000**	**141,000**	**169**	**2020**	**4,540,000**
4639	MD50-14-75401	50-603470	278	04/25/2014	—	—	659.58	474.47	—	—	919.07	92.70	—	50,482.6	—
4639	MD50-14-75402	50-603470	203	04/25/2014	—	—	555.43	569.37	—	—	765.89	125.41	—	45,112.1	—
4639	MD50-14-75403	50-603470	83	04/25/2014	—	—	41.66	677.82	—	—	291.04	—	—	13,963.3	—
4639	MD50-14-75404	50-603471	450	04/24/2014	—	—	183.99	542.26	—	—	99.57	—	—	26,315.4	—
4639	MD50-14-75405	50-603471	360	04/24/2014	—	—	763.72	948.95	—	—	367.63	—	—	45,649.1	—
4639	MD50-14-75406	50-603471	288	04/24/2014	—	—	1596.87	1152.29	—	—	513.15	—	—	53,704.9	—
4639	MD50-14-75407	50-603471	209	04/24/2014	—	—	451.29	948.95	—	—	237.43	—	—	39,741.6	—
4639	MD50-14-75408	50-603471	90.0	04/24/2014	—	—	93.73	515.14	—	—	137.86	—	—	10,203.9	—
4639	MD50-14-75409	50-613183	550	04/24/2014	—	—	—	—	—	—	—	—	—	3813.05	—
4639	MD50-14-75410	50-613183	642.5	04/24/2014	—	—	—	—	—	—	—	—	—	80.56	—
4639	MD50-14-75754	50-603471	Unknown[b]	04/24/2014	—	—	211.76	813.38	—	—	283.38	—	—	17,722.6	—
4639	MD50-14-75411	50-603472	146	04/23/2014	—	—	347.15	813.38	—	—	122.54	—	—	12,889.2	—
4639	MD50-14-75412	50-603472	292	04/23/2014	—	—	763.72	1558.99	—	—	137.86	—	—	29,537.7	—
4639	MD50-14-75413	50-603472	364	04/23/2014	—	—	243.00	881.17	—	—	—	—	—	18,259.7	—
4639	MD50-14-75414	50-603472	450	04/23/2014	—	—	—	488.03	—	—	—	—	—	10,741.0	—
4639	MD50-14-75415	50-603472	27	04/23/2014	—	—	—	474.47	—	—	—	—	—	2738.95	—
4639	MD50-14-75416	50-613182	550	04/23/2014	—	—	—	101.67	—	—	—	—	—	1933.38	—
4639	MD50-14-75417	50-613182	632.5	04/23/2014	—	—	—	10.17	—	—	—	—	—	33.30	—
4639	MD50-14-75347	50-24784	450	04/22/2014	—	—	—	460.92	—	—	—	—	—	1020.39	—
4639	MD50-14-75348	50-24784	362	04/22/2014	—	—	—	1152.29	—	—	—	—	—	2524.13	—
4639	MD50-14-75349	50-24784	244	04/22/2014	—	—	—	1558.99	—	—	91.91	—	—	3222.29	—
4639	MD50-14-75350	50-24784	155	04/22/2014	—	—	—	2033.46	—	—	130.20	—	—	3544.52	—

Notes: Concentrations are in µg/m^3. Data qualifiers are defined in Appendix A. Purple shading means the value exceeds Tier 1 groundwater screening level for the analyte listed.

[a] — = Not detected.

[b] Port was not labeled with the port depth.

[c] na = Not available.

Table C-5.0-8
VOC Pore-Gas Results at MDA C for Fiscal Year 2015

Sampling Plan 2015	Field Sample ID	Location ID	Depth (ft)	Date	Carbon Disulfide	Carbon Tetrachloride	Chloroform	Cyclohexane	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Ethanol
Groundwater Tier 1 Screening Level					**478,000**	**5650**	**12,000**	**79,700,000**	**2,780,000**	**5750**	**242**	**7490**	**11,700**	**580**	**na[a]**
10429	MD50-15-105183	50-24784	155	10/13/2015	—b	194.91	331.81	—	113.67	—	—	—	—	69.28	—
10429	MD50-15-105184	50-24784	244	10/13/2015	—	232.63	112.23	—	118.61	—	—	—	—	43.41	—
10429	MD50-15-105185	50-24784	362	10/13/2015	—	358.38	—	—	187.80	—	—	—	—	—	—
10429	MD50-15-105186	50-24784	450	10/13/2015	—	320.65	—	—	202.63	—	—	—	—	—	—
10429	MD50-15-105187	50-24813	25	10/22/2015	—	1131.71	1024.71	—	217.45	—	—	—	51.51	—	—
10429	MD50-15-105188	50-24813	150	10/22/2015	—	1571.83	2976.55	—	593.06	—	101.12	—	554.73	83.13	—
10429	MD50-15-105189	50-24813	241	10/22/2015	—	1320.33	1659.06	—	988.43	—	—	—	475.48	—	—
10429	MD50-15-105190	50-24813	358	10/22/2015	—	754.48	536.75	—	988.43	—	—	—	190.19	—	—
10429	MD50-15-105191	50-24813	450	10/22/2015	—	528.13	161.03	—	790.74	—	—	—	63.40	—	—
10429	MD50-15-105192	50-24813	600	10/22/2015	—	150.90	—	—	326.18	—	—	—	—	—	—
10429	MD50-15-105193	50-24822	25	10/27/2015	—	—	248.86	—	133.44	—	—	—	—	—	—
10429	MD50-15-105194	50-24822	142	10/27/2015	—	188.62	585.55	—	494.21	—	—	—	122.83	—	—
10429	MD50-15-105195	50-24822	235	10/27/2015	—	245.21	487.96	—	691.90	—	—	—	142.65	—	—
10429	MD50-15-105196	50-24822	351	10/27/2015	—	182.33	156.15	—	593.06	—	—	—	51.51	—	—
10429	MD50-15-105197	50-24822	450	10/27/2015	—	100.60	—	—	400.31	—	—	—	—	—	—
10429	MD50-15-105198	50-603061	25	10/21/2015	—	—	—	—	459.62	—	—	198.12	—	—	—
10429	MD50-15-105199	50-603061	128	10/21/2015	59.13	—	—	—	350.89	—	—	1466.07	—	—	—
10429	MD50-15-105200	50-603061	228	10/21/2015	—	132.03	53.68	—	306.41	—	—	1426.45	—	—	—
10429	MD50-15-105201	50-603061	347	10/21/2015	—	125.75	—	—	266.88	—	—	309.06	—	—	—
10429	MD50-15-105202	50-603061	450	10/21/2015	—	69.16	—	—	172.97	—	—	83.21	—	—	—
10429	MD50-15-105203	50-603062	122	10/26/2015	—	—	68.31	—	172.97	—	—	—	—	—	—
10429	MD50-15-105204	50-603062	217	10/26/2015	—	—	—	—	207.57	—	—	—	—	—	—
10429	MD50-15-105205	50-603062	337	10/26/2015	—	—	—	—	158.15	—	—	—	—	—	—
10429	MD50-15-105206	50-603062	450	10/26/2015	—	—	—	—	88.96	—	—	—	—	—	—
10429	MD50-15-105207	50-603063	25	10/23/2015	—	—	—	—	158.15	—	—	51.51	—	—	—
10429	MD50-15-105208	50-603063	128	10/23/2015	—	119.46	283.02	—	365.72	68.76	—	297.18	—	—	—
10429	MD50-15-105209	50-603063	228	10/23/2015	—	289.22	585.55	—	543.63	56.63	—	396.24	134.72	—	—

Table C-5.0-8 (continued)

Sampling Plan 2015	Field Sample ID	Location ID	Depth (ft)	Date	Carbon Disulfide	Carbon Tetrachloride	Chloroform	Cyclohexane	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Ethanol
Groundwater Tier 1 Screening Level					**478,000**	**5650**	**12,000**	**79,700,000**	**2,780,000**	**5750**	**242**	**7490**	**11,700**	**580**	**na[a]**
10429	MD50-15-105210	50-603063	347	10/23/2015	—	207.48	258.62	—	316.30	—	—	71.32	39.62	—	—
10429	MD50-15-105211	50-603063	450	10/23/2015	—	125.75	146.39	—	237.22	—	—	—	—	—	—
10429	MD50-15-105212	50-603064	113	10/16/2015	—	182.33	878.33	—	434.91	—	—	554.73	221.89	46.18	—
10429	MD50-15-105213	50-603064	214	10/16/2015	—	333.23	683.14	—	741.32	—	—	713.23	257.55	—	—
10429	MD50-15-105214	50-603064	332	10/16/2015	—	201.19	68.31	—	464.56	—	—	130.76	—	—	69.67
10429	MD50-15-105215	50-603064	500	10/16/2015	—	75.45	—	—	256.99	—	—	—	—	—	—
10429	MD50-15-105216	50-603383	26	10/20/2015	—	75.45	97.59	—	261.93	—	—	47.55	—	46.18	—
10429	MD50-15-105217	50-603383	139	10/20/2015	—	138.32	195.18	—	286.64	—	—	95.10	39.23	258.63	—
10429	MD50-15-105218	50-603383	244	10/20/2015	—	276.64	190.30	—	341.01	—	—	99.06	71.32	415.66	—
10429	MD50-15-105219	50-603383	359	10/20/2015	—	163.47	—	—	227.34	—	—	—	—	50.80	—
10429	MD50-15-105220	50-603383	450	10/20/2015	—	150.90	—	—	207.57	—	—	—	—	—	—
10429	MD50-15-105221	50-603467	143	10/29/2015	—	320.65	585.55	—	271.82	—	—	—	126.80	—	—
10429	MD50-15-105222	50-603467	244	10/29/2015	—	452.69	683.14	—	311.35	—	—	—	186.23	—	—
10429	MD50-15-105223	50-603467	360	10/29/2015	—	333.23	322.05	—	296.53	—	—	—	95.10	—	—
10429	MD50-15-105224	50-603467	500	10/29/2015	—	150.90	53.68	—	177.92	—	—	—	—	—	—
10429	MD50-15-105225	50-603467	600	10/29/2015	—	94.31	—	—	148.26	—	—	—	—	—	—
10429	MD50-15-105226	50-603468	142	10/28/2015	—	144.61	473.32	—	316.30	—	—	—	138.68	—	—
10429	MD50-15-105227	50-603468	233	10/28/2015	—	301.79	585.55	—	494.21	—	—	—	194.16	—	—
10429	MD50-15-105228	50-603468	354	10/28/2015	—	333.23	390.37	—	543.63	—	—	—	138.68	—	—
10429	MD50-15-105229	50-603468	403	10/28/2015	—	289.22	239.10	—	543.63	—	—	—	95.10	—	—
10429	MD50-15-105233	50-603470	83	10/19/2015	—	308.08	1073.51	—	256.99	—	—	—	154.53	—	—
10429	MD50-15-105234	50-603470	203	10/19/2015	—	396.10	1073.51	—	691.90	—	—	—	289.25	—	—
10429	MD50-15-105235	50-603470	278	10/19/2015	—	484.12	780.73	—	889.58	—	—	—	269.44	—	—
10429	MD50-15-105236	50-603470	351	10/19/2015	—	414.96	322.05	—	790.74	—	—	—	130.76	—	—
10429	MD50-15-105237	50-603470	450	10/19/2015	—	333.23	112.23	—	741.32	—	—	—	47.55	—	—
10429	MD50-15-105239	50-603470	650	10/19/2015	—	—	—	—	79.07	—	—	—	—	—	—
10429	MD50-15-105240	50-603471	90	10/15/2015	—	817.35	1122.30	—	128.50	—	56.63	—	87.17	—	—
10429	MD50-15-105241	50-603471	209	10/15/2015	—	817.35	1805.45	—	395.37	—	133.48	—	435.86	101.61	—

Table C-5.0-8 (continued)

Sampling Plan 2015	Field Sample ID	Location ID	Depth (ft)	Date	Carbon Disulfide	Carbon Tetrachloride	Chloroform	Cyclohexane	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Ethanol
Groundwater Tier 1 Screening Level					**478,000**	**5650**	**12,000**	**79,700,000**	**2,780,000**	**5750**	**242**	**7490**	**11,700**	**580**	**na[a]**
10429	MD50-15-105242	50-603471	288	10/15/2015	—	1068.84	1512.67	—	790.74	—	—	—	435.86	—	—
10429	MD50-15-105243	50-603471	360	10/15/2015	—	754.48	683.14	—	790.74	—	—	—	233.78	—	—
10429	MD50-15-105244	50-603471	450	10/15/2015	—	553.28	585.55	—	459.62	—	—	—	166.42	—	—
10429	MD50-15-105398	50-603471	Unknown[c]	10/15/2015	—	1383.21	1805.45	—	227.34	—	133.48	—	229.82	87.75	—
10429	MD50-15-105248	50-603472	146	10/14/2015	—	194.91	585.55	—	128.50	—	52.58	—	118.87	92.37	—
10429	MD50-15-105247	50-603472	27	10/14/2015	—	—	243.98	—	—	—	—	—	—	—	—
10429	MD50-15-105249	50-603472	292	10/14/2015	—	521.85	683.14	—	405.25	—	—	—	194.16	60.04	—
10429	MD50-15-105250	50-603472	364	10/14/2015	—	465.26	214.70	—	415.14	—	—	—	67.36	—	—
10429	MD50-15-105251	50-603472	450	10/14/2015	—	333.23	73.19	—	341.01	—	—	—	—	—	—
10429	MD50-15-105254	50-603503	133	10/30/2015	—	—	102.47	—	54.36	—	—	—	—	—	—
10429	MD50-15-105255	50-603503	237	10/30/2015	—	—	131.75	—	74.13	—	—	—	—	—	—
10429	MD50-15-105256	50-603503	347	10/30/2015	—	—	53.68	—	69.19	—	—	—	—	—	—
10429	MD50-15-105257	50-603503	450	10/30/2015	—	—	—	—	69.19	—	—	—	—	—	—
10429	MD50-15-105252	50-613182	550	10/14/2015	—	188.62	—	—	266.88	—	—	—	—	—	—
10429	MD50-15-105253	50-613182	632.5	10/14/2015	—	—	—	—	—	—	—	—	—	—	—
10429	MD50-15-105245	50-613183	550	10/15/2015	—	213.77	—	—	439.85	—	—	—	—	—	—
10429	MD50-15-105246	50-613183	642.5	10/15/2015	—	—	—	—	—	—	—	—	—	—	—
10429	MD50-15-105230	50-613184	500	10/28/2015	—	75.45	—	—	247.11	—	—	—	—	—	—
10429	MD50-15-105231	50-613184	600	10/28/2015	—	—	—	—	128.50	—	—	—	—	—	—
10429	MD50-15-105232	50-613184	664.5	10/28/2015	—	—	—	—	—	—	—	—	—	—	—
10429	MD50-15-105258	50-613185	145	11/02/2015	—	—	87.83	—	93.90	—	—	—	—	—	—
10429	MD50-15-105259	50-613185	235	11/02/2015	—	81.73	92.71	—	153.21	—	—	—	—	—	—
10429	MD50-15-105260	50-613185	350	11/02/2015	—	—	—	—	138.38	—	—	—	—	—	—
10429	MD50-15-105261	50-613185	450	11/02/2015	—	—	—	—	123.55	—	—	—	—	—	—
10429	MD50-15-105262	50-613185	600	11/02/2015	—	—	—	—	49.42	—	—	—	—	—	—
8110	MD50-15-92946	50-24784	155	03/23/2015	—	150.90	278.14	—	93.90	—	—	—	—	55.42	—
8110	MD50-15-92947	50-24784	244	03/23/2015	—	213.77	107.35	—	113.67	—	—	—	—	40.18	—
8110	MD50-15-92948	50-24784	362	03/23/2015	—	326.94	—	—	158.15	—	—	—	—	—	—

Table C-5.0-8 (continued)

Sampling Plan 2015	Field Sample ID	Location ID	Depth (ft)	Date	Carbon Disulfide	Carbon Tetrachloride	Chloroform	Cyclohexane	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Ethanol
Groundwater Tier 1 Screening Level					**478,000**	**5650**	**12,000**	**79,700,000**	**2,780,000**	**5750**	**242**	**7490**	**11,700**	**580**	**na[a]**
8110	MD50-15-92949	50-24784	450	03/23/2015	—	226.34	—	—	143.32	—	—	—	—	—	—
8110	MD50-15-92951	50-24813	150	04/15/2015	—	1320.33	2537.38	—	489.27	—	84.94	—	475.48	69.28	—
8110	MD50-15-92952	50-24813	241	04/15/2015	—	1571.83	2000.63	—	1136.69	—	—	—	554.73	—	—
8110	MD50-15-92950	50-24813	25	04/15/2015	—	1005.97	927.12	—	182.86	—	—	—	51.51	—	—
8110	MD50-15-92953	50-24813	358	04/15/2015	—	754.48	536.75	—	889.58	—	—	—	182.27	—	—
8110	MD50-15-92954	50-24813	450	04/15/2015	—	414.96	121.99	—	593.06	—	—	—	47.55	—	—
8110	MD50-15-92955	50-24813	600	04/15/2015	—	106.88	—	—	256.99	—	—	—	—	—	—
8110	MD50-15-92957	50-24822	142	04/13/2015	—	176.04	458.68	—	395.37	—	—	—	95.10	—	—
8110	MD50-15-92958	50-24822	235	04/13/2015	—	251.49	424.52	—	593.06	—	—	—	114.91	—	—
8110	MD50-15-92956	50-24822	25	04/13/2015	—	—	156.15	—	88.96	—	—	—	—	—	—
8110	MD50-15-92959	50-24822	351	04/13/2015	—	201.19	136.63	—	494.21	—	—	—	—	—	—
8110	MD50-15-92960	50-24822	450	04/13/2015	—	81.73	—	—	247.11	—	—	—	—	—	—
8110	MD50-15-92962	50-603061	128	04/01/2015	—	62.87	63.43	—	375.60	—	—	1426.45	—	—	—
8110	MD50-15-92963	50-603061	228	04/01/2015	—	113.17	—	—	261.93	—	—	1149.09	—	—	—
8110	MD50-15-92961	50-603061	25	04/01/2015	—	—	—	—	444.79	—	—	198.12	—	—	—
8110	MD50-15-92964	50-603061	347	04/01/2015	—	106.88	—	—	212.51	—	—	237.74	—	—	—
8110	MD50-15-92965	50-603061	450	04/01/2015	—	—	—	—	148.26	—	—	67.36	—	—	—
8110	MD50-15-92966	50-603062	122	03/31/2015	—	—	58.56	—	158.15	—	—	—	—	—	—
8110	MD50-15-92967	50-603062	217	03/31/2015	—	—	47.33	—	212.51	—	—	—	—	—	—
8110	MD50-15-92968	50-603062	337	03/31/2015	—	—	—	—	143.32	—	—	—	—	—	—
8110	MD50-15-92969	50-603062	450	03/31/2015	—	—	—	—	88.96	—	—	—	—	—	—
8110	MD50-15-92971	50-603063	128	04/03/2015	—	157.18	278.14	—	326.18	68.76	—	229.82	—	—	—
8110	MD50-15-92972	50-603063	228	04/03/2015	—	414.96	585.55	—	593.06	64.72	—	360.58	130.76	—	—
8110	MD50-15-92970	50-603063	25	04/03/2015	—	—	—	—	123.55	—	—	—	—	—	—
8110	MD50-15-92973	50-603063	347	04/03/2015	—	201.19	195.18	99.76	247.11	—	—	47.55	—	—	—
8110	MD50-15-92974	50-603063	450	04/03/2015	—	163.47	136.63	—	227.34	—	—	—	—	—	—
8110	MD50-15-92975	50-603064	113	04/02/2015	—	169.76	780.73	—	410.20	—	—	515.11	190.19	55.42	—
8110	MD50-15-92976	50-603064	214	04/02/2015	—	295.50	585.55	—	593.06	—	—	673.60	190.19	—	—

Table C-5.0-8 (continued)

Sampling Plan 2015	Field Sample ID	Location ID	Depth (ft)	Date	Carbon Disulfide	Carbon Tetrachloride	Chloroform	Cyclohexane	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Ethanol
Groundwater Tier 1 Screening Level					**478,000**	**5650**	**12,000**	**79,700,000**	**2,780,000**	**5750**	**242**	**7490**	**11,700**	**580**	**na[a]**
8110	MD50-15-92977	50-603064	332	04/02/2015	—	176.04	73.19	—	415.14	—	—	130.76	—	—	—
8110	MD50-15-92978	50-603064	500	04/02/2015	—	—	—	—	202.63	—	—	—	—	—	—
8110	MD50-15-92980	50-603383	139	03/30/2015	—	182.33	170.79	—	237.22	—	—	63.40	—	235.54	—
8110	MD50-15-92981	50-603383	244	03/30/2015	—	320.65	165.91	—	286.64	—	—	75.28	55.47	378.71	—
8110	MD50-15-92979	50-603383	26	03/30/2015	—	—	—	—	69.19	—	—	—	—	—	—
8110	MD50-15-92982	50-603383	359	03/30/2015	—	194.91	—	—	187.80	—	—	—	—	—	—
8110	MD50-15-92983	50-603383	450	03/30/2015	—	182.33	—	—	182.86	—	—	—	—	—	—
8110	MD50-15-92984	50-603467	143	04/08/2015	—	377.24	536.75	—	227.34	—	—	—	118.87	—	—
8110	MD50-15-92985	50-603467	244	04/08/2015	—	509.27	634.35	—	286.64	—	—	—	166.42	—	—
8110	MD50-15-92986	50-603467	360	04/08/2015	—	414.96	283.02	—	256.99	—	—	—	79.25	—	—
8110	MD50-15-92987	50-603467	500	04/08/2015	—	201.19	—	—	192.74	—	—	—	—	—	—
8110	MD50-15-92988	50-603467	600	04/08/2015	—	113.17	—	—	128.50	—	—	—	—	—	—
8110	MD50-15-92989	50-603468	142	04/07/2015	—	295.50	429.40	—	286.64	—	—	—	114.91	—	—
8110	MD50-15-92990	50-603468	233	04/07/2015	—	471.55	536.75	—	400.31	—	—	—	142.65	—	—
8110	MD50-15-92991	50-603468	354	04/07/2015	—	471.55	322.05	—	494.21	—	—	—	118.87	—	—
8110	MD50-15-92992	50-603468	403	04/07/2015	—	427.54	204.94	—	474.44	—	—	—	75.28	—	—
8110	MD50-15-92997	50-603470	203	03/26/2015	—	326.94	878.33	—	543.63	—	—	—	241.70	—	—
8110	MD50-15-92998	50-603470	278	03/26/2015	—	440.11	780.73	—	790.74	—	—	—	237.74	—	—
8110	MD50-15-92999	50-603470	351	03/26/2015	—	383.53	331.81	—	741.32	—	—	—	118.87	—	—
8110	MD50-15-93000	50-603470	450	03/26/2015	—	245.21	87.83	—	543.63	—	—	—	—	—	—
8110	MD50-15-93002	50-603470	650	03/26/2015	—	—	—	—	—	—	—	—	—	—	—
8110	MD50-15-92996	50-603470	83	03/26/2015	—	201.19	683.14	—	148.26	—	—	—	99.06	—	—
8110	MD50-15-93004	50-603471	209	03/25/2015	—	754.48	1268.69	—	593.06	—	44.49	—	324.91	60.04	—
8110	MD50-15-93005	50-603471	288	03/25/2015	—	628.73	927.12	—	494.21	—	—	—	253.59	46.18	—
8110	MD50-15-93006	50-603471	360	03/25/2015	—	817.35	683.14	—	741.32	—	—	—	202.08	—	—
8110	MD50-15-93007	50-603471	450	03/25/2015	—	389.81	351.33	—	385.49	—	—	—	99.06	—	—
8110	MD50-15-93003	50-603471	90	03/25/2015	—	943.10	1219.90	—	133.44	—	68.76	—	126.80	46.18	—
8110	MD50-15-93331	50-603471	Unknown[c]	03/25/2015	—	1320.33	1659.06	—	227.34	—	105.17	—	206.04	78.51	—

Table C-5.0-8 (continued)

Sampling Plan 2015	Field Sample ID	Location ID	Depth (ft)	Date	Carbon Disulfide	Carbon Tetrachloride	Chloroform	Cyclohexane	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Ethanol
Groundwater Tier 1 Screening Level					**478,000**	**5650**	**12,000**	**79,700,000**	**2,780,000**	**5750**	**242**	**7490**	**11,700**	**580**	**na[a]**
8110	MD50-15-93011	50-603472	146	03/24/2015	—	176.04	487.96	—	128.50	—	36.00	—	99.06	92.37	—
8110	MD50-15-93010	50-603472	27	03/24/2015	—	—	175.67	—	—	—	—	—	—	—	—
8110	MD50-15-93012	50-603472	292	03/24/2015	—	320.65	409.89	—	242.16	—	—	—	99.06	—	—
8110	MD50-15-93013	50-603472	364	03/24/2015	—	377.24	170.79	—	326.18	—	—	—	55.47	—	—
8110	MD50-15-93014	50-603472	450	03/24/2015	—	157.18	—	—	163.09	—	—	—	—	—	—
8110	MD50-15-93017	50-603503	133	04/09/2015	—	—	102.47	—	44.97	—	—	—	—	40.64	—
8110	MD50-15-93018	50-603503	237	04/09/2015	—	88.02	117.11	—	69.19	—	—	—	—	46.18	—
8110	MD50-15-93019	50-603503	347	04/09/2015	—	81.73	53.68	—	79.07	—	—	—	—	—	—
8110	MD50-15-93020	50-603503	450	04/09/2015	—	69.16	—	—	64.25	—	—	—	—	—	—
8110	MD50-15-93015	50-613182	550	03/24/2015	—	113.17	—	—	187.80	—	—	—	—	—	—
8110	MD50-15-93008	50-613183	550	03/25/2015	—	150.90	—	—	336.06	—	—	—	—	—	—
8110	MD50-15-93009	50-613183	642.5	03/25/2015	—	—	—	—	—	—	—	—	—	—	—
8110	MD50-15-92993	50-613184	500	04/07/2015	—	138.32	—	—	217.45	—	—	—	—	—	—
8110	MD50-15-92994	50-613184	600	04/07/2015	—	—	—	—	93.90	—	—	—	—	—	—
8110	MD50-15-92995	50-613184	664.5	04/07/2015	—	—	—	—	—	—	—	—	—	—	—
8110	MD50-15-93021	50-613185	145	04/10/2015	—	62.87	92.71	—	84.02	—	—	—	—	—	—
8110	MD50-15-93022	50-613185	235	04/10/2015	—	106.88	82.95	—	133.44	—	—	—	—	—	—
8110	MD50-15-93023	50-613185	350	04/10/2015	—	81.73	—	—	128.50	—	—	—	—	—	—
8110	MD50-15-93024	50-613185	450	04/10/2015	—	—	—	—	98.84	—	—	—	—	—	—
8110	MD50-15-93025	50-613185	600	04/10/2015	—	—	—	—	—	—	—	—	—	—	—

Table C-5.0-8 (continued)

Sampling Plan 2015	Field Sample ID	Location ID	Depth (ft)	Date	Methylene Chloride	Tetrachloroethylene	Tetrahydrofuran	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethylene	Trichlorofluoromethane	Xylene[1,3-]+Xylene[1,4-]
Groundwater Tier 1 Screening Level					**665**	**3630**	**9790**	**272,000**	**1,190,000,000**	**141,000**	**169**	**2020**	**4,540,000**	**131,000**
10429	MD50-15-105183	50-24784	155	10/13/2015	—	2236.81	—	—	137.86	51.25	—	3651.93	—	52.07
10429	MD50-15-105184	50-24784	244	10/13/2015	—	1694.55	—	—	84.25	—	—	3276.00	—	—
10429	MD50-15-105185	50-24784	362	10/13/2015	—	1423.42	—	—	—	—	—	2846.36	—	—
10429	MD50-15-105186	50-24784	450	10/13/2015	—	630.37	—	—	—	—	—	1342.62	—	—
10429	MD50-15-105187	50-24813	25	10/22/2015	—	447.36	—	—	—	—	—	11,815.10	—	—
10429	MD50-15-105188	50-24813	150	10/22/2015	416.58	657.49	—	—	—	—	212.65	42,426.90	—	—
10429	MD50-15-105189	50-24813	241	10/22/2015	590.15	745.60	—	—	—	—	—	59,075.40	—	—
10429	MD50-15-105190	50-24813	358	10/22/2015	—	515.14	—	—	—	—	—	45,649.10	—	—
10429	MD50-15-105191	50-24813	450	10/22/2015	149.27	338.91	—	—	—	—	—	31,148.80	—	—
10429	MD50-15-105192	50-24813	600	10/22/2015	—	—	—	—	—	—	—	4081.57	—	—
10429	MD50-15-105193	50-24822	25	10/27/2015	—	135.56	—	—	—	—	—	5907.54	—	—
10429	MD50-15-105194	50-24822	142	10/27/2015	159.69	203.35	—	—	145.52	—	—	20,944.90	—	—
10429	MD50-15-105195	50-24822	235	10/27/2015	270.77	230.46	—	—	176.15	—	—	30,074.70	—	—
10429	MD50-15-105196	50-24822	351	10/27/2015	121.50	115.23	—	—	84.25	—	—	19,333.80	—	—
10429	MD50-15-105197	50-24822	450	10/27/2015	—	—	—	—	—	—	—	9129.83	—	—
10429	MD50-15-105198	50-603061	25	10/21/2015	—	135.56	—	—	9956.55	1199.58	—	537.05	—	—
10429	MD50-15-105199	50-603061	128	10/21/2015	—	345.69	—	—	26,806.10	3980.43	—	2846.36	—	—
10429	MD50-15-105200	50-603061	228	10/21/2015	48.60	311.80	—	—	22,976.60	3707.80	—	4511.21	—	—
10429	MD50-15-105201	50-603061	347	10/21/2015	—	135.56	—	—	8424.77	599.79	—	1879.67	—	—
10429	MD50-15-105202	50-603061	450	10/21/2015	—	—	—	—	2604.02	70.88	—	805.57	—	—
10429	MD50-15-105203	50-603062	122	10/26/2015	—	—	—	—	413.58	—	—	5263.08	—	—
10429	MD50-15-105204	50-603062	217	10/26/2015	—	—	—	—	482.51	—	—	5907.54	—	—
10429	MD50-15-105205	50-603062	337	10/26/2015	—	—	—	—	122.54	—	—	2040.79	—	—
10429	MD50-15-105206	50-603062	450	10/26/2015	—	—	—	—	—	—	—	644.46	—	—
10429	MD50-15-105207	50-603063	25	10/23/2015	—	332.13	—	—	2144.49	190.84	—	1181.51	—	—
10429	MD50-15-105208	50-603063	128	10/23/2015	—	881.17	—	—	4288.97	518.00	—	7518.68	—	—
10429	MD50-15-105209	50-603063	228	10/23/2015	—	1626.77	—	—	5131.45	599.79	—	21,481.90	55.59	—

Table C-5.0-8 (continued)

Sampling Plan 2015	Field Sample ID	Location ID	Depth (ft)	Date	Methylene Chloride	Tetrachloroethylene	Tetrahydrofuran	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethylene	Trichlorofluoromethane	Xylene[1,3-]+Xylene[1,4-]
Groundwater Tier 1 Screening Level					**665**	**3630**	**9790**	**272,000**	**1,190,000,000**	**141,000**	**169**	**2020**	**4,540,000**	**131,000**
10429	MD50-15-105210	50-603063	347	10/23/2015	—	745.60	—	—	1148.83	54.53	—	12,889.20	—	—
10429	MD50-15-105211	50-603063	450	10/23/2015	—	352.47	—	—	206.79	—	—	7518.68	—	—
10429	MD50-15-105212	50-603064	113	10/16/2015	111.09	630.37	—	—	9956.55	2235.58	—	23,630.10	—	—
10429	MD50-15-105213	50-603064	214	10/16/2015	451.29	637.15	—	—	13,020.10	2290.11	—	37,056.40	61.76	—
10429	MD50-15-105214	50-603064	332	10/16/2015	62.49	196.57	—	—	3369.91	190.84	—	12,352.10	—	—
10429	MD50-15-105215	50-603064	500	10/16/2015	—	—	—	—	283.38	—	—	1933.38	—	—
10429	MD50-15-105216	50-603383	26	10/20/2015	—	745.60	—	—	842.48	114.51	—	1987.08	—	—
10429	MD50-15-105217	50-603383	139	10/20/2015	48.60	1287.86	—	—	1148.83	174.49	—	4457.50	—	—
10429	MD50-15-105218	50-603383	244	10/20/2015	83.32	1626.77	—	—	919.07	158.13	—	6444.58	—	—
10429	MD50-15-105219	50-603383	359	10/20/2015	—	555.81	—	—	298.70	—	—	2524.13	—	—
10429	MD50-15-105220	50-603383	450	10/20/2015	—	271.13	—	—	398.26	—	—	1396.33	—	—
10429	MD50-15-105221	50-603467	143	10/29/2015	38.19	474.47	—	—	—	—	—	16,648.50	—	—
10429	MD50-15-105222	50-603467	244	10/29/2015	166.63	745.60	—	—	—	—	—	22,556.00	—	—
10429	MD50-15-105223	50-603467	360	10/29/2015	—	637.15	—	—	—	—	—	19,870.80	—	—
10429	MD50-15-105224	50-603467	500	10/29/2015	—	264.35	—	—	—	—	—	7518.68	—	—
10429	MD50-15-105225	50-603467	600	10/29/2015	—	149.12	35.37	—	—	—	—	3866.75	—	—
10429	MD50-15-105226	50-603468	142	10/28/2015	65.96	311.80	—	—	—	—	—	19,333.80	—	—
10429	MD50-15-105227	50-603468	233	10/28/2015	451.29	427.03	—	—	—	—	—	25,778.30	—	—
10429	MD50-15-105228	50-603468	354	10/28/2015	302.02	399.91	—	—	—	—	—	26,852.40	—	—
10429	MD50-15-105229	50-603468	403	10/28/2015	215.23	332.13	—	—	—	—	—	22,019.00	—	—
10429	MD50-15-105233	50-603470	83	10/19/2015	48.60	813.38	—	—	275.72	65.43	103.60	14,500.30	—	—
10429	MD50-15-105234	50-603470	203	10/19/2015	486.01	528.70	—	—	727.59	103.60	—	37,593.40	—	—
10429	MD50-15-105235	50-603470	278	10/19/2015	624.86	481.25	—	—	727.59	—	—	44,575.00	—	—
10429	MD50-15-105236	50-603470	351	10/19/2015	336.73	311.80	—	—	505.49	—	—	33,834.10	—	—
10429	MD50-15-105237	50-603470	450	10/19/2015	114.56	189.79	—	—	283.38	—	—	23,093.10	—	—
10429	MD50-15-105239	50-603470	650	10/19/2015	—	—	—	—	—	—	—	102.04	—	—
10429	MD50-15-105240	50-603471	90	10/15/2015	34.71	562.59	—	—	137.86	—	—	6981.63	—	—
10429	MD50-15-105241	50-603471	209	10/15/2015	1145.58	1152.29	—	—	306.36	53.44	53.44	43,500.90	—	—

Table C-5.0-8 (continued)

Sampling Plan 2015	Field Sample ID	Location ID	Depth (ft)	Date	Methylene Chloride	Tetrachloroethylene	Tetrahydrofuran	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethylene	Trichlorofluoromethane	Xylene[1,3-]+Xylene[1,4-]
Groundwater Tier 1 Screening Level					**665**	**3630**	**9790**	**272,000**	**1,190,000,000**	**141,000**	**169**	**2020**	**4,540,000**	**131,000**
10429	MD50-15-105242	50-603471	288	10/15/2015	1527.44	1152.29	—	—	490.17	—	—	51,556.70	—	—
10429	MD50-15-105243	50-603471	360	10/15/2015	729.01	948.95	—	—	291.04	—	—	42426.90	—	—
10429	MD50-15-105244	50-603471	450	10/15/2015	232.59	813.38	—	—	176.15	—	—	36,519.30	—	—
10429	MD50-15-105398	50-603471	Unknown[c]	10/15/2015	215.23	948.95	—	—	260.40	50.71	114.51	16,648.50	—	—
10429	MD50-15-105248	50-603472	146	10/14/2015	347.15	745.60	—	—	107.22	—	—	11,815.10	—	—
10429	MD50-15-105247	50-603472	27	10/14/2015	—	467.70	—	—	—	51.25	—	2470.42	—	—
10429	MD50-15-105249	50-603472	292	10/14/2015	902.58	1694.55	—	—	137.86	—	—	31,148.80	—	—
10429	MD50-15-105250	50-603472	364	10/14/2015	326.32	1084.51	—	—	—	—	—	22,019.00	—	—
10429	MD50-15-105251	50-603472	450	10/14/2015	97.20	745.60	—	—	—	—	—	13,426.20	—	—
10429	MD50-15-105254	50-603503	133	10/30/2015	45.13	440.58	—	—	107.22	—	—	1825.97	—	—
10429	MD50-15-105255	50-603503	237	10/30/2015	124.97	501.59	—	—	—	—	—	4350.09	—	—
10429	MD50-15-105256	50-603503	347	10/30/2015	62.49	338.91	—	—	—	—	—	3061.18	—	—
10429	MD50-15-105257	50-603503	450	10/30/2015	—	216.90	—	—	—	—	—	2470.42	—	—
10429	MD50-15-105252	50-613182	550	10/14/2015	—	196.57	—	—	—	—	—	3651.93	—	—
10429	MD50-15-105253	50-613182	632.5	10/14/2015	—	—	—	—	—	—	—	53.17	—	—
10429	MD50-15-105245	50-613183	550	10/15/2015	—	108.45	—	—	—	—	—	4887.14	—	—
10429	MD50-15-105246	50-613183	642.5	10/15/2015	—	—	—	52.73	—	—	—	118.15	—	47.73
10429	MD50-15-105230	50-613184	500	10/28/2015	—	67.78	—	—	—	—	—	4403.80	—	—
10429	MD50-15-105231	50-613184	600	10/28/2015	—	—	—	—	—	—	—	859.28	—	—
10429	MD50-15-105232	50-613184	664.5	10/28/2015	—	—	—	—	—	—	—	145.00	—	—
10429	MD50-15-105258	50-613185	145	11/02/2015	48.60	67.78	—	—	—	—	—	3651.93	—	—
10429	MD50-15-105259	50-613185	235	11/02/2015	79.84	122.01	—	—	—	—	—	6444.58	—	—
10429	MD50-15-105260	50-613185	350	11/02/2015	—	67.78	—	—	—	—	—	3490.82	—	—
10429	MD50-15-105261	50-613185	450	11/02/2015	—	—	—	—	—	—	—	1611.15	—	—
10429	MD50-15-105262	50-613185	600	11/02/2015	—	—	—	—	—	—	—	145.00	—	—
8110	MD50-15-92946	50-24784	155	03/23/2015	—	2033.46	—	—	137.86	—	—	2900.06	—	—
8110	MD50-15-92947	50-24784	244	03/23/2015	—	1965.68	—	—	91.91	—	—	3168.59	—	—
8110	MD50-15-92948	50-24784	362	03/23/2015	—	1287.86	—	—	—	—	—	2255.60	—	—

Table C-5.0-8 (continued)

Sampling Plan 2015	Field Sample ID	Location ID	Depth (ft)	Date	Methylene Chloride	Tetrachloroethylene	Tetrahydrofuran	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethylene	Trichlorofluoromethane	Xylene[1,3-]+Xylene[1,4-]
Groundwater Tier 1 Screening Level					**665**	**3630**	**9790**	**272,000**	**1,190,000,000**	**141,000**	**169**	**2020**	**4,540,000**	**131,000**
8110	MD50-15-92949	50-24784	450	03/23/2015	—	501.59	—	—	—	—	—	966.69	—	—
8110	MD50-15-92951	50-24813	150	04/15/2015	381.86	589.70	—	—	—	—	—	35,445.20	—	—
8110	MD50-15-92952	50-24813	241	04/15/2015	729.01	881.17	—	—	—	—	—	69,816.30	—	—
8110	MD50-15-92950	50-24813	25	04/15/2015	—	393.14	—	—	—	—	—	10,203.90	—	—
8110	MD50-15-92953	50-24813	358	04/15/2015	41.66	549.03	—	—	—	—	—	48,871.40	—	—
8110	MD50-15-92954	50-24813	450	04/15/2015	131.92	277.91	—	—	—	—	—	24,167.20	—	—
8110	MD50-15-92955	50-24813	600	04/15/2015	—	—	—	—	—	—	—	2900.06	—	—
8110	MD50-15-92957	50-24822	142	04/13/2015	138.86	162.68	—	—	130.20	—	—	18,796.70	—	—
8110	MD50-15-92958	50-24822	235	04/13/2015	256.89	203.35	—	—	176.15	—	—	29,000.60	—	—
8110	MD50-15-92956	50-24822	25	04/13/2015	—	94.89	—	—	—	—	—	4027.87	—	—
8110	MD50-15-92959	50-24822	351	04/13/2015	107.62	101.67	—	—	84.25	—	—	18,259.70	—	—
8110	MD50-15-92960	50-24822	450	04/13/2015	—	—	—	—	—	—	—	6444.58	—	—
8110	MD50-15-92962	50-603061	128	04/01/2015	—	311.80	—	—	26,806.10	4034.96	—	2631.54	—	—
8110	MD50-15-92963	50-603061	228	04/01/2015	38.19	244.02	—	—	19,913.10	3162.53	—	3544.52	—	—
8110	MD50-15-92961	50-603061	25	04/01/2015	—	122.01	—	—	9956.55	1199.58	—	531.68	—	—
8110	MD50-15-92964	50-603061	347	04/01/2015	—	108.45	—	—	7122.76	518.00	—	1503.74	—	—
8110	MD50-15-92965	50-603061	450	04/01/2015	—	—	—	—	2067.90	59.98	—	698.16	—	—
8110	MD50-15-92966	50-603062	122	03/31/2015	—	—	—	—	390.60	—	—	5048.26	—	—
8110	MD50-15-92967	50-603062	217	03/31/2015	—	—	—	—	536.12	—	—	6444.58	—	—
8110	MD50-15-92968	50-603062	337	03/31/2015	—	—	—	—	145.52	—	—	1987.08	—	—
8110	MD50-15-92969	50-603062	450	03/31/2015	—	—	—	—	—	—	—	590.75	—	—
8110	MD50-15-92971	50-603063	128	04/03/2015	—	948.95	—	—	4595.33	599.79	—	8055.73	—	—
8110	MD50-15-92972	50-603063	228	04/03/2015	—	1897.90	—	—	6280.28	708.84	—	24,704.20	61.76	—
8110	MD50-15-92970	50-603063	25	04/03/2015	—	277.91	—	—	1838.13	185.39	—	966.69	—	—
8110	MD50-15-92973	50-603063	347	04/03/2015	—	589.70	—	—	995.66	—	—	10,741.00	—	—
8110	MD50-15-92974	50-603063	450	04/03/2015	—	345.69	—	—	183.81	—	—	7518.68	—	—
8110	MD50-15-92975	50-603064	113	04/02/2015	90.26	589.70	—	—	9956.55	1908.43	—	22,556.00	—	—
8110	MD50-15-92976	50-603064	214	04/02/2015	347.15	596.48	—	—	12,254.20	1908.43	—	33,297.00	55.03	—

Table C-5.0-8 (continued)

Sampling Plan 2015	Field Sample ID	Location ID	Depth (ft)	Date	Methylene Chloride	Tetrachloroethylene	Tetrahydrofuran	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethylene	Trichlorofluoromethane	Xylene[1,3-]+Xylene[1,4-]
Groundwater Tier 1 Screening Level					**665**	**3630**	**9790**	**272,000**	**1,190,000,000**	**141,000**	**169**	**2020**	**4,540,000**	**131,000**
8110	MD50-15-92977	50-603064	332	04/02/2015	48.60	203.35	—	—	3446.50	169.03	—	11,815.10	—	—
8110	MD50-15-92978	50-603064	500	04/02/2015	—	—	—	—	222.11	—	—	1396.33	—	—
8110	MD50-15-92980	50-603383	139	03/30/2015	—	1152.29	—	—	1225.42	174.49	—	4135.27	—	—
8110	MD50-15-92981	50-603383	244	03/30/2015	59.01	1558.99	—	—	919.07	185.39	—	5907.54	—	—
8110	MD50-15-92979	50-603383	26	03/30/2015	—	216.90	—	—	199.13	—	—	386.68	—	—
8110	MD50-15-92982	50-603383	359	03/30/2015	—	488.03	—	—	428.90	—	—	2148.19	—	—
8110	MD50-15-92983	50-603383	450	03/30/2015	—	298.24	—	—	214.45	—	—	1288.92	—	—
8110	MD50-15-92984	50-603467	143	04/08/2015	—	474.47	—	—	—	—	—	17,185.60	—	—
8110	MD50-15-92985	50-603467	244	04/08/2015	166.63	813.38	—	—	—	—	—	24,167.20	—	—
8110	MD50-15-92986	50-603467	360	04/08/2015	—	637.15	—	—	—	—	—	20,407.90	—	—
8110	MD50-15-92987	50-603467	500	04/08/2015	—	264.35	—	—	—	—	—	8055.73	—	—
8110	MD50-15-92988	50-603467	600	04/08/2015	—	122.01	53.05	—	—	—	—	3813.05	—	—
8110	MD50-15-92989	50-603468	142	04/07/2015	65.96	298.24	—	—	—	—	—	20,407.90	—	—
8110	MD50-15-92990	50-603468	233	04/07/2015	381.86	393.14	—	—	—	—	—	24,704.20	—	—
8110	MD50-15-92991	50-603468	354	04/07/2015	263.83	366.02	—	—	—	—	—	25,241.30	—	—
8110	MD50-15-92992	50-603468	403	04/07/2015	190.93	311.80	—	—	—	—	—	22,019.00	—	—
8110	MD50-15-92997	50-603470	203	03/26/2015	381.86	481.25	—	—	574.42	81.79	—	31,148.80	—	—
8110	MD50-15-92998	50-603470	278	03/26/2015	590.15	460.92	—	—	712.28	76.34	—	40,815.70	—	—
8110	MD50-15-92999	50-603470	351	03/26/2015	315.90	311.80	—	—	528.46	—	—	31,685.90	—	—
8110	MD50-15-93000	50-603470	450	03/26/2015	79.84	155.90	—	—	245.08	—	—	17,185.60	—	—
8110	MD50-15-93002	50-603470	650	03/26/2015	—	—	—	—	—	—	—	52.63	—	—
8110	MD50-15-92996	50-603470	83	03/26/2015	—	576.15	—	—	191.47	—	—	8592.78	—	—
8110	MD50-15-93004	50-603471	209	03/25/2015	451.29	1084.51	—	—	291.04	—	—	45,112.10	—	—
8110	MD50-15-93005	50-603471	288	03/25/2015	972.01	813.38	—	—	291.04	—	—	34,371.10	—	—
8110	MD50-15-93006	50-603471	360	03/25/2015	729.01	1016.73	—	—	321.67	—	—	42,426.90	—	—
8110	MD50-15-93007	50-603471	450	03/25/2015	183.99	603.26	—	—	99.57	—	—	24,167.20	—	—
8110	MD50-15-93003	50-603471	90	03/25/2015	86.79	677.82	—	—	183.81	—	—	10,741.00	—	—
8110	MD50-15-93331	50-603471	Unknown[c]	03/25/2015	215.23	948.95	—	—	268.06	—	—	17,185.60	—	—

Table C-5.0-8 (continued)

Sampling Plan 2015	Field Sample ID	Location ID	Depth (ft)	Date	Methylene Chloride	Tetrachloroethylene	Tetrahydrofuran	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethylene	Trichlorofluoromethane	Xylene[1,3-]+Xylene[1,4-]
Groundwater Tier 1 Screening Level					**665**	**3630**	**9790**	**272,000**	**1,190,000,000**	**141,000**	**169**	**2020**	**4,540,000**	**131,000**
8110	MD50-15-93011	50-603472	146	03/24/2015	291.60	745.60	—	—	91.91	—	—	10,203.90	—	—
8110	MD50-15-93010	50-603472	27	03/24/2015	—	386.36	—	—	—	—	—	1825.97	—	—
8110	MD50-15-93012	50-603472	292	03/24/2015	520.72	1084.51	—	—	84.25	—	—	18,259.70	—	—
8110	MD50-15-93013	50-603472	364	03/24/2015	243.00	948.95	—	—	—	—	—	17,185.60	—	—
8110	MD50-15-93014	50-603472	450	03/24/2015	41.66	345.69	—	—	—	—	—	5907.54	—	—
8110	MD50-15-93017	50-603503	133	04/09/2015	30.2017 (J)	352.47	—	—	76.59	—	—	1825.97	—	—
8110	MD50-15-93018	50-603503	237	04/09/2015	100.67	535.48	—	—	—	—	—	4296.39	—	—
8110	MD50-15-93019	50-603503	347	04/09/2015	45.13	352.47	—	—	—	—	—	3222.29	—	—
8110	MD50-15-93020	50-603503	450	04/09/2015	—	250.79	—	—	—	—	—	2309.31	—	—
8110	MD50-15-93015	50-613182	550	03/24/2015	—	155.90	—	—	—	—	—	2577.83	—	—
8110	MD50-15-93008	50-613183	550	03/25/2015	—	94.89	—	—	—	—	—	3705.64	—	—
8110	MD50-15-93009	50-613183	642.5	03/25/2015	—	—	—	—	—	—	—	85.93	—	—
8110	MD50-15-92993	50-613184	500	04/07/2015	—	—	—	—	—	—	—	4135.27	—	—
8110	MD50-15-92994	50-613184	600	04/07/2015	—	—	—	—	—	—	—	537.05	—	—
8110	MD50-15-92995	50-613184	664.5	04/07/2015	—	—	—	—	—	—	—	128.89	—	—
8110	MD50-15-93021	50-613185	145	04/10/2015	—	67.78	—	—	—	—	—	3598.23	—	—
8110	MD50-15-93022	50-613185	235	04/10/2015	55.54	122.01	—	—	—	—	—	5907.54	—	—
8110	MD50-15-93023	50-613185	350	04/10/2015	—	—	—	—	—	—	—	3490.82	—	—
8110	MD50-15-93024	50-613185	450	04/10/2015	—	—	—	—	—	—	—	1503.74	—	—
8110	MD50-15-93025	50-613185	600	04/10/2015	—	—	—	—	—	—	—	128.89	—	—

Notes: Concentrations are in µg/m^3. Data qualifiers are defined in Appendix A. Purple shading means the value exceeds Tier 1 groundwater screening level for the analyte listed.

[a] na = Not available.

[b] — = Not detected.

[c] Port was not labeled with the port depth.

Table C-5.0-9
VOC Pore-Gas Results at MDA C for Fiscal Year 2016

Sampling Plan 2016	Field Sample ID	Location ID	Depth (ft)	Date	Acetone	Carbon Tetrachloride	Chloroform	Cyclohexane	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Ethanol
Groundwater Tier 1 Screening Level					**20,300**	**5650**	**12,000**	**79,700,000**	**2,780,000**	**5750**	**242**	**7490**	**11,700**	**580**	**na[a]**
10982	MD50-16-126557	50-603503	133	10/28/2016	—[b]	—	97.59	—	—	—	—	—	—	—	—
10982	MD50-16-126558	50-603503	237	10/28/2016	—	100.60	126.87	—	64.25	—	—	—	—	—	—
10982	MD50-16-126559	50-603503	347	10/28/2016	—	113.17	63.43	—	79.07	—	—	—	—	—	—
10982	MD50-16-126560	50-603503	450	10/28/2016	—	81.73	—	—	79.07	—	—	—	—	—	—
10982	MD50-16-126561	50-613185	145	10/27/2016	—	81.73	97.59	—	88.96	—	—	—	—	—	—
10982	MD50-16-126562	50-613185	235	10/27/2016	—	138.32	87.83	—	153.21	—	—	—	—	—	—
10982	MD50-16-126563	50-613185	350	10/27/2016	—	88.02	—	—	118.61	—	—	—	—	—	—
10982	MD50-16-126564	50-613185	450	10/27/2016	—	75.45	—	—	108.73	—	—	—	—	—	—
10982	MD50-16-126565	50-613185	600	10/27/2016	—	—	—	—	—	—	—	—	—	—	—
10982	MD50-16-126525	50-603467	143	10/26/2016	—	370.95	585.55	—	163.09	—	—	—	95.10	—	—
10982	MD50-16-126526	50-603467	244	10/26/2016	—	515.56	585.55	—	291.59	—	—	—	166.42	—	—
10982	MD50-16-126527	50-603467	360	10/26/2016	—	509.27	473.32	—	291.59	—	—	—	142.65	—	—
10982	MD50-16-126528	50-603467	500	10/26/2016	—	257.78	58.56	—	232.28	—	—	—	—	—	—
10982	MD50-16-126529	50-603467	600	10/26/2016	—	163.47	—	—	158.15	—	—	—	—	—	—
10982	MD50-16-126530	50-603468	142	10/25/2016	—	220.06	317.17	—	172.97	—	—	—	71.32	—	—
10982	MD50-16-126531	50-603468	233	10/25/2016	—	591.01	634.35	—	429.97	—	—	—	217.93	—	—
10982	MD50-16-126532	50-603468	354	10/25/2016	—	609.87	448.92	—	494.21	—	—	—	178.31	—	—
10982	MD50-16-126533	50-603468	403	10/25/2016	—	597.30	336.69	—	593.06	—	—	—	134.72	—	—
10982	MD50-16-126534	50-613184	500	10/25/2016	—	176.04	—	—	247.11	—	—	—	—	—	—
10982	MD50-16-126535	50-613184	600	10/25/2016	—	75.45	—	—	128.50	—	—	—	—	—	—
10982	MD50-16-126536	50-613184	664.5	10/25/2016	—	—	—	—	—	—	—	—	—	—	—
10982	MD50-16-126497	50-24822	25	10/24/2016	—	75.45	239.10	—	118.61	—	—	—	—	—	—
10982	MD50-16-126498	50-24822	142	10/24/2016	—	238.92	585.60	—	459.62	—	—	—	126.80	—	—
10982	MD50-16-126499	50-24822	235	10/24/2016	—	440.11	683.14	—	939.00	—	—	—	194.16	—	—
10982	MD50-16-126500	50-24822	351	10/24/2016	—	276.64	170.79	—	642.48	—	—	—	55.47	—	—
10982	MD50-16-126501	50-24822	450	10/24/2016	—	—	—	—	128.50	—	—	—	—	—	116.75
10982	MD50-16-126507	50-603062	122	10/21/2016	—	—	78.07	—	207.57	—	—	—	—	—	—

Table C-5.0-9 (continued)

Sampling Plan 2016	Field Sample ID	Location ID	Depth (ft)	Date	Acetone	Carbon Tetrachloride	Chloroform	Cyclohexane	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Ethanol
Groundwater Tier 1 Screening Level					**20,300**	**5650**	**12,000**	**79,700,000**	**2,780,000**	**5750**	**242**	**7490**	**11,700**	**580**	**na[a]**
10982	MD50-16-126508	50-603062	217	10/21/2016	—	—	53.68	—	222.40	—	—	—	—	—	—
10982	MD50-16-126509	50-603062	337	10/21/2016	—	—	—	—	202.63	—	—	—	—	—	—
10982	MD50-16-126510	50-603062	450	10/21/2016	—	—	—	—	133.44	—	—	—	—	—	—
10982	MD50-16-126516	50-603064	113	10/20/2016	—	157.18	731.94	—	345.95	—	—	475.48	190.19	—	—
10982	MD50-16-126517	50-603064	214	10/20/2016	—	352.09	683.14	—	741.32	—	—	713.23	273.40	—	—
10982	MD50-16-126518	50-603064	332	10/20/2016	—	276.64	121.99	—	642.48	—	—	206.04	43.59	—	—
10982	MD50-16-126519	50-603064	500	10/20/2016	—	94.31	—	—	306.41	—	—	—	—	—	—
10982	MD50-16-126502	50-603061	25	10/19/2016	—	—	—	—	345.95	—	—	186.23	—	—	—
10982	MD50-16-126503	50-603061	128	10/19/2016	—	69.16	63.43	—	326.18	—	—	1307.58	—	—	—
10982	MD50-16-126504	50-603061	228	10/19/2016	—	138.32	58.56	—	316.30	—	—	1426.45	—	—	—
10982	MD50-16-126505	50-603061	347	10/19/2016	—	132.03	—	—	252.05	—	—	320.95	—	—	—
10982	MD50-16-126506	50-603061	450	10/19/2016	—	—	—	—	98.84	—	—	47.55	—	—	—
10982	MD50-16-126511	50-603063	25	10/18/2016	—	—	—	—	128.50	—	—	—	—	—	—
10982	MD50-16-126512	50-603063	128	10/18/2016	—	201.19	356.21	—	395.37	84.94	—	305.10	43.59	—	—
10982	MD50-16-126513	50-603063	228	10/18/2016	—	477.84	731.94	—	642.48	80.90	—	475.48	182.27	55.42	—
10982	MD50-16-126514	50-603063	347	10/18/2016	—	339.51	331.81	—	375.60	—	—	106.98	63.40	—	—
10982	MD50-16-126515	50-603063	450	10/18/2016	—	188.62	146.39	—	212.51	—	—	—	—	—	—
10982	MD50-16-126520	50-603383	26	10/17/2016	—	132.03	112.23	—	237.22	—	—	38.43	—	69.28	—
10982	MD50-16-126521	50-603383	139	10/17/2016	—	201.19	190.30	—	252.05	—	—	67.36	43.59	240.16	—
10982	MD50-16-126522	50-603383	244	10/17/2016	90.21	377.24	175.67	—	296.53	—	—	83.21	63.40	392.56	—
10982	MD50-16-126523	50-603383	359	10/17/2016	—	238.92	—	—	187.80	—	—	—	—	—	—
10982	MD50-16-126524	50-603383	450	10/17/2016	—	150.90	—	—	153.21	—	—	—	—	—	—
10982	MD50-16-126491	50-24813	25	10/07/2016	—	754.48	731.94	—	128.50	—	—	—	35.66	—	—
10982	MD50-16-126492	50-24813	150	10/07/2016	—	1257.46	2244.61	—	425.02	—	60.67	—	435.86	50.80	—
10982	MD50-16-126493	50-24813	241	10/07/2016	—	1508.95	1951.83	—	1087.27	—	—	—	594.36	—	—
10982	MD50-16-126494	50-24813	358	10/07/2016	—	817.35	585.55	—	988.43	—	—	—	210.01	—	—
10982	MD50-16-126495	50-24813	450	10/07/2016	—	515.56	151.27	—	741.32	—	—	—	59.44	—	—
10982	MD50-16-126496	50-24813	600	10/07/2016	—	144.61	—	—	316.30	—	—	—	—	—	—
10982	MD50-16-126537	50-603470	83	10/06/2016	—	276.64	927.12	—	207.57	—	—	—	134.72	—	—
10982	MD50-16-126538	50-603470	203	10/06/2016	—	402.39	1073.51	—	691.90	—	—	—	316.90	—	—
10982	MD50-16-126539	50-603470	278	10/06/2016	—	591.01	975.92	—	988.43	—	—	39.62	332.84	—	—

Table C-5.0-9 (continued)

Sampling Plan 2016	Field Sample ID	Location ID	Depth (ft)	Date	Acetone	Carbon Tetrachloride	Chloroform	Cyclohexane	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Ethanol
Groundwater Tier 1 Screening Level					**20,300**	**5650**	**12,000**	**79,700,000**	**2,780,000**	**5750**	**242**	**7490**	**11,700**	**580**	**na[a]**
10982	MD50-16-126540	50-603470	351	10/06/2016	—	509.27	405.01	—	988.43	—	—	—	162.46	—	—
10982	MD50-16-126541	50-603470	450	10/06/2016	—	314.37	107.35	—	691.90	—	—	—	39.62	—	—
10982	MD50-16-126542	50-603470	650	10/06/2016	—	—	—	—	98.84	—	—	—	—	—	—
10982	MD50-16-126543	50-603471	90	10/05/2016	—	502.98	731.94	—	79.07	—	—	—	79.25	—	—
10982	MD50-16-126544	50-603471	209	10/05/2016	—	754.48	927.12	—	593.06	—	—	—	293.22	—	—
10982	MD50-16-126545	50-603471	288	10/05/2016	—	1068.84	1463.88	—	790.74	—	—	—	475.48	60.04	—
10982	MD50-16-126546	50-603471	360	10/05/2016	—	880.22	780.73	—	889.58	—	—	—	265.48	—	—
10982	MD50-16-126547	50-603471	450	10/05/2016	—	452.69	409.89	—	449.73	—	—	—	126.80	—	—
10982	MD50-16-126548	50-613183	550	10/05/2016	—	213.77	—	—	415.14	—	—	—	—	—	—
10982	MD50-16-126549	50-613183	642.5	10/05/2016	—	—	—	—	—	—	—	—	—	—	—
10982	MD50-16-126582	50-603471	Unknown[c]	10/05/2016	—	1383.21	1659.06	—	232.28	—	105.17	—	229.82	69.28	—
10982	MD50-16-126550	50-603472	27	10/04/2016	—	—	209.82	—	—	—	—	—	—	—	—
10982	MD50-16-126551	50-603472	146	10/04/2016	—	176.04	487.96	—	128.50	—	44.50	—	103.02	73.89	—
10982	MD50-16-126552	50-603472	292	10/04/2016	—	502.98	683.14	—	341.01	—	—	—	194.16	60.04	—
10982	MD50-16-126553	50-603472	364	10/04/2016	—	490.41	234.22	—	415.14	—	—	—	79.25	—	—
10982	MD50-16-126554	50-603472	450	10/04/2016	—	169.76	—	—	182.86	—	—	—	—	—	—
10982	MD50-16-126555	50-613182	550	10/04/2016	—	176.04	—	—	217.45	—	—	—	—	—	—
10982	MD50-16-126556	50-613182	632.5	10/04/2016	—	—	—	—	—	—	—	—	—	—	—
10982	MD50-16-126487	50-24784	155	10/03/2016	—	201.19	331.81	—	108.73	—	—	—	—	69.28	—
10982	MD50-16-126488	50-24784	244	10/03/2016	—	201.19	92.71	37.84	98.84	—	—	—	—	—	—
10982	MD50-16-126489	50-24784	362	10/03/2016	—	333.23	—	—	168.03	—	—	—	—	—	—
10982	MD50-16-126490	50-24784	450	10/03/2016	—	289.22	—	—	172.97	—	—	—	—	—	—
10643	MD50-16-116404	50-603383	139	04/26/2016	—	226.34	209.82	—	336.06	—	—	55.47	47.55	254.01	—
10643	MD50-16-115122	50-24822	25	04/25/2016	—	81.73	273.26	—	148.26	—	—	—	—	—	—
10643	MD50-16-115123	50-24822	142	04/25/2016	—	270.35	585.55	—	593.06	—	—	—	134.72	—	—
10643	MD50-16-115124	50-24822	235	04/25/2016	—	364.66	585.55	—	790.74	—	—	—	162.46	—	—
10643	MD50-16-115125	50-24822	351	04/25/2016	—	238.92	170.79	—	642.48	—	—	—	47.55	—	—
10643	MD50-16-115126	50-24822	450	04/25/2016	—	150.90	—	—	439.85	—	—	—	—	—	—
10643	MD50-16-115187	50-613185	145	04/22/2016	—	75.45	97.60	—	93.90	—	—	—	—	—	—
10643	MD50-16-115188	50-613185	235	04/22/2016	—	125.75	92.71	—	158.15	—	—	—	—	—	—
10643	MD50-16-115189	50-613185	350	04/22/2016	—	106.88	—	—	163.09	—	—	—	—	—	—

Table C-5.0-9 (continued)

Sampling Plan 2016	Field Sample ID	Location ID	Depth (ft)	Date	Acetone	Carbon Tetrachloride	Chloroform	Cyclohexane	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Ethanol
Groundwater Tier 1 Screening Level					**20,300**	**5650**	**12,000**	**79,700,000**	**2,780,000**	**5750**	**242**	**7490**	**11,700**	**580**	**na**[a]
10643	MD50-16-115190	50-613185	450	04/22/2016	—	75.45	—	—	128.50	—	—	—	—	—	—
10643	MD50-16-115191	50-613185	600	04/22/2016	—	—	—	—	64.25	—	—	—	—	—	—
10643	MD50-16-115183	50-603503	133	04/21/2016	—	—	112.23	—	—	—	—	—	—	—	—
10643	MD50-16-115184	50-603503	237	04/21/2016	—	100.60	141.51	—	79.07	—	—	—	—	—	—
10643	MD50-16-115185	50-603503	347	04/21/2016	—	119.46	68.31	—	98.84	—	—	—	—	—	—
10643	MD50-16-115186	50-603503	450	04/21/2016	—	88.02	—	—	74.13	—	—	—	—	—	—
10643	MD50-16-115150	50-603467	143	04/20/2016	—	352.09	536.75	—	197.69	—	—	—	126.80	—	—
10643	MD50-16-115151	50-603467	244	04/20/2016	—	591.01	683.14	—	336.06	—	—	—	198.12	—	—
10643	MD50-16-115152	50-603467	360	04/20/2016	—	433.82	385.49	—	301.47	—	—	—	134.72	—	—
10643	MD50-16-115153	50-603467	500	04/20/2016	—	207.48	—	—	222.40	—	—	—	—	—	—
10643	MD50-16-115154	50-603467	600	04/20/2016	—	62.87	—	—	79.07	—	—	—	—	—	—
10643	MD50-16-115155	50-603468	142	04/19/2016	—	213.77	351.33	—	148.26	—	—	—	91.13	—	—
10643	MD50-16-115156	50-603468	233	04/19/2016	—	547.00	585.55	—	444.79	—	—	—	198.12	—	—
10643	MD50-16-115157	50-603468	354	04/19/2016	—	534.42	380.61	—	543.63	—	—	—	142.65	—	—
10643	MD50-16-115158	50-603468	403	04/19/2016	—	484.12	243.98	—	593.06	—	—	—	103.02	—	—
10643	MD50-16-115159	50-613184	500	04/19/2016	—	157.18	—	—	256.99	—	—	—	—	—	—
10643	MD50-16-115160	50-613184	600	04/19/2016	—	54.70 (J)	—	—	123.55	—	—	—	—	—	—
10643	MD50-16-115161	50-613184	664.5	04/19/2016	—	—	—	—	—	—	—	—	—	—	—
10643	MD50-16-115132	50-603062	122	04/15/2016	—	—	73.19	—	207.57	—	—	—	—	—	—
10643	MD50-16-115133	50-603062	217	04/15/2016	—	—	58.56	—	266.88	—	—	—	—	—	—
10643	MD50-16-115134	50-603062	337	04/15/2016	—	—	—	—	172.97	—	—	—	—	—	—
10643	MD50-16-115135	50-603062	450	04/15/2016	—	—	—	—	118.61	—	—	—	—	—	—
10643	MD50-16-115141	50-603064	113	04/14/2016	—	169.76	878.33	—	405.25	—	—	475.48	229.82	—	—
10643	MD50-16-115142	50-603064	214	04/14/2016	—	333.23	634.35	—	741.32	—	—	594.36	261.52	—	—
10643	MD50-16-115143	50-603064	332	04/14/2016	—	207.48	87.83	—	543.63	—	—	142.65	43.59	—	—
10643	MD50-16-115144	50-603064	500	04/14/2016	—	—	—	—	256.99	—	—	—	—	—	—
10643	MD50-16-115127	50-603061	25	04/13/2016	—	—	—	—	341.01	—	—	194.16	—	—	282.46
10643	MD50-16-115128	50-603061	128	04/13/2016	—	61.62	73.19	—	301.47	—	—	1426.45	—	—	—
10643	MD50-16-115129	50-603061	228	04/13/2016	—	75.45	45.87	—	202.63	—	—	1069.84	—	—	—
10643	MD50-16-115130	50-603061	347	04/13/2016	—	81.73	—	—	168.03	—	—	213.97	—	—	—
10643	MD50-16-115131	50-603061	450	04/13/2016	—	—	—	—	128.50	—	—	79.25	—	—	—

Table C-5.0-9 (continued)

Sampling Plan 2016	Field Sample ID	Location ID	Depth (ft)	Date	Acetone	Carbon Tetrachloride	Chloroform	Cyclohexane	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Ethanol
Groundwater Tier 1 Screening Level					**20,300**	**5650**	**12,000**	**79,700,000**	**2,780,000**	**5750**	**242**	**7490**	**11,700**	**580**	**na[a]**
10643	MD50-16-115136	50-603063	25	04/12/2016	—	—	—	—	118.61	—	—	—	—	—	—
10643	MD50-16-115137	50-603063	128	04/12/2016	—	163.47	302.53	—	326.18	72.81	—	249.63	39.62	—	—
10643	MD50-16-115138	50-603063	228	04/12/2016	—	358.38	536.75	—	454.68	56.63	—	348.69	134.72	—	—
10643	MD50-16-115139	50-603063	347	04/12/2016	—	251.49	268.38	—	316.30	—	—	79.25	55.47	—	—
10643	MD50-16-115140	50-603063	450	04/12/2016	—	188.62	151.27	—	222.40	—	—	—	—	—	—
10643	MD50-16-115145	50-603383	26	04/11/2016	—	—	68.31	—	59.31	—	—	—	—	40.64	—
10643	MD50-16-115147	50-603383	244	04/11/2016	—	364.66	170.79	—	286.64	—	—	67.36	63.40	360.24	—
10643	MD50-16-115148	50-603383	359	04/11/2016	—	251.49	—	—	232.28	—	—	—	—	50.80	—
10643	MD50-16-115149	50-603383	450	04/11/2016	—	238.92	—	—	202.63	—	—	—	—	—	—
10643	MD50-16-115116	50-24813	25	04/08/2016	—	1068.84	927.12	—	192.74	—	—	—	47.55	—	—
10643	MD50-16-115117	50-24813	150	04/08/2016	—	1383.21	2634.98	—	494.21	—	88.99	—	515.11	73.89	—
10643	MD50-16-115118	50-24813	241	04/08/2016	—	1634.70	2049.43	—	1136.69	—	33.57 (J)	—	633.98	—	—
10643	MD50-16-115119	50-24813	358	04/08/2016	—	943.10	634.35	—	1037.85	—	—	—	206.04	—	—
10643	MD50-16-115120	50-24813	450	04/08/2016	—	308.08	87.83	—	400.31	—	—	—	39.62	—	—
10643	MD50-16-115121	50-24813	600	04/08/2016	—	157.18	—	—	326.18	—	—	—	—	—	—
10643	MD50-16-115162	50-603470	83	04/07/2016	—	188.62	829.53	—	148.26	—	—	—	134.72	—	—
10643	MD50-16-115163	50-603470	203	04/07/2016	—	452.69	1171.10	—	691.90	—	—	39.62	356.61	—	—
10643	MD50-16-115165	50-603470	351	04/07/2016	—	427.54	375.73	—	840.16	—	—	—	142.65	—	—
10643	MD50-16-115168	50-603470	650	04/07/2016	—	—	—	—	—	—	—	—	—	—	—
10643	MD50-16-115164	50-603470	278	04/06/2016	—	565.86	927.12	—	939.00	—	—	43.59	356.61	—	—
10643	MD50-16-115166	50-603470	450	04/06/2016	—	226.34	73.19	—	474.44	—	—	—	—	—	—
10643	MD50-16-115169	50-603471	90	04/06/2016	—	238.92	419.64	—	—	—	—	—	38.04	—	—
10643	MD50-16-115170	50-603471	209	04/06/2016	—	301.79	829.53	—	148.26	—	64.72	—	182.27	—	—
10643	MD50-16-115171	50-603471	288	04/06/2016	—	1131.71	1463.88	—	691.90	—	39.64	—	435.86	60.04	—
10643	MD50-16-115172	50-603471	360	04/06/2016	—	754.48	683.14	—	691.90	—	—	—	241.70	—	—
10643	MD50-16-115173	50-603471	450	04/06/2016	—	427.54	585.55	—	123.55	—	—	—	190.19	—	—
10643	MD50-16-115174	50-613183	550	04/06/2016	—	138.32	—	—	316.30	—	—	—	—	—	—
10643	MD50-16-115175	50-613183	642.5	04/06/2016	—	—	—	—	—	—	—	—	—	—	—
10643	MD50-16-115192	50-603471	Unknown[c]	04/06/2016	—	754.48	1073.51	—	108.73	—	72.81	—	122.83	43.41	—
10643	MD50-16-115176	50-603472	27	04/05/2016	—	—	229.34	—	—	—	—	—	—	—	—
10643	MD50-16-115177	50-603472	146	04/05/2016	—	182.33	483.08	—	103.79	—	—	—	99.06	60.04	—

Table C-5.0-9 (continued)

Sampling Plan 2016	Field Sample ID	Location ID	Depth (ft)	Date	Acetone	Carbon Tetrachloride	Chloroform	Cyclohexane	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Ethanol
Groundwater Tier 1 Screening Level					**20,300**	**5650**	**12,000**	**79,700,000**	**2,780,000**	**5750**	**242**	**7490**	**11,700**	**580**	**na[a]**
10643	MD50-16-115178	50-603472	292	04/05/2016	—	502.98	585.55	—	341.01	—	—	—	190.19	55.42	—
10643	MD50-16-115179	50-603472	364	04/05/2016	—	408.68	180.55	—	341.01	—	—	—	55.47	—	—
10643	MD50-16-115180	50-603472	450	04/05/2016	—	289.22	68.31	—	296.53	—	—	—	—	—	—
10643	MD50-16-115181	50-613182	550	04/05/2016	—	150.90	—	—	212.51	—	—	—	—	—	—
10643	MD50-16-115182	50-613182	632.5	04/05/2016	—	—	—	—	—	—	—	—	—	—	—
10643	MD50-16-115112	50-24784	155	04/04/2016	—	169.76	322.05	—	93.90	—	—	—	—	55.42	—
10643	MD50-16-115113	50-24784	244	04/04/2016	—	138.32	73.19	—	64.25	—	—	—	—	—	—
10643	MD50-16-115114	50-24784	362	04/04/2016	—	370.95	—	—	177.92	—	—	—	—	—	—
10643	MD50-16-115115	50-24784	450	04/04/2016	—	257.78	—	—	148.26	—	—	—	—	—	—

Table C-5.0-9 (continued)

Sampling Plan 2016	Field Sample ID	Location ID	Depth (ft)	Date	Hexane	Isooctane	Methylene Chloride	Propanol[2-]	Tetrachloroethylene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethylene	Trichlorofluoromethane
Groundwater Tier 1 Screening Level					**23,500,000**	**na**	**665**	**136**	**3630**	**1,190,000,000**	**141,000**	**169**	**2020**	**4,540,000**
10982	MD50-16-126557	50-603503	133	10/28/2016	—	—	—	—	318.58	—	—	—	2094.49	—
10982	MD50-16-126558	50-603503	237	10/28/2016	—	—	—	—	508.37	—	—	—	5263.08	—
10982	MD50-16-126559	50-603503	347	10/28/2016	—	—	—	—	420.25	—	—	—	4726.03	—
10982	MD50-16-126560	50-603503	450	10/28/2016	—	—	—	—	244.02	—	—	—	3061.18	—
10982	MD50-16-126561	50-613185	145	10/27/2016	—	—	—	—	74.56	—	—	—	3759.34	—
10982	MD50-16-126562	50-613185	235	10/27/2016	—	—	—	—	135.56	—	—	—	6981.63	—
10982	MD50-16-126563	50-613185	350	10/27/2016	—	—	—	—	—	—	—	—	3114.88	—
10982	MD50-16-126564	50-613185	450	10/27/2016	—	—	—	—	—	—	—	—	1772.26	—
10982	MD50-16-126565	50-613185	600	10/27/2016	—	—	—	—	—	—	—	—	102.04	—
10982	MD50-16-126525	50-603467	143	10/26/2016	—	—	—	—	366.02	—	—	—	11,278	—
10982	MD50-16-126526	50-603467	244	10/26/2016	—	—	201.35	—	677.82	—	—	—	22,556	—
10982	MD50-16-126527	50-603467	360	10/26/2016	—	—	—	—	745.60	—	—	—	25,778.3	—
10982	MD50-16-126528	50-603467	500	10/26/2016	—	—	—	—	311.80	—	—	—	9666.88	—
10982	MD50-16-126529	50-603467	600	10/26/2016	—	—	—	—	162.68	—	—	—	4726.03	—
10982	MD50-16-126530	50-603468	142	10/25/2016	—	—	—	—	210.12	—	—	—	9666.88	—
10982	MD50-16-126531	50-603468	233	10/25/2016	—	—	590.15 (J)	—	427.03	—	—	—	30,074.7	—
10982	MD50-16-126532	50-603468	354	10/25/2016	—	—	343.68 (J)	—	433.81	—	—	—	31,685.9	—
10982	MD50-16-126533	50-603468	403	10/25/2016	—	—	—	—	413.47	—	—	—	32,222.9	—
10982	MD50-16-126534	50-613184	500	10/25/2016	—	—	—	—	94.89	—	—	—	5907.54	—
10982	MD50-16-126535	50-613184	600	10/25/2016	—	—	—	—	—	—	—	—	1127.8	—
10982	MD50-16-126536	50-613184	664.5	10/25/2016	—	—	—	—	—	—	—	—	171.86	—
10982	MD50-16-126497	50-24822	25	10/24/2016	—	—	—	—	149.12	—	—	—	5907.54	—
10982	MD50-16-126498	50-24822	142	10/24/2016	—	—	166.63	—	210.12	—	—	—	22,02	—
10982	MD50-16-126499	50-24822	235	10/24/2016	—	—	381.86	—	264.35	—	—	—	40,815.7	—
10982	MD50-16-126500	50-24822	351	10/24/2016	—	—	—	—	149.12	—	—	—	22,019	—
10982	MD50-16-126501	50-24822	450	10/24/2016	—	—	—	—	—	—	—	—	3114.88	—
10982	MD50-16-126507	50-603062	122	10/21/2016	—	—	—	—	—	551.44	65.43	—	6444.58	—

Table C-5.0-9 (continued)

Sampling Plan 2016	Field Sample ID	Location ID	Depth (ft)	Date	Hexane	Isooctane	Methylene Chloride	Propanol[2-]	Tetrachloroethylene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethylene	Trichlorofluoromethane
Groundwater Tier 1 Screening Level					**23,500,000**	**na**	**665**	**136**	**3630**	**1,190,000,000**	**141,000**	**169**	**2020**	**4,540,000**
10982	MD50-16-126508	50-603062	217	10/21/2016	—	—	—	—	—	589.73	52.89	—	6981.63	—
10982	MD50-16-126509	50-603062	337	10/21/2016	—	—	—	—	—	222.11	—	—	2846.36	—
10982	MD50-16-126510	50-603062	450	10/21/2016	—	—	—	—	—	—	—	—	912.98	—
10982	MD50-16-126516	50-603064	113	10/20/2016	—	—	—	—	569.37	8424.77	1744.85	—	19,870.8	—
10982	MD50-16-126517	50-603064	214	10/20/2016	—	—	451.29	—	637.15	13,786	2290.11	—	37,593.4	61.76
10982	MD50-16-126518	50-603064	332	10/20/2016	—	—	—	—	291.46	5437.81	288.99	—	17,185.6	55.59
10982	MD50-16-126519	50-603064	500	10/20/2016	—	—	—	—	—	444.22	—	—	2470.42	—
10982	MD50-16-126502	50-603061	25	10/19/2016	—	—	—	—	101.67	7658.88	872.42	—	451.12	—
10982	MD50-16-126503	50-603061	128	10/19/2016	—	—	—	—	318.58	25,274.3	3435.17	—	2524.13	—
10982	MD50-16-126504	50-603061	228	10/19/2016	—	—	—	—	291.46	24,508.4	3598.75	—	4081.57	—
10982	MD50-16-126505	50-603061	347	10/19/2016	—	—	—	—	128.79	9190.66	599.79	—	1825.97	—
10982	MD50-16-126506	50-603061	450	10/19/2016	—	—	—	—	—	1531.78	—	—	429.64	—
10982	MD50-16-126511	50-603063	25	10/18/2016	—	—	—	—	277.91	2067.90	212.65	—	1235.21	—
10982	MD50-16-126512	50-603063	128	10/18/2016	—	—	—	—	1084.51	5514.39	708.84	—	10,741	—
10982	MD50-16-126513	50-603063	228	10/18/2016	—	—	-	—	1830.11	7275.94	872.42	—	32,222.9	84.22
10982	MD50-16-126514	50-603063	347	10/18/2016	—	—	—	—	948.95	1608.37	92.70	—	18,796.7	51.66
10982	MD50-16-126515	50-603063	450	10/18/2016	—	—	—	—	338.91	268.06	—	—	8592.78	—
10982	MD50-16-126520	50-603383	26	10/17/2016	—	—	—	—	881.17	1072.24	169.03	—	2900.06	56.15
10982	MD50-16-126521	50-603383	139	10/17/2016	—	—	—	—	1220.08	1148.83	185.39	—	5263.08	—
10982	MD50-16-126522	50-603383	244	10/17/2016	—	—	—	—	1694.55	919.07	185.39	—	7518.68	—
10982	MD50-16-126523	50-603383	359	10/17/2016	—	—	—	—	325.35	145.52	—	—	1825.97	—
10982	MD50-16-126524	50-603383	450	10/17/2016	—	—	—	—	393.14	206.79	—	—	2040.79	—
10982	MD50-16-126491	50-24813	25	10/07/2016	—	—	—	—	284.68	—	—	—	7518.68	—
10982	MD50-16-126492	50-24813	150	10/07/2016	—	—	274.25	—	467.70	—	—	152.70	29,000.6	—
10982	MD50-16-126493	50-24813	241	10/07/2016	—	—	624.86	—	813.38	76.59	—	—	64,445.8	—
10982	MD50-16-126494	50-24813	358	10/07/2016	—	—	—	—	508.37	—	—	—	46,723.2	—
10982	MD50-16-126495	50-24813	450	10/07/2016	—	—	—	—	284.68	—	—	—	25,778.3	—
10982	MD50-16-126496	50-24813	600	10/07/2016	—	—	—	—	—	—	—	—	3437.11	—
10982	MD50-16-126537	50-603470	83	10/06/2016	—	—	—	—	745.60	275.72	—	81.79	11,815.1	—
10982	MD50-16-126538	50-603470	203	10/06/2016	—	—	520.72	—	515.14	742.91	109.05	—	34,371.1	—
10982	MD50-16-126539	50-603470	278	10/06/2016	—	—	763.72	—	521.92	919.07	98.15	—	48,871.4	—

Table C-5.0-9 (continued)

Sampling Plan 2016	Field Sample ID	Location ID	Depth (ft)	Date	Hexane	Isooctane	Methylene Chloride	Propanol[2-]	Tetrachloroethylene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethylene	Trichlorofluoromethane
Groundwater Tier 1 Screening Level					**23,500,000**	**na**	**665**	**136**	**3630**	**1,190,000,000**	**141,000**	**169**	**2020**	**4,540,000**
10982	MD50-16-126540	50-603470	351	10/06/2016	—	—	416.58	—	366.02	673.98	—	—	38,130.5	—
10982	MD50-16-126541	50-603470	450	10/06/2016	—	—	—	—	162.68	291.04	—	—	19,870.8	—
10982	MD50-16-126542	50-603470	650	10/06/2016	—	—	—	—	—	—	—	—	145.00	—
10982	MD50-16-126543	50-603471	90	10/05/2016	—	—	—	—	379.58	91.91	—	—	6981.63	—
10982	MD50-16-126544	50-603471	209	10/05/2016	—	—	173.57	—	948.95	291.04	—	—	41,352.8	—
10982	MD50-16-126545	50-603471	288	10/05/2016	—	—	1492.73	—	1220.08	490.17	—	—	52,093.7	—
10982	MD50-16-126546	50-603471	360	10/05/2016	—	—	902.58	—	1016.73	405.92	—	—	46,186.2	56.15
10982	MD50-16-126547	50-603471	450	10/05/2016	—	—	243.00	—	610.04	137.86	—	—	26,852.4	—
10982	MD50-16-126548	50-613183	550	10/05/2016	—	—	—	—	101.67	—	—	—	4618.62	—
10982	MD50-16-126549	50-613183	642.5	10/05/2016	—	—	—	—	—	—	—	—	112.78	—
10982	MD50-16-126582	50-603471	Unknown[c]	10/05/2016	—	—	218.70	—	948.95	291.04	—	98.15	17,185.6	—
10982	MD50-16-126550	50-603472	27	10/04/2016	—	—	—	—	433.81	—	—	—	2470.42	—
10982	MD50-16-126551	50-603472	146	10/04/2016	—	—	381.86	—	677.82	107.22	—	—	11,815.1	—
10982	MD50-16-126552	50-603472	292	10/04/2016	—	—	1006.72	—	1626.77	137.86	—	—	33,297	51.66
10982	MD50-16-126553	50-603472	364	10/04/2016	—	—	416.58	—	1220.08	84.25	—	—	25,241.3	—
10982	MD50-16-126554	50-603472	450	10/04/2016	—	—	—	—	345.69	—	—	—	7518.68	—
10982	MD50-16-126555	50-613182	550	10/04/2016	—	—	—	—	176.23	—	—	—	3920.46	—
10982	MD50-16-126556	50-613182	632.5	10/04/2016	—	—	—	—	—	—	—	—	64.45	—
10982	MD50-16-126487	50-24784	155	10/03/2016	—	—	—	—	2101.24	130.20	—	—	3329.7	—
10982	MD50-16-126488	50-24784	244	10/03/2016	—	—	—	—	1287.86	72.76	—	—	2363.01	—
10982	MD50-16-126489	50-24784	362	10/03/2016	—	—	—	—	1220.08	—	—	—	2363.01	—
10982	MD50-16-126490	50-24784	450	10/03/2016	—	—	—	—	515.14	—	—	—	1127.80	—
10643	MD50-16-116404	50-603383	139	04/26/2016	—	—	41.66	—	1491.20	1072.24	218.11	—	5370.49	—
10643	MD50-16-115122	50-24822	25	04/25/2016	—	—	—	—	155.90	—	—	—	6444.58	—
10643	MD50-16-115123	50-24822	142	04/25/2016	—	—	152.74	—	223.68	145.52	—	—	23,630.1	—
10643	MD50-16-115124	50-24822	235	04/25/2016	—	—	260.36	—	237.24	191.47	—	—	33,297	—
10643	MD50-16-115125	50-24822	351	04/25/2016	—	—	97.20	—	115.23	84.25	—	—	20,407.9	—
10643	MD50-16-115126	50-24822	450	04/25/2016	—	—	—	—	—	—	—	—	9666.88	—
10643	MD50-16-115187	50-613185	145	04/22/2016	—	—	—	—	81.34	—	—	—	3974.16	—
10643	MD50-16-115188	50-613185	235	04/22/2016	—	—	55.54	—	115.23	—	—	—	6444.58	—
10643	MD50-16-115189	50-613185	350	04/22/2016	—	—	—	—	—	—	—	—	3813.05	—

Table C-5.0-9 (continued)

Sampling Plan 2016	Field Sample ID	Location ID	Depth (ft)	Date	Hexane	Isooctane	Methylene Chloride	Propanol[2-]	Tetrachloroethylene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethylene	Trichlorofluoromethane
Groundwater Tier 1 Screening Level					**23,500,000**	**na**	**665**	**136**	**3630**	**1,190,000,000**	**141,000**	**169**	**2020**	**4,540,000**
10643	MD50-16-115190	50-613185	450	04/22/2016	—	—	—	—	—	—	—	—	1825.97	—
10643	MD50-16-115191	50-613185	600	04/22/2016	—	—	—	—	—	—	—	—	177.23	—
10643	MD50-16-115183	50-603503	133	04/21/2016	—	—	—	132.65	311.80	—	—	—	1933.38	—
10643	MD50-16-115184	50-603503	237	04/21/2016	—	—	93.73	—	488.03	—	—	—	4779.73	—
10643	MD50-16-115185	50-603503	347	04/21/2016	—	—	48.60	—	413.47	—	—	—	4027.87	—
10643	MD50-16-115186	50-603503	450	04/21/2016	—	—	—	—	250.79	—	—	—	2846.36	—
10643	MD50-16-115150	50-603467	143	04/20/2016	—	—	69.43	—	386.36	—	—	—	12,889.20	—
10643	MD50-16-115151	50-603467	244	04/20/2016	—	—	183.99	—	745.60	—	—	—	24,704.20	—
10643	MD50-16-115152	50-603467	360	04/20/2016	—	—	—	—	637.15	—	—	—	21,481.90	—
10643	MD50-16-115153	50-603467	500	04/20/2016	—	—	—	—	210.12	—	—	—	6981.63	—
10643	MD50-16-115154	50-603467	600	04/20/2016	—	—	—	—	81.34	—	—	—	2524.13	—
10643	MD50-16-115155	50-603468	142	04/19/2016	—	—	—	—	264.35	—	—	—	13,426.20	—
10643	MD50-16-115156	50-603468	233	04/19/2016	—	—	381.86	—	420.25	—	—	—	25,778.30	—
10643	MD50-16-115157	50-603468	354	04/19/2016	—	—	236.06	—	393.14	—	—	—	26,315.40	—
10643	MD50-16-115158	50-603468	403	04/19/2016	—	—	177.05	—	311.80	—	—	—	23,630.10	—
10643	MD50-16-115159	50-613184	500	04/19/2016	—	—	—	—	81.34	—	—	—	4779.73	—
10643	MD50-16-115160	50-613184	600	04/19/2016	—	—	—	—	—	—	—	—	859.28	—
10643	MD50-16-115161	50-613184	664.5	04/19/2016	—	—	—	—	—	—	—	—	112.78	—
10643	MD50-16-115132	50-603062	122	04/15/2016	—	—	—	—	—	413.58	54.53	—	6444.58	—
10643	MD50-16-115133	50-603062	217	04/15/2016	—	—	—	—	—	559.10	65.43	—	7518.68	—
10643	MD50-16-115134	50-603062	337	04/15/2016	—	—	—	—	—	153.18	—	—	2309.31	—
10643	MD50-16-115135	50-603062	450	04/15/2016	—	—	—	—	—	—	—	—	698.16	—
10643	MD50-16-115141	50-603064	113	04/14/2016	—	—	90.26	—	589.70	8424.77	2072.00	—	23,093.10	—
10643	MD50-16-115142	50-603064	214	04/14/2016	—	—	347.15	—	603.26	10,722.40	2181.06	—	34,371.10	—
10643	MD50-16-115143	50-603064	332	04/14/2016	—	—	52.07	—	230.46	3676.26	223.56	—	13,963.30	—
10643	MD50-16-115144	50-603064	500	04/14/2016	—	—	—	—	—	245.08	—	—	1772.26	—
10643	MD50-16-115127	50-603061	25	04/13/2016	—	—	—	—	108.45	9956.55	1036.00	—	537.05	—
10643	MD50-16-115128	50-603061	128	04/13/2016	—	—	—	—	318.58	27,572.00	3544.22	—	2792.65	—
10643	MD50-16-115129	50-603061	228	04/13/2016	—	—	34.37	—	203.35	16,083.70	2399.16	—	3437.11	—
10643	MD50-16-115130	50-603061	347	04/13/2016	—	—	—	—	94.89	6510.05	398.04	—	1450.03	—
10643	MD50-16-115131	50-603061	450	04/13/2016	—	—	—	—	—	2374.25	—	—	805.57	—

Table C-5.0-9 (continued)

Sampling Plan 2016	Field Sample ID	Location ID	Depth (ft)	Date	Hexane	Isooctane	Methylene Chloride	Propanol[2-]	Tetrachloroethylene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethylene	Trichlorofluoromethane
Groundwater Tier 1 Screening Level					23,500,000	na	665	136	3630	1,190,000,000	141,000	169	2020	4,540,000
10643	MD50-16-115136	50-603063	25	04/12/2016	—	—	—	—	250.79	1838.13	174.49	—	1181.51	—
10643	MD50-16-115137	50-603063	128	04/12/2016	—	—	—	—	1016.73	4901.68	654.32	—	9666.88	—
10643	MD50-16-115138	50-603063	228	04/12/2016	—	—	—	—	1626.77	5744.16	654.32	—	25,778.30	61.76
10643	MD50-16-115139	50-603063	347	04/12/2016	—	—	—	—	813.38	1378.60	76.34	—	16,648.50	—
10643	MD50-16-115140	50-603063	450	04/12/2016	—	—	—	—	386.36	260.40	—	—	9666.88	—
10643	MD50-16-115145	50-603383	26	04/11/2016	—	—	—	—	521.92	245.08	59.98	—	1450.03	—
10643	MD50-16-115147	50-603383	244	04/11/2016	—	—	76.37	—	1558.99	919.07	185.39	—	6981.63	—
10643	MD50-16-115148	50-603383	359	04/11/2016	—	—	—	—	569.37	329.33	51.80	—	3222.29	—
10643	MD50-16-115149	50-603383	450	04/11/2016	—	—	—	—	332.13	291.04	—	—	1772.26	—
10643	MD50-16-115116	50-24813	25	04/08/2016	—	—	—	—	372.80	—	—	—	10,741.00	—
10643	MD50-16-115117	50-24813	150	04/08/2016	—	—	291.60	—	576.15	—	—	185.39	40,815.70	—
10643	MD50-16-115118	50-24813	241	04/08/2016	—	—	763.72	—	813.38	84.25	—	—	80,557.30	49.97
10643	MD50-16-115119	50-24813	358	04/08/2016	—	—	55.54	—	555.81	—	—	—	59,075.40	54.46
10643	MD50-16-115120	50-24813	450	04/08/2016	—	—	90.26	—	169.46	—	—	—	15,574.40	—
10643	MD50-16-115121	50-24813	600	04/08/2016	—	—	—	—	—	—	—	—	3866.75	—
10643	MD50-16-115162	50-603470	83	04/07/2016	—	—	52.07	—	494.81	145.52	—	92.70	10,203.90	—
10643	MD50-16-115163	50-603470	203	04/07/2016	—	—	590.15	—	508.37	842.48	125.41	—	41,889.80	—
10643	MD50-16-115165	50-603470	351	04/07/2016	—	—	416.58	—	305.02	643.35	—	—	36,519.30	—
10643	MD50-16-115168	50-603470	650	04/07/2016	—	—	—	—	—	—	—	—	91.30	—
10643	MD50-16-115164	50-603470	278	04/06/2016	—	—	763.72	—	488.03	919.07	109.05	—	53,704.90	56.15
10643	MD50-16-115166	50-603470	450	04/06/2016	—	—	72.90	—	115.23	183.81	—	—	14,500.30	—
10643	MD50-16-115169	50-603471	90	04/06/2016	—	—	—	—	203.35	—	—	—	2738.95	—
10643	MD50-16-115170	50-603471	209	04/06/2016	—	—	416.58	—	542.26	137.86	—	—	18,796.70	—
10643	MD50-16-115171	50-603471	288	04/06/2016	—	—	1492.73	—	1084.51	536.12	—	—	52,630.80	55.59
10643	MD50-16-115172	50-603471	360	04/06/2016	—	—	763.72	—	948.95	306.36	—	—	44,038.00	53.90
10643	MD50-16-115173	50-603471	450	04/06/2016	—	—	121.50	—	745.60	99.57	—	—	29,537.70	—
10643	MD50-16-115174	50-613183	550	04/06/2016	—	—	48.60	—	88.12	—	—	—	3866.75	—
10643	MD50-16-115175	50-613183	642.5	04/06/2016	—	—	—	—	—	—	—	—	107.41	—
10643	MD50-16-115192	50-603471	Unknown[c]	04/06/2016	—	—	118.03	—	542.26	145.52	—	—	9666.88	—
10643	MD50-16-115176	50-603472	27	04/05/2016	—	—	—	—	406.69	—	—	—	2524.13	—
10643	MD50-16-115177	50-603472	146	04/05/2016	—	—	343.68	—	630.37	76.59	—	—	10,741.00	—

Table C-5.0-9 (continued)

Sampling Plan 2016	Field Sample ID	Location ID	Depth (ft)	Date	Hexane	Isooctane	Methylene Chloride	Propanol[2-]	Tetrachloroethylene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethylene	Trichlorofluoromethane
Groundwater Tier 1 Screening Level					**23,500,000**	**na**	**665**	**136**	**3630**	**1,190,000,000**	**141,000**	**169**	**2020**	**4,540,000**
10643	MD50-16-115178	50-603472	292	04/05/2016	—	—	902.58	—	1491.20	122.54	—	—	28,463.60	—
10643	MD50-16-115179	50-603472	364	04/05/2016	—	—	319.38	—	881.17	76.59	—	—	18,796.70	—
10643	MD50-16-115180	50-603472	450	04/05/2016	—	—	149.27	—	589.70	—	—	—	11,815.10	—
10643	MD50-16-115181	50-613182	550	04/05/2016	—	—	—	—	162.68	—	—	—	3329.70	—
10643	MD50-16-115182	50-613182	632.5	04/05/2016	—	—	—	—	—	—	—	—	64.45	—
10643	MD50-16-115112	50-24784	155	04/04/2016	45.79	298.82	—	—	2033.46	137.86	49.07	—	3598.23	—
10643	MD50-16-115113	50-24784	244	04/04/2016	—	—	—	—	948.95	—	—	—	2201.90	—
10643	MD50-16-115114	50-24784	362	04/04/2016	—	—	—	—	1287.86	—	—	—	2900.06	—
10643	MD50-16-115115	50-24784	450	04/04/2016	—	—	—	—	501.59	—	—	—	1074.10	—

Notes: Concentrations are in µg/m^3. Data qualifiers are defined in Appendix A. Purple shading means the value exceeds Tier 1 groundwater screening level for the analyte listed.

[a] na = Not available.

[b] — = Not detected.

[c] Port was not labeled with the port depth.

Table C-5.0-10
VOC Pore-Gas Results at MDA C for Fiscal Year 2017

Sampling Plan 2017	Field Sample ID	Location ID	Depth (ft)	Date	Acetone	Benzene	Carbon Tetrachloride	Chloroform	Cyclohexane	Dichloro-1,1,2,2-tetrafluoroethane[1,2-]	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Ethanol
Groundwater Tier 1 Screening Level					**20,300**	**1140**	**5650**	**12,000**	**79,700,000**	**na[a]**	**2,780,000**	**5750**	**242**	**7490**	**11,700**	**580**	**na**
11484	MD50-17-146525	50-24813	25	10/27/2017	18.28 (J)	—[b]	427.54	405.01	—	—	59.31	—	—	—	19.42 (J)[c]	—	33.90 (J)
11484	MD50-17-146526	50-24813	150	10/27/2017	—	—	1320.33	2586.18	—	—	395.37	—	109.21	13.08 (J)	396.24	78.51 (J)	—
11484	MD50-17-146527	50-24813	241	10/27/2017	18.52 (J)	—	1446.08	1903.04	—	—	889.58	—	32.36 (J)	12.28 (J)	475.48	50.80	—
11484	MD50-17-146528	50-24813	358	10/27/2017	—	—	943.10	634.35	—	—	939.00	—	—	—	198.12	—	—
11484	MD50-17-146529	50-24813	450	10/27/2017	33.24 (J)	—	559.57	175.67	—	—	741.32	—	—	—	59.44	—	—
11484	MD50-17-146530	50-24813	600	10/27/2017	—	—	163.47	—	—	—	345.95	—	—	—	—	—	—
11484	MD50-17-146571	50-603470	83	10/26/2017	21.13 (J)	—	188.62	780.73	—	—	123.55	—	21.44 (J)	6.34 (J)	99.06	29.56 (J)	28.25 (J)
11484	MD50-17-146572	50-603470	203	10/26/2017	17.09 (J)	11.813 (J)	452.69	1171.1	—	—	593.06	—	19.82 (J)	39.62 (J)	293.21	43.41 (J)	—
11484	MD50-17-146573	50-603470	278	10/26/2017	14.48 (J)	11.813 (J)	465.26	780.73	—	—	691.90	—	6.47 (J)	28.53 (J)	225.86	19.40 (J)	26.36 (J)
11484	MD50-17-146574	50-603470	351	10/26/2017	—	9.89737 (J)	452.69	365.97	—	—	691.90	—	—	21.79 (J)	114.91	—	15.44 (J)
11484	MD50-17-146575	50-603470	450	10/26/2017	—	—	276.64	97.59	—	—	593.06	—	—	10.70 (J)	38.04 (J)	—	—
11484	MD50-17-146576	50-603470	650	10/26/2017	33.24 (J)	—	10.69 (J)	—	—	—	35.58 (J)	—	—	—	—	—	64.02 (J)
11484	MD50-17-146577	50-603471	90	10/25/2017	—	—	433.82	585.55	—	—	44.48 (J)	—	34.38 (J)	—	26.94 (J)	—	65.91 (J)
11484	MD50-17-146578	50-603471	209	10/25/2017	—	—	1068.84	1756.65	—	—	405.25	—	125.39	—	380.39	87.75	—
11484	MD50-17-146579	50-603471	288	10/25/2017	—	—	817.35	1171.1	—	—	543.63	—	44.49 (J)	—	289.25	27.71 (J)	—
11484	MD50-17-146580	50-603471	360	10/25/2017	—	—	880.22	634.35	—	—	691.90	—	—	—	213.97	—	—
11484	MD50-17-146581	50-603471	450	10/25/2017	—	—	238.92	536.75	—	—	93.90	—	—	—	118.87	—	—
11484	MD50-17-146583	50-613183	550	10/25/2017	—	—	182.33	—	—	—	306.41	—	—	—	—	—	—
11484	MD50-17-146584	50-613183	642.5	10/25/2017	—	—	—	—	—	—	—	—	—	—	—	—	—
11484	MD50-17-147715	50-603471	Unknown[c]	10/25/2017	54.60 (J)	—	691.60	927.12	—	—	84.02	—	68.77	—	114.91	45.26 (J)	—
11484	MD50-17-146585	50-603472	27	10/24/2017	—	—	22.01 (J)	200.06	—	—	18.78 (J)	—	—	—	—	—	—
11484	MD50-17-146586	50-603472	146	10/24/2017	—	—	169.76	453.80	—	—	103.79	—	40.45	—	87.17	55.42	—
11484	MD50-17-146587	50-603472	292	10/24/2017	—	—	370.95	536.75	—	—	202.63	—	—	—	138.68	26.32 (J)	—
11484	MD50-17-146588	50-603472	364	10/24/2017	—	—	364.66	161.03	—	—	296.53	—	—	—	47.55	—	—
11484	MD50-17-146589	50-603472	450	10/24/2017	—	—	213.77	63.43	—	—	158.15	—	—	—	—	—	—
11484	MD50-17-146590	50-613182	550	10/24/2017	—	—	201.19	—	—	—	187.80	—	—	—	—	—	—
11484	MD50-17-146591	50-613182	632.5	10/24/2017	—	—	—	—	—	—	—	—	—	—	—	—	—

Table C-5.0-10 (continued)

Sampling Plan 2017	Field Sample ID	Location ID	Depth (ft)	Date	Acetone	Benzene	Carbon Tetrachloride	Chloroform	Cyclohexane	Dichloro-1,1,2,2-tetrafluoroethane[1,2-]	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Ethanol
Groundwater Tier 1 Screening Level					**20,300**	**1140**	**5650**	**12,000**	**79,700,000**	**na[a]**	**2,780,000**	**5750**	**242**	**7490**	**11,700**	**580**	**na**
11484	MD50-17-146521	50-24784	155	10/23/2017	40.36 (J)	—	106.88	190.30	13.07 (J)	—	49.42 (J)	—	—	—	—	44.34 (J)	79.09 (J)
11484	MD50-17-146522	50-24784	244	10/23/2017	—	—	150.40	87.83	—	—	64.25	—	—	—	9.91 (J)	29.10 (J)	—
11484	MD50-17-146523	50-24784	362	10/23/2017	—	—	402.39	32.20 (J)	—	—	177.92	—	—	—	—	—	—
11484	MD50-17-146524	50-24784	450	10/23/2017	—	—	320.65	—	—	—	172.97	—	—	—	—	—	—
11484	MD50-17-146564	50-603468	142	10/20/2017	—	—	308.08	395.25	—	—	237.22	—	—	—	87.17	—	—
11484	MD50-17-146565	50-603468	233	10/20/2017	—	6.07 (J)	591.01	634.35	—	—	415.14	—	—	—	166.42	12.93 (J)	—
11484	MD50-17-146566	50-603468	354	10/20/2017	—	8.62 (J)	603.58	458.68	—	—	494.21	—	—	—	126.80	11.08 (J)	—
11484	MD50-17-146567	50-603468	403	10/20/2017	—	8.62 (J)	603.58	307.41	—	—	543.63	—	—	—	95.10	—	—
11484	MD50-17-146568	50-613184	500	10/20/2017	—	—	220.06	11.71 (J)	—	—	266.88	—	—	—	—	—	—
11484	MD50-17-146569	50-613184	600	10/20/2017	—	—	75.45 (J)	—	—	—	153.21	—	—	—	—	—	—
11484	MD50-17-146570	50-613184	664.5	10/20/2017	—	—	19.49 (J)	—	—	—	37.07 (J)	—	—	—	—	—	—
11484	MD50-17-146531	50-24822	25	10/19/2017	—	—	69.16	248.86	—	—	98.84	—	—	—	8.72 (J)	—	—
11484	MD50-17-146532	50-24822	142	10/19/2017	23.74 (J)	5.11 (J)	213.77	487.96	—	—	321.24	—	—	—	99.06	11.55 (J)	41.43 (J)
11484	MD50-17-146533	50-24822	235	10/19/2017	—	—	364.66	585.55	—	—	642.48	—	—	—	142.65	—	—
11484	MD50-17-146534	50-24822	351	10/19/2017	—	13.09 (J)	540.71	780.73	—	—	939.00	—	—	9.51 (J)	202.08	10.16 (J)	—
11484	MD50-17-146535	50-24822	450	10/19/2017	—	—	182.33	107.35	—	—	345.95	—	—	—	26.94 (J)	—	—
11484	MD50-17-146545	50-603063	25	10/18/2017	54.60 (J)	—	—	7.81 (J)	—	—	—	—	—	—	—	—	109.22
11484	MD50-17-146546	50-603063	128	10/18/2017	30.86 (J)	—	23.89 (J)	24.89 (J)	—	—	88.96	—	—	6.34 (J)	—	—	65.91 (J)
11484	MD50-17-146547	50-603063	228	10/18/2017	68.85 (J)	—	176.04	302.53	—	—	326.18	68.7	—	241.70	32.49 (J)	18.01 (J)	92.27
11484	MD50-17-146548	50-603063	347	10/18/2017	—	—	427.54	634.35	—	15.37 (J)	494.21	72.81	—	372.46	134.72	60.04	—
11484	MD50-17-146549	50-603063	450	10/18/2017	—	—	352.09	331.81	—	—	355.83	31.15 (J)	—	79.25	63.40	21.24 (J)	—
11484	MD50-17-146536	50-603061	25	10/17/2017	—	—	10.69 (J)	15.61 (J)	—	—	385.45	—	—	174.34	—	—	—
11484	MD50-17-146537	50-603061	128	10/17/2017	—	—	75.45 (J)	68.31	—	—	306.41	23.87 (J)	—	1386.83	—	—	—
11484	MD50-17-146538	50-603061	228	10/17/2017	54.60 (J)	—	100.60	47.82	—	—	207.57	14.97 (J)	—	1030.21	11.09 (J)	—	—
11484	MD50-17-146539	50-603061	347	10/17/2017	—	—	125.75	11.71 (J)	—	—	222.40	—	—	336.80	—	—	—
11484	MD50-17-146540	50-603061	450	10/17/2017	—	—	62.87 (J)	—	—	—	148.26	—	—	103.02	—	—	—
11484	MD50-17-146554	50-603383	26	10/16/2017	—	—	—	—	—	—	32.12 (J)	—	—	—	—	—	—
11484	MD50-17-146555	50-603383	139	10/16/2017	—	—	169.76	204.94	—	—	212.51	—	—	55.47	35.66 (J)	198.59	—
11484	MD50-17-146556	50-603383	244	10/16/2017	—	—	333.20	180.55	—	—	281.70	—	—	59.44	43.60	411.04	—

Table C-5.0-10 (continued)

Sampling Plan 2017	Field Sample ID	Location ID	Depth (ft)	Date	Acetone	Benzene	Carbon Tetrachloride	Chloroform	Cyclohexane	Dichloro-1,1,2,2-tetrafluoroethane[1,2-]	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Ethanol
Groundwater Tier 1 Screening Level					**20,300**	**1140**	**5650**	**12,000**	**79,700,000**	**na[a]**	**2,780,000**	**5750**	**242**	**7490**	**11,700**	**580**	**na**
11484	MD50-17-146557	50-603383	359	10/16/2017	—	—	264.07	46.84 (J)	—	—	192.74	—	—	—	16.25 (J)	37.87 (J)	—
11484	MD50-17-146558	50-603383	450	10/16/2017	—	—	220.06	—	—	—	232.28	—	—	—	—	—	—
11484	MD50-17-146596	50-613185	145	10/06/2017	—	—	100.60	107.35	—	—	88.96	—	—	—	15.06 (J)	—	—
11484	MD50-17-146597	50-613185	235	10/06/2017	—	—	163.47	107.35	—	—	153.21	—	—	—	32.49 (J)	—	—
11484	MD50-17-146598	50-613185	350	10/06/2017	—	—	132.03	19.52 (J)	—	—	148.26	—	—	—	—	—	—
11484	MD50-17-146599	50-613185	450	10/06/2017	23.74 (J)	—	88.02	—	—	—	118.61	—	—	—	—	—	—
11484	MD50-17-146600	50-613185	600	10/06/2017	—	—	27.66 (J)	—	—	—	59.31 (J)	—	—	—	—	—	—
11484	MD50-17-146592	50-603503	133	10/05/2017	—	—	53.44 (J)	82.95	—	—	20.26 (J)	—	—	—	19.81 (J)	37.41 (J)	—
11484	MD50-17-146593	50-603503	237	10/05/2017	—	—	119.46	156.15	—	—	59.31	—	—	—	32.10 (J)	36.02 (J)	—
11484	MD50-17-146594	50-603503	347	10/05/2017	—	—	113.17	78.07	—	—	74.13	—	—	—	—	—	—
11484	MD50-17-146595	50-603503	450	10/05/2017	—	—	100.60	31.72 (J)	—	—	54.36 (J)	—	—	—	—	—	—
11484	MD50-17-146559	50-603467	143	10/04/2017	—	—	352.09	487.96	—	—	158.15	—	—	—	91.13	—	—
11484	MD50-17-146560	50-603467	244	10/04/2017	—	—	628.73	731.94	—	—	276.76	—	—	—	194.16	29.10 (J)	—
11484	MD50-17-146561	50-603467	360	10/04/2017	—	—	502.98	346.45	—	—	168.03	—	—	—	95.10	—	—
11484	MD50-17-146562	50-603467	500	10/04/2017	—	—	314.37	68.31	—	—	197.69	—	—	—	—	—	—
11484	MD50-17-146563	50-603467	600	10/04/2017	—	—	150.90	33.18 (J)	—	—	138.38	—	—	—	—	—	—
11484	MD50-17-146541	50-603062	122	10/03/2017	—	—	42.75 (J)	68.31	—	—	153.21	—	—	10.70 (J)	10.70 (J)	—	—
11484	MD50-17-146542	50-603062	217	10/03/2017	—	—	69.16 (J)	63.43	—	—	232.28	—	—	19.81 (J)	15.45 (J)	—	—
11484	MD50-17-146543	50-603062	337	10/03/2017	—	—	49.67 (J)	11.22 (J)	—	—	168.03	—	—	—	—	—	—
11484	MD50-17-146544	50-603062	450	10/03/2017	—	—	23.89 (J)	—	—	—	108.73	—	—	—	—	—	—
11484	MD50-17-146550	50-603064	113	10/02/2017	—	—	213.77	878.33	—	—	380.50	—	8.50 (J)	554.73	213.97	45.72 (J)	—
11484	MD50-17-146551	50-603064	214	10/02/2017	—	—	370.95	683.14	—	—	642.48	—	—	792.47	241.70	33.25 (J)	—
11484	MD50-17-146552	50-603064	332	10/02/2017	—	—	264.07	92.71	—	—	494.21	—	—	206.04	39.62 (J)	—	—
11484	MD50-17-146553	50-603064	500	10/02/2017	15.67 (J)	—	81.73	—	—	—	227.30	—	—	8.72 (J)	—	—	—
11194	MD50-17-131726	50-613185	145	04/21/2017	—	—	100.60	102.47	—	—	88.96	—	—	—	—	—	—
11194	MD50-17-131727	50-613185	235	04/21/2017	—	—	169.76	92.71	—	—	172.97	—	—	—	39.62	—	—
11194	MD50-17-131728	50-613185	350	04/21/2017	—	—	119.46	—	—	—	138.38	—	—	—	—	—	—
11194	MD50-17-131729	50-613185	450	04/21/2017	—	—	88.02	—	—	—	103.79	—	—	—	—	—	—
11194	MD50-17-131730	50-613185	600	04/21/2017	—	—	—	—	—	—	—	—	—	—	—	—	—

Table C-5.0-10 (continued)

Sampling Plan 2017	Field Sample ID	Location ID	Depth (ft)	Date	Acetone	Benzene	Carbon Tetrachloride	Chloroform	Cyclohexane	Dichloro-1,1,2,2-tetrafluoroethane[1,2-]	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Ethanol
Groundwater Tier 1 Screening Level					**20,300**	**1140**	**5650**	**12,000**	**79,700,000**	**na[a]**	**2,780,000**	**5750**	**242**	**7490**	**11,700**	**580**	**na**
11194	MD50-17-131722	50-603503	133	04/20/2017	—	—	69.16	102.41	—	—	—	—	—	—	—	—	—
11194	MD50-17-131723	50-603503	237	04/20/2017	—	—	132.03	136.63	—	—	74.13	—	—	—	—	—	—
11194	MD50-17-131724	50-603503	347	04/20/2017	—	—	119.459	68.31	—	—	84.02	—	—	—	—	—	—
11194	MD50-17-131725	50-603503	450	04/20/2017	—	—	100.60	—	—	—	74.13	—	—	—	—	—	—
11194	MD50-17-131690	50-603467	143	04/19/2017	—	—	345.80	487.96	—	—	148.26	—	—	—	95.10	—	—
11194	MD50-17-131691	50-603467	244	04/19/2017	—	—	628.73	683.14	—	—	311.35	—	—	—	170.38	—	—
11194	MD50-17-131692	50-603467	360	04/19/2017	—	—	540.71	390.37	—	—	276.76	—	—	—	126.80	—	—
11194	MD50-17-131693	50-603467	500	04/19/2017	—	—	264.07	—	—	—	177.92	—	—	—	—	—	—
11194	MD50-17-131694	50-603467	600	04/19/2017	—	—	169.76	—	—	—	153.21	—	—	—	—	—	—
11194	MD50-17-131695	50-603468	142	04/18/2017	—	—	207.48	341.57	—	—	108.73	—	—	—	75.28	—	—
11194	MD50-17-131696	50-603468	233	04/18/2017	—	—	584.72	585.55	—	—	395.37	—	—	—	202.08	—	—
11194	MD50-17-131697	50-603468	354	04/18/2017	—	—	628.73	405.01	—	—	543.63	—	—	—	166.42	—	—
11194	MD50-17-131698	50-603468	403	04/18/2017	—	—	540.71	253.74	—	—	484.33	—	—	—	103.02	—	—
11194	MD50-17-131699	50-613184	500	04/18/2017	—	—	213.77	—	—	—	252.05	—	—	—	—	—	—
11194	MD50-17-131700	50-613184	600	04/18/2017	—	—	75.45	—	—	—	128.50	—	—	—	—	—	—
11194	MD50-17-131701	50-613184	664.5	04/18/2017	—	—	—	—	—	—	—	—	—	—	—	—	—
11194	MD50-17-131662	50-24822	25	04/17/2017	—	—	—	107.35	—	—	54.36	—	—	—	—	—	—
11194	MD50-17-131663	50-24822	142	04/17/2017	—	—	88.02	229.34	—	—	153.21	—	—	—	51.51	—	—
11194	MD50-17-131664	50-24822	235	04/17/2017	—	—	113.17	151.27	—	—	197.69	—	—	—	47.55	—	—
11194	MD50-17-131665	50-24822	351	04/17/2017	—	—	150.90	92.71	—	—	306.41	—	—	—	—	—	—
11194	MD50-17-131666	50-24822	450	04/17/2017	—	—	125.75	—	—	—	276.76	—	—	—	—	—	—
11194	MD50-17-131672	50-603062	122	04/14/2017	—	—	—	73.19	—	—	172.97	—	—	—	—	—	—
11194	MD50-17-131673	50-603062	217	04/14/2017	—	—	62.24	58.56	—	—	217.45	—	—	—	—	—	—
11194	MD50-17-131674	50-603062	337	04/14/2017	—	—	—	—	—	—	133.44	—	—	—	—	—	—
11194	MD50-17-131675	50-603062	450	04/14/2017	—	—	—	—	—	—	103.79	—	—	—	—	—	—
11194	MD50-17-131681	50-603064	113	04/13/2017	—	—	207.48	878.33	—	—	410.20	—	—	554.73	213.97	43.41	—
11194	MD50-17-131682	50-603064	214	04/13/2017	—	—	345.80	683.14	—	—	691.90	—	—	713.23	229.82	—	—
11194	MD50-17-131683	50-603064	332	04/13/2017	—	—	238.92	87.83	—	—	494.21	—	—	194.16	—	—	—
11194	MD50-17-131684	50-603064	500	04/13/2017	—	—	81.73	—	—	—	232.28	—	—	—	—	—	—

Table C-5.0-10 (continued)

Sampling Plan 2017	Field Sample ID	Location ID	Depth (ft)	Date	Acetone	Benzene	Carbon Tetrachloride	Chloroform	Cyclohexane	Dichloro-1,1,2,2-tetrafluoroethane[1,2-]	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Ethanol
Groundwater Tier 1 Screening Level					**20,300**	**1140**	**5650**	**12,000**	**79,700,000**	**na[a]**	**2,780,000**	**5750**	**242**	**7490**	**11,700**	**580**	**na**
11194	MD50-17-131667	50-603061	25	04/12/2017	—	—	—	—	—	—	365.72	—	—	217.93	—	—	—
11194	MD50-17-131668	50-603061	128	04/12/2017	—	—	75.45	73.20	—	—	350.89	—	—	1584.95	—	—	—
11194	MD50-17-131669	50-603061	228	04/12/2017	—	—	94.31	—	—	—	222.40	—	—	1109.46	—	—	—
11194	MD50-17-131670	50-603061	347	04/12/2017	—	—	119.46	—	—	—	227.40	—	—	344.73	—	—	—
11194	MD50-17-131671	50-603061	450	04/12/2017	—	—	69.16	—	—	—	143.32	—	—	95.10	—	—	—
11194	MD50-17-131676	50-603063	25	04/11/2017	—	—	—	—	—	—	138.38	—	—	—	—	—	—
11194	MD50-17-131677	50-603063	128	04/11/2017	—	—	188.62	336.69	—	—	365.72	76.85	—	261.52	38.43	—	—
11194	MD50-17-131678	50-603063	228	04/11/2017	—	—	402.39	634.35	—	—	494.21	68.76	—	364.54	134.72	50.80	—
11194	MD50-17-131679	50-603063	347	04/11/2017	—	—	333.23	326.93	—	—	355.83	—	—	87.17	47.55	—	—
11194	MD50-17-131680	50-603063	450	04/11/2017	—	—	213.77	175.67	—	—	261.93	—	—	—	—	—	—
11194	MD50-17-131685	50-603383	26	04/10/2017	—	—	—	—	—	—	—	—	—	—	—	—	—
11194	MD50-17-131686	50-603383	139	04/10/2017	—	—	238.92	185.42	—	—	252.05	—	—	63.40	—	267.87	—
11194	MD50-17-131687	50-603383	244	04/10/2017	—	—	427.54	195.18	—	—	326.18	—	—	71.32	67.36	424.89	—
11194	MD50-17-131688	50-603383	359	04/10/2017	—	—	295.50	—	—	—	247.11	—	—	—	—	—	—
11194	MD50-17-131689	50-603383	450	04/10/2017	—	—	264.07	—	—	—	227.34	—	—	—	—	—	—
11194	MD50-17-131656	50-24813	25	04/07/2017	—	—	1005.97	927.12	—	—	163.09	—	—	—	47.55	—	—
11194	MD50-17-131657	50-24813	150	04/07/2017	—	—	1446.08	2830.16	—	—	474.44	—	105.17	—	515.11	73.89	—
11194	MD50-17-131658	50-24813	241	04/07/2017	—	—	1697.57	2244.61	—	—	1087.27	—	—	—	633.98	50.80	—
11194	MD50-17-131659	50-24813	358	04/07/2017	—	—	943.10	683.14	—	—	988.43	—	—	—	225.86	—	—
11194	MD50-17-131660	50-24813	450	04/07/2017	—	—	565.86	185.42	—	—	741.32	—	—	—	63.40	—	—
11194	MD50-17-131661	50-24813	600	04/07/2017	—	—	163.47	—	—	—	326.18	—	—	—	—	—	—
11194	MD50-17-131702	50-603470	83	04/06/2017	—	—	163.47	927.12	—	—	88.96	—	—	—	126.80	—	—
11194	MD50-17-131703	50-603470	203	04/06/2017	—	—	477.84	1219.90	—	—	691.90	—	—	43.60	320.96	42.95	—
11194	MD50-17-131704	50-603470	278	04/06/2017	—	—	565.86	927.12	82.56	—	840.16	—	—	—	297.18	—	—
11194	MD50-17-131705	50-603470	351	04/06/2017	—	—	446.40	400.13	—	—	790.74	—	—	—	134.72	—	—
11194	MD50-17-131706	50-603470	450	04/06/2017	—	—	182.33	68.31	—	—	375.60	—	—	—	—	—	—
11194	MD50-17-131707	50-603470	650	04/06/2017	—	—	—	—	—	—	54.36	—	—	—	—	—	—
11194	MD50-17-131708	50-603471	90	04/05/2017	—	—	578.43	1024.71	9.29 (J)	—	88.96	—	56.63	—	79.25	—	—
11194	MD50-17-131709	50-603471	209	04/05/2017	—	—	213.77	1024.71	—	—	—	—	52.58	—	221.89	—	—

Table C-5.0-10 (continued)

Sampling Plan 2017	Field Sample ID	Location ID	Depth (ft)	Date	Acetone	Benzene	Carbon Tetrachloride	Chloroform	Cyclohexane	Dichloro-1,1,2,2-tetrafluoroethane[1,2-]	Dichlorodifluoromethane	Dichloroethane[1,1-]	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Ethanol
Groundwater Tier 1 Screening Level					**20,300**	**1140**	**5650**	**12,000**	**79,700,000**	**na**[a]	**2,780,000**	**5750**	**242**	**7490**	**11,700**	**580**	**na**
11194	MD50-17-131710	50-603471	288	04/05/2017	—	—	1194.59	1561.47	—	—	790.74	—	48.54	—	475.48	64.66	—
11194	MD50-17-131711	50-603471	360	04/05/2017	—	—	880.22	731.94	—	—	741.32	—	—	—	233.78	—	—
11194	MD50-17-131712	50-603471	450	04/05/2017	—	—	484.12	405.01	—	—	474.44	—	—	—	122.83	—	—
11194	MD50-17-131713	50-613183	550	04/05/2017	—	—	226.34	—	—	—	395.37	—	—	—	—	—	—
11194	MD50-17-131714	50-613183	642.5	04/05/2017	—	—	—	—	—	—	—	—	—	—	—	—	—
11194	MD50-17-131715	50-603472	27	04/05/2017	—	—	—	243.98	—	—	—	—	—	—	—	—	—
11194	MD50-17-131721	50-613182	632.5	04/05/2017	—	—	—	—	—	—	—	—	—	—	—	—	—
11194	MD50-17-131731	50-603471	Unknown[c]	04/05/2017	—	—	1131.71	1610.26	—	—	177.92	—	109.21	—	186.23	69.28	—
11194	MD50-17-131716	50-603472	146	04/04/2017	—	—	276.64	634.35	—	—	168.03	—	48.54	—	122.83	101.61	—
11194	MD50-17-131717	50-603472	292	04/04/2017	—	—	591.01	731.94	—	—	390.43	—	—	—	194.16	69.28	—
11194	MD50-17-131718	50-603472	364	04/04/2017	—	—	509.27	248.86	—	—	415.14	—	—	—	71.32	—	—
11194	MD50-17-131719	50-603472	450	04/04/2017	—	—	270.35	58.56	—	—	252.05	—	—	—	—	—	—
11194	MD50-17-131720	50-613182	550	04/04/2017	—	—	125.75	—	—	—	168.03	—	—	—	—	—	—
11194	MD50-17-131652	50-24784	155	04/03/2017	—	—	201.19	346.45	—	—	98.84	—	—	—	—	78.51	—
11194	MD50-17-131653	50-24784	244	04/03/2017	—	—	320.65	151.27	—	—	143.32	—	—	—	—	55.42	—
11194	MD50-17-131654	50-24784	362	04/03/2017	—	—	408.68	—	—	—	192.74	—	—	—	—	—	—
11194	MD50-17-131655	50-24784	450	04/03/2017	—	—	314.37	—	—	—	168.03	—	—	—	—	—	—

Table C-5.0-10 (continued)

Sampling Plan 2017	Field Sample ID	Location ID	Depth (ft)	Date	Hexane	Hexanone[2-]	Methylene Chloride	n-Heptane	Propanol[2-]	Styrene	Tetrachloroethylene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethylene	Trichlorofluoromethane	Xylene[1,3-]+Xylene[1,4-]
Groundwater Tier 1 Screening Level					**23,500,000**	**145**	**665**	**na**	**136**	**11,300**	**3630**	**272,000**	**1,190,000,000**	**141,000**	**169**	**2020**	**4,540,000**	**131,000**
11484	MD50-17-146525	50-24813	25	10/27/2017	—	—	17.36 (J)	—	—	—	189.79	—	—	—	12.00 (J)	4779.73	4.72 (J)	6.94 (J)
11484	MD50-17-146526	50-24813	150	10/27/2017	—	—	381.86	—	—	—	610.04	—	39.06 (J)	—	201.75	41,889.8	19.09 (J)	—
11484	MD50-17-146527	50-24813	241	10/27/2017	—	—	590.15	—	—	—	881.17	—	84.25 (J)	17.45 (J)	22.9011 (J)	75,186.8	37.06 (J)	—
11484	MD50-17-146528	50-24813	358	10/27/2017	—	—	48.60 (J)	—	—	—	630.373	—	58.21 (J)	9.82 (J)	—	64,445.8	52.22 (J)	—
11484	MD50-17-146529	50-24813	450	10/27/2017	—	—	166.63 (J)	—	—	—	338.91	—	19.91 (J)	—	—	33,297	46.61 (J)	—
11484	MD50-17-146530	50-24813	600	10/27/2017	—	—	—	—	—	—	74.56 (J)	—	—	—	—	4779.73	21.34 (J)	—
11484	MD50-17-146571	50-603470	83	10/26/2017	126.81	—	45.13 (J)	7.37 (J)	—	—	643.93	—	168.50	37.62 (J)	92.70	10,741	—	—
11484	MD50-17-146572	50-603470	203	10/26/2017	—	—	624.86	—	—	—	623.60	—	842.48	119.96	19.08 (J)	47,260.3	37.06 (J)	—
11484	MD50-17-146573	50-603470	278	10/26/2017	—	—	659.58	—	—	—	488.03	—	758.23	87.24	—	49,408.5	42.67 (J)	—
11484	MD50-17-146574	50-603470	351	10/26/2017	—	—	381.86	—	—	—	318.58	—	605.05	36.53 (J)	—	41,889.8	47.73 (J)	—
11484	MD50-17-146575	50-603470	450	10/26/2017	—	—	104.14 (J)	—	—	—	162.68	—	283.38	11.45 (J)	—	22.56	37.62 (J)	—
11484	MD50-17-146576	50-603470	650	10/26/2017	—	—	22.91 (J)	—	—	—	—	—	—	—	—	75.19	—	6.94 (J)
11484	MD50-17-146577	50-603471	90	10/25/2017	634.06	—	31.24 (J)	—	—	—	311.80	—	75.82	—	—	3813.05	—	—
11484	MD50-17-146578	50-603471	209	10/25/2017	—	—	1076.15	—	—	—	948.95	—	490.17	87.2423	—	39,741.6	38.18 (J)	—
11484	MD50-17-146579	50-603471	288	10/25/2017	422.71	—	1041.44	—	—	—	745.60	—	474.85	40.89 (J)	—	35,982.3	47.73 (J)	—
11484	MD50-17-146580	50-603471	360	10/25/2017	—	—	763.72	—	—	—	948.95	—	329.33	26.17 (J)	—	45,649.1	56.15 (J)	—
11484	MD50-17-146581	50-603471	450	10/25/2017	200.79	—	—	—	—	—	569.37	—	76.59 (J)	—	—	19,870.8	—	—
11484	MD50-17-146583	50-613183	550	10/25/2017	—	—	—	—	—	—	122.01	—	—	—	—	4511.21	33.69 (J)	—
11484	MD50-17-146584	50-613183	642.5	10/25/2017	—	—	—	—	—	—	—	—	—	—	—	112.78	—	—
11484	MD50-17-147715	50-603471	Unknown[c]	10/25/2017	387.48	—	111.09 (J)	—	—	—	488.03	—	176.15	26.17 (J)	—	9129.83	—	—
11484	MD50-17-146585	50-603472	27	10/24/2017	—	—	—	—	—	—	386.36	—	38.29 (J)	37.08 (J)	—	1772.26	—	—
11484	MD50-17-146586	50-603472	146	10/24/2017	—	—	274.25	—	—	—	813.38	—	68.16 (J)	26.7 (J)	—	10,74	12.91 (J)	—
11484	MD50-17-146587	50-603472	292	10/24/2017	—	—	624.86	—	—	—	1084.51	—	73.53(J)	15.27 (J)	—	20,944.9	26.4 (J)	—
11484	MD50-17-146588	50-603472	364	10/24/2017	35.23	—	270.77	—	—	—	881.17	—	84.25	—	—	17,185.6	28.64 (J)	—
11484	MD50-17-146589	50-603472	450	10/24/2017	—	—	65.96 (J)	—	—	—	447.36	—	—	—	—	8055.73	17.97 (J)	—
11484	MD50-17-146590	50-613182	550	10/24/2017	—	—	—	—	—	—	216.90	—	—	—	—	4135.27	22.46 (J)	—
11484	MD50-17-146591	50-613182	632.5	10/24/2017	348.73	—	—	—	—	—	—	—	—	—	—	—	—	—

Table C-5.0-10 (continued)

Sampling Plan 2017	Field Sample ID	Location ID	Depth (ft)	Date	Hexane	Hexanone[2-]	Methylene Chloride	n-Heptane	Propanol[2-]	Styrene	Tetrachloroethylene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethylene	Trichlorofluoromethane	Xylene[1,3-]+Xylene[1,4-]
Groundwater Tier 1 Screening Level					**23,500,000**	**145**	**665**	**na**	**136**	**11,300**	**3630**	**272,000**	**1,190,000,000**	**141,000**	**169**	**2020**	**4,540,000**	**131,000**
11484	MD50-17-146521	50-24784	155	10/23/2017	598.83	—	25.69 (J)	35.63 (J)	—	—	1287.86	—	91.91	22.90 (J)	—	2201.9	6.18 (J)	—
11484	MD50-17-146522	50-24784	244	10/23/2017	—	—	—	—	—	—	1152.29	—	59.74 (J)	20.72 (J)	—	2577.83	11.79 (J)	—
11484	MD50-17-146523	50-24784	362	10/23/2017	—	—	—	—	—	—	1558.99	—	68.93 (J)	16.90 (J)	—	3544.52	21.34 (J)	—
11484	MD50-17-146524	50-24784	450	10/23/2017	—	—	—	—	—	—	657.49	—	18.38 (J)	—	—	1503.74	17.97 (J)	—
11484	MD50-17-146564	50-603468	142	10/20/2017	—	—	52.07 (J)	—	—	—	237.24	—	—	—	—	15,574.4	11.23 (J)	—
11484	MD50-17-146565	50-603468	233	10/20/2017	—	—	555.43	—	—	—	474.47	—	—	—	—	34,371.1	19.65 (J)	—
11484	MD50-17-146566	50-603468	354	10/20/2017	—	—	347.15	—	—	—	467.70	—	—	—	—	35,445.2	23.58 (J)	—
11484	MD50-17-146567	50-603468	403	10/20/2017	—	—	270.77	—	—	—	433.81	—	—	—	—	32,760	29.20 (J)	—
11484	MD50-17-146568	50-613184	500	10/20/2017	—	—	—	—	—	—	101.67	—	—	—	—	6981.63	14.04 (J)	—
11484	MD50-17-146569	50-613184	600	10/20/2017	—	—	—	—	—	—	18.30 (J)	—	—	—	—	1342.62	—	—
11484	MD50-17-146570	50-613184	664.5	10/20/2017	—	—	—	—	—	—	10.85 (J)	—	—	—	—	247.042	—	—
11484	MD50-17-146531	50-24822	25	10/19/2017	—	—	—	—	—	—	135.56	—	49.02 (J)	15.81 (J)	—	6444.58	—	—
11484	MD50-17-146532	50-24822	142	10/19/2017	—	—	163.16	—	—	—	176.23	37.66	137.86	29.44 (J)	12.54 (J)	20,407.9	13.48(J)	—
11484	MD50-17-146533	50-24822	235	10/19/2017	—	—	312.43	—	—	—	216.90	—	222.11	—	—	33,834.1	—	—
11484	MD50-17-146534	50-24822	351	10/19/2017	—	—	520.72	—	—	—	372.80	—	329.33	54.53 (J)	—	53,704.9	52.78 (J)	—
11484	MD50-17-146535	50-24822	450	10/19/2017	—	—	86.79 (J)	—	—	—	74.56	—	70.47	7.09 (J)	—	15,574.4	21.34 (J)	—
11484	MD50-17-146545	50-603063	25	10/18/2017	—	—	52.07 (J)	—	100.72	3.62 (J)	—	37.66	—	—	—	—	—	17.79 (J)
11484	MD50-17-146546	50-603063	128	10/18/2017	—	—	32.28 (J)	—	—	3.24 (J)	244.01	34.65	1455.19	152.67	—	912.983	11.23 (J)	13.02 (J)
11484	MD50-17-146547	50-603063	228	10/18/2017	—	—	55.54 (J)	—	—	—	1084.51	37.66	4748.51	599.79	—	9666.88	41.55 (J)	16.06 (J)
11484	MD50-17-146548	50-603063	347	10/18/2017	—	—	—	—	—	—	1897.9	—	6356.87	763.37	—	29,537.7	67.38 (J)	—
11484	MD50-17-146549	50-603063	450	10/18/2017	—	—	34.37 (J)	—	—	—	1084.51	—	1684.95	92.70	—	21,481.9	46.60 (J)	—
11484	MD50-17-146536	50-603061	25	10/17/2017	—	—	—	—	—	—	128.79	—	9190.66	1036	—	590.754	17.97 (J)	—
11484	MD50-17-146537	50-603061	128	10/17/2017	—	—	—	—	—	—	352.47	—	26,040.20	3544.22	—	2953.77	26.39 (J)	—
11484	MD50-17-146538	50-603061	228	10/17/2017	—	—	38.19 (J)	—	—	—	230.46	—	15,317.80	2508.22	—	3544.52	25.27 (J)	—
11484	MD50-17-146539	50-603061	347	10/17/2017	—	—	—	—	—	—	149.12	—	9190.66	654.32	—	2148.19	26.39 (J)	—
11484	MD50-17-146540	50-603061	450	10/17/2017	—	—	—	—	—	—	44.74 (J)	—	2910.38	65.43	—	966.69	15.72 (J)	—
11484	MD50-17-146554	50-603383	26	10/16/2017	—	—	—	—	—	—	169.46	—	122.54	29.99 (J)	—	392.05	—	—
11484	MD50-17-146555	50-603383	139	10/16/2017	—	—	31.94 (J)	—	—	—	1355.64	—	1302.01	185.39	—	4564.91	37.62 (J)	—
11484	MD50-17-146556	50-603383	244	10/16/2017	—	—	62.49 (J)	—	—	—	1626.77	—	765.89	158.13	—	6981.63	23.58 (J)	—

Table C-5.0-10 (continued)

Sampling Plan 2017	Field Sample ID	Location ID	Depth (ft)	Date	Hexane	Hexanone[2-]	Methylene Chloride	n-Heptane	Propanol[2-]	Styrene	Tetrachloroethylene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethylene	Trichlorofluoromethane	Xylene[1,3-]+Xylene[1,4-]
Groundwater Tier 1 Screening Level					**23,500,000**	**145**	**665**	**na**	**136**	**11,300**	**3630**	**272,000**	**1,190,000,000**	**141,000**	**169**	**2020**	**4,540,000**	**131,000**
11484	MD50-17-146557	50-603383	359	10/16/2017	—	—	—	—	—	—	643.93	—	482.51	70.88	—	3383.41	14.60 (J)	—
11484	MD50-17-146558	50-603383	450	10/16/2017	—	—	—	—	—	—	359.25	—	168.50	27.26 (J)	—	1718.56	20.21 (J)	—
11484	MD50-17-146596	50-613185	145	10/06/2017	—	—	32.98 (J)	—	—	—	81.34	—	—	—	—	4457.50	—	—
11484	MD50-17-146597	50-613185	235	10/06/2017	—	—	83.31 (J)	—	—	—	128.79	—	—	—	—	8055.73	—	—
11484	MD50-17-146598	50-613185	350	10/06/2017	—	—	—	—	—	—	88.12	—	—	—	—	4726.03	7.30 (J)	—
11484	MD50-17-146599	50-613185	450	10/06/2017	—	—	—	—	—	—	42.02 (J)	—	—	—	—	2255.6	5.56 (J)	—
11484	MD50-17-146600	50-613185	600	10/06/2017	—	—	—	—	—	—	—	—	—	—	—	225.60	—	—
11484	MD50-17-146592	50-603503	133	10/05/2017	—	—	—	—	—	—	311.80	—	76.60 (J)	—	—	1987.08	—	—
11484	MD50-17-146593	50-603503	237	10/05/2017	—	—	100.67 (J)	—	—	—	521.92	—	61.27 (J)	20.72 (J)	—	4887.14	—	—
11484	MD50-17-146594	50-603503	347	10/05/2017	—	—	48.60 (J)	—	—	—	427.03	—	35.23 (J)	—	—	4403.80	—	—
11484	MD50-17-146595	50-603503	450	10/05/2017	—	—	—	—	—	—	—	—	—	—	—	3114.88	12.35 (J)	—
11484	MD50-17-146559	50-603467	143	10/04/2017	—	—	—	—	—	—	399.91	—	—	—	—	14,500.3	—	—
11484	MD50-17-146560	50-603467	244	10/04/2017	—	—	208.29	—	—	—	745.60	—	15.32 (J)	—	—	26,315.4	17.41 (J)	—
11484	MD50-17-146561	50-603467	360	10/04/2017	—	—	—	—	—	—	745.60	—	—	—	—	24,704.2	13.48 (J)	—
11484	MD50-17-146562	50-603467	500	10/04/2017	—	—	—	—	—	—	325.35	—	—	—	—	10,203.9	15.72 (J)	—
11484	MD50-17-146563	50-603467	600	10/04/2017	—	21.70 (J)	—	—	—	—	176.23	—	—	—	—	5101.96	—	—
11484	MD50-17-146541	50-603062	122	10/03/2017	—	—	—	—	—	—	43.38 (J)	—	490.17	53.44 (J)	—	6444.58	10.11 (J)	—
11484	MD50-17-146542	50-603062	217	10/03/2017	—	—	—	—	—	—	39.31 (J)	—	727.59	59.98 (J)	—	8592.78	17.97 (J)	—
11484	MD50-17-146543	50-603062	337	10/03/2017	—	—	—	—	—	—	10.17 (J)	—	214.45	8.18 (J)	—	3007.47	8.42 (J)	—
11484	MD50-17-146544	50-603062	450	10/03/2017	—	—	—	—	—	—	—	—	54.38 (J)	—	—	912.98	7.30 (J)	—
11484	MD50-17-146550	50-603064	113	10/02/2017	—	—	131.92 (J)	—	—	—	677.82	—	10,722.40	2017.48	—	26,852.4	38.18 (J)	—
11484	MD50-17-146551	50-603064	214	10/02/2017	—	—	520.72	—	—	—	677.82	—	13,79	2344.64	—	41,352.8	61.76	—
11484	MD50-17-146552	50-603064	332	10/02/2017	—	—	65.96 (J)	—	—	—	264.35	—	4825.10	256.27	—	17,185.6	51.10 (J)	—
11484	MD50-17-146553	50-603064	500	10/02/2017	—	—	—	—	—	—	36.60 (J)	—	375.29	—	—	2201.90	23.58 (J)	—
11194	MD50-17-131726	50-613185	145	04/21/2017	—	—	—	—	—	—	74.56	—	—	—	—	4081.57	—	—
11194	MD50-17-131727	50-613185	235	04/21/2017	—	—	—	—	—	—	122.01	—	—	—	—	7518.68	—	—
11194	MD50-17-131728	50-613185	350	04/21/2017	—	—	—	—	—	—	—	—	—	—	—	3974.16	—	—
11194	MD50-17-131729	50-613185	450	04/21/2017	—	—	—	—	—	—	—	—	—	—	—	1933.38	—	—
11194	MD50-17-131730	50-613185	600	04/21/2017	—	—	—	—	—	—	—	—	—	—	—	177.23	—	—

Table C-5.0-10 (continued)

Sampling Plan 2017	Field Sample ID	Location ID	Depth (ft)	Date	Hexane	Hexanone[2-]	Methylene Chloride	n-Heptane	Propanol[2-]	Styrene	Tetrachloroethylene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethylene	Trichlorofluoromethane	Xylene[1,3-]+Xylene[1,4-]
Groundwater Tier 1 Screening Level					**23,500,000**	**145**	**665**	**na**	**136**	**11,300**	**3630**	**272,000**	**1,190,000,000**	**141,000**	**169**	**2020**	**4,540,000**	**131,000**
11194	MD50-17-131722	50-603503	133	04/20/2017	—	—	—	—	—	—	318.58	—	84.25	—	—	1987.08	—	—
11194	MD50-17-131723	50-603503	237	04/20/2017	—	—	138.86	—	—	—	508.37	—	—	—	—	4779.73	—	—
11194	MD50-17-131724	50-603503	347	04/20/2017	—	—	—	—	—	—	393.14	—	—	—	—	4296.39	—	—
11194	MD50-17-131725	50-603503	450	04/20/2017	—	—	—	—	—	—	237.24	—	—	—	—	2900.06	—	—
11194	MD50-17-131690	50-603467	143	04/19/2017	—	—	—	—	—	—	386.36	—	—	—	—	11,278	—	—
11194	MD50-17-131691	50-603467	244	04/19/2017	—	—	211.76	—	—	—	745.60	—	—	—	—	24,704.2	—	—
11194	MD50-17-131692	50-603467	360	04/19/2017	—	—	—	—	—	—	677.82	—	—	—	—	23,630.1	—	—
11194	MD50-17-131693	50-603467	500	04/19/2017	—	—	—	—	—	—	230.46	—	—	—	—	8055.73	—	—
11194	MD50-17-131694	50-603467	600	04/19/2017	—	—	—	—	—	—	149.12	—	—	—	—	4618.62	—	—
11194	MD50-17-131695	50-603468	142	04/18/2017	—	—	—	—	—	—	216.90	—	—	—	—	10,74	—	—
11194	MD50-17-131696	50-603468	233	04/18/2017	—	—	520.72	—	—	—	386.36	—	—	—	—	26,315.4	—	—
11194	MD50-17-131697	50-603468	354	04/18/2017	—	—	326.32	—	—	—	413.47	—	—	—	—	27,926.5	—	—
11194	MD50-17-131698	50-603468	403	04/18/2017	—	—	243.00	—	—	—	305.02	—	—	—	—	23,093.1	—	—
11194	MD50-17-131699	50-613184	500	04/18/2017	—	—	—	—	—	—	—	—	—	—	—	5155.67	—	—
11194	MD50-17-131700	50-613184	600	04/18/2017	—	—	—	—	—	—	—	—	—	—	—	1020.39	—	—
11194	MD50-17-131701	50-613184	664.5	04/18/2017	—	—	—	—	—	—	—	—	—	—	—	69.82	—	—
11194	MD50-17-131662	50-24822	25	04/17/2017	—	—	—	—	—	—	61.00	—	—	—	—	2792.65	—	—
11194	MD50-17-131663	50-24822	142	04/17/2017	—	—	—	—	103.18	—	—	—	—	—	—	8592.78	—	—
11194	MD50-17-131664	50-24822	235	04/17/2017	—	—	—	—	—	—	—	—	—	—	—	9666.88	—	—
11194	MD50-17-131665	50-24822	351	04/17/2017	—	—	—	—	—	—	—	—	—	—	—	11,815.1	—	—
11194	MD50-17-131666	50-24822	450	04/17/2017	—	—	—	—	—	—	—	—	—	—	—	6981.63	—	—
11194	MD50-17-131672	50-603062	122	04/14/2017	—	—	—	—	—	—	—	—	528.46	59.981	—	5907.54	—	—
11194	MD50-17-131673	50-603062	217	04/14/2017	—	—	—	—	—	—	—	—	658.66	70.88	—	7518.68	—	—
11194	MD50-17-131674	50-603062	337	04/14/2017	—	—	—	—	—	—	—	—	191.47	—	—	2094.49	—	—
11194	MD50-17-131675	50-603062	450	04/14/2017	—	—	—	—	—	—	—	—	—	—	—	751.87	—	—
11194	MD50-17-131681	50-603064	113	04/13/2017	—	—	124.97	—	—	—	657.49	—	9956.55	2126.53	—	26,852.4	—	—
11194	MD50-17-131682	50-603064	214	04/13/2017	—	—	486.00	—	—	—	643.93	—	13,020.10	2235.58	—	40,278.7	67.38	—
11194	MD50-17-131683	50-603064	332	04/13/2017	—	—	—	—	—	—	237.24	—	4825.10	267.18	—	17,185.6	—	—
11194	MD50-17-131684	50-603064	500	04/13/2017	—	—	—	—	—	—	—	—	329.33	—	—	2094.49	—	—

Table C-5.0-10 (continued)

Sampling Plan 2017	Field Sample ID	Location ID	Depth (ft)	Date	Hexane	Hexanone[2-]	Methylene Chloride	n-Heptane	Propanol[2-]	Styrene	Tetrachloroethylene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethylene	Trichlorofluoromethane	Xylene[1,3-]+Xylene[1,4-]
Groundwater Tier 1 Screening Level					**23,500,000**	**145**	**665**	**na**	**136**	**11,300**	**3630**	**272,000**	**1,190,000,000**	**141,000**	**169**	**2020**	**4,540,000**	**131,000**
11194	MD50-17-131667	50-603061	25	04/12/2017	—	—	—	—	—	—	135.56	—	9956.55	1145.06	—	644.46	—	—
11194	MD50-17-131668	50-603061	128	04/12/2017	—	—	—	—	—	—	338.91	—	27,57	3871.38	—	3061.18	—	—
11194	MD50-17-131669	50-603061	228	04/12/2017	—	—	—	—	—	—	210.12	—	15,317.80	2726.32	—	3705.64	—	—
11194	MD50-17-131670	50-603061	347	04/12/2017	—	—	—	—	—	—	128.79	—	9190.66	654.32	—	2040.79	—	—
11194	MD50-17-131671	50-603061	450	04/12/2017	—	—	—	—	—	—	—	—	2757.20	65.43	—	912.98	—	—
11194	MD50-17-131676	50-603063	25	04/11/2017	—	—	—	—	—	—	325.35	—	2144.49	239.92	—	1288.92	—	—
11194	MD50-17-131677	50-603063	128	04/11/2017	—	—	—	—	—	—	1084.51	—	4901.68	708.84	—	10,203.9	—	—
11194	MD50-17-131678	50-603063	228	04/11/2017	—	—	—	—	—	—	1694.55	—	5744.16	708.84	—	26,852.4	67.38	—
11194	MD50-17-131679	50-603063	347	04/11/2017	—	—	—	—	—	—	881.17	—	1608.37	92.70	—	18,796.7	—	—
11194	MD50-17-131680	50-603063	450	04/11/2017	—	—	—	—	—	—	413.47	—	291.04	—	—	10,741	—	—
11194	MD50-17-131685	50-603383	26	04/10/2017	—	—	—	—	—	—	142.34	—	76.59	—	—	392.05	—	—
11194	MD50-17-131686	50-603383	139	04/10/2017	—	—	—	—	—	—	1355.64	—	1225.42	196.30	—	5370.49	—	—
11194	MD50-17-131687	50-603383	244	04/10/2017	—	—	—	—	—	—	1694.55	—	995.66	196.30	—	8055.73	—	—
11194	MD50-17-131688	50-603383	359	04/10/2017	—	—	—	—	—	—	643.93	—	359.97	—	—	3276	—	—
11194	MD50-17-131689	50-603383	450	04/10/2017	—	—	—	—	—	—	372.80	—	176.15	—	—	1987.08	—	—
11194	MD50-17-131656	50-24813	25	04/07/2017	—	—	—	—	73.70	—	386.36	27.87	—	—	—	11,278	—	—
11194	MD50-17-131657	50-24813	150	04/07/2017	—	—	343.68	—	—	—	623.60	—	—	—	196.30	41,889.8	—	—
11194	MD50-17-131658	50-24813	241	04/07/2017	—	—	798.44	—	—	—	948.95	41.43	84.25	—	—	85,927.8	—	—
11194	MD50-17-131659	50-24813	358	04/07/2017	—	—	—	—	—	—	603.26	—	—	—	—	59,075.4	—	—
11194	MD50-17-131660	50-24813	450	04/07/2017	—	—	170.10	—	—	—	311.80	—	—	—	—	31,685.9	—	—
11194	MD50-17-131661	50-24813	600	04/07/2017	—	—	—	—	—	—	—	—	—	—	—	4403.8	—	—
11194	MD50-17-131702	50-603470	83	04/06/2017	—	—	—	—	—	—	528.70	—	114.88	—	92.70	10,741	—	—
11194	MD50-17-131703	50-603470	203	04/06/2017	—	—	624.86	—	—	—	603.26	—	919.07	125.41	—	45,649.1	—	—
11194	MD50-17-131704	50-603470	278	04/06/2017	—	—	798.44	—	—	—	528.70	45.19	919.07	98.15	—	53,704.9	—	—
11194	MD50-17-131705	50-603470	351	04/06/2017	—	—	451.29	—	—	—	352.47	—	696.96	—	—	40,815.7	—	—
11194	MD50-17-131706	50-603470	450	04/06/2017	—	—	—	—	—	—	101.67	—	153.18	—	—	13,426.2	—	—
11194	MD50-17-131707	50-603470	650	04/06/2017	—	—	—	—	—	—	—	37.66	—	—	—	91.30	—	—
11194	MD50-17-131708	50-603471	90	04/05/2017	—	—	—	—	—	—	555.81	—	107.22	—	—	10,741	—	—
11194	MD50-17-131709	50-603471	209	04/05/2017	—	—	—	—	—	—	948.95	—	—	—	—	38,667.5	—	—

Table C-5.0-10 (continued)

Sampling Plan 2017	Field Sample ID	Location ID	Depth (ft)	Date	Hexane	Hexanone[2-]	Methylene Chloride	n-Heptane	Propanol[2-]	Styrene	Tetrachloroethylene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethylene	Trichlorofluoromethane	Xylene[1,3-]+Xylene[1,4-]
Groundwater Tier 1 Screening Level					**23,500,000**	**145**	**665**	**na**	**136**	**11,300**	**3630**	**272,000**	**1,190,000,000**	**141,000**	**169**	**2020**	**4,540,000**	**131,000**
11194	MD50-17-131710	50-603471	288	04/05/2017	—	—	1839.88	—	—	—	1220.08	—	597.39	—	—	64,445.8	67.38	—
11194	MD50-17-131711	50-603471	360	04/05/2017	—	—	937.30	—	—	—	948.95	—	375.30	—	—	50,482.6	61.76	—
11194	MD50-17-131712	50-603471	450	04/05/2017	—	—	284.66	—	—	—	664.26	—	153.18	—	—	31,685.9	—	—
11194	MD50-17-131713	50-613183	550	04/05/2017	—	—	—	—	—	—	108.45	—	—	—	—	5155.67	—	—
11194	MD50-17-131714	50-613183	642.5	04/05/2017	—	—	—	—	—	—	—	—	—	—	—	118.15	—	—
11194	MD50-17-131715	50-603472	27	04/05/2017	—	—	—	—	—	—	447.36	—	—	—	—	2738.95	—	—
11194	MD50-17-131721	50-613182	632.5	04/05/2017	—	—	—	—	—	—	—	—	—	—	—	64.45	—	—
11194	MD50-17-131731	50-603471	Unknown[c]	04/05/2017	—	—	183.99	—	—	—	948.94	—	222.11	—	76.34	19,870.8	—	—
11194	MD50-17-131716	50-603472	146	04/04/2017	—	—	451.29	—	—	—	948.95	—	130.20	—	—	15,574.4	—	—
11194	MD50-17-131717	50-603472	292	04/04/2017	—	—	1041.44	—	—	—	1830.11	—	160.84	—	—	35,982.3	—	—
11194	MD50-17-131718	50-603472	364	04/04/2017	—	—	381.86	—	—	—	1152.29	—	99.57	—	—	24,704.2	—	—
11194	MD50-17-131719	50-603472	450	04/04/2017	—	—	—	—	—	—	515.14	—	—	—	—	10,741	—	—
11194	MD50-17-131720	50-613182	550	04/04/2017	—	—	—	—	—	—	149.12	—	—	—	—	2846.36	—	—
11194	MD50-17-131652	50-24784	155	04/03/2017	—	—	—	—	108.09	—	2304.59	41.27	145.52	—	—	3974.16	—	—
11194	MD50-17-131653	50-24784	244	04/03/2017	—	—	—	—	—	—	2304.59	—	122.54	—	—	4672.32	—	—
11194	MD50-17-131654	50-24784	362	04/03/2017	—	—	—	—	—	—	1491.20	—	—	—	—	3276.00	—	—
11194	MD50-17-131655	50-24784	450	04/03/2017	—	—	—	—	—	—	569.37	—	—	—	—	1342.62	—	—

Notes: Concentrations are in µg/m^3. Data qualifiers are defined in Appendix A. Purple shading means the value exceeds Tier 1 groundwater screening level for the analyte listed.

[a] na = Not available.

[b] — = Not detected.

[c] Port was not labeled with the port depth.

Table C-5.0-11
VOC Pore-Gas Results from First Round 2019

Field Sample ID 2019 – 2nd round	Location ID	Depth (ft)	Acetone	Benzene	Carbon Disulfide	Carbon Tetrachloride	Chloroform	Dichlorodifluoromethane	Dichloro-1,1,2,2-tetrafluoroethane[1,2]	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloroethene[trans-1,2-]	Dichloropropane[1,2-]	Ethanol	Methylene Chloride	Methyl tert-Butyl Ether	Propanol[2-]	Tetrachloroethylene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethylene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]
Groundwater Tier 1 Screening Level			**20,300**	**1140**	**478,000**	**5650**	**12,000**	**2,780,000**	**na[a]**	**242**	**7490**	**11,700**	**15,600**	**580**	**na**	**665**	**336**	**136**	**3630**	**272,000**	**1,190,000,000**	**141,000**	**169**	**2020**	**4,540,000**	**14,100**
MD50-20-191444	50-24784	155	28 (J)	—[b]	—	—	14 (J)	—	—	—	—	—	—	—	—	—	—	64 (J)	100	—	—	—	—	140	—	—
MD50-20-191446	50-24784	362	—	—	—	430	38 (J)	200	—	—	—	—	—	—	—	—	—	—	1400	—	80 (J)	20 (J)	—	3100	27 (J)	—
MD50-20-191447	50-24784	450	—	—	—	320	—	170	—	—	—	—	—	—	—	—	—	—	590	—	28 (J)	—	—	1300	19 (J)	—
MD50-20-191452	50-24813	25	—	—	—	750	680	100	—	—	—	38 (J)	—	—	—	—	—	—	360	—	16 (J)	—	30 (J)	8100	—	—
MD50-20-191453	50-24813	150	—	6.7 (J)	—	1100	2400	300	—	97	15 (J)	400	—	65	—	320	—	—	580	—	41 (J)	11 (J)	170	33,000	15 (J)	—
MD50-20-191454	50-24813	241	—	—	—	1400	1900	840	—	27 (J)	13 (J)	550	13 (J)	50 (J)	—	490	—	—	1000	—	100 (J)	19 (J)	31 (J)	75,000	34 (J)	—
MD50-20-191456	50-24813	450	—	8 (J)	—	500	170	640	—	—	—	59	—	—	—	140 (J)	7.2 (J)	—	360	—	34 (J)	—	—	27,000	39 (J)	—
MD50-20-191466	50-24822	235	—	11 (J)	—	360	540	690	—	—	—	150	—	—	—	300	—	—	230	—	280	39 (J)	—	33,000	34 (J)	—
MD50-20-191467	50-24822	351	—	—	—	280	200	640	—	—	—	59	—	—	—	170	—	—	150	—	160	11 (J)	—	24,000	31 (J)	—
MD50-20-191468	50-24822	450	—	—	—	190	46 (J)	450	—	—	—	18 (J)	—	—	—	—	—	—	61 (J)	—	57 (J)	—	—	11,000	21 (J)	—
MD50-20-191579	50-603062	217	—	9.3 (J)	—	75 (J)	68	280	—	—	28 (J)	17 (J)	—	—	—	—	—	—	46 (J)	—	840	76	—	8600	19 (J)	—
MD50-20-191580	50-603062	337	—	—	—	51 (J)	10 (J)	200	—	—	—	—	—	—	—	—	—	—	—	—	290	11 (J)	—	3000	12 (J)	—
MD50-20-191581	50-603062	450	—	—	—	29 (J)	—	130	—	—	—	—	—	—	—	—	—	—	—	—	84 (J)	—	—	1000	—	—
MD50-20-191484	50-603064	113	—	7.7 (J)	—	180	780	370	—	—	520	200	—	41 (J)	—	100 (J)	—	—	500	—	8400	1500	—	23,000	31 (J)	—
MD50-20-191485	50-603064	214	—	13 (J)	—	310	630	540	—	—	670	220	—	29 (J)	—	420	—	—	580	—	11,000	1700	—	32,000	49 (J)	—
MD50-20-191486	50-603064	332	—	—	—	300	100	540	—	—	260	48 (J)	—	—	—	—	—	—	260	—	5900	320	—	17,000	55 (J)	—
MD50-20-191487	50-603064	500	—	—	—	75 (J)	—	260	—	—	21 (J)	—	—	—	—	—	—	—	49 (J)	—	520	—	—	2600	24 (J)	—
MD50-20-191502	50-603467	143	31 (J)	—	—	280	410	160	—	12 (J)	—	91	—	—	—	—	—	470	330	—	—	27 (J)	—	10,000	—	—
MD50-20-191503	50-603467	244	—	—	—	150	200	79	—	—	—	38 (J)	—	—	45 (J)	—	—	—	150	—	—	—	—	5300	—	—
MD50-20-191504	50-603467	360	33 (J)	—	—	69 (J)	59 (J)	38 (J)	—	—	—	—	—	—	41 (J)	—	—	19 (J)	88	—	—	19 (J)	—	3000	—	—
MD50-20-191505	50-603467	500	20 (J)	—	—	69 (J)	22 (J)	74	—	—	—	—	—	—	—	—	—	—	95	—	—	—	—	2800	—	—
MD50-20-191506	50-603467	600	22 (J)	—	—	69 (J)	26 (J)	79	—	—	—	—	—	—	—	—	—	—	—	—	—	20 (J)	—	2000	—	—
MD50-20-191512	50-603468	142	—	—	—	290	410	240	—	—	—	110	—	—	—	32 (J)	—	—	210	—	—	—	—	15,000	—	—

Table C-5.0-11 (continued)

Field Sample ID 2019 – 2nd round	Location ID	Depth (ft)	Acetone	Benzene	Carbon Disulfide	Carbon Tetrachloride	Chloroform	Dichlorodifluoromethane	Dichloro-1,2,2-tetrafluoroethane[1,2]	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloroethene[trans-1,2-]	Dichloropropane[1,2-]	Ethanol	Methylene Chloride	Methyl tert-Butyl Ether	Propanol[2-]	Tetrachloroethylene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethylene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]
Groundwater Tier 1 Screening Level			**20,300**	**1140**	**478,000**	**5650**	**12,000**	**2,780,000**	**na[a]**	**242**	**7490**	**11,700**	**15,600**	**580**	**na**	**665**	**336**	**136**	**3630**	**272,000**	**1,190,000,000**	**141,000**	**169**	**2020**	**4,540,000**	**14,100**
MD50-20-191513	50-603468	233	—	—	—	600	630	420	—	—	—	180	—	—	—	490	—	—	370	—	—	—	—	26,000	19 (J)	—
MD50-20-191514	50-603468	354	18 (J)	7 (J)	—	600	460	540	—	—	—	150	—	—	—	320	—	—	390	—	—	—	—	28,000	19 (J)	—
MD50-20-191515	50-603468	403	20 (J)	—	—	430	260	500	—	—	—	99	—	—	34 (J)	200	—	—	160	—	—	—	—	18,000	25 (J)	—
MD50-20-191526	50-603470	83	36 (J)	—	—	200	730	120	—	19 (J)	10 (J)	83	—	28 (J)	—	30 (J)	—	—	750	—	210	37 (J)	87	9700	—	—
MD50-20-191527	50-603470	203	—	8.6 (J)	14 (J)	350	930	430	—	18 (J)	34 (J)	250	—	29 (J)	—	490	—	—	530	—	720	93	15 (J)	33,000	29 (J)	—
MD50-20-191528	50-603470	278	—	12 (J)	—	530	880	690	—	9.7 (J)	44 (J)	280	—	27 (J)	—	760	—	—	600	—	1000	87	—	49,000	46 (J)	—
MD50-20-191529	50-603470	351	36 (J)	8.9 (J)	—	430	400	690	—	—	32 (J)	140	—	—	—	420	—	—	410	—	800	46 (J)	—	40,000	47 (J)	—
MD50-20-191530	50-603470	450	33 (J)	8.6 (J)	14 (J)	300	110	540	—	—	17 (J)	44 (J)	—	—	16 (J)	120 (J)	—	—	200	—	370	15 (J)	—	20,000	42 (J)	—
MD50-20-191531	50-603470	650	—	—	—	—	—	29 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	91	—	—
MD50-20-191538	50-603471	Unknown[c]	20 (J)	—	53 (J)	940	1400	100	—	97	16 (J)	180	—	65	—	170 (J)	—	—	880	—	260	38 (J)	82	17,000	13 (J)	—
MD50-20-191539	50-603471	90	—	10 (J)	—	750	1200	100	—	80	—	100	—	43 (J)	—	56 (J)	—	—	750	—	180	30 (J)	47 (J)	12,000	13 (J)	—
MD50-20-191540	50-603471	209	—	13 (J)	—	750	1200	460	—	65	27 (J)	340	9.9 (J)	69	—	730	—	—	1100	—	500	42 (J)	25 (J)	44,000	34 (J)	—
MD50-20-191541	50-603471	288	—	17 (J)	—	940	1300	590	—	38 (J)	31 (J)	350	9.1 (J)	55 (J)	—	1500	—	—	1200	—	570	50 (J)	14 (J)	53,000	44 (J)	—
MD50-20-191542	50-603471	360	—	14 (J)	—	750	680	690	—	12 (J)	24 (J)	220	—	25 (J)	—	830	—	—	950	—	470	27 (J)	11 (J)	45,000	53 (J)	—
MD50-20-191543	50-603471	450	70 (J)	8.6 (J)	—	200	190	220	—	—	—	63	—	—	110	120 (J)	—	—	240	10 (J)	80 (J)	—	—	11,000	18 (J)	—
MD50-20-191554	50-603472	27	—	—	—	36 (J)	210	32 (J)	—	—	—	—	—	18 (J)	—	—	—	—	460	—	50 (J)	71 (J)	—	2300	—	—
MD50-20-191555	50-603472	146	23 (J)	—	—	210	540	130	—	49 (J)	10 (J)	100	—	79	—	380	—	—	810	—	100	53 (J)	—	11,000	15 (J)	—
MD50-20-191556	50-603472	292	20 (J)	—	—	140	180	100	—	—	—	55	—	—	—	200	—	19 (J)	430	—	52 (J)	13 (J)	—	7500	11 (J)	—
MD50-20-191557	50-603472	364	—	7 (J)	—	520	270	430	—	—	12 (J)	91	—	—	—	380	—	—	1200	—	110	28 (J)	—	24,000	40 (J)	—
MD50-20-191558	50-603472	450	—	—	—	130	37 (J)	140	—	—	—	—	—	—	—	52 (J)	—	—	290	—	—	—	—	5200	12 (J)	—
MD50-20-191586	50-603503	133	—	—	—	62 (J)	110	36 (J)	—	12 (J)	—	—	—	29 (J)	—	31 (J)	—	—	420	—	80 (J)	98	—	2300	—	24 (J)
MD50-20-191587	50-603503	237	—	—	—	110	160	69	—	—	—	30 (J)	—	45 (J)	—	120 (J)	—	—	560	—	80 (J)	46 (J)	—	5200	11 (J)	—
MD50-20-191588	50-603503	347	—	—	—	150	100	110	—	—	—	19 (J)	—	17 (J)	—	76 (J)	—	—	520	—	47 (J)	46 (J)	—	5300	11 (J)	—
MD50-20-191589	50-603503	450	21 (J)	—	—	100	31 (J)	89	—	—	—	—	—	—	—	28 (J)	—	—	330	—	—	100	—	3500	—	16 (J)
MD50-20-191564	50-613182	550	—	—	—	220	13 (J)	290	—	—	—	—	—	—	—	—	—	—	260	—	—	—	—	4600	22 (J)	—
MD50-20-191565	50-613182	632.5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	64 (J)	—	—
MD50-20-191550	50-613183	550	—	—	—	250	13 (J)	450	—	—	—	—	—	—	—	—	—	—	140	—	35 (J)	40 (J)	—	5000	38 (J)	—
MD50-20-191551	50-613183	642.5	—	—	—	—	—	21 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—	39 (J)	—	200	—	—

Table C-5.0-11 (continued)

Field Sample ID 2019 – 2nd round	Location ID	Depth (ft)	Acetone	Benzene	Carbon Disulfide	Carbon Tetrachloride	Chloroform	Dichlorodifluoromethane	Dichloro-1,1,2,2-tetrafluoroethane[1,2]	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloroethene[trans-1,2-]	Dichloropropane[1,2-]	Ethanol	Methylene Chloride	Methyl tert-Butyl Ether	Propanol[2-]	Tetrachloroethylene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethylene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]
Groundwater Tier 1 Screening Level			**20,300**	**1140**	**478,000**	**5650**	**12,000**	**2,780,000**	**na[a]**	**242**	**7490**	**11,700**	**15,600**	**580**	**na**	**665**	**336**	**136**	**3630**	**272,000**	**1,190,000,000**	**141,000**	**169**	**2020**	**4,540,000**	**14,100**
MD50-20-191520	50-613184	500	—	—	—	190	18 (J)	290	—	—	—	—	—	—	—	—	—	—	95	—	—	—	—	5900	11 (J)	—
MD50-20-191521	50-613184	600	—	—	—	88 (J)	—	170	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1400	—	—
MD50-20-191522	50-613184	664.5	—	—	—	20 (J)	—	36 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	220	—	—
MD50-20-191594	50-613185	145	—	—	—	88	100	100	—	—	—	18 (J)	—	—	—	42 (J)	—	—	81 (J)	—	—	—	—	4000	—	—
MD50-20-191595	50-613185	235	—	—	—	160	110	170	—	—	—	40 (J)	—	—	—	87 (J)	—	—	150	—	—	—	—	7500	—	—
MD50-20-191596	50-613185	350	—	—	—	130	26 (J)	170	—	—	—	—	—	—	—	—	—	—	81 (J)	—	—	—	—	5000	—	—
MD50-20-191597	50-613185	450	—	—	—	94	—	130	—	—	—	—	—	—	—	—	—	—	43 (J)	—	—	—	—	2400	—	—
MD50-20-191598	50-613185	600	—	—	—	34 (J)	—	79	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	300	—	—

Notes: Concentrations are in µg/m^3. Data qualifiers are defined in Appendix A. Purple shading means the value exceeds Tier 1 groundwater screening level for the analyte listed.

[a] na = Not available.

[b] — = Not detected.

[c] Port was not labeled with the port depth.

Table C-5.0-12
VOC Pore-Gas Results from Second Round 2019

Field Sample ID 2019 – 1st round	Location ID	Depth (ft)	Acetone	Bromodichloromethane	Carbon Disulfide	Carbon Tetrachloride	Chloroform	Dichlorodifluoromethane	Dichloro-1,1,2-ttetrafluoroethane[1,2]	Dichloroethane[1,1-]	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Isooctane	Methylene Chloride	Propanol[2-]	Tetrachloroethylene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethylene	Trichlorofluoromethane
Groundwater Tier 1 Screening Level			**20,300**	**6,950**	**478,000**	**5650**	**12,000**	**2,780,000**	**na[a]**	**5750**	**242**	**7490**	**11,700**	**580**	**na**	**665**	**136**	**3630**	**1,190,000,000**	**141,000**	**169**	**2020**	**4,540,000**
MD50-19-166032	50-24784	155	—[b]	—	—	163.47	302.53	88.96	—	—	—	—	—	60.04	—	30.55 (J)	—	1897.9	122.54	32.17 (J)	—	2953.77	10.11 (J)
MD50-19-166033	50-24784	244	—	—	43.57(J)	113.17	58.56 (J)	59.31 (J)	—	—	—	—	—	16.16 (J)	—	204.82	—	881.17	40.59 (J)	—	—	1664.85	—
MD50-19-166034	50-24784	362	—	—	—	358.38	27.33 (J)	172.97	—	—	—	—	—	—	—	—	—	1355.64	65.87 (J)	16.36 (J)	—	2738.95	15.16 (J)
MD50-19-166035	50-24784	450	—	—	—	276.64	—	158.15	—	—	—	—	—	—	—	—	—	582.92	22.21 (J)	—	—	1235.21	15.16 (J)
MD50-19-166036	50-24813	25	—	—	—	880.22	731.94	128.50	—	—	—	—	32.49 (J)	—	—	—	—	372.80	—	—	25.63 (J)	8592.78	—
MD50-19-166037	50-24813	150	—	—	—	1131.71	2049.43	345.95	—	—	76.85 (J)	—	384.35	45.26 (J)	—	222.17 (J)	—	569.37	—	—	163.58 (J)	30,074.7	—
MD50-19-166038	50-24813	241	—	—	—	1634.7	2098.22	1087.27	—	—	—	—	633.98	—	—	624.86 (J)	—	948.95	—	—	—	75,186.8	—
MD50-19-166039	50-24813	358	—	—	—	817.35	487.96	790.74	—	--	—	—	178.31	—	—	—	—	562.59	—	—	—	43,500.9	—
MD50-19-166040	50-24813	450	—	—	—	490.41	151.27	593.06	—	—	—	—	55.47 (J)	—	—	118.03 (J)	—	311.80	—	—	—	25,241.3	29.76 (J)
MD50-19-166041	50-24813	600	—	—	—	157.18	5.86	316.3	—	—	—	—	—	—	—	—	—	52.19 (J)	—	—	—	4081.57	18.53 (J)
MD50-19-166042	50-24822	25	—	—	—	62.87	219.58	98.84	—	—	—	—	—	—	25.21 (J)	—	—	108.45	47.49 (J)	13.63 (J)	—	5316.78	—
MD50-19-166043	50-24822	142	—	—	—	251.49	487.96	454.68	—	—	—	—	103.02 (J)	—	—	166.63 (J)	—	210.12	168.5 (J)	32.72 (J)	—	20,407.9	—
MD50-19-166044	50-24822	235	—	—	—	326.94	536.75	691.90	—	—	—	—	146.61	—	—	277.72 (J)	—	244.02	214.45 (J)	40.35 (J)	—	30,611.8	—
MD50-19-166045	50-24822	351	—	—	—	270.35	175.67	642.48	—	—	—	—	59.44 (J)	—	—	131.92 (J)	—	135.56 (J)	114.88 (J)	—	—	21,481.9	—
MD50-19-166046	50-24822	450	—	—	—	176.04	47.82 (J)	459.61	—	—	—	—	—	—	—	41.66 (J)	—	65.75 (J)	—	—	—	10,203.9	—
MD50-19-166047	50-603061	25	—	—	—	—	18.54 (J)	311.35	—	—	—	166.419	—	—	—	—	—	122.01 (J)	7658.88	817.90	—	537.05	—
MD50-19-166048	50-603061	128	—	—	—	69.16 (J)	63.43 (J)	276.76	—	—	—	1109.46	—	—	—	—	—	338.91	22,210.8	2671.8	—	2470.42	19.09 (J)
MD50-19-166049	50-603061	228	—	—	—	138.32 (J)	53.68 (J)	286.64	—	—	—	1307.58	—	—	—	—	—	352.47	22,976.6	3108.01	—	4403.8	30.88 (J)
MD50-19-166050	50-603061	347	—	—	—	119.46	10.25 (J)	207.57	—	—	—	340.76	—	—	—	—	—	142.34	8424.77	545.26	—	1879.67	24.14 (J)
MD50-19-166051	50-603061	450	—	—	—	58.47 (J)	—	138.38	—	—	—	87.17	—	—	—	—	—	50.84 (J)	2604.02	59.98 (J)	—	859.28	13.48 (J)
MD50-19-166052	50-603062	122	—	—	—	44.64 (J)	78.07	207.57	—	—	—	13.87 (J)	16.64 (J)	—	—	12.15 (J)	—	46.09 (J)	551.44	65.43	—	6444.58	—
MD50-19-166053	50-603062	217	—	—	—	69.16 (J)	68.31 (J)	281.70	—	—	—	20.21 (J)	20.21 (J)	—	—	19.09 (J)	—	44.74 (J)	727.59	65.43 (J)	—	8055.73	—
MD50-19-166054	50-603062	337	—	—	—	36.47 (J)	—	172.97	—	—	—	—	—	—	—	—	—	—	214.45	—	—	2524.13	—

Table C-5.0-12 (continued)

Field Sample ID 2019 – 1st round	Location ID	Depth (ft)	Acetone	Bromodichloromethane	Carbon Disulfide	Carbon Tetrachloride	Chloroform	Dichlorodifluoromethane	Dichloro-1,1,2-ttetrafluoroethane[1,2]	Dichloroethane[1,1-]	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Isooctane	Methylene Chloride	Propanol[2-]	Tetrachloroethylene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethylene	Trichlorofluoromethane
Groundwater Tier 1 Screening Level			**20,300**	**6950**	**478,000**	**5650**	**12,000**	**2,780,000**	**na[a]**	**5750**	**242**	**7490**	**11,700**	**580**	**na**	**665**	**136**	**3630**	**1,190,000,000**	**141,000**	**169**	**2020**	**4,540,000**
MD50-19-166055	50-603062	450	—	—	—	—	—	133.44	—	—	—	—	—	—	—	—	—	—	76.59 (J)	—	—	912.98	—
MD50-19-166056	50-603063	25	—	—	—	—	22.93 (J)	98.84	—	—	—	—	—	—	—	—	—	237.24	1072.24	130.86	—	805.57	10.11 (J)
MD50-19-166057	50-603063	128	—	—	—	163.47	287.90	345.95	—	—	—	206.04	30.11 (J)	—	—	—	—	1016.73	4288.97	545.26	—	8592.78	34.25 (J)
MD50-19-166058	50-603063	228	—	—	—	370.95	536.75	494.21	—	48.54 (J)	—	289.25	106.98 (J)	45.72 (J)	—	—	—	1694.55	5284.63	599.79	—	22,556	51.66 (J)
MD50-19-166059	50-603063	347	—	—	—	194.91	190.30	227.34	—	—	—	55.47 (J)	35.66 (J)	—	—	—	—	576.15	919.07	65.43 (J)	—	10,203.9	26.95 (J)
MD50-19-166060	50-603063	450	—	—	—	213.77	146.39	311.35	—	18.61 (J)	—	15.06 (J)	—	—	—	—	—	413.47	367.63	—	—	9129.83	30.88 (J)
MD50-19-166061	50-603064	113	—	—	—	150.90 (J)	683.14	385.49	—	—	—	396.24	146.61	—	65.37 (J)	111.09 (J)	—	637.15	7658.88	1526.74	—	18,259.7	—
MD50-19-166062	50-603064	214	—	—	—	314.37	585.55	691.90	—	—	—	594.36	210.01	—	—	381.86 (J)	—	650.71	10,722.4	1744.85	—	31,148.8	—
MD50-19-166063	50-603064	332	—	—	—	245.21	87.83 (J)	543.63	—	—	—	198.12	38.43 (J)	—	—	55.54 (J)	—	264.35	4978.27	283.54	—	15,037.4	43.80 (J)
MD50-19-166064	50-603064	500	12.34 (J)	—	—	75.45	—	256.99	—	—	—	10.70 (J)	—	—	—	—	7.37 (J)	33.21 (J)	375.23	—	—	1718.56	18.53 (J)
MD50-19-166065	50-603383	26	—	—	—	138.32	107.35	232.28	—	10.11 (J)	—	35.27 (J)	14.66 (J)	87.75	—	—	—	948.95	919.07	125.41	—	2953.77	35.94 (J)
MD50-19-166066	50-603383	139	—	—	—	238.92	161.03	252.05	—	21.03 (J)	—	55.47	38.04 (J)	254.01	—	41.66 (J)	—	1423.42	995.66	147.22	—	5370.49	35.94 (J)
MD50-19-166067	50-603383	244	—	—	—	377.24	146.39	301.47	18.16 (J)	—	—	63.40	55.47 (J)	351	—	72.90 (J)	—	1558.99	919.07	158.13	—	6444.58	41.55 (J)
MD50-19-166068	50-603383	359	—	—	—	289.22	28.30 (J)	252.05	—	—	—	23.77 (J)	—	26.79 (J)	—	—	—	623.60	321.67	41.44 (J)	—	2900.06	27.51 (J)
MD50-19-166069	50-603383	450	—	—	—	226.34	-	187.80	—	—	—	—	—	—	—	—	—	325.35	130.20	—	—	1611.15	19.09 (J)
MD50-19-166070	50-603467	143	—	—	—	389.81	419.644	192.74	—	—	—	—	91.13	—	—	—	—	515.14	—	—	—	15,037.4	—
MD50-19-166071	50-603467	244	—	—	—	490.41	473.32	187.80 (J)	—	—	—	39.23 (J)	110.95 (J)	—	—	100.67 (J)	—	745.60	122.54 (J)	—	—	20,407.9	49.41 (J)
MD50-19-166072	50-603467	360	—	—	—	377.24	214.70	227.34	—	—	—	—	55.47 (J)	—	—	—	—	582.93	—	—	—	17,722.6	—
MD50-19-166073	50-603467	500	—	—	—	232.63	40.99 (J)	197.69	—	—	—	—	—	—	—	—	—	271.13	—	—	—	8055.73	—
MD50-19-166074	50-603467	600	—	—	—	150.90	26.84 (J)	138.38	—	—	—	—	—	—	—	—	—	176.23	—	—	—	4403.8	12.35 (J)
MD50-19-166075	50-603468	142	—	—	—	125.75 (J)	234.22	49.42 (J)	—	—	—	—	55.47 (J)	—	—	—	—	305.02	—	—	—	12,352.1	—
MD50-19-166076	50-603468	233	—	—	—	496.70	468.44	316.30	—	—	—	—	134.72 (J)	—	—	347.15 (J)	—	372.80	—	—	—	23,093.1	—
MD50-19-166077	50-603468	354	—	—	—	490.41	268.38	410.20	—	—	—	—	106.98 (J)	—	—	194.40 (J)	—	372.80	—	—	—	21,481.9	—
MD50-19-166078	50-603468	403	—	—	—	440.11	—	375.60	—	—	—	—	67.36 (J)	—	—	173.57 (J)	—	325.35	—	—	—	19,870.8	—
MD50-19-166082	50-603470	83	—	—	—	213.77	731.94	138.38	—	—	—	—	99.06	22.63 (J)	—	38.19 (J)	—	677.82	206.80	42.53 (J)	87.24	9666.88	—
MD50-19-166083	50-603470	203	—	—	—	364.66	878.325	429.97	—	—	—	—	233.78	—	—	381.86 (J)	—	562.59	765.89	87.24 (J)	—	32,760	—

Table C-5.0-12 (continued)

Field Sample ID 2019 – 1st round	Location ID	Depth (ft)	Acetone	Bromodichloromethane	Carbon Disulfide	Carbon Tetrachloride	Chloroform	Dichlorodifluoromethane	Dichloro-1,1,2-ttetrafluoroethane[1,2]	Dichloroethane[1,1-]	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Isooctane	Methylene Chloride	Propanol[2-]	Tetrachloroethylene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethylene	Trichlorofluoromethane
Groundwater Tier 1 Screening Level			**20,300**	**6950**	**478,000**	**5650**	**12,000**	**2,780,000**	**na[a]**	**5750**	**242**	**7490**	**11,700**	**580**	**na**	**665**	**136**	**3630**	**1,190,000,000**	**141,000**	**169**	**2020**	**4,540,000**
MD50-19-166084	50-603470	278	—	—	—	502.98	780.73	691.90	—	—	—	—	237.74	—	—	590.15 (J)	—	528.7	995.66	87.24 (J)	—	40,815.7	—
MD50-19-166085	50-603470	351	—	—	—	352.09	287.90	543.63	—	—	—	—	103.02 (J)	—	—	288.13 (J)	—	305.02	597.39	—	—	26,852.4	31.4 (J)
MD50-19-166086	50-603470	450	—	—	—	295.50	97.59 (J)	543.63	—	—	—	—	30.51 (J)	—	—	97.20 (J)	—	183.01	306.36	—	—	18,796.7	39.87 (J)
MD50-19-166087	50-603470	650	—	—	—	—	—	49.42 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—	102.039	—
MD50-19-166130	50-603471	Unknown[c]	—	—	—	943.10	1268.69	138.38	—	—	93.03	11.49 (J)	158.50	60.04 (J)	—	163.16 (J)	—	813.38	229.77	34.89 (J)	70.88 (J)	13,426.2	—
MD50-19-166088	50-603471	90	—	—	—	754.48	1219.9	98.84	—	—	72.81	—	110.95	31.87(J)	—	59.01 (J)	—	677.82	153.18	28.35 (J)	45.26 (J)	9666.88	—
MD5019-166089	50-603471	209	—	—	—	628.73	1024.71	444.79	—	—	—	—	261.52	55.42 (J)	—	—	—	1084.51	306.36 (J)	—	—	44,038	—
MD50-19-166090	50-603471	288	—	—	—	943.10	1219.9	543.63	—	—	—	—	348.69	—	—	1110.87	—	1220.08	559.10	—	—	48,334.4	—
MD50-19-166091	50-603471	360	—	—	—	754.48	585.55	593.06	—	—	—	—	198.12(J)	—	—	624.86 (J)	—	948.95	405.92 (J)	—	—	39,741.6	—
MD50-19-166092	50-603471	450	—	—	—	471.55	326.93	444.79	—	—	—	—	106.98 (J)	—	—	218.70 (J)	—	671.04	137.86 (J)	—	—	26,852.4	31.44 (J)
MD50-19-166098	50-603472	27	—	—	—	26.41 (J)	190.30	29.65 (J)	—	—	—	—	11.89 (J)	11.55 (J)	—	—	—	386.36	29.10 (J)	32.72 (J)	—	1987.08	—
MD50-19-166099	50-603472	146	—	—	—	201.19	487.96	123.55	—	—	35.60 (J)	—	95.10	83.13	—	340.20	—	677.82	107.22	26.72 (J)	19.63 (J)	10,741	13.48 (J)
MD50-19-166100	50-603472	292	—	—	—	496.70	536.75	296.53	—	—	—	—	150.57 (J)	60.04 (J)	—	659.58 (J)	—	1762.33	160.84 (J)	—	—	26,852.4	—
MD50-19-166101	50-603472	364	—	—	—	484.12	219.58	365.72	—	—	—	—	71.32 (J)	—	—	329.79 (J)	—	1152.29	84.25 (J)	—	—	20,407.9	34.81 (J)
MD50-19-166102	50-603472	450	—	—	—	339.51	78.07 (J)	306.41	—	—	—	—	30.11 (J)	—	—	107.62 (J)	—	677.82	29.87 (J)	—	—	12,352.1	29.76 (J)
MD50-19-166105	50-603503	133	—	—	—	75.45	107.35	46.46	—	—	—	—	13.87(J)	30.02 (J)	—	38.19 (J)	—	488.03	130.20	40.89 (J)	—	2577.83	—
MD50-19-166106	50-603503	237	—	—	—	113.17	126.87	64.25	—	—	—	—	29.72 (J)	36.49 (J)	—	111.09 (J)	—	582.93	71.99	27.81 (J)	—	5155.67	8.42 (J)
MD50-19-166107	50-603503	347	—	—	—	132.03	63.43	84.02	—	—	—	—	15.06 (J)	8.77 (J)	—	62.49 (J)	—	481.25	31.40 (J)	16.36 (J)	—	4779.73	9.55 (J)
MD50-19-166108	50-603503	450	66.47 (J)	—	—	113.17	19.5 (J)	69.19	—	—	—	—	—	—	—	26.04 (J)	—	284.68	—	—	—	3114.88	—
MD50-19-166103	50-613182	550	—	—	—	182.33	8.30 (J)	252.05	—	—	—	—	—	—	—	—	—	230.46	—	—	—	4027.87	20.78 (J)
MD50-19-166104	50-613182	632.5	—	10.71 (J)	—	—	23.42 (J)	—	—	—	—	—	—	—	—	—	—	12.88 (J)	—	—	—	46.19 (J)	—
MD50-19-166093	50-613183	550	—	—	—	194.91	7.81 (J)	360.78	—	—	—	—	—	—	—	—	—	115.23	—	—	—	4672.32	29.76 (J)
MD50-19-166094	50-613183	642.5	—	—	—	—	—	12.85 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—	123.521	—
MD50-19-166079	50-613184	500	—	—	—	169.76	10.25 (J)	242.16	—	—	—	—	—	—	—	—	—	81.34 (J)	—	—	—	5048.26	12.91 (J)
MD50-19-166080	50-613184	600	—	—	—	75.4476	—	138.38	—	—	—	—	—	—	—	—	—	17.62 (J)	—	—	—	1127.8	—
MD50-19-166081	50-613184	664.5	—	—	—	16.35 (J)	—	29.65 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—	193.338	—

Table C-5.0-12 (continued)

Field Sample ID 2019 – 1st round	Location ID	Depth (ft)	Acetone	Bromodichloromethane	Carbon Disulfide	Carbon Tetrachloride	Chloroform	Dichlorodifluoromethane	Dichloro-1,1,2-ttetrafluoroethane[1,2]	Dichloroethane[1,1-]	Dichloroethane[1,2-]	Dichloroethene[1,1-]	Dichloroethene[cis-1,2-]	Dichloropropane[1,2-]	Isooctane	Methylene Chloride	Propanol[2-]	Tetrachloroethylene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethane[1,1,2-]	Trichloroethylene	Trichlorofluoromethane
Groundwater Tier 1 Screening Level			**20,300**	**6950**	**478,000**	**5650**	**12,000**	**2,780,000**	**na[a]**	**5750**	**242**	**7490**	**11,700**	**580**	**na**	**665**	**136**	**3630**	**1,190,000,000**	**141,000**	**169**	**2020**	**4,540,000**
MD50-19-166109	50-613185	145	—	—	—	88.02	92.71	88.96	—	—	—	—	16.64 (J)	—	—	30.20 (J)	—	81.34	—	—	—	3705.64	—
MD50-19-166110	50-613185	235	—	—	—	150.90	97.59	143.32	—	—	—	—	35.27	—	—	65.96 (J)	—	122.00	—	—	—	6981.63	—
MD50-19-166111	50-613185	350	—	—	—	119.46	19.52 (J)	143.32	—	—	—	—	—	—	—	—	—	—	—	—	—	4188.98	—
MD50-19-166112	50-613185	450	—	—	—	88.02 (J)	—	123.55	—	—	—	—	—	—	—	—	—	38.64 (J)	—	—	—	1933.38	—
MD50-19-166113	50-613185	600	—	—	—	27.66 (J)	—	59.31	—	—	—	—	—	—	—	—	—	—	—	—	—	225.56	—

Notes: Concentrations are in $\mu g/m^3$. Data qualifiers are defined in Appendix A. Purple shading means the value exceeds Tier 1 groundwater screening level for the analyte listed.

[a] na = Not available.

[b] — = Not detected.

[c] Port was not labeled with the port depth.

Table C-5.0-13
Tritium Detected in Vapor Samples
at MDA C during August 2011 Sampling Event

Location ID	Sample ID	Depth (ft)	Analytical Result
50-603383	MD50-11-23287	26	164,864
50-603383	MD50-11-23288	85	772,983
50-603383	MD50-11-23289	139	1,065,080
50-603383	MD50-11-23290	206	266,573
50-603383	MD50-11-23291	244	309,595
50-603383	MD50-11-23292	286	233,642
50-603383	MD50-11-23295	359	248,544
50-603383	MD50-11-23294	408	246,503
50-603383	MD50-11-23293	450	177,226
50-603470	MD50-11-23311	351	2451.28
50-603470	MD50-11-23312	450	1265.27
50-603470	MD50-11-23313	600	780.389
50-603470	MD50-11-23314	650	998.503
50-603471	MD50-11-23308	360	3970.95
50-603471	MD50-11-23310	410	2614.47
50-603471	MD50-11-23309	450	4649.73
50-603472	MD50-11-23307	364	4407.17
50-603472	MD50-11-23306	414	4110.57
50-603472	MD50-11-23305	450	5493.12
50-613182	MD50-11-23273	500	4322.8
50-613182	MD50-11-23276	550	2119.78
50-613182	MD50-11-23275	600	626,077
50-613182	MD50-11-23274	620	5021.35
50-613182	MD50-11-23277	632.5	5679.9
50-613183	MD50-11-23282	500	1450.64
50-613183	MD50-11-23283	550	1942.16
50-613183	MD50-11-23284	600	1002.81
50-613183	MD50-11-23285	630	2596.7
50-613183	MD50-11-23286	642.5	1083.85
50-613185	MD50-11-23268	350	445.491
50-613185	MD50-11-23269	450	5230.83
50-613185	MD50-11-23270	675	5181.33

Note: Results are in pCi/L.

Table C-5.0-14
Tritium Detected in Vapor Samples at MDA C during October 2011–November 2011 Sampling Event

Location ID	Sample ID	Depth (ft)	Analytical Result
50-24784	MD50-12-936	25	4041
50-24784	MD50-12-935	96	2332
50-24784	MD50-12-934	155	2636
50-24784	MD50-12-933	215	3289
50-24784	MD50-12-932	244	3454
50-24784	MD50-12-931	289	2537
50-24784	MD50-12-930	362	2149
50-24784	MD50-12-929	411	1217
50-24784	MD50-12-928	450	1075
50-24813	MD50-12-946	25	771.6
50-24813	MD50-12-945	99	54,960
50-24813	MD50-12-944	150	190,400
50-24813	MD50-12-943	207	3654
50-24813	MD50-12-942	241	3142
50-24813	MD50-12-941	286	1898
50-24813	MD50-12-940	358	687.6
50-24813	MD50-12-939	408	1017
50-24822	MD50-12-947	25	782.4
50-24822	MD50-12-948	81	720.6
50-24822	MD50-12-949	142	1016
50-24822	MD50-12-951	204	178,600
50-24822	MD50-12-952	235	1381
50-24822	MD50-12-950	280	543.3
50-24822	MD50-12-953	351	1149
50-24822	MD50-12-954	402	696.4
50-24822	MD50-12-955	450	1158
50-603064	MD50-12-956	25	1152
50-603064	MD50-12-957	66	1440
50-603064	MD50-12-958	113	1642
50-603064	MD50-12-959	176	1528
50-603064	MD50-12-960	214	1636
50-603064	MD50-12-961	259	1533
50-603064	MD50-12-962	332	1139
50-603064	MD50-12-963	482	770.5
50-603064	MD50-12-964	500	1230
50-603383	MD50-12-982	26	243,700

Table C-5.0-14 (continued)

Location ID	Sample ID	Depth (ft)	Analytical Result
50-603383	MD50-12-978	85	691,700
50-603383	MD50-12-979	139	1,390,000
50-603383	MD50-12-980	206	136,200
50-603383	MD50-12-981	244	103,900
50-603383	MD50-12-977	286	74,490
50-603383	MD50-12-976	359	63,130
50-603383	MD50-12-975	408	116,800
50-603383	MD50-12-974	450	89,390
50-603468	MD49-12-967	92–97	716
50-603468	MD49-12-965	142	2004
50-603468	MD49-12-966	198	1006
50-603468	MD49-12-971	233	944.8
50-603468	MD49-12-969	282	1085
50-603468	MD49-12-970	354	1228
50-603468	MD49-12-972	403	2242
50-603468	MD49-12-973	450	1505
50-603470	MD50-12-983	30	60,050
50-603470	MD50-12-984	83	2,710,000
50-603470	MD50-12-985	143	9507
50-603470	MD50-12-986	203	2003
50-603470	MD50-12-987	233	2724
50-603470	MD50-12-988	278	1730
50-603470	MD50-12-989	351	1177
50-603470	MD50-12-990	450	1352
50-603470	MD50-12-991	600	1264
50-603470	MD50-12-992	650	702.5
50-603471	MD50-12-1000	90	268,400
50-603471	MD50-12-999	146	4859
50-603471	MD50-12-998	209	55,540
50-603471	MD50-12-997	242	6121
50-603471	MD50-12-996	288	4923
50-603471	MD50-12-995	360	1,127,000
50-603471	MD50-12-994	410	13,770
50-603471	MD50-12-993	450	2295
50-603472	MD50-12-1010	27	454,100
50-603472	MD50-12-1007	93	9513
50-603472	MD50-12-1008	146	12,710
50-603472	MD50-12-1006	210	33,460,000
50-603472	MD50-12-1009	247	38,820

Table C-5.0-14 (continued)

Location ID	Sample ID	Depth (ft)	Analytical Result
50-603472	MD50-12-1005	292	20,080
50-603472	MD50-12-1004	364	66,580
50-603472	MD50-12-1003	414	1885
50-603472	MD50-12-1002	450	2170
50-613182	MD50-12-1015	500	1966
50-613182	MD50-12-1014	550	969.9
50-613182	MD50-12-1013	600	2111
50-613182	MD50-12-1011	632	561
50-613183	MD50-12-1020	30	2,499,000
50-613183	MD50-12-1021	500	994.7
50-613183	MD50-12-1022	550	29,570
50-613183	MD50-12-1017	600	2221
50-613183	MD50-12-1018	630	2677
50-613184	MD50-12-1028	664.5	971.5
50-613185	MD50-12-1038	85	663
50-613185	MD50-12-1034	280	613.2
50-613185	MD50-12-1031	600	690.3
50-613185	MD50-12-1030	675	837.6
50-613185	MD50-12-1029	688	1773

Note: Results are in pCi/L.

Table C-5.0-15
Tritium Detected in Vapor Samples at MDA C during
Sampling Events from March 2012 through October 2017

Sampling Year	Borehole ID	Sample Depth (ft)	Analytical Result (pCi/L)
2012	50-24784	155.0	29,900.00
2012	50-24784	155	4759.15
2012	50-24784	244.0	3541.00
2012	50-24784	244	2177.90
2012	50-24784	362.0	3822.00
2012	50-24784	362	4174.94
2012	50-24784	450.0	1909.00
2012	50-24784	450	534.17
2012	50-24813	25.0	1094.00
2012	50-24813	25	481.04

Table C-5.0-15 (continued)

Sampling Year	Borehole ID	Sample Depth (ft)	Analytical Result (pCi/L)
2012	50-24813	150.0	195,100.00
2012	50-24813	150	164,506.00
2012	50-24813	241.0	1917.00
2012	50-24813	241	2304.70
2012	50-24813	358.0	1365.00
2012	50-24813	450.0	2339.00
2012	50-24813	450	777.28
2012	50-24813	600.0	693.20
2012	50-24813	600	680.49
2012	50-24822	25	641.80
2012	50-24822	25	7026.22
2012	50-24822	142.0	362.10
2012	50-24822	142	2962.70
2012	50-24822	235.0	6,001,000.00
2012	50-24822	235	6694.07
2012	50-24822	351	5843.40
2012	50-24822	450.0	1623.00
2012	50-24822	450	5141.45
2012	50-603061	25	483.40
2012	50-603061	25	672.85
2012	50-603061	128	1976.00
2012	50-603061	128	15,292.80
2012	50-603061	228	1723.00
2012	50-603061	228	3091.32
2012	50-603061	347	3821.00
2012	50-603061	347	3061.97
2012	50-603061	450	1477.00
2012	50-603061	450	2343.69
2012	50-603062	122	571.90
2012	50-603062	122	4307.39
2012	50-603062	217.0	539.70
2012	50-603062	217	7364.55
2012	50-603062	337.0	1185.00
2012	50-603062	337	4792.64
2012	50-603062	450.0	751.50

Table C-5.0-15 (continued)

Sampling Year	Borehole ID	Sample Depth (ft)	Analytical Result (pCi/L)
2012	50-603062	450	10,177.20
2012	50-603063	25	696.67
2012	50-603063	128.0	1972.11
2012	50-603063	128	2408.52
2012	50-603063	228.0	3224.50
2012	50-603063	228	2027.12
2012	50-603063	347.0	1489.20
2012	50-603063	347	1427.92
2012	50-603063	450	2241.28
2012	50-603064	113.0	2715.40
2012	50-603064	113	7895.52
2012	50-603064	214.0	2107.10
2012	50-603064	214	8380.32
2012	50-603064	332.0	1148.00
2012	50-603064	332	3327.35
2012	50-603064	500.0	47,055.00
2012	50-603064	500	5412.37
2012	50-603383	26.0	1,624,200.00
2012	50-603383	26	248,542.00
2012	50-603383	139.0	113,404.00
2012	50-603383	139	1,554,510.00
2012	50-603383	244.0	204,505.00
2012	50-603383	244	290,803.00
2012	50-603383	359.0	157,375.00
2012	50-603383	359	363,969.00
2012	50-603383	450.0	2227.80
2012	50-603383	450	340,920.00
2012	50-603467	143.0	1265.00
2012	50-603467	143	9315.99
2012	50-603467	244.0	790.30
2012	50-603467	244	8535.58
2012	50-603467	360.0	4294.00
2012	50-603467	360	3810.57
2012	50-603467	500.0	1253.00
2012	50-603467	500	3671.11

Table C-5.0-15 (continued)

Sampling Year	Borehole ID	Sample Depth (ft)	Analytical Result (pCi/L)
2012	50-603467	600.0	1606.00
2012	50-603467	600	6051.68
2012	50-603468	142	840.80
2012	50-603468	142	6635.91
2012	50-603468	233	585.00
2012	50-603468	233	1175.42
2012	50-603468	354	491.80
2012	50-603468	354	2245.55
2012	50-603468	403	1391.00
2012	50-603468	403	1738.31
2012	50-603470	83.0	3,166,000.00
2012	50-603470	83	2,834,900.00
2012	50-603470	203.0	3552.00
2012	50-603470	278.0	4325.00
2012	50-603470	351.0	5140.00
2012	50-603470	450.0	4083.00
2012	50-603470	600.0	2533.00
2012	50-603470	600	531.33
2012	50-603471	90.0	49,720.00
2012	50-603471	90	52,232.00
2012	50-603471	209.0	3731.00
2012	50-603471	209	3309.17
2012	50-603471	288.0	2920.00
2012	50-603471	288	11,255.20
2012	50-603471	360.0	27,070.00
2012	50-603471	360	4088.73
2012	50-603471	450.0	2574.00
2012	50-603471	450	5157.25
2012	50-603472	27.0	480,200.00
2012	50-603472	27	608,131.00
2012	50-603472	146.0	3114.00
2012	50-603472	146	2405.29
2012	50-603472	292.0	5246.00
2012	50-603472	292	4006.26
2012	50-603472	364.0	1688.00

Table C-5.0-15 (continued)

Sampling Year	Borehole ID	Sample Depth (ft)	Analytical Result (pCi/L)
2012	50-603472	364	3355.53
2012	50-603472	450.0	2116.00
2012	50-603472	450	7014.55
2012	50-603503	133.0	199,500.00
2012	50-603503	133	18,944.40
2012	50-603503	237.0	2194.00
2012	50-603503	237	6980.61
2012	50-603503	347.0	1525.00
2012	50-603503	347	3441.99
2012	50-603503	450.0	396.30
2012	50-603503	450	3279.36
2012	50-613182	550	659.14
2012	50-613182	632.5	2725.00
2012	50-613183	550.0	3223.00
2012	50-613184	500	1155.63
2012	50-613184	600	2610.00
2012	50-613184	600	1204.07
2012	50-613184	664.5	2145.45
2012	50-613185	145	2434.72
2012	50-613185	235	6291.28
2012	50-613185	350	789.30
2012	50-613185	350	1921.87
2012	50-613185	450	4444.63
2012	50-613185	600	2160.49
2013	50-24784	155	2705.21
2013	50-24784	155	2317.20
2013	50-24784	244	1689.87
2013	50-24784	244	20,883.90
2013	50-24784	362	1056.60
2013	50-24784	362	1069.76
2013	50-24784	450	1045.35
2013	50-24813	25	568.92
2013	50-24813	150	198,426.00
2013	50-24813	150	142,621.00
2013	50-24813	241	1665.30

Table C-5.0-15 (continued)

Sampling Year	Borehole ID	Sample Depth (ft)	Analytical Result (pCi/L)
2013	50-24813	241	1418.30
2013	50-24822	25	929.71
2013	50-24822	25	789.76
2013	50-24822	142	567.59
2013	50-24822	142	488.59
2013	50-24822	235	1012.22
2013	50-24822	235	517.68
2013	50-24822	351	995.46
2013	50-24822	351	548.89
2013	50-24822	450	1016.34
2013	50-24822	450	542.96
2013	50-603061	25	1730.77
2013	50-603061	128	1499.92
2013	50-603061	128	5220.71
2013	50-603061	228	1519.61
2013	50-603061	228	1971.11
2013	50-603061	347	3613.59
2013	50-603061	347	3169.19
2013	50-603061	450	569.83
2013	50-603062	217	405.35
2013	50-603062	337	2617.70
2013	50-603062	450	2374.54
2013	50-603063	25	900.16
2013	50-603063	128	1327.73
2013	50-603063	128	1109.45
2013	50-603063	228	1499.13
2013	50-603063	228	3617.67
2013	50-603063	347	1630.48
2013	50-603063	347	918.67
2013	50-603063	450	2242.64
2013	50-603063	450	3050.28
2013	50-603064	113	1661.41
2013	50-603064	113	999.95
2013	50-603064	214	1892.47
2013	50-603064	214	441.53

Table C-5.0-15 (continued)

Sampling Year	Borehole ID	Sample Depth (ft)	Analytical Result (pCi/L)
2013	50-603064	332	987.12
2013	50-603064	332	882.16
2013	50-603383	26	248,873.00
2013	50-603383	26	206,010.00
2013	50-603383	139	2,166,610.00
2013	50-603383	139	2,289,520.00
2013	50-603383	244	280,727.00
2013	50-603383	244	596,944.00
2013	50-603383	359	108,848.00
2013	50-603383	359	356,461.00
2013	50-603383	450	489,395.00
2013	50-603383	450	420,900.00
2013	50-603467	143	698.33
2013	50-603467	244	1032.28
2013	50-603467	600	1561.83
2013	50-603470	83	3,235,070.00
2013	50-603470	83	3,202,520.00
2013	50-603470	203	1397.55
2013	50-603470	203	964.28
2013	50-603470	278	1542.40
2013	50-603470	278	687.52
2013	50-603470	351	816.32
2013	50-603470	351	522.66
2013	50-603470	600	472.46
2013	50-603470	650	590.63
2013	50-603471	90	39,694.10
2013	50-603471	90.0	42,534.40
2013	50-603471	209	23,788.20
2013	50-603471	209	2262.94
2013	50-603471	288	2842.06
2013	50-603471	288	2706.28
2013	50-603471	360	1656.97
2013	50-603471	360	2113.10
2013	50-603471	450	1550.06
2013	50-603471	450	2006.30

Table C-5.0-15 (continued)

Sampling Year	Borehole ID	Sample Depth (ft)	Analytical Result (pCi/L)
2013	50-603472	27	543,802.00
2013	50-603472	27	628,078.00
2013	50-603472	146	1708.03
2013	50-603472	146	2230.21
2013	50-603472	292	3263.48
2013	50-603472	292	3498.66
2013	50-603472	364	978.44
2013	50-603472	364	1391.89
2013	50-603472	450	1006.70
2013	50-603503	133	1656.10
2013	50-603503	133	1287.90
2013	50-603503	237	1214.37
2013	50-603503	237	747.87
2013	50-603503	347	490.06
2013	50-613182	550	703.18
2013	50-613182	550	849.26
2013	50-613182	632.5	778.91
2013	50-613183	550	2736.33
2013	50-613183	550	2616.74
2013	50-613184	500	2627.04
2014	50-24784	155	775.63
2014	50-24784	155	2092.76
2014	50-24784	244	1123.79
2014	50-24784	244	1565.82
2014	50-24784	362	510.53
2014	50-24784	362	1228.17
2014	50-24784	450	413.58
2014	50-24784	450	680.28
2014	50-24813	25	544.27
2014	50-24813	150	157,608.00
2014	50-24813	150	179,410.00
2014	50-24813	241	2492.17
2014	50-24813	241	1600.54
2014	50-24813	358	730.88
2014	50-24813	450	744.47

Table C-5.0-15 (continued)

Sampling Year	Borehole ID	Sample Depth (ft)	Analytical Result (pCi/L)
2014	50-24813	450	2491.84
2014	50-24813	600	5307.27
2014	50-24822	25	1086.85
2014	50-24822	25	713.54
2014	50-24822	235	645.37
2014	50-24822	351	859.74
2014	50-603061	128	799.57
2014	50-603061	128	739.95
2014	50-603061	228	30,608.50
2014	50-603061	228	2011.18
2014	50-603061	347	7160.25
2014	50-603061	347	3265.89
2014	50-603062	122	1794.37
2014	50-603062	337	6911.51
2014	50-603062	450	656.95
2014	50-603063	25	989.59
2014	50-603063	128	1040.68
2014	50-603063	128	1338.14
2014	50-603063	228	3802.32
2014	50-603063	228	1372.73
2014	50-603063	347	2255.26
2014	50-603063	347	1651.13
2014	50-603063	450	1616.23
2014	50-603063	450	3213.35
2014	50-603064	113	1432.86
2014	50-603064	113	1048.90
2014	50-603064	214	1376.91
2014	50-603064	332	1063.19
2014	50-603064	332	809.77
2014	50-603064	500	884.49
2014	50-603383	26	187,020.00
2014	50-603383	26	192,891.00
2014	50-603383	139	2,119,240.00
2014	50-603383	139	2,537,390.00
2014	50-603383	244	154,443.00

Table C-5.0-15 (continued)

Sampling Year	Borehole ID	Sample Depth (ft)	Analytical Result (pCi/L)
2014	50-603383	244	421,384.00
2014	50-603383	359	5,097.89
2014	50-603383	359	501,111.00
2014	50-603383	450	661,098.00
2014	50-603383	450	452,668.00
2014	50-603467	143	730.26
2014	50-603467	244	1128.26
2014	50-603467	244	750.69
2014	50-603467	360	865.40
2014	50-603467	500	6157.06
2014	50-603468	403	2199.19
2014	50-603470	83	960,960.00
2014	50-603470	83	2,728,890.00
2014	50-603470	203	490.08
2014	50-603470	203	652.71
2014	50-603470	278	567.52
2014	50-603470	278	2301.63
2014	50-603470	351	618.03
2014	50-603470	351	2157.12
2014	50-603470	450	387.16
2014	50-603471	Unknown*	15,678.50
2014	50-603471	Unknown*	34,705.90
2014	50-603471	90.0	9523.10
2014	50-603471	90	12,351.50
2014	50-603471	209	2719.29
2014	50-603471	209	6343.10
2014	50-603471	288	9698.13
2014	50-603471	360	2935.82
2014	50-603471	360	11,494.40
2014	50-603471	450	4645.69
2014	50-603471	450	19,632.20
2014	50-603472	27	315,002.00
2014	50-603472	27	646,712.00
2014	50-603472	146	711.84
2014	50-603472	146	2028.20

Table C-5.0-15 (continued)

Sampling Year	Borehole ID	Sample Depth (ft)	Analytical Result (pCi/L)
2014	50-603472	292	950.48
2014	50-603472	292	3821.30
2014	50-603472	364	491.59
2014	50-603472	364	1142.53
2014	50-603472	450	5839.31
2014	50-603472	450	8163.37
2014	50-603503	133	1288.52
2014	50-603503	133	739.11
2014	50-603503	237	1341.67
2014	50-603503	237	1199.10
2014	50-603503	347	1056.51
2014	50-603503	450	1015.84
2014	50-613182	550	974.13
2014	50-613182	550	2877.34
2014	50-613182	632.5	595.77
2014	50-613182	632.5	3057.51
2014	50-613183	642.5	3202.66
2015	50-24784	155	649.499
2015	50-24784	155	2813.47
2015	50-24784	244	503.318
2015	50-24784	244	3292.63
2015	50-24784	362	611.08
2015	50-24784	362	1860.73
2015	50-24784	450-450	297.531
2015	50–24784	450	1270.1
2015	50-24813	25	683.766
2015	50-24813	150	114,583
2015	50-24813	150	157,943
2015	50-24813	241	2212
2015	50-24813	241	1848.65
2015	50-24813	358	1081.68
2015	50-24813	358	684.626
2015	50-24813	450	689.837
2015	50-24822	25	828.998
2015	50-24822	25	796.259

Table C-5.0-15 (continued)

Sampling Year	Borehole ID	Sample Depth (ft)	Analytical Result (pCi/L)
2015	50-24822	142	687.962
2015	50-24784	155	649.499
2015	50-24822	235	844.539
2015	50-24822	351	819.781
2015	50-603061	25	902.535
2015	50-603061	128	1660.74
2015	50-603061	128	1041.01
2015	50-603061	228	2681.66
2015	50-603061	228	2371.54
2015	50-603061	347	16,242.9
2015	50-603061	347	3348.83
2015	50-603061	450	19,274.8
2015	50-603062	217	892.3
2015	50-603063	25	685.927
2015	50-603063	128	2132.99
2015	50-603063	128	2126.93
2015	50-603063	228	2301.65
2015	50-603063	228	2435.11
2015	50-603063	347	8133.76
2015	50-603063	347	3496.8
2015	50-603063	450	2070.15
2015	50-603063	450	3375.49
2015	50-603064	113	403.725
2015	50-603064	113	1547.81
2015	50-603064	214	323.549
2015	50-603064	214	1344.59
2015	50-603064	332	1096.19
2015	50-603064	332	1222.18
2015	50-603383	26	110,335
2015	50-603383	26	234,977
2015	50-603383	139	1,047,890
2015	50-603383	139	3,006,620
2015	50-603383	244	226,926
2015	50-603383	244	609,378
2015	50-603383	359	219,380

Table C-5.0-15 (continued)

Sampling Year	Borehole ID	Sample Depth (ft)	Analytical Result (pCi/L)
2015	50-603383	359	618,200
2015	50-603383	450	176,804
2015	50-603383	450	626,713
2015	50-603468	233	615.938
2015	50-603470	83	1,291,780
2015	50-603470	83	3,478,570
2015	50-603470	203	299.325
2015	50-603470	203	1741.5
2015	50-603470	278	269.617
2015	50-603470	278	1094.58
2015	50-603470	351	268.699
2015	50-603470	351	800.617
2015	50-603471	Unknown*	22,311.1
2015	50-603471	Unknown*	49,510
2015	50-603471	90	6400.72
2015	50-603471	90	15,389.3
2015	50-603471	209	4078.61
2015	50-603471	209	14,911.6
2015	50-603471	288	3252.4
2015	50-603471	288	11,386.7
2015	50-603471	360	6665.45
2015	50-603471	360	23,817.1
2015	50-603471	450	5721.68
2015	50-603471	450	17,054.9
2015	50-603472	27	565,730
2015	50-603472	27	893,484
2015	50-603472	146	429.919
2015	50-603472	146	2112.76
2015	50-603472	292	2699.96
2015	50-603472	292	3327.76
2015	50-603472	364	1200.18
2015	50-603472	364	1954.89
2015	50-603472	450	239.492
2015	50-603472	450	11,874.2
2015	50-603503	133	1823.19

Table C-5.0-15 (continued)

Sampling Year	Borehole ID	Sample Depth (ft)	Analytical Result (pCi/L)
2015	50-603503	133	1008.53
2015	50-603503	237	1739.17
2015	50-603503	237	1458.54
2015	50-613182	550	15,177.3
2015	50-613182	550	1460.23
2015	50-613182	632.5	618.256
2015	50-613183	550	328.377
2016	50-24784	155	2142.35
2016	50-24784	155	482.06
2016	50-24784	244	1937.64
2016	50-24784	244	522.04
2016	50-24784	362	2960.00
2016	50-24784	362	246.91
2016	50-24784	450	2539.61
2016	50-24784	450	263.12
2016	50-24813	25	991.07
2016	50-24813	150	108,124.00
2016	50-24813	150	132,949.00
2016	50-24813	241	1729.75
2016	50-24813	241	963.03
2016	50-24813	358	810.30
2016	50-24822	25	431.52
2016	50-24822	142	620.04
2016	50-24822	235	314.39
2016	50-603061	128	1112.66
2016	50-603061	128	927.79
2016	50-603061	228	2076.29
2016	50-603061	228	2148.34
2016	50-603061	347	2646.59
2016	50-603061	347	2616.13
2016	50-603062	217	1658.57
2016	50-603062	450	1088.92
2016	50-603063	25	677.93
2016	50-603063	128	57,423.10
2016	50-603063	128	1013.05

Table C-5.0-15 (continued)

Sampling Year	Borehole ID	Sample Depth (ft)	Analytical Result (pCi/L)
2016	50-603063	228	1476.07
2016	50-603063	228	826.11
2016	50-603063	347	2726.85
2016	50-603063	347	606.87
2016	50-603063	450	3989.44
2016	50-603063	450	1676.20
2016	50-603064	113	2022.47
2016	50-603064	214	1095.86
2016	50-603064	332	2016.84
2016	50-603064	332	1236.39
2016	50-603383	26	190,954.00
2016	50-603383	26	164,789.00
2016	50-603383	139	2,070,170.00
2016	50-603383	139	2,088,090.00
2016	50-603383	244	375,777.00
2016	50-603383	244	432,558.00
2016	50-603383	359	581,957.00
2016	50-603383	359	414,190.00
2016	50-603383	450	502,209.00
2016	50-603383	450	452,293.00
2016	50-603470	83	2,984,470.00
2016	50-603470	83	2,596,820.00
2016	50-603470	203	1199.43
2016	50-603470	203	1366.05
2016	50-603470	278	908.11
2016	50-603470	278	718.19
2016	50-603470	351	954.45
2016	50-603470	351	764.23
2016	50-603470	450	627.03
2016	50-603471	Unknown*	39,284.30 (J)
2016	50-603471	Unknown*	39,023.60
2016	50-603471	90	14,855.10 (J)
2016	50-603471	90	11,572.30
2016	50-603471	209	10,864.30 (J)
2016	50-603471	209	5047.56

Table C-5.0-15 (continued)

Sampling Year	Borehole ID	Sample Depth (ft)	Analytical Result (pCi/L)
2016	50-603471	288	10,804.20 (J)
2016	50-603471	288	6328.06
2016	50-603471	360	12,478.70 (J)
2016	50-603471	360	10,363.00
2016	50-603471	450	15,069.50 (J)
2016	50-603471	450	14,612.80
2016	50-603472	27	931,818.00
2016	50-603472	27	374,060.00
2016	50-603472	146	4196.54
2016	50-603472	146	1202.89
2016	50-603472	292	4172.43
2016	50-603472	292	7789.36
2016	50-603472	364	4401.78
2016	50-603472	364	1486.42
2016	50-603472	450	4116.18
2016	50-603472	450	1582.30
2016	50-603503	133	1062.54
2016	50-603503	133	264.06
2016	50-603503	237	1149.27
2016	50-603503	237	269.46
2016	50-603503	347	812.47
2016	50-613182	550	785.65
2016	50-613182	632.5	683.16
2017	50-24784	155	487.50
2017	50-24784	155	934.16
2017	50-24784	244	1008.40
2017	50-24784	244	670.02
2017	50-24784	362	820.92
2017	50-24784	362	572.60
2017	50-24784	450	1031.49
2017	50-24784	450	595.66
2017	50-24813	25	564.39
2017	50-24813	150	42,244.90
2017	50-24813	150	46,250.80
2017	50-24813	241	504.76

Table C-5.0-15 (continued)

Sampling Year	Borehole ID	Sample Depth (ft)	Analytical Result (pCi/L)
2017	50-24813	241	450.08
2017	50-24813	358	395.76
2017	50-24813	450	314.59
2017	50-24813	600	318.08
2017	50-24822	25	449.52
2017	50-24822	142	430.27
2017	50-24822	235	292.91
2017	50-24822	351	268.41
2017	50-24822	351	224.04
2017	50-24822	450	284.43
2017	50-603061	128	421.67
2017	50-603061	128	316.62
2017	50-603061	228	722.13
2017	50-603061	228	712.07
2017	50-603061	347	975.25
2017	50-603061	347	1114.11
2017	50-603061	450	213.18
2017	50-603063	128	3460.30 (J+)
2017	50-603063	128	341.68
2017	50-603063	228	706.57 (J+)
2017	50-603063	228	677.36
2017	50-603063	347	1966.48 (J+)
2017	50-603063	347	474.40
2017	50-603063	450	534.39 (J+)
2017	50-603063	450	392.79
2017	50-603064	113	440.53
2017	50-603064	214	341.93
2017	50-603064	332	528.77
2017	50-603064	332	635.34
2017	50-603383	26	89,829.20
2017	50-603383	26	111,753.00
2017	50-603383	139	730,930.00
2017	50-603383	139	698,136.00
2017	50-603383	244	95,566.70
2017	50-603383	244	100,398.00

Table C-5.0-15 (continued)

Sampling Year	Borehole ID	Sample Depth (ft)	Analytical Result (pCi/L)
2017	50-603383	359	194,954.00
2017	50-603383	359	128,701.00
2017	50-603383	450	160,498.00
2017	50-603383	450	108,054.00
2017	50-603467	244	262.33
2017	50-603467	360	220.72
2017	50-603468	142	678.44
2017	50-603468	142	313.59
2017	50-603468	233	346.25
2017	50-603468	233	222.29
2017	50-603468	403	238.54
2017	50-603470	83	278.53
2017	50-603470	83	1,326,830.00
2017	50-603470	203	227.18
2017	50-603470	203	365.53
2017	50-603470	278	222.13
2017	50-603470	351	385.34
2017	50-603470	351	255.05
2017	50-603470	650	680.64
2017	50-603471	Unknown*	17,598.70
2017	50-603471	Unknown*	17,518.10
2017	50-603471	90	4903.43
2017	50-603471	90	5057.68
2017	50-603471	209	1701.31
2017	50-603471	209	2494.67
2017	50-603471	288	25,076.10
2017	50-603471	288	2932.95
2017	50-603471	360	3574.32
2017	50-603471	360	52,970.10
2017	50-603471	450	4095.55
2017	50-603471	450	4740.16
2017	50-603472	27	318,329.00
2017	50-603472	27	595,093.00
2017	50-603472	146	992.14
2017	50-603472	146	502.91

Table C-5.0-15 (continued)

Sampling Year	Borehole ID	Sample Depth (ft)	Analytical Result (pCi/L)
2017	50-603472	292	1247.47
2017	50-603472	292	1262.88
2017	50-603472	364	512.47
2017	50-603472	364	605.05
2017	50-603472	450	885.35
2017	50-603472	450	3240.91
2017	50-603503	133	699.72
2017	50-603503	133	451.32
2017	50-603503	237	547.64
2017	50-603503	237	431.90
2017	50-613182	550	483.75
2017	50-613182	550	486.78
2017	50-613182	632.5	236.04
2017	50-613183	642.5	39,737.90
2017	50-613184	500	269.39
2017	50-613185	235	413.30
2017	50-613185	350	296.65

Note: Data qualifiers are defined in Appendix A.

*The unknown port could be at 30 ft or it could be at 90 ft and the one labeled 90 ft could actually be the 30-ft port. During the sampling, the sampling team was unable to determine the actual depth, which is why both ports were sampled.

Tier 1 screening level for tritium is 20,000 pCi/L.

Table C-5.0-16
Tritium Detected in Vapor Samples in MDA C in 2019

Borehole ID	Sample Depth (ft)	Analytical Result (pCi/L) First Round	Analytical Result (pCi/L) Second Round
50-24784	155	925	2077
50-24784	244	923	1860
50-24784	362	673	2318
50-24784	450	269	1041
50-24813	25	2800	636
50-24813	150	38,745	33,642
50-24813	241	558	1874
50-24813	358	—[a]	702
50-24813	450	—	573
50-24813	600	—	—
50-24822	25	659	247
50-24822	142	—	527
50-24822	235	—	387
50-24822	351	780	—
50-24822	450	—	—
50-603161	25	—	—
50-603061	128	1367	—
50-603061	228	1363	701
50-603061	347	1551	821
50-603061	450	—	257
50-603062	122	—	1594
50-603062	217	—	—
50-603062	337	—	—
50-603062	450	—	3773
50-603063	25	5360	331
50-603063	128	10,760	1311
50-603063	228	10,227	2420
50-603063	347	2219	25,875
50-603063	450	5894	1442
50-603064	113	281	113,187
50-603064	214	698	588
50-603064	332	—	327
50-603064	500	—	—
50-603383	26	68,652	50,560
50-603383	139	175,629	168,348

Table C-5.0-16 (continued)

Borehole ID	Sample Depth (ft)	Analytical Result (pCi/L) First Round	Analytical Result (pCi/L) Second Round
50-603383	244	92,722	46,297
50-603383	359	107,526	70,424
50-603383	450	88,638	73,487
50-603467	143	—	—
50-603467	244	—	269
50-603467	360	—	369
50-603467	500	—	—
50-603467	600	—	538
50-603468	142	—	—
50-603468	233	—	306
50-603468	354	—	363
50-603468	403	—	517
50-603470	83	673,577	882,380
50-603470	203	420	823
50-603470	278	831	4041
50-603470	351	1757	633
50-603470	450	—	468
50-603470	650	—	—
50-603471	Unknown[b]	4296	11,825
50-603471	90	3674	4948
50-603471	209	2099	3384
50-603471	288	1915	4171
50-603471	360	1139	2344
50-603471	450	51,742	4848
50-603472	27	135,699	473,917
50-603472	146	567	893
50-603472	292	511	2512
50-603472	364	427	1330
50-603472	450	411	824
50-603503	133	2562	827
50-603503	237	2169	820
50-603503	347	1205	300
50-603503	450	1331	444
50-613182	550	—	472
50-613182	632.5	727	492
50-613183	550	—	317
50-613183	642.5	—	—
50-613184	500	—	—

Table C-5.0-16 (continued)

Borehole ID	Sample Depth (ft)	Analytical Result (pCi/L) First Round	Analytical Result (pCi/L) Second Round
50-613184	600	—	—
50-613184	664.5	—	—
50-613185	145	—	—
50-613185	235	—	—
50-613185	350	—	—
50-613185	450	—	—
50-613185	600	—	—

Note: Tier 1 screening level for tritium is 20,000 pCi/L.

[a] — = The analyte was analyzed for but not detected.

[b] Port was not labeled with the port depth.

Appendix D

Characteristics of the Trichloroethene Vapor Plume

D-1.0 INTRODUCTION

This appendix describes the nature and extent of the vapor-phase trichloroethene (TCE) plume within the vadose zone beneath Material Disposal Area (MDA) C at Los Alamos National Laboratory. Specifically, it investigates the characteristics of the plume by assessing the current distribution of soil-vapor concentrations to answer questions such as the following:

- How stable is the plume? (Is it growing or receding?)
- Which sampling ports exceed the Tier 1 and Tier 2 screening levels (i.e., how large is the affected area?)
- What are the lateral and vertical extent of the plume? (Is it approaching the regional aquifer?)

This detailed plume analysis was warranted by the fact that numerous TCE samples exceeded the Tier 1 screening level (SL) of 2020 µg/m^3 and several exceeded depth-dependent Tier 2 SLs. A discussion of how both Tier 1 and Tier 2 SLs were developed is presented in section 3.2.4 of the report.

The following sections detail how the analytical data (vapor samples collected with SUMMA canisters and analyzed at an analytical laboratory) from the 156 ports listed in Table C-4.1.1 in Appendix C of this report are used to develop a three-dimensional (3-D) model of the TCE vapor-phase plume and how this model is subsequently used to illustrate the extent of TCE contamination beneath MDA C. A baseline plume comprising average data from 2010–2012 is created and used to compare to recent plume measurements to show plume evolution through time.

D-2.0 METHODOLOGY

D-2.1 Data Evaluation

Baseline Plume: First, the creation of a baseline plume spanning fiscal year (FY) 2010 through FY 2012 is described. The evaluation began with an analysis of the data through time to determine the most appropriate technique for representing the baseline vapor plume. Data from FY 2010 through FY 2012 are compiled in Table D-2.1.1, which juxtaposes for each sampling port the vapor-phase TCE concentrations detected in each of the nine quarters between second quarter FY 2010 and second quarter FY 2012. This reorganization of the data reveals that not all ports were sampled in all nine quarters because of the varying sampling strategies imposed during each event. Only half the ports were sampled in at least seven of the nine quarters. Sampling frequency was 80% to 95% for the majority of FY 2010 and FY 2011 but dropped to 30% to 80% during FY 2012 and was only 50% during the most recent quarter.

The data were analyzed to determine whether an average of all nine quarters from FY 2010–FY 2012 could legitimately be used to include all 156 ports as input to the 3-D model. Of the regularly sampled ports mentioned above, approximately two-thirds have a coefficient of variation (CV) less than 0.5 (the dispersion in the data is relatively low compared with the mean). In other words, the concentrations at these locations appear relatively stable through time for the majority of sampling ports with an abundance of data. Some locations appear to have a subtle increasing trend through time, while others appear to have a subtle decreasing trend through time. Most locations exhibit small oscillations in concentrations. The magnitude of these oscillations is greater at locations for which the CV is greater than 0.5 and masks any temporal trends that might be present at these locations. Data from sampling ports with fewer than seven rounds of data were more difficult to interpret. The analysis of the data suggests an average of all nine quarters is an acceptable means of improving confidence in the model by increasing the sample population.

It should be noted first, however, approximately 25% of the sampling ports exhibit concentrations during the first and second quarters of FY 2011 that are more than an order of magnitude lower than concentrations in both the preceding and subsequent sampling rounds. This apparent bias is obvious in the 17 ports exhibiting this phenomenon that were sampled in at least seven of the nine quarters. All 47 samples exhibiting anomalously low concentrations were collected during the 2.5-month period (November 5, 2010, to January 13, 2011) during which Phase III vapor-well drilling activities occurred. Dilution caused by loss of air into the subsurface during drilling is the suspected reason for the apparent bias in these results. These samples were omitted from the data set (a conservative measure to prevent a low bias) before analysis of the temporal trend.

A Mann-Kendall analysis was performed to confidently determine whether the vapor plume was stable enough over the nine quarters defining the baseline period of time to allow the average concentrations at each port to be used as input to the 3-D model. The Mann-Kendall test is a nonparametric trend test developed to handle data exhibiting skewed distributions, irregular sampling frequency, data gaps, and even seasonal effects if enough years of data are available. With the exception of the biased samples noted above, the MDA C vapor-phase concentrations through time for all 156 sampling ports were used as input to the U.S. Environmental Protection Agency's ProUCL 4.1.00 software (https://www.epa.gov/sites/production/files/2015-03/documents/proucl_v4.1_user.pdf and https://www.epa.gov/sites/production/files/2015-03/documents/proucl_v4.1_tech.pdf). ProUCL employs a modification to the Mann-Kendall trend tool designed to handle nondetected data. The primary output of the Mann-Kendall analysis is the standardized "S" statistic. The sign of this value indicates whether the trend at a particular port is increasing or decreasing, and the magnitude of the value is a measure of the strength of the trend. The program uses this value, along with a level of confidence based on the number of samples, to determine if the result is statistically significant. Table D-2.1.2 lists the results of the Mann-Kendall analysis based on a 95% level of confidence. At the 95% confidence level, only 14% of the sampling ports exhibited a statistically significant trend. Several of these ports exhibited an increasing trend, but the overall lack of ports exhibiting any trend is strong evidence the plume is relatively stable. The nine-quarter averages were consequently deemed sufficient representations of the plume baseline.

The average concentrations for each sampling port were used as input to a 3-D interpolation process to better visualize the horizontal and vertical extents of the vapor plume as well as the concentration gradients from the center of the site outward.

D-2.2 Plume Interpolation

For visualizing the plume, concentrations are mapped onto three views using the EarthVision software package. The first view is a map-view showing contours that follow the highest concentration seen at any depth in each well. The baseline plume FY 2010–FY 2012 plume images use the average values discussed above. For FY 2019, there are only two rounds of sampling and the maximum value from either sampling round was used to create a maximum plume interpolation.

D-3.0 RESULTS

This section presents the interpolated 3-D vapor-plume distributions for TCE vapor concentrations (Figure D-3.0-1). Plan-view maps illustrating the lateral extent of TCE are shown at the top of this figure. Two cross-sections (A-A´ and B-B´) are shown below each map-view. The cross-sections follow existing wells and are shown on the map-view images. The left side of Figure D-3.0-1 shows the baseline plume measured in FY 2010–FY 2012. The right side of Figure D-3.0-1 shows the maximum measured plume from FY 2019 sampling. Immediately apparent is that very little has changed in the extent of the plume over this time period.

The TCE plume is ellipsoidal, with the lateral extent being greater than the vertical extent. The plume is also asymmetric with the greater extent parallel to the axis of the mesa.

The plume is almost entirely contained within the Bandelier Tuff, with the majority constrained to the Tshirege Member that makes up the upper 300 ft of the Bandelier Tuff at MDA C. The highest concentrations of TCE reside in unit 1g, which represents a transition zone from extremely dry tuff within unit 1g and units above to slightly wetter conditions in the underlying Cerro Toledo interval and Otowi Member units (Table D-3.0-1). This finding suggests the elevated moisture in the Cerro Toledo interval and the Otowi Member may hinder vapor transport vertically downward, resulting in a greater extent in the Tshirege Member tuff units than in underlying units. This is consistent with diffusion theory and experimental results (Millington and Quirk 1961, 110521) showing gas phase diffusion being reduced by lower air-filled porosity. Diffusion reductions caused by lower air-filled porosity have been successfully used at MDA L to match plume behavior over 30 yr (Stauffer et al. 2005, 090537).

One area of change from the baseline FY 2010–FY 2012 is that in FY 2019, concentrations beneath the source area appear to be dropping from the plume core (200–300 ft deep) to the surface. This observation is consistent with no further significant leakage from the source area. Figure D-3.0-2 shows this in an X-Y plot for data spanning November 2011 through January 2020.

Table D-3.0-2 indicates that nearly a third of the FY 2019 sample concentrations are less than 10% of the screening value for porous media flow, while nearly 20% of the sample concentrations are below 10% of the Tier 2 fracture flow values. These samples are primarily from vapor wells that form the perimeter of the monitoring network, and a few are from the shallowest and deepest depths of more centrally located wells. Two-thirds of the 2019 maximum concentrations are less than 50% of the Tier 2 porous media screening value and are distributed across all site vapor wells and a variety of depths. Only seven sampling ports have average concentrations greater than 80% of the Tier 2 porous media screening value, and only four of these exceed the screening value. All four Tier 2 porous media screening exceedances are located in the center of the site between 241 ft and 360 ft below ground surface (bgs). One is from vapor-monitoring well 50-24813 (241 ft bgs), one in well 50-603470 (278 ft bgs), and two in well 50-603471 (288 ft bgs and 360 ft bgs). These ratios indicate a pattern of TCE concentrations that decrease radially from the center of the site outward as well as vertically away from the 200-ft- to 300-ft-depth zone.

D-4.0 SUMMARY

TCE data collected from vapor-monitoring wells within and around MDA C were screened using a two-tiered process to evaluate potential for contamination of groundwater. The results of this screening indicate levels of contamination currently found in the subsurface at MDA C do not present a risk to groundwater. This conclusion is consistent with the results of groundwater sampling performed at regional wells R-46 and R-60, both downgradient of MDA C. Concentrations of TCE within the center of the TCE plume exceed Tier 1 and Tier 2 SLs, but these high concentration levels are not found in the lower stratigraphic units through which transport to the regional aquifer would have to occur.

The subsurface TCE data were also evaluated to estimate the dimensions of the subsurface plume. This evaluation shows the lateral and vertical extent of the TCE plume to be defined by the existing vapor-monitoring well network. Most of the TCE is present in the upper stratigraphic units (i.e., above the Cerro Toledo interval). This distribution of mass is consistent with the conceptual model of vapor diffusion through the lower units being impeded by the relatively higher moisture content of these units. Finally, very little change in the extent of the plume has been observed during the last decade, with no evidence of increased leakage from the source region.

D-5.0 REFERENCES

The following reference list includes documents cited in this appendix. Parenthetical information following each reference provides the author(s), publication date, and ERID, ESHID, or EMID. This information is also included in text citations. ERIDs were assigned by the Laboratory's Associate Directorate for Environmental Management (IDs through 599999); ESHIDs were assigned by the Laboratory's Associate Directorate for Environment, Safety, and Health (IDs 600000 through 699999); and EMIDs are assigned by Newport News Nuclear BWXT-Los Alamos, LLC (N3B) (IDs 700000 and above). IDs are used to locate documents in N3B's Records Management System and in the Master Reference Set. The NMED Hazardous Waste Bureau and N3B maintain copies of the Master Reference Set. The set ensures that NMED has the references to review documents. The set is updated when new references are cited in documents.

Hollis, D., E. Vold, R. Shuman, K.H. Birdsell, K. Bower, W.R. Hansen, D. Krier, P.A. Longmire, B. Newman, D.B. Rogers, and E.P. Springer, March 27, 1997. "Performance Assessment and Composite Analysis for Los Alamos National Laboratory Material Disposal Area G," Rev. 2.1, Los Alamos National Laboratory document LA-UR-97-85, Los Alamos, New Mexico. (Hollis et al. 1997, 063131)

Millington, R.J., and J.P. Quirk, 1961. "Permeability of Porous Solids," *Transactions of the Faraday Society,* Vol. 57, pp. 1200–1207. (Millington and Quirk 1961, 110521)

Springer, E.P., 2005. "Statistical Exploration of Matrix Hydrologic Properties for the Bandelier Tuff, Los Alamos, New Mexico," *Vadose Zone Journal,* Vol. 4, pp. 505–521. (Springer 2005, 098534)

Stauffer, P.H., K.H. Birdsell, M.S. Witkowski, and J.K. Hopkins, 2005. "Vadose Zone Transport of 1,1,1-Trichloroethane: Conceptual Model Validation through Numerical Simulation," *Vadose Zone Journal,* Vol. 4, pp. 760–773. (Stauffer et al. 2005, 090537)

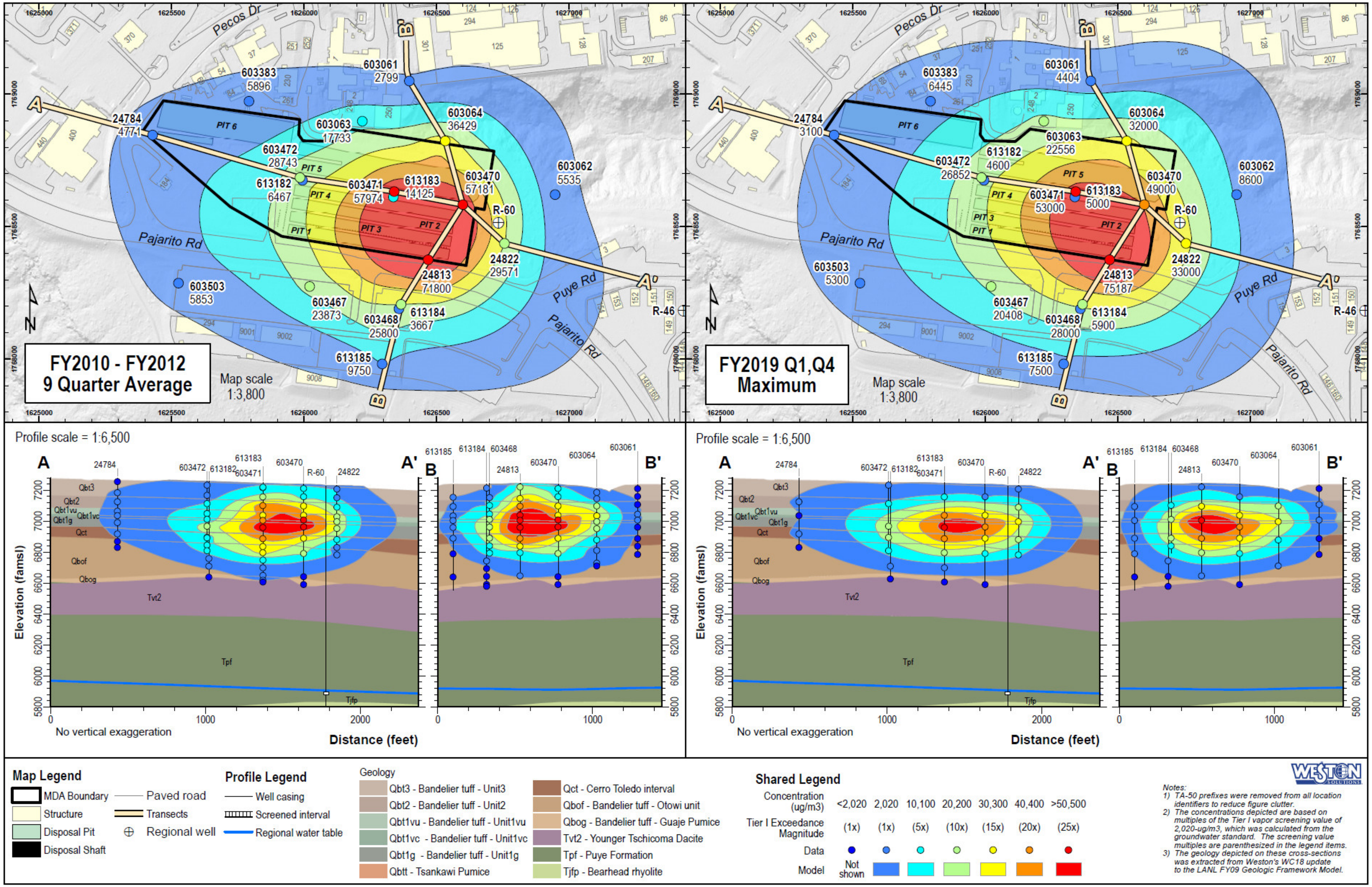


Figure D-3.0-1 Three-dimensional representation of TCE vapor plume beneath MDA C. Figure shows the maximum plume from 2019 compared with the average plume from 2010–2012.

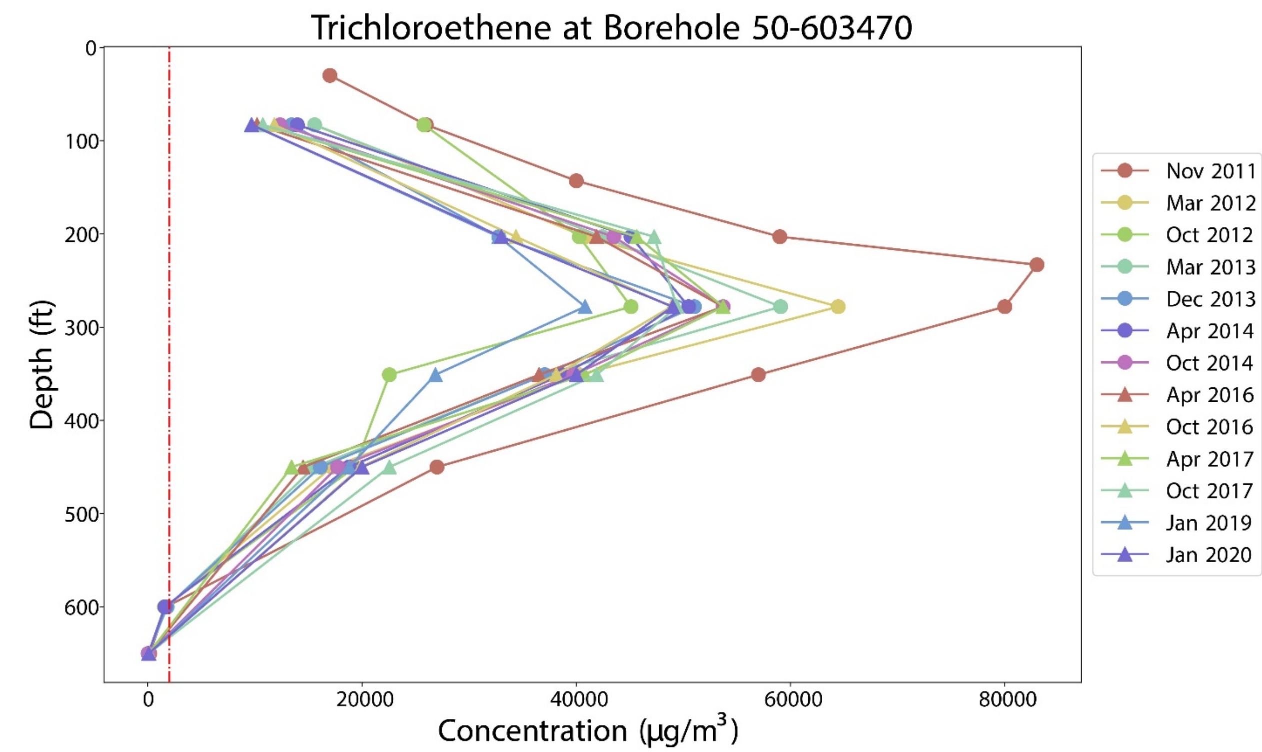


Figure D-3.0-2 TCE concentration versus depth and time for borehole 50-603470. The red dashed line is the Tier I screening level of 2020 µg/m³ for TCE.

Table D-2.1-1
TCE Time-Series Data and Statistics for Each Sample Port used in the 2010–2012 Baseline Plume Analysis

		Results									Statistics						
Location ID	Depth (ft bgs)	FY 2010 Q[a]2	FY 2010 Q3	FY 2010 Q4	FY 2011 Q1	FY 2011 Q2	FY 2011 Q3	FY 2011 Q4	FY 2012 Q1	FY 2012 Q2	Count	Minimum	Maximum	Median	Mean	Standard Deviation	Coefficient of Variation
50-24784	25	1100	1300	900	990	920	1100	—[b]	1100	—	7	900	1300	1100	1059	137	0.13
50-24784	96	3700	2500	2700	2800	2600	3200	—	3300	—	7	2500	3700	2800	2971	439	0.15
50-24784	155	3800	2600	3200	3700	3000	2300	—	4400	3598	8	2300	4400	3399	3325	686	0.21
50-24784	215	5200	4700	4900	5400	5000	3600	—	320	—	7	320	5400	4900	4160	1790	0.43
50-24784	244	6800	4300	4500	5100	4600	630	—	5000	4082	8	630	6800	4550	4377	1731	0.4
50-24784	289	4000	4500	4600	4800	5000	5000	—	5500	—	7	4000	5500	4800	4771	472	0.1
50-24784	362	4300	3900	1800	3000	2600	510	—	3600	2632	8	510	4300	2816	2793	1222	0.44
50-24784	411	1400	1600	1700	2100	1500 (U)	1400	—	1900	—	6	1400	2100	1650	1683	279	0.17
50-24784	450	1000	1200	630	1200	550 (U)	1200	—	1100	1020	7	630	1200	1100	1050	204	0.19
50-24813	25	13,000	12,000	11,000	13,000	37,000	93,000	—	19,000	13,960	8	11,000	93,000	13,480	26,495	28,186	1.06
50-24813	99	31,000	32,000	37 (U)	26,000	42,000	93,000	—	52,000	—	7	0	93,000	32,000	39,429	28,565	0.72
50-24813	150	44,000	37,000	41,000	31,000	39,000	48,000	—	68,000	42,430	8	31,000	68,000	41,715	43,804	10,995	0.25
50-24813	207	67,000	50,000	62,000	1200	1100	39,000	—	130,000	—	5	39,000	130,000	62,000	69,600	35,473	0.51
50-24813	241	67,000	70,000	62,000	15,000	360	15,000	—	120,000	85,930	6	15,000	120,000	68500	69,988	34,210	0.49
50-24813	286	62,000	33,000	75,000	1300	9900	79,000	—	110,000	—	5	33,000	110,000	75,000	71,800	27,941	0.39
50-24813	358	19,000	46,000	45,000	120	43,000	52,000	32,000	70,000	53,700	8	19,000	70,000	45,500	45,088	15,117	0.34
50-24813	408	35,000	60,000	43,000	32,000	15,000	36,000	31,000	50,000	—	8	15,000	60,000	35,500	37,750	13,520	0.36
50-24813	450	6000	23,000	3900	5300	13,000	16,000	3800	27,000	24,700	9	3800	27,000	13,000	13,633	9447	0.69
50-24813	600	430	2400	2400	12	170	3100	2100	3600	2632	7	430	3600	2400	2380	996	0.42
50-24822	25	4100	32000	6100	7000	6100	1500	—	8900	8056	8	1500	32,000	6550	9220	9491	1.03
50-24822	81	12,000	11,000	11,000	11,000	—	2400	—	9900	—	6	2400	12,000	11,000	9550	3565	0.37
50-24822	142	29,000	14,000	19,000	9000	500	1100	—	28,000	25,240	7	1100	29,000	19,000	17,906	10,464	0.58
50-24822	204	17,000	33,000	32,000	28,000	28,000	33,000	—	36,000	—	7	17,000	36,000	32,000	29,571	62,41	0.21
50-24822	235	27,000	6000	32,000	32,000	32,000	6900	—	50,000	40,820	8	6000	50,000	32,000	28,340	15,239	0.54
50-24822	280	30,000	27,000	30,000	32,000	17,000	28,000	—	42,000	—	7	17,000	42,000	30,000	29,429	7390	0.25
50-24822	351	5700	17,000	17,000	14,000	11	18,000	—	26,000	22,020	7	5700	26,000	17,000	17,103	6375	0.37
50-24822	402	11,000	14,000	3.2 (U)	—	—	2.1 (U)	—	6900	—	5	0	14,000	6900	6380	6346	0.99
50-24822	450	2400	10,000	9300	11,000	—	4300	—	13,000	10,740	7	2400	13,000	10,000	8677	3852	0.44
50-603061	25	160	250	370	290	380	390	—	—	526.3	7	160	526.3	370	338	117	0.35
50-603061	76	1800	1900	1200	1900	1900	5.1	—	—	—	6	5.1	1900	1850	1451	759	0.52
50-603061	128	42	2400	1700	2500	2500	580	—	—	2793	7	42	2793	2400	1788	1073	0.6
50-603061	190	2100	1800	2000	4000	3700	38	—	—	—	6	38	4000	2050	2273	1438	0.63
50-603061	228	3300	2800	3400	3200	2700	3600	—	—	590.8	7	590.8	3600	3200	2799	1025	0.37
50-603061	274	1100	2100	2100	2000	1500	1600	—	—	—	6	1100	2100	1800	1733	403	0.23
50-603061	347	470	1100	1200	1200	1000	2100	—	—	1343	7	470	2100	1200	1202	485	0.4

Table D-2.1-1 (continued)

Location ID	Depth (ft bgs)	Results									Statistics						
		FY 2010 Q[a]2	FY 2010 Q3	FY 2010 Q4	FY 2011 Q1	FY 2011 Q2	FY 2011 Q3	FY 2011 Q4	FY 2012 Q1	FY 2012 Q2	Count	Minimum	Maximum	Median	Mean	Standard Deviation	Coefficient of Variation
50-603061	397	610	1600	1200	960	1300	760	—	—	—	6	610	1600	1080	1072	366	0.34
50-603061	450	180	500	620	550	390	650	—	—	483.3	7	180	650	500	482	159	0.33
50-603062	25	1700	1700	1600	1200	1400	1500	—	—	—	6	1200	1700	1550	1517	194	0.13
50-603062	64	890	2100	2900	2400	7400	2400	—	—	—	6	890	7400	2400	3015	2252	0.75
50-603062	122	2700	3900	6700	7200 (J)	6100	5700	—	—	6445	7	2700	7200	6100	5535	1634	0.3
50-603062	184	1800	8300	8000	5900	6000	85 (U)	—	—	—	6	0	8300	5950	5000	3375	0.67
50-603062	217	2300	8400	4800	5700	1100	5800	—	—	8056	7	1100	8400	5700	5165	2720	0.53
50-603062	263	970	4400	4000	6300	5700	4700	—	—	—	6	970	6300	4550	4345	1860	0.43
50-603062	337	14	2400	2000	1900	1400	2000	—	—	2041	7	14	2400	2000	1679	791	0.47
50-603062	387	680	1100	1700	1900	1700	1000	—	—	—	6	680	1900	1400	1347	486	0.36
50-603062	450	140	500	660	700	320	580	—	—	590.8	7	140	700	580	499	201	0.4
50-603063	25	1000	1800	960	2100	1700	6300	—	—	1611	7	960	6300	1700	2210	1851	0.84
50-603063	76	4200	7200	5600	5400	6500	7400	—	—	—	6	4200	7400	6050	6050	1216	0.2
50-603063	128	3500	5700	2700	9600	8700	11,000	—	—	10,740	7	2700	11,000	8700	7420	3436	0.46
50-603063	190	9400	16,000	18,000	22,000	20,000	220	—	—	—	6	220	22,000	17,000	14,270	8132	0.57
50-603063	228	7400	17,000	5500	22,000	3.3	9700	—	—	25,240	6	5500	25,240	13,350	14,473	8152	0.56
50-603063	274	7400	20,000	18,000	25,000	22,000	14,000	—	—	—	6	7400	25,000	19,000	17,733	6276	0.35
50-603063	347	2900	8700	2900	9900	4600	7500	—	—	12,890	7	2900	12,890	7500	7056	3777	0.54
50-603063	397	2400	9300	—	—	910	5800	—	—	—	3	2400	9300	5800	5833	3450	0.59
50-603063	450	1700	8600	6700	8200	8400	7900	—	—	8593	7	1700	8600	8200	7156	2494	0.35
50-603064	25	4600	3300	3700	3600	3900	2600	—	4100	—	7	2600	4600	3700	3686	631	0.17
50-603064	66	5100	3300	9000	7300	3700	7000	—	8400	—	7	3300	9000	7000	6257	2250	0.36
50-603064	113	2900	18,000	23,000	28,000	31,000	32,000	—	29,000	24,700	8	2900	32,000	26,350	23,575	9526	0.4
50-603064	176	20,000	45,000	24,000	40,000	34,000	39,000	—	53,000	—	7	20,000	53,000	39,000	36,429	11,530	0.32
50-603064	214	11,000	5700	32,000	36,000	3800	37,000	—	34,000	34,900	8	3800	37,000	33,000	24,300	14,673	0.6
50-603064	259	8200	17,000	28,000	27,000	21,000	30,000	—	35,000	—	7	8200	35,000	27,000	23,743	9029	0.38
50-603064	332	8600	9500	12,000	13,000	11,000	7200	—	16,000	12,900	8	7200	16,000	11,500	11,275	2815	0.25
50-603064	482	3600	2000	8200	8700	4800	6500	—	9000	—	7	2000	9000	6500	6114	2723	0.45
50-603064	500	290	1200	1200	1600	1500	600	—	1500	1400	8	290	1600	1300	1161	471	0.41
50-603383	26	180	1100	910	690	2000	2400	1100	1800	698	9	180	2400	1100	1209	716	0.59
50-603383	85	1200	2200	2400	2600	1900	2800	2700	3100	—	8	1200	3100	2500	2363	597	0.25
50-603383	139	3600	4500	4100	5200	250	1100	3700	4900	4990	8	1100	5200	4300	4011	1317	0.33
50-603383	206	2100	4800	7100	6700	4600	2.1 (U)	3100	8700	—	8	0	8700	4700	4638	2858	0.62
50-603383	244	2200	6500	6700	510	5900	6400	4800	9300	5370	8	2200	9300	6150	5896	2000	0.34
50-603383	286	1100	2700	3900	3300	190 (U)	1300	4600	5100	—	7	1100	5100	3300	3143	1545	0.49
50-603383	359	80	18 (J-)	29	4000	300	1500	91	55	1400	9	18	4000	91	830	1328	1.6
50-603383	408	520	1100	1800	1400	1500	1600	140	1300	—	8	140	1800	1350	1170	567	0.48

Table D-2.1-1 (continued)

Location ID	Depth (ft bgs)	Results									Statistics						
		FY 2010 Q[a]2	FY 2010 Q3	FY 2010 Q4	FY 2011 Q1	FY 2011 Q2	FY 2011 Q3	FY 2011 Q4	FY 2012 Q1	FY 2012 Q2	Count	Minimum	Maximum	Median	Mean	Standard Deviation	Coefficient of Variation
50-603383	450	110	220	2000	—	1500	2700	1200	1500	1340	8	110	2700	1420	1321	855	0.65
50-603467	26	3500	2700	5900	9400	9400 (U)	6300	—	—	—	5	2700	9400	5900	5560	2638	0.47
50-603467	91	4900	12,000	13,000	7400	12,000	12,000	—	—	—	6	4900	13,000	12,000	10,217	3271	0.32
50-603467	143	12,000	12,000	15,000	18,000	18,000 (U)	16,000	—	—	15,040	6	12,000	18,000	15,020	14,673	2339	0.16
50-603467	206	7700	25,000	24,000	25,000	11,000	25,000	—	—	—	6	7700	25,000	24,500	19,617	8030	0.41
50-603467	244	8000	24,000	31,000	26,000	20,000 (U)	29,000	—	—	25,240	6	8000	31,000	25,620	23,873	8191	0.34
50-603467	287	7900	—	33,000	22,000	8800 (J-)	21,000	—	—	—	5	7900	33,000	21,000	18,540	10,431	0.56
50-603467	360	12,000	19,000	24,000	26,000	12,000 (U)	11,000	—	—	30,610	6	11,000	30,610	21,500	20,435	7867	0.38
50-603467	409	1900	7600	18,000	15,000	7200	11,000	—	—	—	6	1900	18,000	9300	10,117	5816	0.57
50-603467	500	1000	5500	8100	8100	6000	3300	—	—	6982	7	1000	8100	6000	5569	2615	0.47
50-603467	600	530	1500	8500	3700	3400 (J-)	4300	—	—	3383	7	530	8500	3400	3616	2531	0.7
50-603468	30	28	—	—	—	—	—	—	—	—	1	28	28	28	28	na[c]	na
50-603468	92	2900	9200	6400	5700	33	5300	—	12,000	—	6	2900	12,000	6050	6917	3211	0.46
50-603468	142	1500	6400	3900	5500	55	12,000	—	37,000	10,200	7	1500	37,000	6400	10,929	12,039	1.1
50-603468	198	6400	18,000	19,000	20,000	11,000	24,000	—	35,000	—	7	6400	35,000	19,000	19,057	9181	0.48
50-603468	233	7600	27,000	23,000	23,000	21	26,000	—	37,000	29,000	7	7600	37,000	26,000	24,657	8897	0.36
50-603468	282	5600	23,000	22,000	23,000	23,000	29,000	—	55,000	—	7	5600	55,000	23,000	25,800	14,770	0.57
50-603468	354	7600	24,000	25,000	20,000	38,000	34,000	900	43,000	32,760	9	900	43,000	25,000	25,029	13,891	0.56
50-603468	403	4000	19,000	25,000	22,000	19,000	20,000	3700	39,000	27,930	9	3700	39,000	20,000	19,959	11,049	0.55
50-603468	450	6700	12,000	15,000	12,000	15,000	10,000	21,000	23,000	—	8	6700	23,000	13,500	14,338	5456	0.38
50-603470	30	9700	12,000	13,000	14,000	—	13,000	—	17,000	—	6	9700	17,000	13,000	13,117	2400	0.18
50-603470	83	19,000	18,000	18,000	13,000	6000	13,000	—	26,000	15,570	8	6000	26,000	16,785	16,071	5796	0.36
50-603470	143	35,000	32,000	29,000	33,000	41,000	34,000	—	40,000	—	7	29,000	41,000	34,000	34,857	4298	0.12
50-603470	203	48,000	34,000	44,000	9200	12,000	55,000	—	59,000	40,820	8	9200	59,000	42,410	37,753	18,497	0.49
50-603470	233	49,000	53,000	46,000	50,000	2.1 (U)	32,000	—	83,000	—	6	32,000	83,000	49,500	52,167	16,798	0.32
50-603470	278	52,000	61,000	48,000	55,000	39,000	58,000	—	80,000	64,450	8	39,000	80,000	56,500	57,181	12,161	0.21
50-603470	351	10,000	29,000	31,000	37,000	32	25,000	42,000	57,000	40,280	8	10,000	57,000	34,000	33,910	13,796	0.41
50-603470	450	11,000	47,000	17,000	12,000	120	16,000	18,000	27,000	17,190	8	11,000	47,000	17,095	20,649	11,690	0.57
50-603470	600	1200	1400	1800	1700	19	1800	1800	1700	1719	8	1200	1800	1709.5	1640	221	0.13
50-603470	650	14	120 (U)	94	12	13 (U)	35	120	190	80.56	9	0	190	35	61	65	1.08
50-603471	30	18,000	—	—	20,000	5900	—	—	—	—	3	5900	20,000	18,000	14,633	7629	0.52
50-603471	90	27,000	17,000	19,000	28,000	3700	20,000	—	34,000	19,870	7	17,000	34,000	20,000	23,553	6200	0.26
50-603471	146	47,000	27,000	38,000	4300	46,000	63,000	—	68,000	—	6	27,000	68,000	46,500	48,167	15,303	0.32
50-603471	209	41,000	44,000	51,000	48,000	11,000	1800	—	69,000	53,700	8	1800	69,000	46,000	39,938	22,459	0.56
50-603471	242	62,000	50,000	52,000	72,000	12,000	890	—	100,000	—	7	890	100,000	52,000	49,841	34,126	0.68
50-603471	288	48,000	58,000	50,000	70,000	37,000	—	—	73,000	69,820	7	37,000	73,000	58,000	57,974	13,624	0.24
50-603471	360	45,000	43,000	51,000	34,000	24,000	15,000	57,000	—	53,170	8	15,000	57,000	44,000	40,271	14,803	0.37

Table D-2.1-1 (continued)

Location ID	Depth (ft bgs)	Results									Statistics						
		FY 2010 Q[a]2	FY 2010 Q3	FY 2010 Q4	FY 2011 Q1	FY 2011 Q2	FY 2011 Q3	FY 2011 Q4	FY 2012 Q1	FY 2012 Q2	Count	Minimum	Maximum	Median	Mean	Standard Deviation	Coefficient of Variation
50-603471	410	36,000	40,000	38,000	34,000	23,000	21,000	44,000	59,000	—	8	21,000	59,000	37,000	36,875	11981	0.32
50-603471	450	30,000	42,000	35,000	23,000	31,000	31,000	26,000	50,000	39,740	9	23,000	50,000	31,000	34,193	8460	0.25
50-603472	27	4800	4400	4100	3000	3200	3200	—	2300	3330	8	2300	4800	3265	3541	823	0.23
50-603472	93	7400	6000	4600	19	2200	3800	—	9700	—	6	2200	9700	5300	5617	2684	0.48
50-603472	146	13,000	7700	9100	29	11,000	6900	—	7600	17,190	7	6900	17,190	9100	10,356	3703	0.36
50-603472	210	20,000	15,000	17,000	110	7100	14,000	—	6200	—	6	6200	20,000	14,500	13217	5491	0.42
50-603472	247	12,000	9400	9500	7100	3700	10,000	—	41,000	—	7	3700	41,000	9500	13,243	12,517	0.95
50-603472	292	35,000	39,000	31,000	240	—	18,000	—	21,000	28,460	6	18,000	39,000	29,730	28,743	8061	0.28
50-603472	364	17,000	20,000	19,000	910	310	10,000	10,000	17,000	15,570	7	10,000	20,000	17,000	15,510	4031	0.26
50-603472	414	17,000	17,000	15,000	20	15,000	12,000	21,000	27,000	—	7	12,000	27000	17,000	17,714	4923	0.28
50-603472	450	12,000	14,000	14,000	56	11,000	14,000	5900	17,000	12,890	8	5900	17,000	13,445	12,599	3232	0.26
50-603503	25	2800	4200	660	1300	1900	1300	—	—	—	6	660	4200	1600	2027	1285	0.63
50-603503	80	2000	4300	1900	2000	1900	2300	—	—	—	6	1900	4300	2000	2400	942	0.39
50-603503	133	990	4200	1500	2300	2600	2500	—	—	435	7	435	4200	2300	2075	1240	0.6
50-603503	198	1000	4400	4500	2200	5600	3400	—	—	—	6	1000	5600	3900	3517	1683	0.48
50-603503	237	2000	4600	4700	12,000	6600	5700	—	—	5370	7	2000	12,000	5370	5853	3064	0.52
50-603503	278	3200	490	5900	5600	4000	6300	—	—	—	6	490	6300	4800	4248	2193	0.52
50-603503	347	530	2600	1600	1200	1800	1800	—	—	2632	7	530	2632	1800	1737	744	0.43
50-603503	397	70	5200	1300	1100	2100	1600	—	—	—	6	70	5200	1450	1895	1753	0.93
50-603503	450	910	1500	3200	2000	2400	3400	—	—	3115	7	910	3400	2400	2361	943	0.4
50-613182	500	—	—	—	—	—	4500	6100	8800	—	3	4500	8800	6100	6467	2173	0.34
50-613182	550	—	—	—	—	31	3600	4700	4100	3491	4	3491	4700	3850	3973	553	0.14
50-613182	600	—	—	—	—	2.2	5.2	110	48	—	3	5.2	110	48	54	53	0.97
50-613182	620	—	—	—	—	290	2.1 (U)	1200	1500	—	4	0	1500	745	748	716	0.96
50-613182	632.5	—	—	—	—	23 (U)	4.6	2.1 (U)	4.9	6.98	3	4.6	6.98	4.9	5.49	1.30	0.24
50-613183	30	—	—	—	—	14,000	11,000	—	13,000	—	3	11,000	14,000	13,000	12,667	1528	0.12
50-613183	500	—	—	—	—	16,000 (J-)	1500	19,000	20,000	—	4	1500	20,000	17,500	14,125	8587	0.61
50-613183	550	—	—	—	—	6500	15,000	2600	4500	3813	5	2600	15,000	4500	6483	4967	0.77
50-613183	600	—	—	—	—	1400	7000	8300	10,000	—	4	1400	10,000	7650	6675	3725	0.56
50-613183	630	—	—	—	—	1400	7500	2800	3200	—	4	1400	7500	3000	3725	2632	0.71
50-613183	642.5	—	—	—	—	58 (U)	39	93	94	96.67	4	39	96.67	93.5	81	28	0.34
50-613184	30	—	—	—	—	2700 (J-)	2100	—	6200	—	3	2100	6200	2700	3667	2214	0.6
50-613184	500	—	—	—	—	3400	3000	720	4900	4296	5	720	4900	3400	3263	1605	0.49
50-613184	550	—	—	—	—	2000 (J-)	1800	220	2200	—	4	220	2200	1900	1555	905	0.58
50-613184	600	—	—	—	—	680 (J-)	580	1100	880	698.2	5	580	1100	698.2	788	205	0.26
50-613184	652	—	—	—	—	150 (J-)	160	17	320	—	4	17	320	155	162	124	0.77
50-613184	664.5	—	—	—	—	31 (J-)	61	33	120	102	5	31	120	61	69	40	0.58

Table D-2.1-1 (continued)

Location ID	Depth (ft bgs)	Results									Statistics						
		FY 2010 Q[a]2	FY 2010 Q3	FY 2010 Q4	FY 2011 Q1	FY 2011 Q2	FY 2011 Q3	FY 2011 Q4	FY 2012 Q1	FY 2012 Q2	Count	Minimum	Maximum	Median	Mean	Standard Deviation	Coefficient of Variation
50-613185	85	—	—	—	—	—	460	—	4100	—	2	460	4100	2280	2280	2574	1.13
50-613185	145	—	—	—	—	3500	3700	—	5600	5317	4	3500	5600	4508.5	4529	1082	0.24
50-613185	205	—	—	—	—	2.1 (U)	2900	—	9600	—	2	2900	9600	6250	6250	4738	0.76
50-613185	235	—	—	—	—	9.1 (U)	7100	—	10,000	8593	3	7100	10,000	8593	8564	1450	0.17
50-613185	280	—	—	—	—	27	4500	—	15,000	—	2	4500	15,000	9750	9750	7425	0.76
50-613185	350	—	—	—	—	29	3100	3900	4500	4243	4	3100	4500	4071.5	3936	609	0.15
50-613185	450	—	—	—	—	930	1400	1300	52	1719	5	52	1719	1300	1080	640	0.59
50-613185	600	—	—	—	—	110	120	110	140	145	5	110	145	120	125	17	0.13
50-613185	675	—	—	—	—	2.1 (U)	26	37	42	—	3	26	42	37	35	8	0.23
50-613185	688	—	—	—	—	18	16	10	38	—	4	10	38	17	21	12	0.59

Notes: Units are µg/m^3. Data qualifiers are defined in Appendix A. Shading indicates results omitted from analysis because of suspected low bias from drilling effects.

[a] Q = Quarter.

[b] — = Not sampled.

[c] na = Not available.

Table D-2.1-2
Mann-Kendall Trend Analysis Results for the FY 2010–FY 2012 Baseline Plume

Location ID	Depth (ft bgs)	Mann-Kendall Results		
		S Statistic	Confidence	Trend
50-24784	25	na*	na	No Trend
50-24784	96	0.601	73	No Trend
50-24784	155	na	na	No Trend
50-24784	215	-1.202	89	No Trend
50-24784	244	-0.866	81	No Trend
50-24784	289	2.886	100	Increasing
50-24784	362	-1.113	87	No Trend
50-24784	411	0.956	83	No Trend
50-24784	450	na	na	No Trend
50-24813	25	1.247	89	No Trend
50-24813	99	1.502	93	No Trend
50-24813	150	0.866	81	No Trend
50-24813	207	na	na	No Trend
50-24813	241	0.3	62	No Trend
50-24813	286	1.715	96	Increasing
50-24813	358	1.361	91	No Trend
50-24813	408	-0.371	65	No Trend
50-24813	450	0.938	83	No Trend
50-24813	600	1.367	91	No Trend
50-24822	25	0.249	60	No Trend
50-24822	81	-1.812	97	Decreasing
50-24822	142	-0.3	62	No Trend
50-24822	204	1.23	89	No Trend
50-24822	235	1.528	94	No Trend
50-24822	280	0.456	68	No Trend
50-24822	351	1.975	98	Increasing
50-24822	402	−0.735	77	No Trend
50-24822	450	1.202	89	No Trend
50-603061	25	2.703	100	Increasing
50-603061	76	−0.201	58	No Trend
50-603061	128	1.367	91	No Trend
50-603061	190	0	50	No Trend
50-603061	228	−0.601	73	No Trend
50-603061	274	−0.191	58	No Trend
50-603061	347	1.671	95	Increasing
50-603061	397	0	50	No Trend

Table D-2.1-2 (continued)

Location ID	Depth (ft bgs)	Mann-Kendall Results		
		S Statistic	Confidence	Trend
50-603061	450	0.601	73	No Trend
50-603062	25	−1.339	91	No Trend
50-603062	64	1.339	91	No Trend
50-603062	122	0.901	82	No Trend
50-603062	184	−0.751	77	No Trend
50-603062	217	0.601	73	No Trend
50-603062	263	1.127	87	No Trend
50-603062	337	0.456	68	No Trend
50-603062	387	0.574	72	No Trend
50-603062	450	0.901	82	No Trend
50-603063	25	0.601	73	No Trend
50-603063	76	1.127	87	No Trend
50-603063	128	1.802	96	Increasing
50-603063	190	0.376	65	No Trend
50-603063	228	1.127	87	No Trend
50-603063	274	0.376	65	No Trend
50-603063	347	1.367	91	No Trend
50-603063	397	0	50	No Trend
50-603063	450	0.901	82	No Trend
50-603064	25	0	50	No Trend
50-603064	66	0.601	73	No Trend
50-603064	113	1.856	97	Increasing
50-603064	176	1.202	89	No Trend
50-603064	214	1.113	87	No Trend
50-603064	259	2.103	98	Increasing
50-603064	332	1.113	87	No Trend
50-603064	482	0.34	63	No Trend
50-603064	500	0.88	81	No Trend
50-603383	26	0.839	80	No Trend
50-603383	85	2.351	99	Increasing
50-603383	139	0.866	81	No Trend
50-603383	206	0.124	55	No Trend
50-603383	244	0.124	55	No Trend
50-603383	286	1.802	96	Increasing
50-603383	359	0.73	77	No Trend
50-603383	408	0.124	55	No Trend
50-603383	450	0.748	77	No Trend
50-603467	26	1.225	89	No Trend

Table D-2.1-2 (continued)

Location ID	Depth (ft bgs)	Mann-Kendall Results		
		S Statistic	Confidence	Trend
50-603467	91	1.098	86	No Trend
50-603467	143	1.339	91	No Trend
50-603467	206	0.604	73	No Trend
50-603467	244	0.751	77	No Trend
50-603467	287	na	na	No Trend
50-603467	360	1.127	87	No Trend
50-603467	409	0.376	65	No Trend
50-603467	500	0.456	68	No Trend
50-603467	600	0.601	73	No Trend
50-603468	30	na	na	No Trend
50-603468	92	0.376	65	No Trend
50-603468	142	1.802	96	Increasing
50-603468	198	2.103	98	Increasing
50-603468	233	1.671	95	Increasing
50-603468	282	2.352	99	Increasing
50-603468	354	1.147	87	No Trend
50-603468	403	1.527	94	No Trend
50-603468	450	1.885	97	Increasing
50-603470	30	2.104	98	Increasing
50-603470	83	−0.628	74	No Trend
50-603470	143	0.901	82	No Trend
50-603470	203	0.371	65	No Trend
50-603470	233	0	50	No Trend
50-603470	278	1.113	87	No Trend
50-603470	351	2.103	98	Increasing
50-603470	450	0.866	81	No Trend
50-603470	600	1.155	88	No Trend
50-603470	650	0.839	80	No Trend
50-603471	30	0	50	No Trend
50-603471	90	0.601	73	No Trend
50-603471	146	1.503	93	No Trend
50-603471	209	0.619	73	No Trend
50-603471	242	0	50	No Trend
50-603471	288	0.901	82	No Trend
50-603471	360	na	na	No Trend
50-603471	410	0.124	55	No Trend
50-603471	450	0.419	66	No Trend
50-603472	27	−1.745	96	No Trend

Table D-2.1-2 (continued)

Location ID	Depth (ft bgs)	Mann-Kendall Results		
		S Statistic	Confidence	Trend
50-603472	93	−0.901	82	No Trend
50-603472	146	0	50	No Trend
50-603472	210	−1.879	97	Decreasing
50-603472	247	0	50	No Trend
50-603472	292	−1.127	87	No Trend
50-603472	364	−0.39	65	No Trend
50-603472	414	0.307	62	No Trend
50-603472	450	0	50	No Trend
50-603503	25	−0.574	72	No Trend
50-603503	80	0	50	No Trend
50-603503	133	0	50	No Trend
50-603503	198	0.751	77	No Trend
50-603503	237	1.202	89	No Trend
50-603503	278	1.127	87	No Trend
50-603503	347	1.367	91	No Trend
50-603503	397	0.376	65	No Trend
50-603503	450	1.802	96	Increasing
50-613182	500	1.044	85	No Trend
50-613182	550	−0.34	63	No Trend
50-613182	600	0	50	No Trend
50-613182	620	1.019	85	No Trend
50-613182	632.5	−1.044	85	No Trend
50-613183	30	0	50	No Trend
50-613183	500	1.019	85	No Trend
50-613183	550	−0.735	77	No Trend
50-613183	600	1.698	96	Increasing
50-613183	630	0.34	63	No Trend
50-613183	642.5	1.698	96	Increasing
50-613184	30	0	50	No Trend
50-613184	500	0.245	60	No Trend
50-613184	550	na	na	No Trend
50-613184	600	0.245	60	No Trend
50-613184	652	0.34	63	No Trend
50-613184	664.5	1.225	89	No Trend
50-613185	85	0	50	No Trend
50-613185	145	1.019	85	No Trend
50-613185	205	0	50	No Trend
50-613185	235	0	50	No Trend

Table D-2.1-2 (continued)

Location ID	Depth (ft bgs)	Mann-Kendall Results		
		S Statistic	Confidence	Trend
50-613185	280	0	50	No Trend
50-613185	350	1.019	85	No Trend
50-613185	450	0.245	60	No Trend
50-613185	600	1.516	94	No Trend
50-613185	675	1.044	85	No Trend
50-613185	688	na	na	No Trend

Note: Concentrations in $\mu g/m^3$.

* na = Not available.

Table D-3.0-1
MDA C Strata-Specific Properties Affecting Mass Estimates

Geologic Zone	Porosity[a]	Volumetric Water Contents[b]	Air-Filled Porosity	Bulk Density[a] (g/cm^3)
Soil	0.4	0.05	0.35	1.5
Qbt 3	0.41	0.02	0.39	1.4
Qbt 2	0.41	0.02	0.39	1.4
Qbt 1vu	0.49	0.01	0.48	1.2
Qbt 1vc	0.49	0.1	0.39	1.1
Qbt 1g	0.46	0.08	0.38	1.2
Qbtt	0.45	0.14	0.31	1.2
Qct	0.45	0.14	0.31	1.2
Qbof	0.44	0.11	0.33	1.2
Qbog	0.67	0.2	0.47	0.8
Tvt 2	0.001	0.0005	0.0005	2.7

[a] Mean values from Springer (2005, 098534).

[b] Mean values from Hollis et al. (1997, 063131).

Table D-3.0-2
Tier 2 Screening Values Compared with FY 2019 Maximum Measured Plume Values

Location ID	Depth (ft bgs)	Tier 2 Screening Value		FY 2019 Max Measured Value	Tier 2 Ratio[a] Measured/Screening Value	
		Porous Media Flow	Fracture Flow	Result	Porous Media Flow	Fracture Flow
50-24784	155	53,511	27,841	2954	0.0552	0.1061
50-24784	244	50,053	24,396	1665	0.0333	0.0682
50-24784	362	45,489	19,819	3100	0.0681	0.1564
50-24784	450	42,069	16,412	1300	0.0309	0.0792
50-24813	25	57,809	32,139	8593	0.1486	0.2674
50-24813	150	52,964	27,295	**33,000**	0.6231	1.2090
50-24813	241	49,430	23,773	**75,187**	1.5211	3.1627
50-24813	358	44,904	19,234	**43,501**	0.9688	2.2617
50-24813	450	41,331	15,674	**27,000**	0.6533	1.7226
50-24813	600	35,521	9864	4082	0.1149	0.4138
50-24822	25	56,677	31,020	5317	0.0938	0.1714
50-24822	142	52,151	26,481	20,408	0.3913	0.7707
50-24822	235	48,540	22,883	**33,000**	0.6799	1.4421
50-24822	351	44,052	18,382	**24,000**	0.5448	1.3056
50-24822	450	40,212	14,555	11,000	0.2736	0.7558
50-603061	25	56,677	31,020	537	0.0095	0.0173
50-603061	128	52,698	27,028	2470	0.0469	0.0914
50-603061	228	48,820	23,150	4404	0.0902	0.1902
50-603061	347	44,204	18,535	1880	0.0425	0.1014
50-603061	450	40,212	14,555	859	0.0214	0.0590
50-603062	122	51,490	25,820	6445	0.1252	0.2496
50-603062	217	47,803	22,146	8600	0.1799	0.3883
50-603062	337	43,162	17,492	3000	0.0695	0.1715
50-603062	450	38,776	13,119	1000	0.0258	0.0762
50-603063	25	56,715	31,058	806	0.0142	0.0260
50-603063	128	52,736	27,066	8593	0.1629	0.3175
50-603063	228	48,858	23,188	22,556	0.4617	0.9727
50-603063	347	44,243	18,586	10,204	0.2306	0.5490
50-603063	450	40,250	14,593	9130	0.2268	0.6256
50-603064	113	52,418	26,761	23,000	0.4388	0.8595
50-603064	214	48,502	22,845	**32,000**	0.6598	1.4007
50-603064	332	43,938	18,268	17,000	0.3869	0.9306
50-603064	500	37,428	11,758	2600	0.0695	0.2211
50-603383	26	57,885	32,215	2954	0.0510	0.0917

Table D-3.0-2 (continued)

Location ID	Depth (ft bgs)	Tier 2 Screening Level		FY 2019 Max Measured Value	Tier 2 Ratio[a] Measured/Screening Level	
		Porous Media Flow	Fracture Flow	Result	Porous Media Flow	Fracture Flow
50-603383	139	53,511	27,841	5370	0.1004	0.1929
50-603383	244	49,430	23,773	6445	0.1304	0.2711
50-603383	359	44,980	19,310	2900	0.0645	0.1502
50-603383	450	41,458	15,789	1611	0.0389	0.1020
50-603467	143	53,003	27,333	15,037	0.2837	0.5501
50-603467	244	49,087	23,430	20,408	0.4158	0.8710
50-603467	360	44,586	18,929	17,723	0.3975	0.9363
50-603467	500	39,170	13,500	8056	0.2057	0.5967
50-603467	600	35,292	9622	4404	0.1248	0.4577
50-603468	142	52,380	26,723	15,000	0.2864	0.5613
50-603468	233	48,858	23,188	**26,000**	0.5322	1.1213
50-603468	354	44,166	18,497	**28,000**	0.6340	1.5138
50-603468	403	42,272	16,602	**19,871**	0.4701	1.1969
50-603470	83	54,783	29,126	9700	0.1771	0.3330
50-603470	203	50,129	24,472	**33,000**	0.6583	1.3485
50-603470	278	47,230	21,561	**49,000**	1.0375	2.2726
50-603470	351	44,395	18,738	**40,000**	0.9010	2.1347
50-603470	450	40,556	14,899	**20,000**	0.4931	1.3424
50-603470	600	34,745	9088	—[b]	na[c]	na
50-603470	650	32,813	7143	102	0.0031	0.0143
50-603471	90	54,706	29,037	12,000	0.2194	0.4133
50-603471	209	50,091	24,434	**44,038**	0.8792	1.8023
50-603471	288	47,027	21,370	**53,000**	1.1270	2.4801
50-603471	360	44,243	18,586	**45,000**	1.0171	2.4212
50-603471	450	40,759	15,089	**26,852**	0.6588	1.7796
50-603471	na	na	na	17,000	na	na
50-603472	27	57,618	31,948	2300	0.0399	0.0720
50-603472	146	53,003	27,333	11,000	0.2075	0.4024
50-603472	292	47,345	21,675	**26,852**	0.5672	1.2388
50-603472	364	44,548	18,891	**24,000**	0.5387	1.2704
50-603472	450	41,217	15,560	12,352	0.2997	0.7938
50-603503	133	53,702	28,032	2578	0.0480	0.0920
50-603503	237	49,672	24,002	5200	0.1047	0.2166
50-603503	347	45,400	19,743	5300	0.1167	0.2684
50-603503	450	41,420	15,750	3500	0.0845	0.2222
50-613182	550	37,339	11,682	4600	0.1232	0.3938

Table D-3.0-2 (continued)

Location ID	Depth (ft bgs)	Tier 2 Screening Level		FY 2019 Max Measured Value	Tier 2 Ratio[a] Measured/Screening Level	
		Porous Media Flow	Fracture Flow	Result	Porous Media Flow	Fracture Flow
50-613182	632.5	34,148	8478	64 (J)	na	na
50-613183	550	36,957	11,288	5000	0.1353	0.4429
50-613183	642.5	33,372	7715	200	0.0060	0.0259
50-613184	500	38,470	12,801	5900	0.1534	0.4609
50-613184	600	34,593	8936	1400	0.0405	0.1567
50-613184	664.5	32,088	6431	220	0.0069	0.0342
50-613185	145	51,998	26,328	4000	0.0769	0.1519
50-613185	235	48,502	22,845	7500	0.1546	0.3283
50-613185	350	44,052	18,382	5000	0.1135	0.2720
50-613185	450	40,174	14,504	2400	0.0597	0.1655
50-613185	600	34,364	8694	300	0.0087	0.0345

Notes: Units are µg/m^3. Data qualifiers are defined in Appendix A. Bold indicates result exceeds Tier 2 screening level for fracture flow. Shading indicates value exceeds Tier 2 screening level for porous media flow.

[a] Ratio = Mean concentration/Tier 2 screening level.

[b] — = Not sampled or no valid data.

[c] na = Not available.

Appendix E

Evaluation of the Locations of Existing Monitoring Wells for Detecting Potential Contaminants in the Regional Aquifer from Material Disposal Area C

E-1.0 INTRODUCTION

This appendix discusses an assessment of the existing groundwater monitoring well network's ability to confidently detect potential contaminant arrival in the regional aquifer from contaminant sources within Material Disposal Area (MDA) C at Los Alamos National Laboratory (LANL or the Laboratory). The current groundwater monitoring network at MDA C includes regional wells R-46 and R-60, both located to the east of MDA C (Figure E-1.0-1). A network evaluation was performed as part of the Phase III investigation work plan for MDA C (LANL 2010, 109260, Appendix C). At that time, only well R-46 had been installed near MDA C. The purpose of that initial network evaluation was to identify the locations for two proposed regional wells near MDA C (R-59 and R-60). Because of construction activities at the proposed location of R-59 to the southeast of MDA C, only well R-60 was installed. The Laboratory submitted a drilling work plan for well R-59 while well R-60 was being installed. The drilling work plan did not specify a location for R-59 but instead recommended proposing a location for R-59 after R-60 was completed and water-level data from R-60 were available (LANL 2010, 110868). Following discussions with the New Mexico Environment Department, the Laboratory recommended deferring decisions related to well R-59 until after the Phase III investigation report had been submitted. The Laboratory presented an updated network evaluation in the Phase III investigation report (LANL 2011, 204370) that incorporated water-level data from R-60. The network evaluation in the Phase III investigation report evaluated the effectiveness of wells R-46 and R-60 in detecting releases of trichloroethene (TCE) and tritium from source locations within the footprint of MDA C. The evaluation of the monitoring effectiveness of wells R-46 and R-60 in this appendix is a continuation of the previous analysis that includes two additional potential source locations outside the footprint of MDA C. The results of this evaluation will help inform the decision of the need for, and location of, well R-59.

E-2.0 CONTAMINANT TRANSPORT THROUGH THE VADOSE ZONE

Contaminant transport through the vadose zone is not explicitly considered in the modeling analyses presented below. Instead, the existing data about spatial distribution of vapor-phase contaminants from vapor samples collected in the vadose zone adjacent to MDA C are applied to evaluate the area of potential contaminant arrival at the top of the regional aquifer. This evaluation considers 2-hexanone historically detected at vapor-monitoring well 50-603467 and tritium detected at vapor-monitoring well 50-603383 (Figure E-1.0-1). The network efficiency is evaluated assuming the contaminants are already within the regional aquifer in hypothesized arrival areas illustrated in Figure E-1.0-1.

The conceptual site model of vapor-phase contaminant transport in the vadose zone is discussed in section 4.0 of this corrective measures evaluation (CME) report. Because TCE is the principal vapor-phase contaminant detected at MDA C, the conceptual model discussion focuses on TCE. The behavior of other vapor-phase contaminants, however, should be similar.

The spatial distribution of TCE within the vadose zone is consistent with radial diffusion from below ground sources. The vertical extent of the TCE plume in excess of screening levels based on groundwater cleanup levels is bounded by the lower portion of the Otowi Member of the Bandelier Tuff (Qbof) and the underlying Guaje Pumice Bed (Qbog). Transport through the underlying Tschicoma dacite (Tvt 2) would occur by diffusion through fractures, and fracture orientation would affect the lateral transport of the plume. Once below Tvt 2, TCE would continue to diffuse through the Puye Formation sediments (Tpf) to the regional aquifer. The distributions of 2-hexanone, which is no longer detected, and tritium are more localized near the wells where they have been observed because these two constituents are less volatile than TCE. Transport from these localized areas of detected concentrations would, however, occur similarly to TCE.

The evaluation presented in this appendix assumes transport of these constituents to the water table is predominantly vertical and downward from the existing source areas near the ground surface at MDA C. However, there is also a potential component of upward and lateral diffusion driven by concentration gradients toward the adjacent canyons and the mesa top because of the continuous removal by atmospheric air flow. In the deeper sections of the vadose zone (at elevations lower than the elevation of the adjacent canyon bottoms), the transport is expected to be predominantly radial and driven by diffusion. This model also assumes the infiltration recharge from the surface-water flow along the canyon bottoms to the north and to the south of MDA C does not affect contaminant transport.

From 2011 through 2014, the vapor monitoring performed at MDA C identified concentrations of 2-hexanone consistently above the Tier 1 screening level and occasionally approaching the Tier 2 screening level in the 600-ft-deep port at vapor-monitoring well 50-603467 (Easting 1626022.62 ft; Northing 1768273.74 ft) (Figure E-1.0-1). The compound has not been detected above the Tier 1 screening level since 2014 and was only detected once in 2017, well below the screening level, at an estimated value of 21.6981 (J) µg/m^3. In addition, tritium was frequently detected above the Tier 2 screening level at vapor-monitoring well 50-603383 (Easting 1625793.32 ft; Northing 1768973.35 ft) (Figure E-1.0-1). Both of these locations are outside the potential source locations evaluated in the previous network evaluations. Location 50-603467 is south of MDA C, to the south of Pajarito Road, and location 50-603383 is to the north of the west end of MDA C. This network evaluation evaluates the efficiency of R-46 and R-60 in detecting releases from these two locations. The source areas being used are similar to those used in the previous evaluations (LANL 2010, 109260, Appendix C; LANL 2011, 204370, Appendix G).

E-3.0 NETWORK EVALUATION OF THE REGIONAL MONITORING WELLS

A major objective of the numerical simulations is to analyze flow and contaminant transport directions near potential breakthrough locations at the regional aquifer beneath MDA C. Through this analysis, the effectiveness of existing wells R-46 and R-60 to detect potential contamination in the regional aquifer originating from MDA C can be evaluated.

The numerical simulation of contaminant transport in the regional aquifer is performed using an analytical model. The model simulates three-dimensional advective-dispersive contaminant transport in the regional aquifer from a contaminant source with a given volume (cf., Wexler 1992, 106994; Wang and Wu 2009, 109751). Previously, this model has been applied to simulate transport in the regional aquifer of chromium beneath Sandia Canyon (LANL 2007, 098938) and high explosives in the Technical Area 16 (TA-16) area (LANL 2012, 213573). Various hydrogeological parameters characterize the potential contaminant transport in the regional aquifer, and a distribution of values is used for each of the parameters. In the analyses presented below, the parameters include (1) groundwater flow directions, (2) the hydraulic gradient, (3) aquifer permeability and porosity, (4) longitudinal and transverse dispersivities, and (5) the size and location of the breakthrough location at the top of the regional aquifer. The model parameters are also listed in Table E-3.0-1. The model analysis incorporates the distribution of possible values for each of the parameters, as discussed below. The analytical simulation of contaminant transport is performed using the code MADS (http://mads.lanl.gov).

Groundwater flow directions and magnitudes that control contaminant transport in the aquifer are generally dictated by the shape of the regional water table (Freeze and Cherry 1979, 088742, Chapter 5; Vesselinov 2004, 090040). However, the groundwater flow directions in the regional aquifer beneath MDA C are uncertain because of the low density of existing wells in the vicinity of MDA C; more specifically, the water-level data for defining regional flow directions west and north of MDA C are limited (Figure E-1.0-1). To the southwest of MDA C near R-47 and to the south near R-17, flow directions appear to be to the northeast.

To the east of MDA C near R-1 and R-14, groundwater flow appears to be to the south-southeast. The differences in the water levels observed at monitoring wells R-60 and R-46 downgradient of MDA C confirm the relatively high hydraulic gradients in the regional aquifer beneath MDA C (Table E-3.0-1); the hydraulic gradients decline downgradient of MDA C (Figure E-1.0-1). The relatively high gradients upgradient of MDA C are thought to be caused by mountain-front recharge of the regional aquifer to the west of MDA C. Based on the geologic contact information shown in Figure E-1.0-1, the contact of the Puye Formation sediments (Tpf) and Miocene pumiceous sediments (Tjfp) near and along the regional water table to the northeast of R-60 potentially impacts the flow direction downgradient of MDA C. It is also possible the flow directions are influenced by water-supply pumping at PM-5; however, the current data regarding water-level transients caused by the water-supply pumping (PM-5, PM-4, PM-2, and O-4) suggest the pumping does not cause a pronounced effect on the groundwater flow direction near the top of the regional aquifer. The additional data and evaluation presented here is consistent with the previous conclusion. Uncertainties in the flow directions and hydraulic gradients are incorporated in the evaluation of network efficiency (Table E-3.0-1).

Puye Formation sediments within the regional aquifer appear to be highly heterogeneous. Estimates of Puye Formation conductivity in the regional aquifer at the monitoring wells downgradient of MDA C vary between 0.3 and 20 m/day (~1–60 ft/day) (Table E-3.0-1). The uncertainty in porosity values for the Puye Formation sediments within regional aquifer units is based on data from the literature (Freeze and Cherry 1979, 088742) and site-specific knowledge (Keating et al. 2001, 095399) (Table E-3.0-1). Dispersion of potential contaminant plumes in the aquifer is represented in the model by longitudinal and transverse dispersivities (cf. Lichtner et al. 2002, 095397). Site-specific data supporting dispersivity values are not available. Based on data from literature, the selected range of values is reasonable for the spatial scale of simulated contaminant transport ([on the order of hundreds of meters] Neuman 1990, 090184) and the properties of the flow medium (Table E-3.0-1).

Contaminant transport in the regional aquifer is modeled from two potential breakthrough locations (Figure E-1.0-1). The selection of the breakthrough locations is based on locations where 2-hexanone and tritium have been measured in the upper several hundred feet below the ground surface. Locations 50-603383 and 50-603467 represent vapor-monitoring wells where elevated concentrations of tritium and 2-hexanone, respectively, have been detected in the vadose zone (Figure E-1.0-1). In the simulations, contaminants migrate in the regional aquifer downgradient of these breakthrough locations. In addition, the analysis takes into account the uncertainty associated with the potential size of the breakthrough locations; the uncertainty ranges are presented in Table E-3.0-1.

To estimate uncertainty in the model predictions, a Monte Carlo analysis is performed. A set of 1000 uncorrelated, equally probable, random realizations are generated using a Latin Hypercube sampling technique with the software MADS (http://mads.lanl.gov). Each realization includes eight random variables representing various model parameters listed in Table E-3.0-1.

Simulated contaminant migration is based on a unit concentration at the potential arrival location for each of the two breakthrough areas. Therefore, the model produces concentrations at the monitoring wells that are relative to the original unit concentration at the breakthrough areas. Transport within the regional aquifer of a nonsorbing, conservative contaminant is then simulated. No analytical detection limits or regulatory limits are used in this analysis because the predicted concentrations are relative, not absolute. Therefore, the modeling results do not indicate whether either of the contaminants would have concentrations that could exceed regulatory standards or detection limits. However, the simulations yield information about flow directions and about relative magnitudes of concentrations at monitoring wells that are evaluated to determine the efficiency of the network.

This network analysis evaluates the existing R-60 and R-46 monitoring well locations. The well locations are presented in Figure E-1.0-1 and Table E-3.0-2. The distances from the potential contaminant source locations to the monitoring wells are listed in Table E-3.0-2.

E-4.0 MONITORING METRICS

The groundwater monitoring metric set for MDA C for this network evaluation is that the monitoring network must detect potential contaminants in the regional aquifer with detection efficiency higher than 95%. In the model, successful detections are contaminants detected by either of the existing monitoring wells near MDA C or a combination of those two wells. The detection efficiency is calculated as the number of successfully detected contaminant distributions divided by the number of simulations. An additional metric is that the wells must be located sufficiently close to the assumed breakthrough locations to support early detection (within approximately 5 yr) in the event that a contaminant arrives at the regional aquifer.

E-5.0 RESULTS

The detection efficiency of the regional monitoring wells to detect plumes potentially originating from MDA C is presented in Table E-5.0-1. Average pore (linear) velocity and travel times from the potential sources to the wells are also presented in the table. For the potential 2-hexanone and tritium breakthrough locations, the results indicate that the combination of the existing monitoring wells R-60 and R-46 is capable of detecting potential contaminants from the assumed breakthrough locations with detection efficiency above 95%. This efficiency is based on the assumed areas of breakthrough located below the two vapor-monitoring wells considered in this analysis.

The average pore (linear) velocities from the two potential source areas to the two wells are listed in Table E-5.0-1. Also presented are the average travel times in the aquifer.

The combination of wells R-46 and R-60 meets the monitoring metrics for both detection efficiency and early detection for 2-hexanone and tritium detected outside the MDA C footprint. The previous analysis presented in the MDA C Phase III investigation report showed that the combination of these two wells also meets the objectives for monitoring the TCE and tritium plumes located within the MDA C footprint. Based on these two analyses, no additional regional monitoring wells are required for the successful detection of contaminants migrating from MDA C.

E-6.0 REFERENCES AND MAP DATA SOURCES

The following reference list includes documents cited in this appendix. Parenthetical information following each reference provides the author(s), publication date, and ERID, ESHID, or EMID. This information is also included in text citations. ERIDs were assigned by the Laboratory's Associate Directorate for Environmental Management (IDs through 599999); ESHIDs were assigned by the Laboratory's Associate Directorate for Environment, Safety, and Health (IDs 600000 through 699999); and EMIDs are assigned by Newport News Nuclear BWXT-Los Alamos, LLC (N3B) (IDs 700000 and above). IDs are used to locate documents in N3B's Records Management System and in the Master Reference Set. The NMED Hazardous Waste Bureau and N3B maintain copies of the Master Reference Set. The set ensures that NMED has the references to review documents. The set is updated when new references are cited in documents.

E-6.1 References

Freeze, R.A., and J.A. Cherry, January 1979. *Groundwater*, Prentice-Hall, Inc., Englewood Cliffs, New Jersey. (Freeze and Cherry 1979, 088742)

Keating, E.H., V.V. Vesselinov, Z. Lu, and E. Kwicklis, 2001. "Annual Report on Regional Aquifer Modeling and Data Analysis," Los Alamos National Laboratory document LA-UR-04-1420, Los Alamos, New Mexico. (Keating et al. 2001, 095399)

LANL (Los Alamos National Laboratory), September 2007. "Fate and Transport Modeling Report for Chromium Contamination from Sandia Canyon," Los Alamos National Laboratory document LA-UR-07-6018, Los Alamos, New Mexico. (LANL 2007, 098938)

LANL (Los Alamos National Laboratory), April 2010. "Phase III Investigation Work Plan for Material Disposal Area C, Solid Waste Management Unit 50-009, at Technical Area 50, Revision 1," Los Alamos National Laboratory document LA-UR-10-2468, Los Alamos, New Mexico. (LANL 2010, 109260)

LANL (Los Alamos National Laboratory), September 2010. "Drilling Work Plan for Regional Aquifer Well R-59," Los Alamos National Laboratory document LA-UR-10-6502, Los Alamos, New Mexico. (LANL 2010, 110868)

LANL (Los Alamos National Laboratory), June 2011. "Phase III Investigation Report for Material Disposal Area C, Solid Waste Management Unit 50-009, at Technical Area 50," Los Alamos National Laboratory document LA-UR-11-3429, Los Alamos, New Mexico. (LANL 2011, 204370)

LANL (Los Alamos National Laboratory), March 2012. "Technical Area 16 Well Network Evaluation and Recommendations," Los Alamos National Laboratory document LA-UR-12-1082, Los Alamos, New Mexico. (LANL 2012, 213573)

Lichtner, P.C., S. Kelkar, and B. Robinson, August 17, 2002. "New Form of Dispersion Tensor for Axisymmetric Porous Media with Implementation in Particle Tracking," *Water Resources Research,* Vol. 38, No. 8, pp. 21-1–21-16. (Lichtner et al. 2002, 095397)

Neuman, S.P., August 1990. "Universal Scaling of Hydraulic Conductivities and Dispersivities in Geologic Media," *Water Resources Research,* Vol. 26, No. 8, pp. 1749-1758. (Neuman 1990, 090184)

Vesselinov, V.V., 2004. "An Alternative Conceptual Model of Groundwater Flow and Transport in Saturated Zone Beneath the Pajarito Plateau," Los Alamos National Laboratory document LA-UR-05-6741, Los Alamos, New Mexico. (Vesselinov 2004, 090040)

Wang, H., and H. Wu, March 2009. "Analytical Solutions of Three-Dimensional Contaminant Transport in Uniform Flow Field in Porous Media: A Library," *Frontiers of Environmental Science and Engineering in China,* Vol. 3, No. 1, pp. 112–128. (Wang and Wu 2009, 109751)

Wexler, E.J., 1992. "Analytical Solutions for One-, Two-, and Three-Dimensional Solute Transport in Ground-Water Systems with Uniform Flow," Chapter B7 of *Techniques of Water-Resources Investigations of the United States Geological Survey*, United States Government Printing Office, Washington, D.C. (Wexler 1992, 106994)

E-6.1 Map Data Sources

Regional well location: As published; EIM data pull, and, Triad SDE Spatial Geodatabase: GISPEMPRD1\PUB.Infrastructure\PUB.fences_arc; January 2021.

Paved Road: As published; Triad SDE Spatial Geodatabase: GISPUBPRD1\PUB.Infrastructure\PUB.paved_rds_arc; January 2021

LANL Boundary: As published; Triad SDE Spatial Geodatabase: GISPUBPRD1\PUB.Boundaries\PUB.lanlarea; January 2021.

MDA Boundary: As published; Triad SDE Spatial Geodatabase: GISPUBPRD1\PUB.regulatory\PUB.mda_boundary; January 2021.

Water Level Contour: As published; N3B/T2S, GIS projects folder; \\n3b-fs01\n3b-shares) (Q: GIS DATA) Project: 19-0011; Q:\19-Projects\19-0011\project_data.gdb\line\waterlevel_contour_04192020; 2021.

Terrain Contour: As published; N3B/T2S, GIS projects folder; \\n3b-fs01\n3b-shares) (Q: GIS DATA) Project: 19-0011; Q:\19-Projects\19-0011\project_data.gdb\line\contour\waterlevel\geology; 2021.

Water table Geology: As published; N3B/T2S, GIS projects folder; \\n3b-fs01\n3b-shares) (Q: GIS DATA) Project: 19-0011; Q:\19-Projects\19-0011\project_data.gdb\poly\watertable_geology_MDAC; 2021.

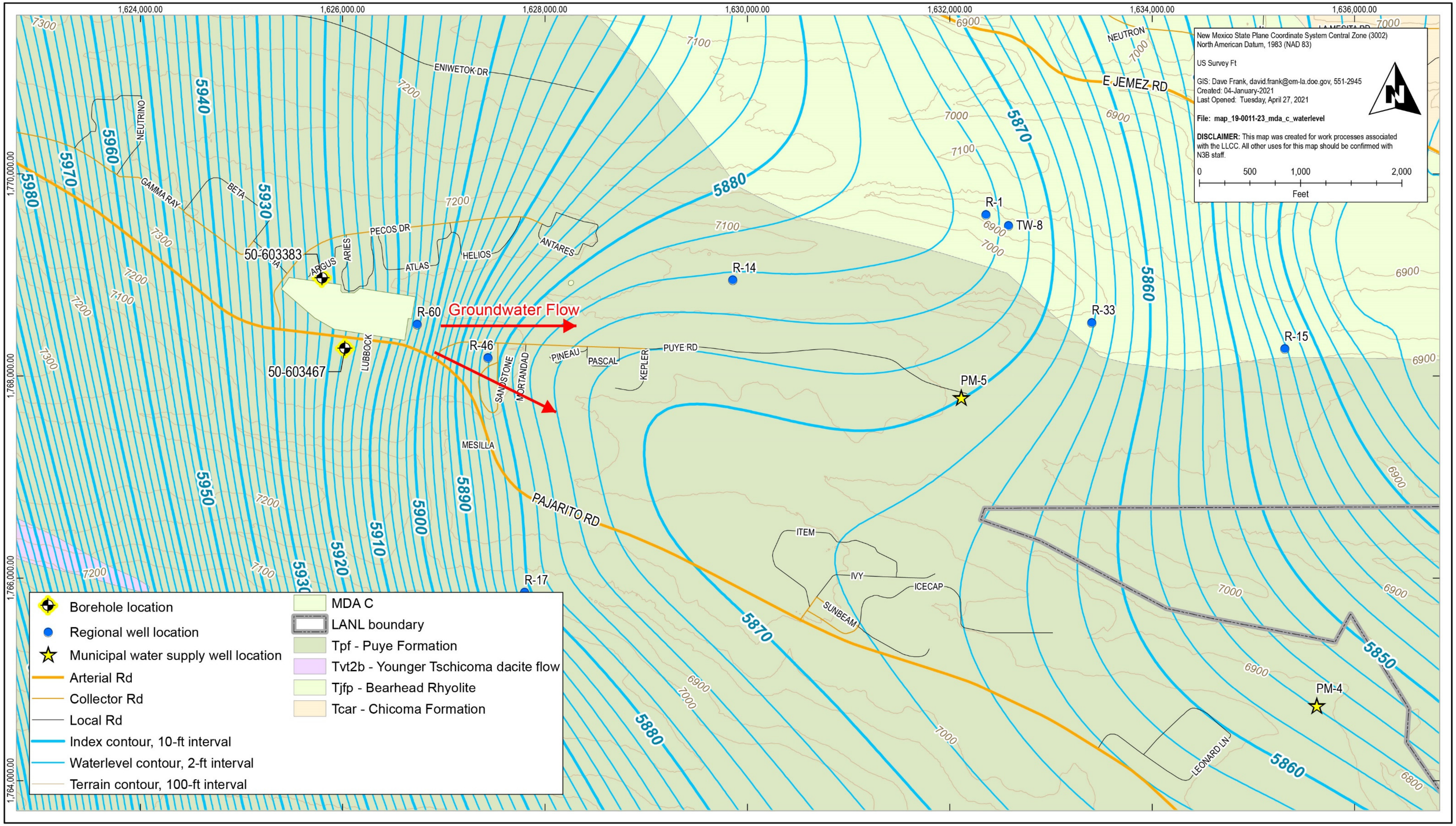


Figure E-1.0-1 Locations of the existing regional monitoring wells near MDA C, including the elevation of the regional water table representative of September 2020, the hydrostratigraphic units along the regional water table near MDA C, and two potential source areas

Table E-3.0-1
Model Parameters Evaluating the Monitoring Network of Regional Aquifer Wells near MDA C

Parameter	Estimate	Range	
		Minimum	Maximum
Source x location 50-603383	495541.8	Fixed	
Source y location 50-603383	539183.0	Fixed	
Source x location 50-603467	495611.7	Fixed	
Source y location 50-603467	538969.8	Fixed	
Source x dimension [m]	50	10	100
Source y dimension [m]	50	10	100
Porosity [m^3/m^3]	0.1	0.05	0.15
Flow angle [degrees]	−5	−40	10
Hydraulic gradient [m/m]	0.014	0.011	0.022
Hydraulic conductivity [m/day]	2.3	0.3	20
Effective pore (linear; advective transport) velocity [m/yr]	100	8	3200
Dispersivity longitudinal [m]	10	1	100
Dispersivity transverse [m]	1	1	10

Note: Each parameter has a range of values used in the model runs.

Table E-3.0-2
Locations of Existing Regional Aquifer Monitoring Wells Near MDA C and Distance from Potential Source Locations

Well	x (m)	y (m)	Distance (m) to Location 50-603383 (tritium)	Distance (m) to Location 50-603467 (2-hexanone)
R-60	495859.6	539036.1	350.1	256.6
R-46	496041.8	538942.2	555.0	431.0

Table E-5.0-1
Detection Efficiency of Monitoring Wells R-60 and R-46

Wells	Location 50-603467 (2-hexanone)			Location 50-603383 (tritium)		
	Detection Efficiency	Average Velocity (m/yr)	Average Travel Time (yr)	Detection Efficiency	Average Velocity (m/yr)	Average Travel Time (yr)
R-60	95.6%	37.2	8.0	93.6%	43.8	6.9
R-46	88.8%	43.5	12.6	98.8%	44.0	9.9
R-60 + R-46	98.3%	38.2	8.3	99.3%	43.9	7.0

Notes: Detection efficiency related to two potential source areas is shown in Figure E-1.0-1. Average pore (linear) velocity and travel time from the potential source areas to the monitoring wells are also presented.

Appendix F

U.S. Department of Energy Requirements for Corrective Measures at Material Disposal Area C

F-1.0 INTRODUCTION

This appendix addresses U.S. Department of Energy (DOE) requirements applicable to corrective measures to be implemented at Los Alamos National Laboratory (LANL or the Laboratory), Material Disposal Area (MDA) C. Major DOE regulatory requirements applicable to the radionuclide inventory at MDA C are described as are the nature and extent of radiological contamination at MDA C. This appendix also presents the results of a preliminary radiological dose assessment to demonstrate that the corrective measure for MDA C recommended in accordance with the corrective measures evaluation (CME) process specified in the June 1, 2016, Compliance Order on Consent (Consent Order), as modified, would comply with DOE radiological protection requirements.

The DOE requirements described in this appendix apply to radioactive contamination at MDA C and the radioactive materials present in the wastes disposed of at MDA C. The corrective measures to be implemented at MDA C are being selected in accordance with the CME process specified in the Consent Order. Radionuclides and radioactive materials are not subject to regulation under the Consent Order, but are regulated solely by DOE under the authority of the Atomic Energy Act and its implementing orders and regulations. Although the CME process does not specifically address radionuclides or radioactive materials, any corrective measure selected and implemented under the Consent Order to address nonradiological contamination and risk must comply with, and be consistent with, DOE requirements for radionuclides and radioactive materials. In the event a corrective measure selected under the Consent Order does not comply with or is inconsistent with DOE requirements for radionuclides and radioactive materials, DOE will revise the corrective measure to assure compliance with DOE requirements. Such revisions would be identified during the corrective measures implementation (CMI) phase of the corrective action process.

Section F-2.0 describes the major DOE radiological protection requirements applicable to corrective measures at MDA C. Section F-3.0 describes the nature and extent of radiological contamination at the MDA C based on the results of past investigations. Section F-4.0 and Attachment F-1 present a preliminary radiological dose assessment based on the radiological inventory present in the waste disposal units at MDA C. The purpose of the dose assessment is to demonstrate the corrective measure alternative recommended as a result of the CME process under the Consent Order is capable of meeting DOE requirements for long-term radiological protection of industrial workers and the public.

F-2.0 MAJOR DOE REGULATORY REQUIREMENTS

F-2.1 DOE Order 458.1, Radiation Protection of the Public and the Environment

The primary objective of DOE Order 458.1 is to operate facilities and conduct activities so radiation exposure to members of the public is maintained within limits (established in the order) that control radioactive contamination and are as low as reasonably achievable (ALARA). The order requires DOE facilities to have the capabilities, consistent with the types of operations conducted, to monitor routine and non-routine releases and to assess radiological doses to members of the public and the environment.

DOE Order 458.1 requires that exposure of members of the public to radiation sources as a consequence of routine DOE activities must not cause, in a year, an effective dose equivalent greater than 100 mrem. The limit of 100 mrem is the sum of the effective dose equivalent from exposures to radiation sources external to the body during the year plus the committed effective dose equivalent from radionuclides taken into the body during the year. The dose limits apply to both operational facilities and those that have been closed. If a facility is removed, but radioactive contamination remains, then the dose limits in

DOE Order 458.1 remain applicable to the property. DOE cannot release the property from its control unless it can be demonstrated the exposure to a member of the public will be below 100 mrem/yr. In accordance with DOE Policy 454.1, "Use of Institutional Controls," DOE will implement institutional controls and maintain them into the future as long as necessary to protect human health and the environment.

Any corrective measure implemented at MDA C that results in a radionuclide inventory remaining on-site (e.g., capping) must comply with the DOE Order 458.1 dose limits. Compliance with dose limits may require the use of more robust barriers than needed for protection of human health and the environment from releases of nonradioactive hazardous constituents. Similarly, any corrective measure that involves removing the radionuclide inventory from MDA C (e.g., excavation) must comply with dose limits during implementation of the corrective measure. Compliance with the dose limits is demonstrated by monitoring and surveillance and conducting dose evaluations. Activities necessary to demonstrate long-term compliance would be performed following implementation of the corrective measure as part of long-term stewardship activities.

F-2.2 Code of Federal Regulations, Title 10, Part 830, Nuclear Safety Management

DOE regulations governing the safety of DOE nuclear facilities are contained in 10 Code of Federal Regulations (CFR) 830. In accordance with the requirements of 10 CFR 830, Subpart B, MDA C was initially categorized as a Hazard Category (HC) 2 nuclear facility based on its estimated gross radioactive inventory. In 2010, a Final Hazard Categorization (FHC) was performed based on a hazard analysis that considered material form, dispersibility, and interaction with energy sources but excluded consideration of engineered safety features (LANL 2010, 227720). Based on this analysis, MDA C was categorized as a radiological facility. A facility safety plan (LANL 2010, 227721) was developed specifying the activities that can be performed at MDA C that are consistent with the hazard analysis and radiological facility categorization. These activities are limited to site maintenance (i.e., removal of vegetation to ground level) and sampling and characterization activities, including drilling (drilling into waste pits and shafts is prohibited, however).

DOE approved the FHC (DOE 2010, 227719) and its approval requires that a new hazard analysis be performed if remediation activities are to be implemented that are inconsistent with the assumptions used in the FHC. Therefore, remedial alternatives that include intrusive activities (e.g., waste excavation) will require a new hazard analysis. Based on the results of the hazard analysis, safety requirements will need to be established to maintain the material at risk available for dispersion from a worst-case accident below HC-3 limits. Alternately, if the hazard analysis indicates that remediation activities will result in categorization of MDA C as a HC-2 or HC-3 nuclear facility, a documented safety analysis (DSA) must be performed, as required by 10 CFR 830, Subpart B. Based on the results of the DSA, technical safety requirements for remediation activities will be established.

F-2.3 10 CFR 835, Occupational Radiation Protection

DOE regulations governing radiation protection of occupational workers are contained in 10 CFR 835. These regulations include requirements for radiation protection programs, dose limits and exposure standards for workers, and requirements for monitoring, posting and labeling, recordkeeping and reporting, training, and design and control. At Newport New Nuclear BWXT-Los Alamos, LLC (N3B), the requirements of 10 CFR 835 are implemented through a radiation protection program contained in N3B-P121, "Radiation Protection."

Any corrective measure implemented at MDA C would have to comply with the requirements of 10 CFR 835 and N3B-P121. Work procedures and controls would need to be established to ensure worker exposure complied with the dose limits contained in 10 CFR 835 and was ALARA. The requirements of 10 CFR 835 would most impact corrective measure alternatives that include excavation of buried radioactive waste because these alternatives would present the potential for significant worker exposure.

F-2.4 Performance Objectives and Regulatory Criteria for MDA Covers

Performance objectives and regulatory criteria for MDA covers are listed in Table 7.1-2 of the main document and these objectives and criteria will be used to ensure that any proposed cover design complies with DOE regulations.

F-3.0 NATURE AND EXTENT OF RADIONUCLIDE CONTAMINATION

Potential radionuclide contamination at MDA C consists of contamination of shallow subsurface soil and tuff from past operational releases or biointrusion into buried wastes, contamination of subsurface tuff from leaching from buried wastes, and contamination of pore gas (and associated pore water) from diffusion of tritium from buried wastes. Radionuclides released to the subsurface could also potentially migrate to the regional aquifer and result in groundwater contamination. The nature and extent of radionuclide contamination, based on the results of the Consent Order investigations, is discussed in the following subsections.

F-3.1 Radionuclides in Soil and Tuff

As described in section 2.4.3 and Appendix C of the CME report, the Consent Order investigation data indicate very limited and minor radionuclide contamination of shallow subsurface soil and tuff. All sampling results for radionuclides in surface and shallow subsurface soil and tuff were below residential and industrial screening action levels (SALs) for radionuclides.

As described in section 2.4.3 and Appendix C of the CME report, the Consent Order investigation data indicate very limited and minor releases of radionuclides from the MDA C disposal units into underlying tuff. All sampling results for radionuclides in subsurface tuff samples were below residential and industrial SALs for radionuclides.

F-3.2 Tritium in Pore Gas

Subsurface vapor monitoring at MDA C includes collection of samples for analysis of tritium. During sampling, tritiated water vapor in pore gas is captured on absorbent media. The tritiated water is then desorbed and condensed to the liquid phase for analysis, and the analytical result is reported as the tritium activity per volume of liquid, rather than as the activity in the gas phase. The tritiated water vapor in the pore gas being sampled is in equilibrium with liquid-phase pore water within the subsurface media. Therefore, although pore gas is the medium being sampled, the analytical result is actually representative of the tritium activity in liquid pore water.

Tritium was detected at every sampling location and was detected in 63% of the MDA C vapor samples collected from October 2012 through February 2020 and analyzed for tritium. The frequency of detection for tritium for each sampling event is summarized in Table F-3.2-1. The locations where tritium was detected most frequently are 50-24784 (98% of samples), 50-603063 (91% of samples), 50-603383

(100% of samples), 50-603471 (99% of samples), and 50-603472 (98% of samples). These locations are in the central part of MDA C and to the north of MDA C. The lowest frequencies of detection were to the south of MDA C at locations 50-603467 (28% of samples), 50-603468 and 50-613184 (21% of the combined samples for the two collocated wells), and 50-613185 (11% of samples).

F-3.2.1 Tier 1 Screening

The Clean Water Act maximum contaminant level of 20,000 pCi/L was used as the Tier 1 screening level for tritium collected in vapor samples. The results of the Tier 1 screening are presented in Table F-3.2-2. Tritium was detected above the Tier 1 screening level in 12% of the MDA C vapor sample results. Tritium results from October 2012 through February 2020 for locations where Tier 1 screening levels were exceeded are presented in Figures F-3.2-1 through F-3.2-16. The highest frequency of detection above the Tier 1 screening level from October 2012 through February 2020 was at location 50-603383 where 98% of the sample results exceeded the Tier 1 screening level. No other location had greater than 20% of results exceeding the Tier 1 screening level. Seven locations outside the MDA C boundary (50-24822, 50-603062, 50-603467, 50-603468, 50-603503, 50-613184, and 50-613185) and one location inside the boundary (50-613182) had no detections above the Tier 1 screening level. Three other locations at or outside the boundary (50-24784, 50-603061, and 50-603064) and one location inside the boundary (50-613183) had tritium activities greater than the Tier 1 screening level in only one sample. The one-time detections above the Tier 1 screening level at these locations are anomalous and were not repeated in any of the other sampling events.

Tritium was detected above the Tier 1 screening level in more than 1 sample at locations 50-24813 (13 samples at 1 depth), 50-603063 (2 samples at 2 depths), 50-603383 (64 samples at 5 depths), 50-603470 (12 samples at 1 depth), 50-603471 (13 samples at 6 depths), and 50-603472 (13 samples at 1 depth). As discussed below, the tritium results show consistently elevated levels at several locations and depths and sporadic elevated detections at other locations.

At location 50-24813, tritium was detected above the Tier 1 screening level at 150 ft below ground surface (bgs) for all sampling events. No results from any other depths at this location exceeded the Tier 1 screening level. At location 50-603063, tritium was detected above the Tier 1 screening level in 1 sample each at depths of 128 ft and 347 ft bgs. These detections above the Tier 1 screening level occurred during 2 different sampling events, and the results were approximately 3 times to 170 times greater than previous or subsequent samples at these same depths. Tritium was detected above the Tier 1 screening level in all but 1 sample collected at location 50-603383. The maximum detected activity at location 50-603383 was generally about 1,000,000 pCi/L and was detected at 139 ft bgs for all sampling events. For 2 sampling events, the result from 139 ft bgs at location 50-603383 was the maximum activity for the entire sampling event. Activities from 200 ft bgs to total depth (450 ft bgs) were variable and showed no clear trend with depth, but have decreased over time since April 2017. At location 50-603470, all but 1 sample collected at a depth of 83 ft bgs exceeded the Tier 1 screening level. For all but 2 sampling events, the result from 83 ft bgs at location 50-603470 was the maximum activity for the sampling event. Tritium did not exceed the Tier 1 screening level in any samples collected from other depths at location 50-603470. At location 50-603471, tritium activities exceeded the Tier 1 screening level in 1 to 5 samples collected from every depth interval. The Tier 1 screening level was exceeded in a total of 13 samples collected during 11 sampling events, thus the exceedances were not consistent over time. At location 50-603472, tritium exceeded the Tier 1 screening level at 27 ft bgs for all sampling events. No results from any other depths at this location exceeded the Tier 1 screening level.

The only location where tritium was consistently detected above the Tier 1 screening level in the deepest sampling interval was 50-603383. The deepest interval at this location is 450 ft bgs and the result from this depth exceeded the Tier 1 screening level for every sample. Activities decreased with depth at this location, however, with the maximum activity detected at 139 ft bgs for every sampling event. The only other location where tritium was detected above the Tier 1 screening level in the deepest sample was location 50-613183. The deepest interval at this location is 642.5 ft bgs and tritium exceeded the Tier 1 screening level in one sample. This was the only sample collected at greater than 450 ft bgs from any location that exceeded the Tier 1 screening level. The result from 642.5 ft bgs at location 50-613183 above the Tier 1 screening level is one of only two detections in samples from this interval, and appears to be anomalous. Location 50-613183 is located adjacent to location 50-603471 and activities decreased with depth for the combined locations.

F-3.2.2 Tier 2 Screening

The development of Tier 2 screening levels for volatile organic compounds (VOCs) is described in section 3.2.4.2 of the CME report.

Because most of the tritium inventory is present in pore water, the Tier 2 screening level for pore water-phase transport would be most appropriate for tritium. Although the Tier 2 screening level is extremely conservative for tritium, it is equal to the Tier 1 screening level multiplied by the dimensionless dilution factor for water-phase transport described by Equation 3.2-3 in section 3.2.4.2 of the main document. The dilution factor calculated using Equation 3.2-3 and the data presented in Table 3.2-15 is 14.5, resulting in a Tier 2 screening level for tritium of 290,000 pCi/L. This is an extremely conservative approach because no credit is taken for tritium decay during transport. Tritium has a 12.3-yr half-life and accounting for tritium decay as part of the Tier 2 screening would result in much higher screening values. Similarly, the reduced diffusivity of tritium, related to tritium being part of the water molecule (H2O) are not included in the Tier 2 estimate and would lead to a further large increase in screening values.

Table F-3.2-2 presents the results of the Tier 2 screening. Tritium was detected above the Tier 2 screening level in 5% of the MDA C vapor sampling results. The Tier 2 screening level was exceeded in samples from 3 of 18 locations. The Tier 2 screening level was exceeded for 48% of the samples collected at location 50-603383, including 11 of 13 samples from 139 ft bgs, 6 of 13 samples from 244 ft bgs and 359 ft bgs, and 8 of 13 samples from 450 ft bgs. The Tier 2 screening level was exceeded for all but 1 sample collected at 83 ft bgs at location 50-603470 and all but 1 sample collected at 27 ft bgs at location 50-603472, and was not exceeded in samples from any other depths at these locations.

With the exception of location 50-603383, tritium detections above the Tier 2 screening level are limited to depth intervals near the surface within the central area of MDA C. The detections above Tier 2 screening levels in the central area of MDA C are similar to the distribution of VOCs above Tier 2 screening levels, although VOC exceedances extend farther to the east and south and are at deeper depths than tritium exceedances. At location 50-603383, which is just outside the western end of the north boundary of MDA C, tritium was not detected above the Tier 2 screening level in the shallowest samples (26 ft bgs) and the maximum activity for each sampling event was detected in the sample collected from 139 ft bgs. The Tier 2 tritium exceedances at this location do not appear correlated to VOC exceedances. Although tritium exceeded the Tier 2 screening level in 8 of 13 samples collected from the deepest sampling interval at location 50-603383 (450 ft bgs), activities at this depth have decreased over time and were below the Tier 2 screening level for the last 2 sampling events (January–February 2019 and January–February 2020).

F-3.3 Radionuclides in Groundwater

Radionuclides detected in samples collected from the MDA C monitoring wells during 2010 through 2019 are presented in Table F-3.3-1. Tritium was not detected in any samples from wells R-14 or R-60 and was detected in only 3 of the 14 sampling events at well R-46. The other detected radionuclides (radium-226, radium-228, uranium-234, uranium-235/236, and uranium-238 are naturally occurring and are not associated with releases from MDA C. A detailed evaluation of data from the MDA C monitoring wells is presented in Appendix E of this CME report.

F-4.0 PRELIMINARY RADIOLOGICAL DOSE ASSESSMENT

The CME process resulted in identifying a recommended corrective measure alternative for MDA C. Under the Consent Order, the recommended corrective measure alternative must protect human health and the environment from releases of nonradioactive hazardous constituents disposed of at MDA C. As described in section F-2.0, any corrective measure implemented at MDA C must also meet DOE requirements for radiological protection of workers and the public. Therefore, a preliminary radiological dose assessment was conducted to evaluate the dose to on-site industrial workers and members of the public from the radionuclide inventory present in the MDA C waste disposal units, assuming the recommended corrective measure under the Consent Order was implemented.

The corrective measure recommended for MDA C under the Consent Order consists of an evapotranspiration (ET) cover, soil-vapor extraction (SVE), and institutional controls. The remedial action objectives (RAOs) addressed by the recommended corrective measure include the following:

- Prevent human and ecological exposure to the waste through excavation, biointrusion, and erosion;
- Prevent human and ecological exposure to the contaminated subsurface soils through excavation and biointrusion;
- Prevent groundwater from being impacted above a regulatory standard by the transport of VOCs through soil vapor; and
- Prevent the creation of contaminated leachate by restricting the infiltration of water into the waste.

The above RAOs would also apply to radionuclides, although the third RAO would apply to tritium rather than VOCs. The ET cover component of the alternative is designed to address the first, second, and fourth RAOs by preventing exposure to waste constituents by direct contact or biointrusion and controlling infiltration of moisture into the waste inventory. The ET cover is also designed to prevent exposure of the waste inventory from erosion, and the institutional control component of the alternative includes inspection and maintenance of the cover to prevent erosion. The institutional control component also includes site access controls to prevent inadvertent intrusion into the waste inventory. These exposure pathways are also applicable to the radionuclide inventory present at MDA C, and the ET cover and institutional controls would provide an identical function for radionuclides.

The SVE component of the recommended corrective measure alternative is designed to remove the inventory of vapor-phase VOCs from the vadose zone to prevent migration to the regional aquifer via vapor-phase diffusion. Tritium (in the form of tritiated water) is also present in the vapor phase in the vadose zone beneath MDA C. Some vapor-phase tritium would be removed by operation of the recommended SVE system. Because of the very low Henry's law constant for tritiated water, however, SVE would have a very low tritium removal efficiency. Stauffer et al. (2002, 097387) report a dimensionless Henry's law constant for tritiated water of approximately 0.00001. The Federal

Remediation Technologies Roundtable recommends that a contaminant have a dimensionless Henry's law constant of at least 0.01 for SVE to be effective (http://www.frtr.gov/matrix2/section4/4-7.html). Therefore, it was assumed that SVE would not be effective in removing the tritium inventory from the vadose zone, and the preliminary radiological dose assessment evaluated migration of tritium to the regional aquifer with no removal by the SVE system.

Although SVE has a low removal efficiency for tritium, some tritium will be captured by the SVE extraction wells and potentially released to the atmosphere with the SVE off gas. The tritium release rate was estimated as the product of the SVE extraction rate and the average tritium activity in pore gas in the extraction zone. The proposed SVE extraction rate is 640 ft^3/min (Appendix G). The average tritium activity in pore gas was calculated as the product of the moisture content of saturated air at an assumed temperature of 20 °C (17.3 g/m^3) and the average tritium activity measured in pore water captured from vapor samples collected in the proposed extraction zone (23,000 pCi/L). The resulting tritium release rate is 0.0104 µCi/d and the total release over the proposed 360-day extraction period is 3.8 µCi. This minor release rate is not expected to require an air emission permit, but the need for a permit will be evaluated during the CMI.

The preliminary radiological dose assessment was performed using appropriate DOE guidance to evaluate the dose to an on-site industrial worker and an off-site resident under two scenarios: (1) the ET cover recommended by the CME was in place over the MDA C waste disposal units and (2) the current operational cover was in place. The off-site residential receptor was assumed to be at Elk Ridge, which is approximately 0.75 mi north of MDA C and is the location of the nearest resident. Consistent with the requirements of DOE Order 435.1, "Radioactive Waste Management" (which does not apply to MDA C because of its period of operation), doses were evaluated over a period of 1000 yr. Details on the dose assessment are provided in Attachment F-1.

The results of the preliminary radiological dose assessment are summarized in Attachment F-1 and shown in Table F-4.0-1.These results show the estimated dose to the on-site industrial worker and off-site resident meets the DOE dose limits for the scenario where the ET cover is in place because the ET cover will prevent erosion or biointrusion, which would otherwise lead to uncovering the waste over the next 1000 yr. Therefore, the recommended corrective measure alternative would comply with DOE radiological protection requirements. A more detailed radiological dose assessment will be performed during the CMI to ensure the final design meets radiological protection requirements.

F-5.0 SUMMARY

Conditions at MDA C currently comply with applicable DOE radiological protection requirements. Extensive surface and subsurface sampling performed at MDA C has shown limited radiological contamination of environmental media or migration of radionuclides, with the exception of tritium in pore vapor and pore water in the vadose zone. Radionuclides detected in soil and tuff samples were all below residential and industrial SALs. Tritium exceeds Tier 1 and Tier 2 screening levels in subsurface vapor samples from some of the vapor-monitoring wells, but tritium does not currently appear to pose a threat of groundwater contamination.

A preliminary radiological dose assessment indicates the corrective measure alternative recommended under the Consent Order would meet DOE radiological protection requirements provided the cover over the waste inventory remains intact. The cover design will be finalized during the CMI. Final design activities will address cover longevity and long-term performance requirements.

F-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, ESHID, or EMID. This information is also included in text citations. ER IDs were assigned by the Laboratory's Associate Directorate for Environmental Management (IDs through 599999); ESHIDs were assigned by the Laboratory's Associate Directorate for Environment, Safety and Health (IDs 600000 through 699999) and EMIDs are assigned by N3B (IDs 700000 and above) IDs are used to locate the documents, in the Master Reference Set.

DOE (U.S. Department of Energy), July 2, 2010. "Response to Final Categorization for Material Disposal Area C," U.S. Department of Energy memorandum (COR-SO-6.30.2010-264748) to R.L. McQuinn (LANL), from J.C. Vozella (DOE-LASO) and D.L. Winchell, Jr. (DOE-LASO), Los Alamos, New Mexico. (DOE 2010, 227719)

LANL (Los Alamos National Laboratory),October 2016. "Groundwater Background Investigation Report, Revision53," Los Alamos National Laboratory document LA-UR-16-27907, Los Alamos, New Mexico. (LANL 2007, 601920)

LANL (Los Alamos National Laboratory), June 2010. "Material Disposal Area (MDA C) Final Hazard Categorization," NES-ABD-0700, R.2, Los Alamos National Laboratory, Los Alamos, New Mexico. (LANL 2010, 227720)

LANL (Los Alamos National Laboratory), October 2010. "Facility Safety Plan for Material Disposal Area C," TA-21 Document No. TA21-MDAC-FSP-00001, R.0, Los Alamos National Laboratory, Los Alamos, New Mexico. (LANL 2010, 227721)

Stauffer, P., G. Lopez, and R. Budd, July 2002. "Tritium Transport Beneath Surface Impoundments at TA-53, Modeling and Analysis in Support of Data Needs," Los Alamos National Laboratory document LA-UR-02-5321, Los Alamos, New Mexico. (Stauffer et al. 2002, 097387)

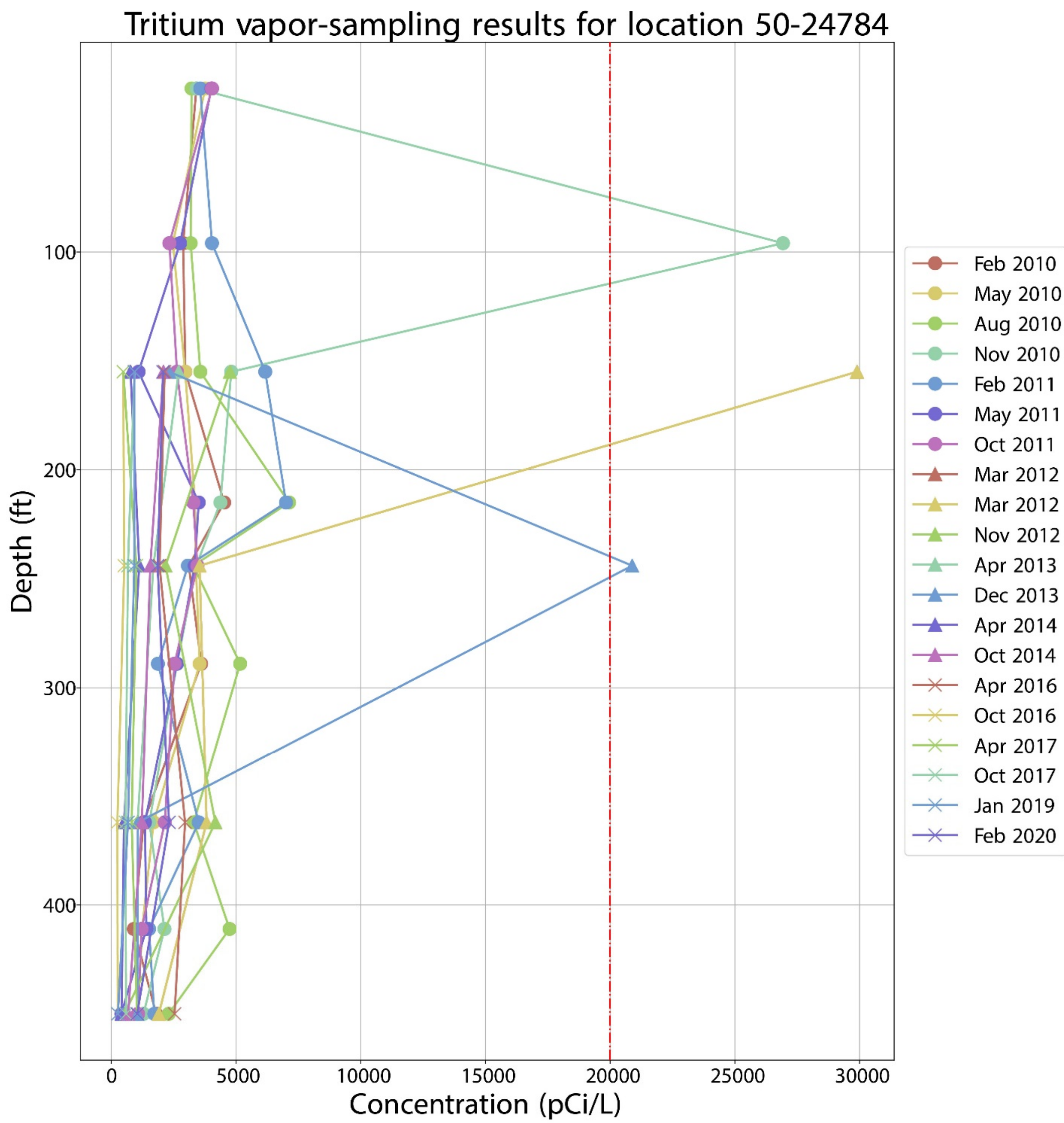


Figure F-3.2-1 Tritium vapor-sampling results for location 50-24784

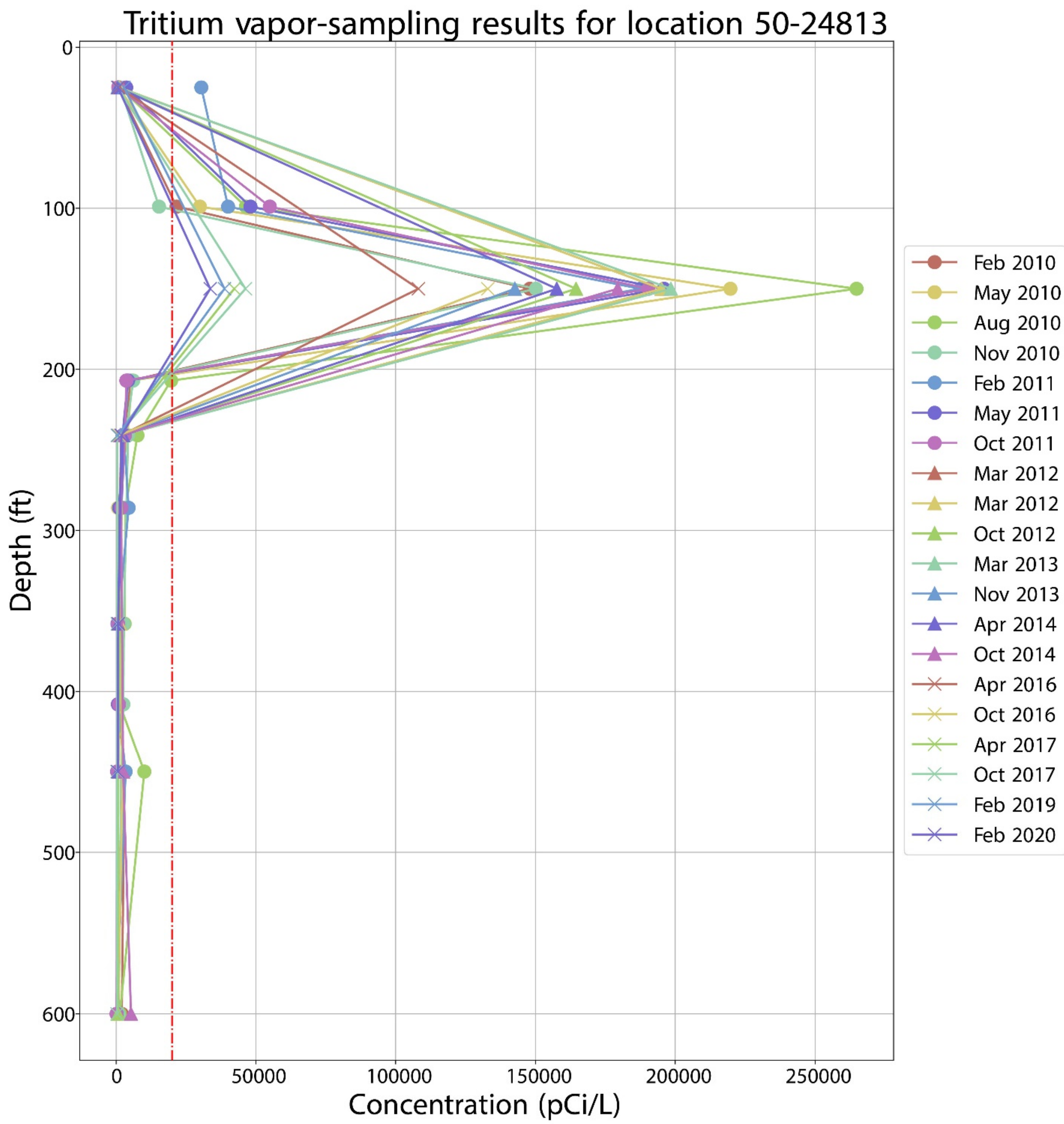


Figure F-3.2-2 Tritium vapor-sampling results for location 50-24813

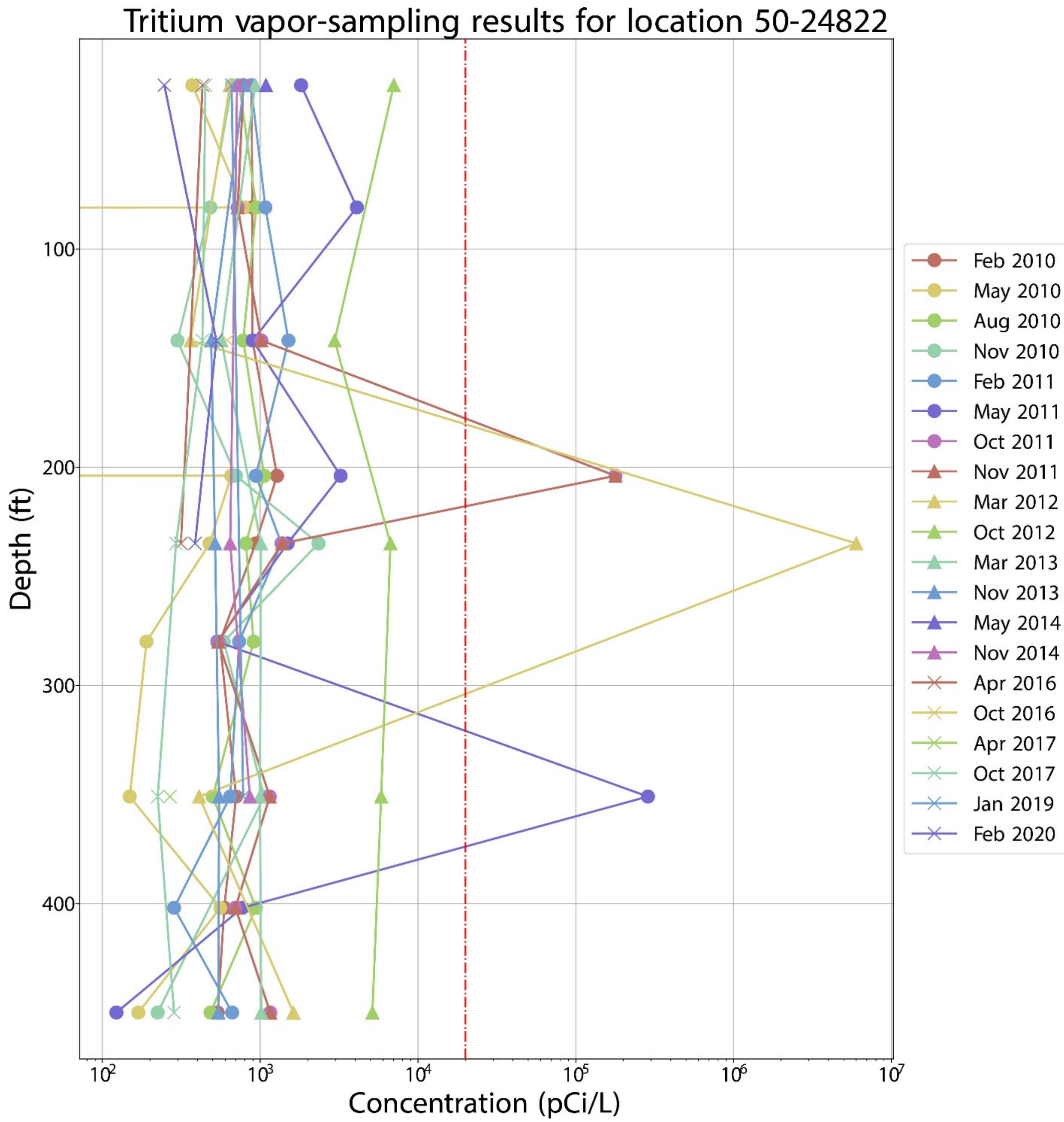


Figure F-3.2-3 Tritium vapor-sampling results for location 50-24822

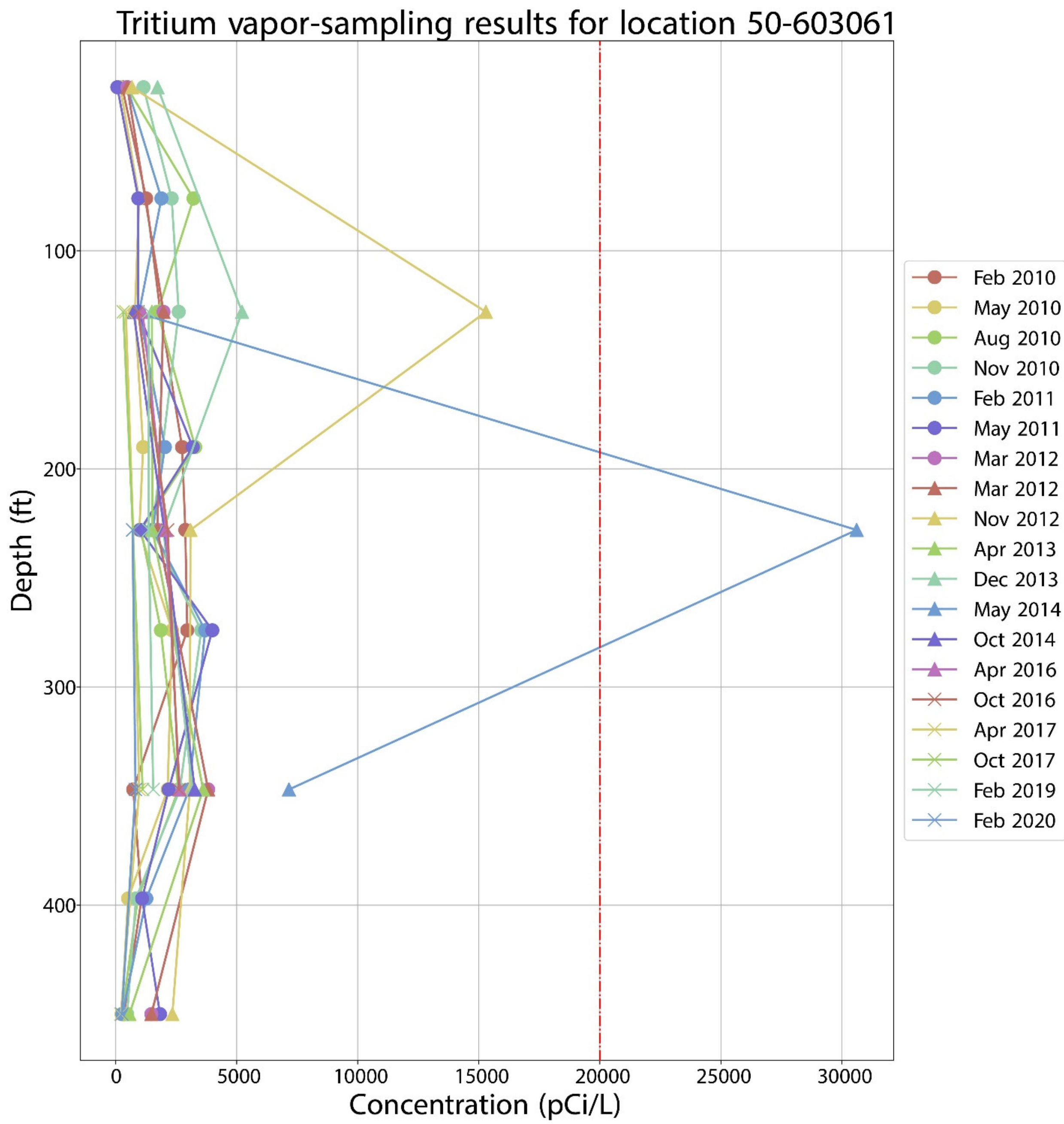


Figure F-3.2-4 Tritium vapor-sampling results for location 50-603061

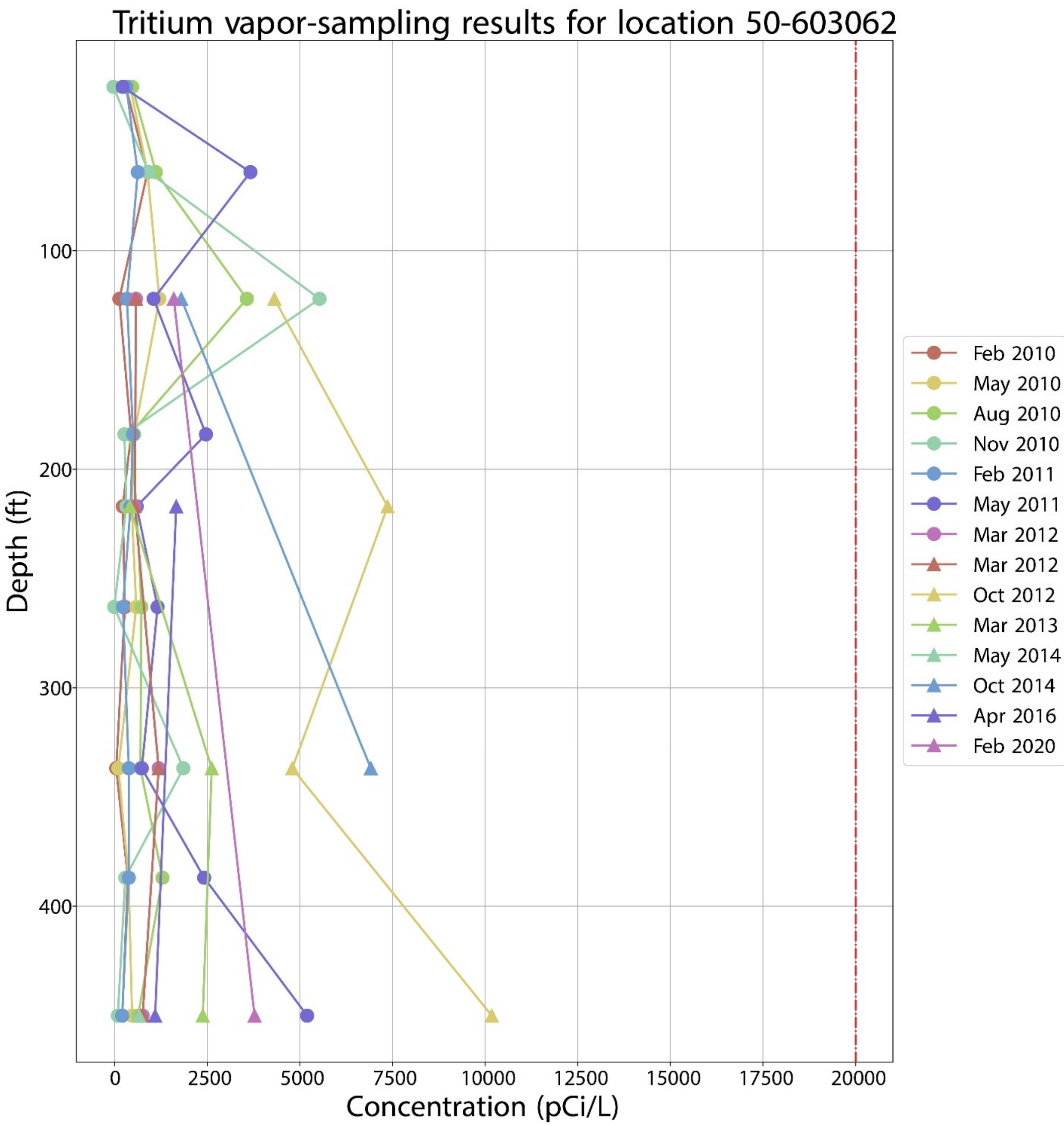


Figure F-3.2-5 Tritium vapor-sampling results for location 50-603062

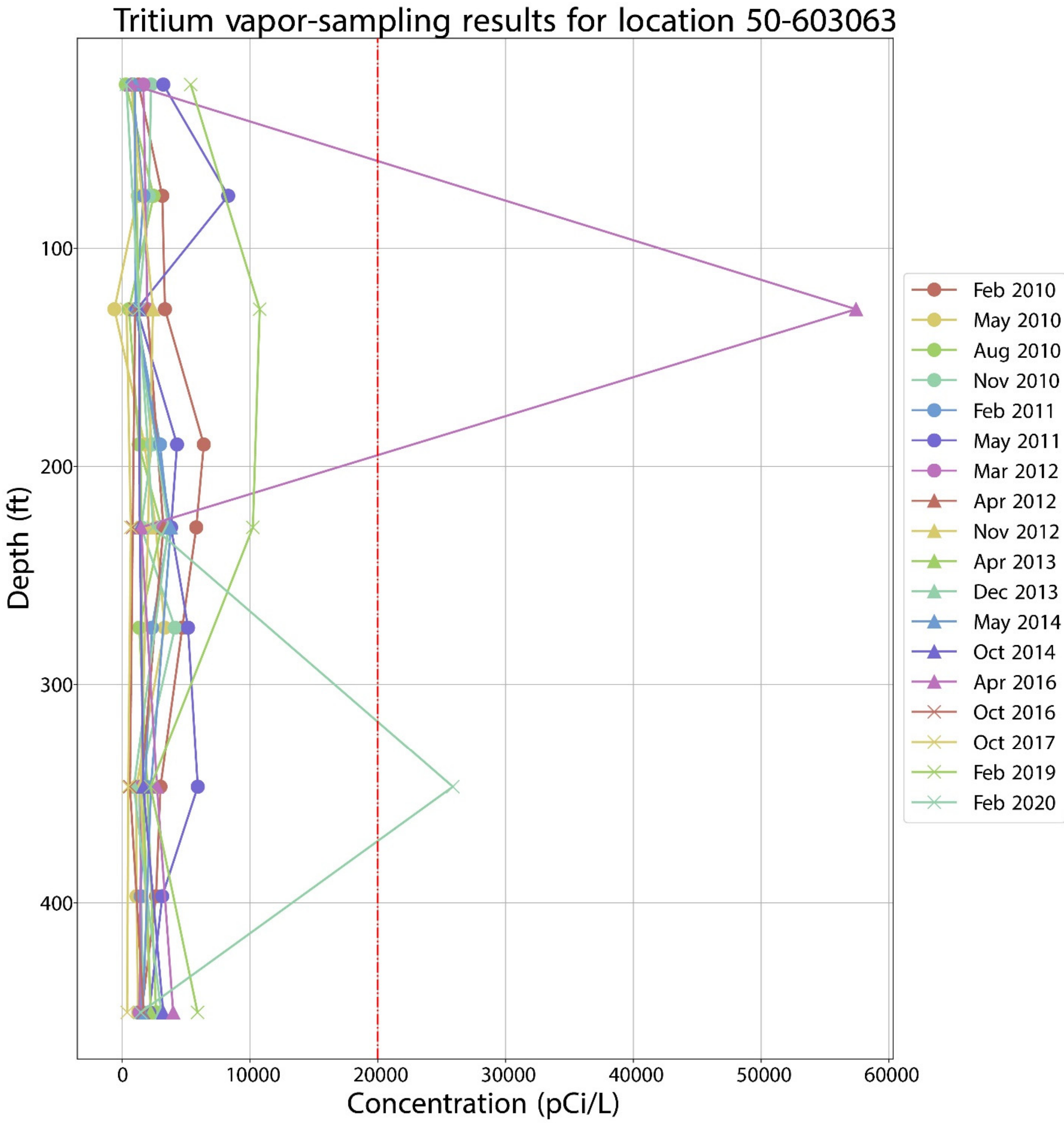


Figure F-3.2-6 Tritium vapor-sampling results for location 50-603063

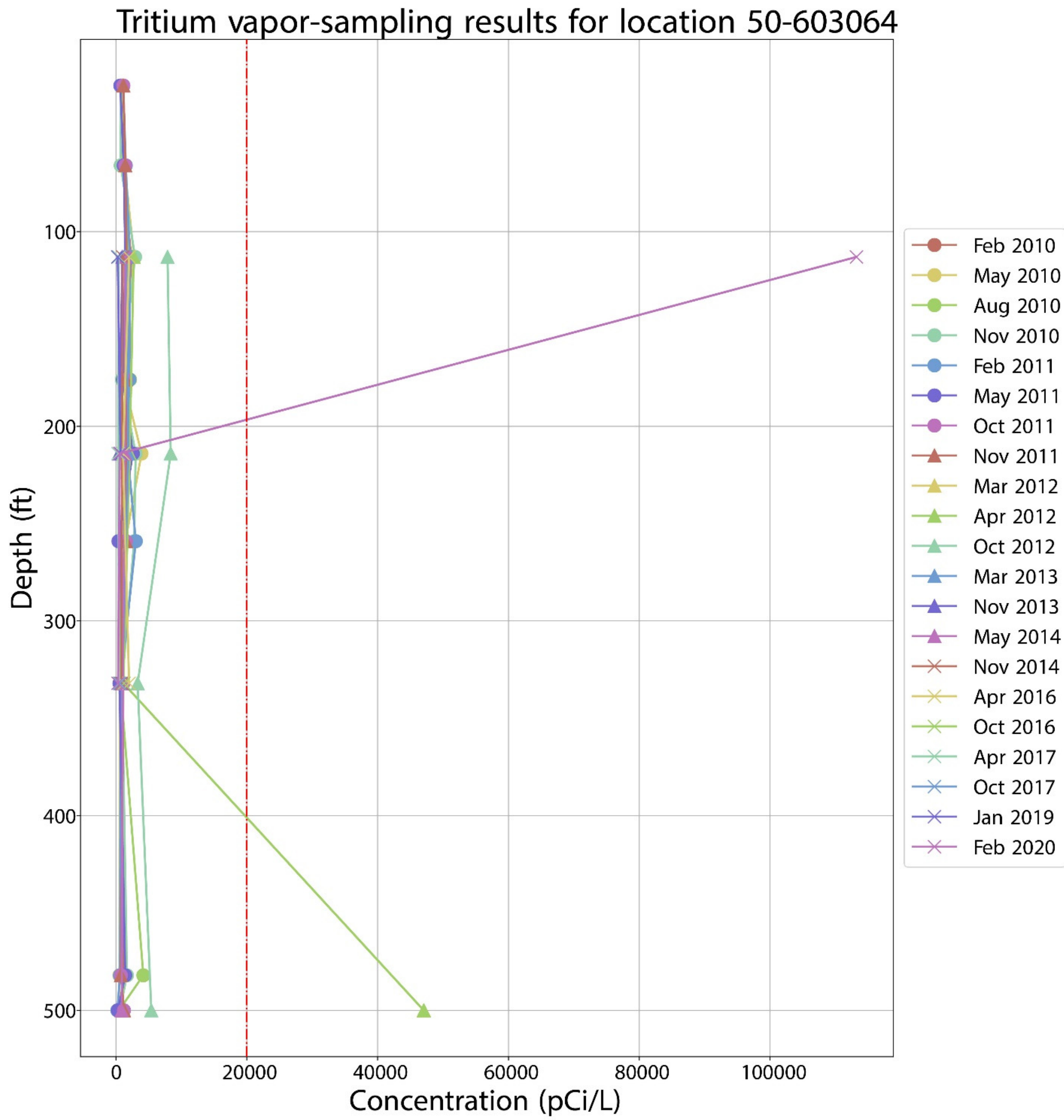


Figure F-3.2-7 Tritium vapor-sampling results for location 50-603064

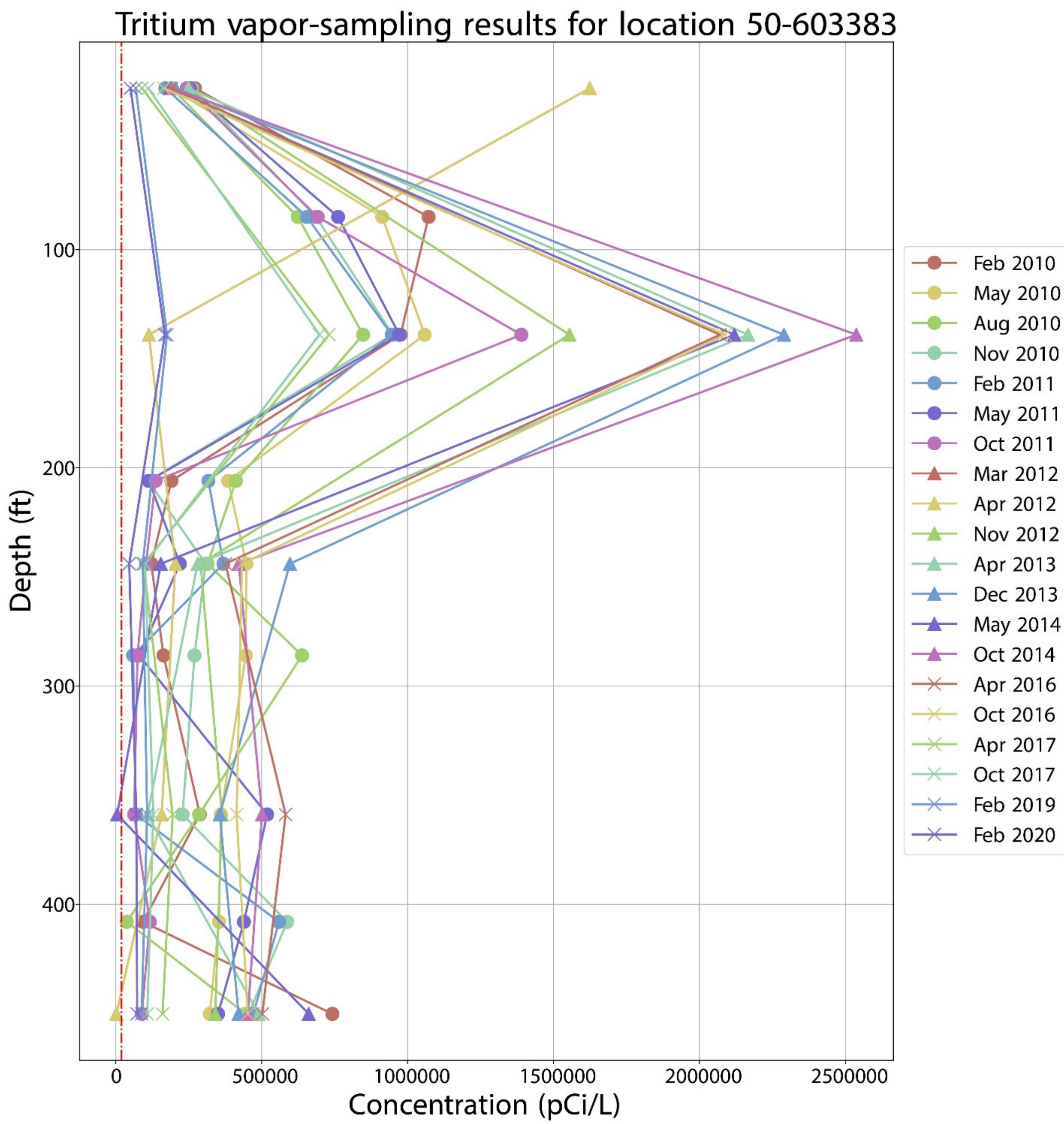


Figure F-3.2-8 Tritium vapor-sampling results for location 50-603383 (Linear)

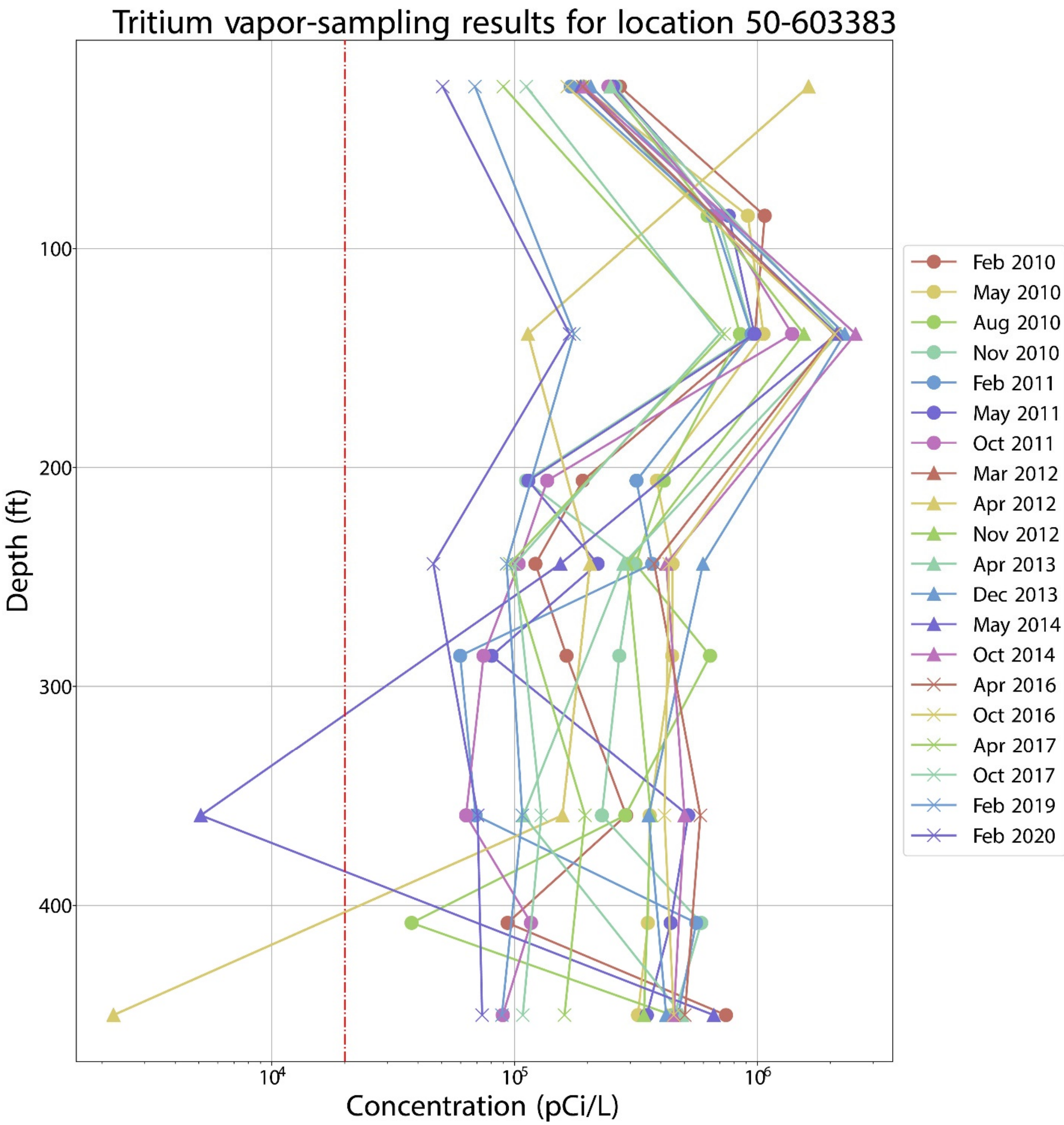


Figure F-3.2-9 Tritium vapor-sampling results for location 50-603383 (Log scale)

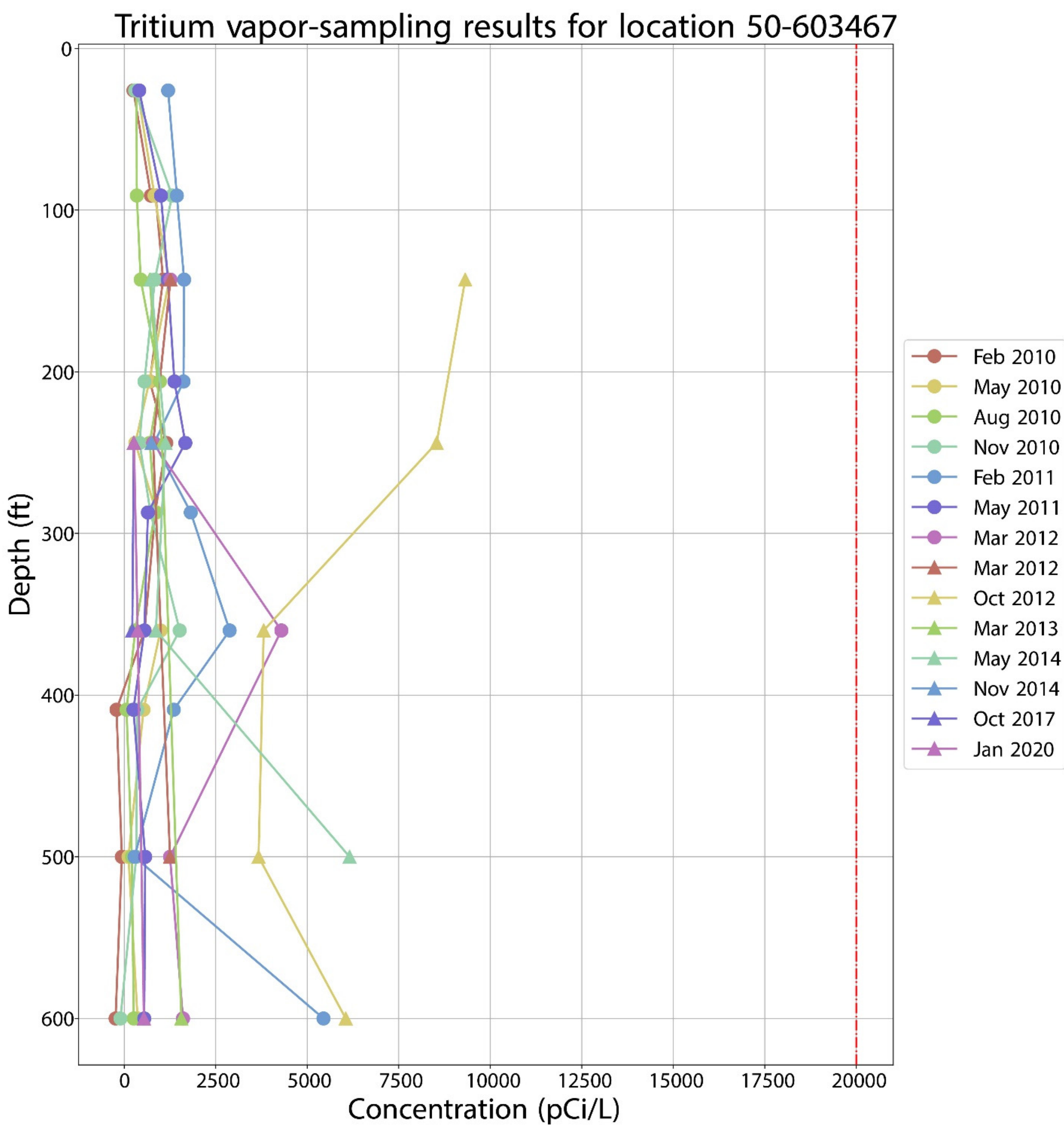


Figure F-3.2-10 Tritium vapor-sampling results for location 50-603467

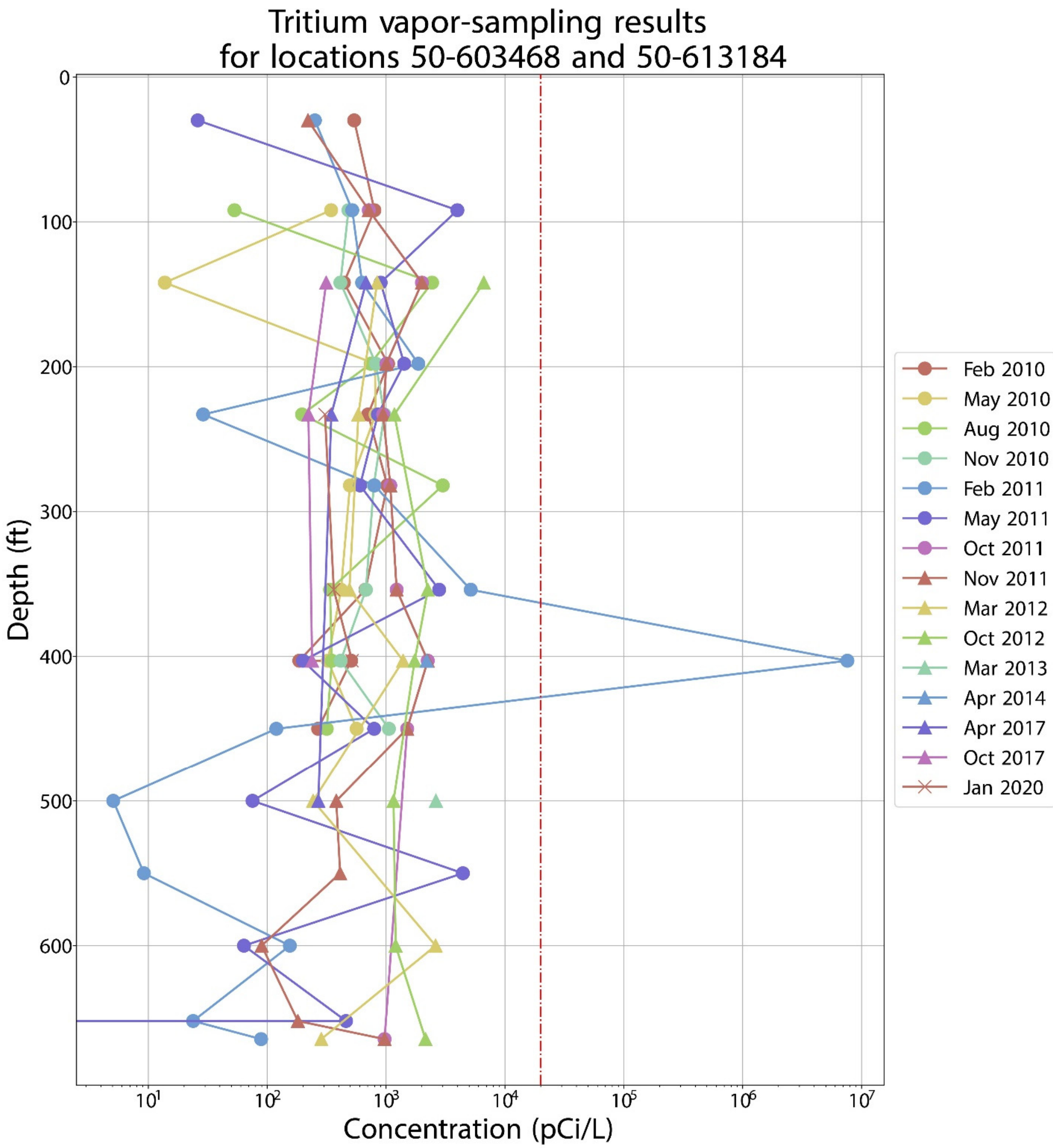


Figure F-3.2-11 Tritium vapor-sampling results for locations 50-603468 and 50-613184

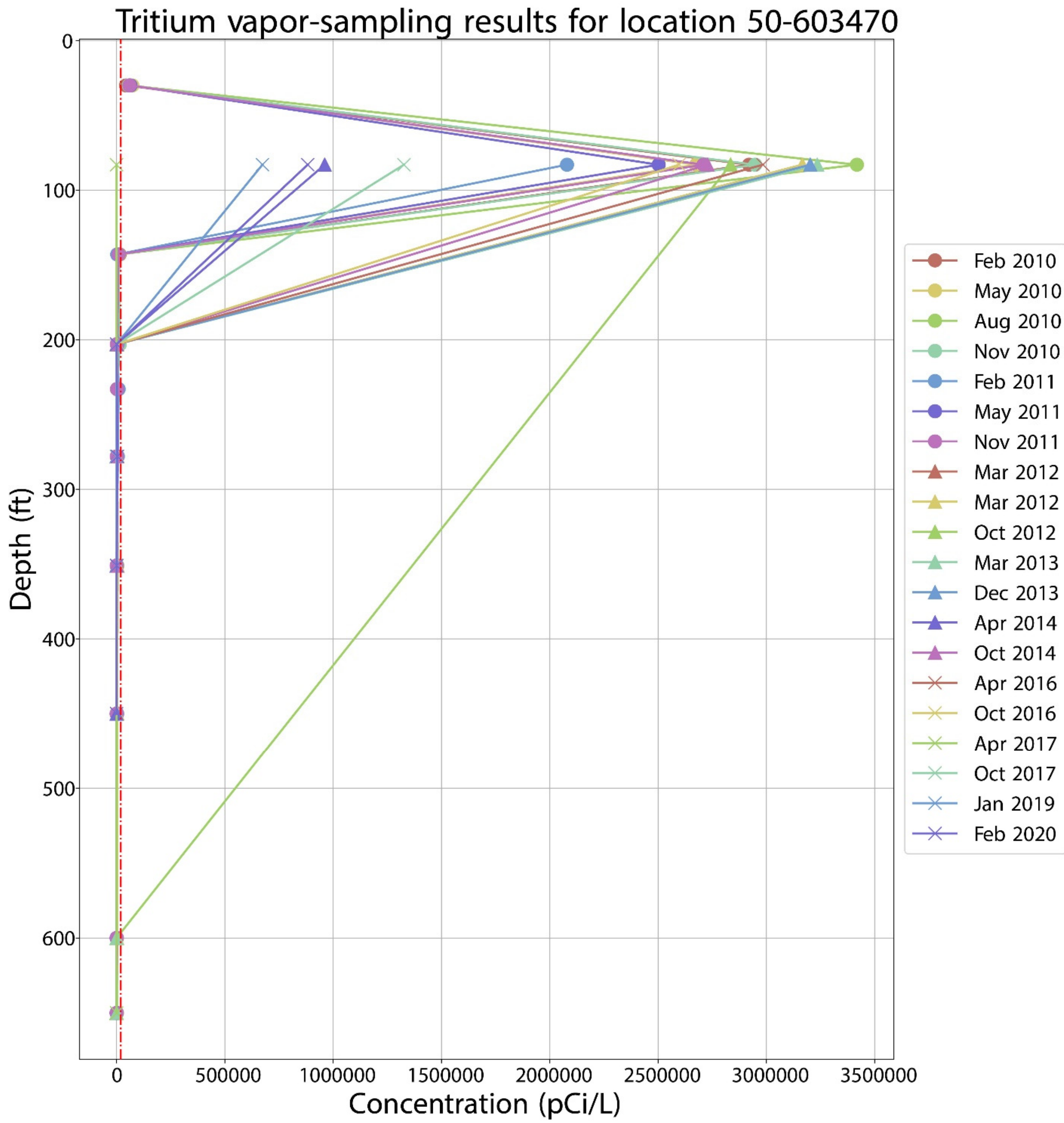


Figure F-3.2-12 Tritium vapor-sampling results for location 50-603470

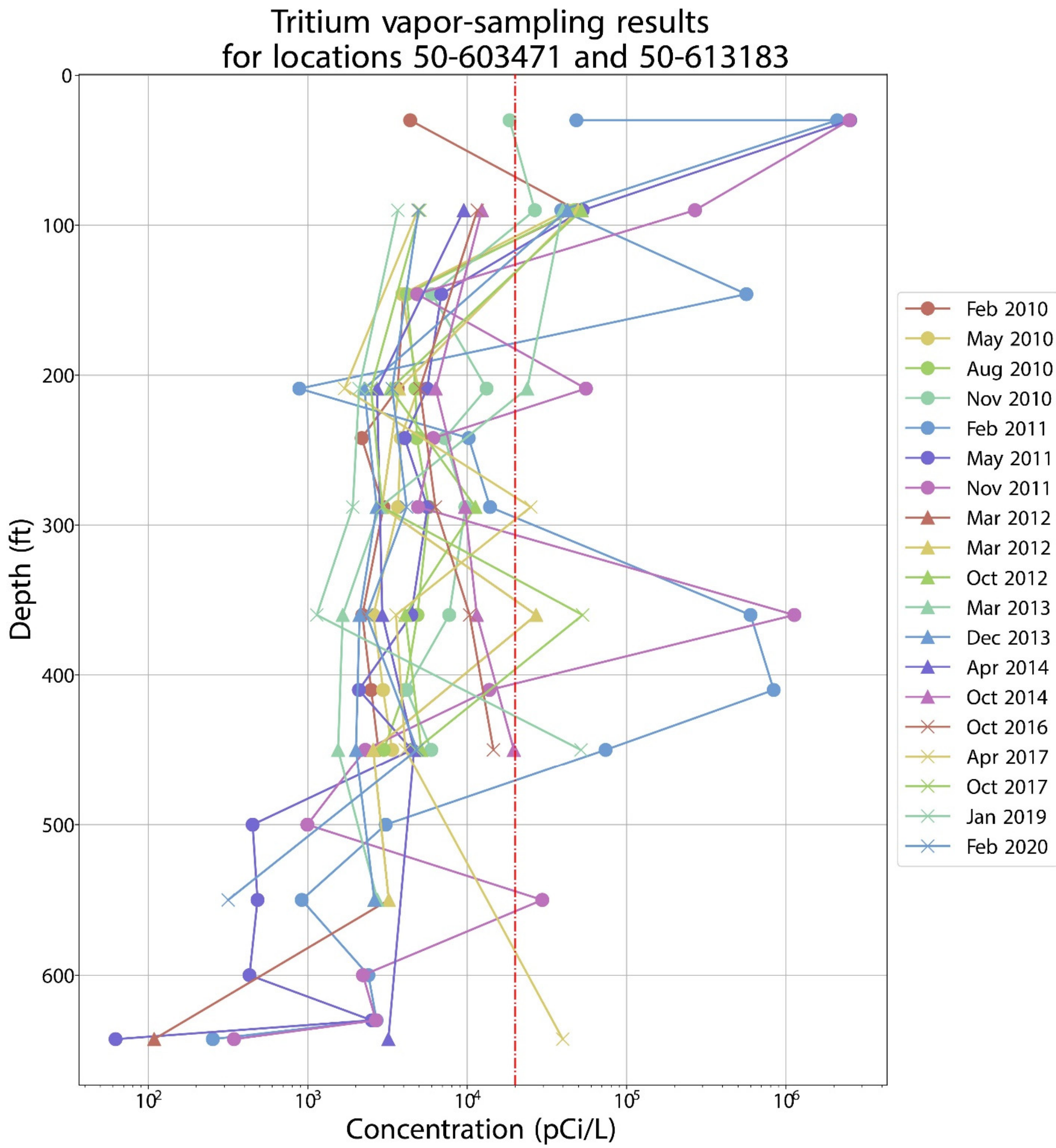


Figure F-3.2-13 Tritium vapor-sampling results for locations 50-603471 and 50-613183

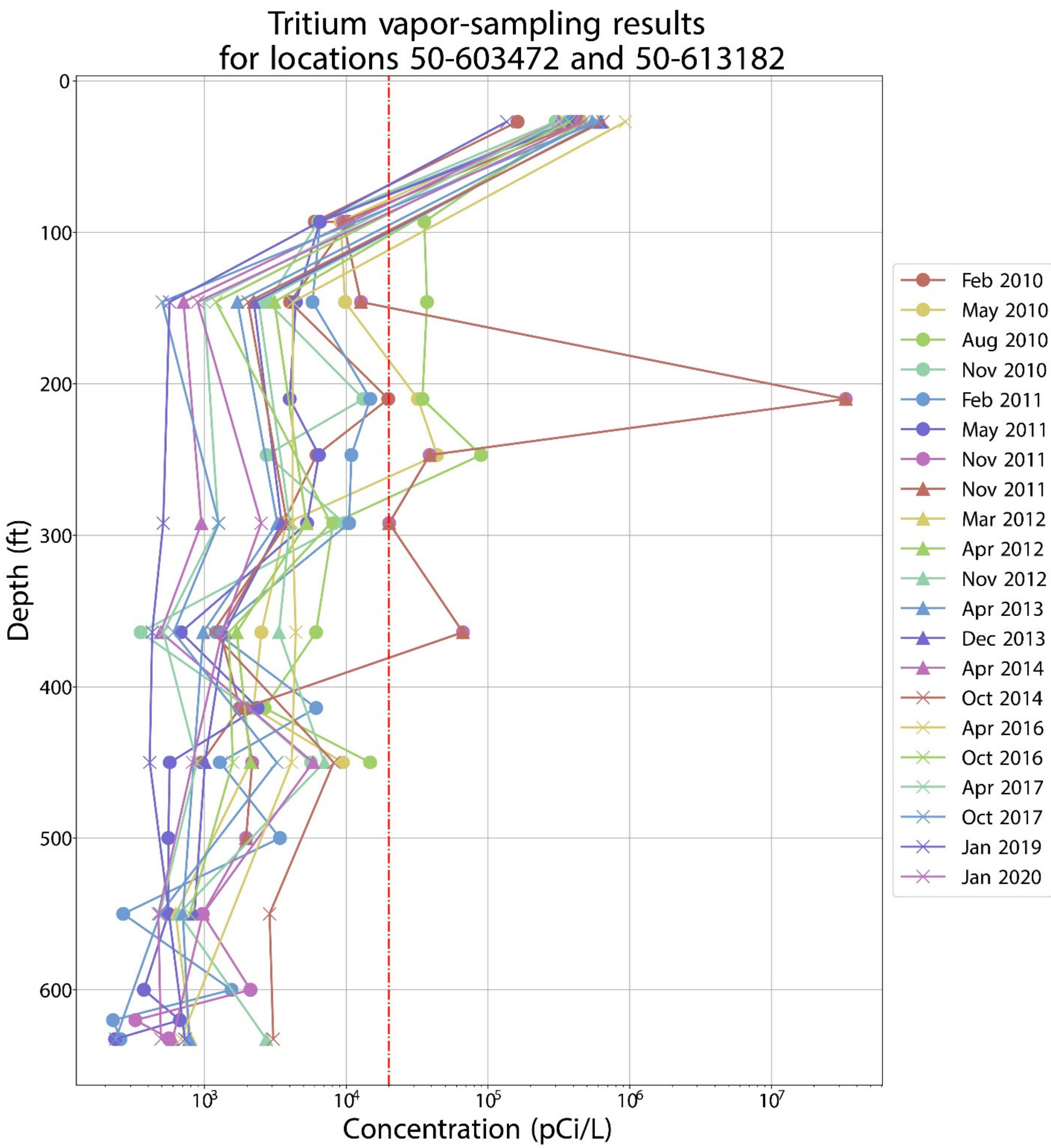


Figure F-3.2-14 Tritium vapor-sampling results for locations 50-603472 and 50-613182

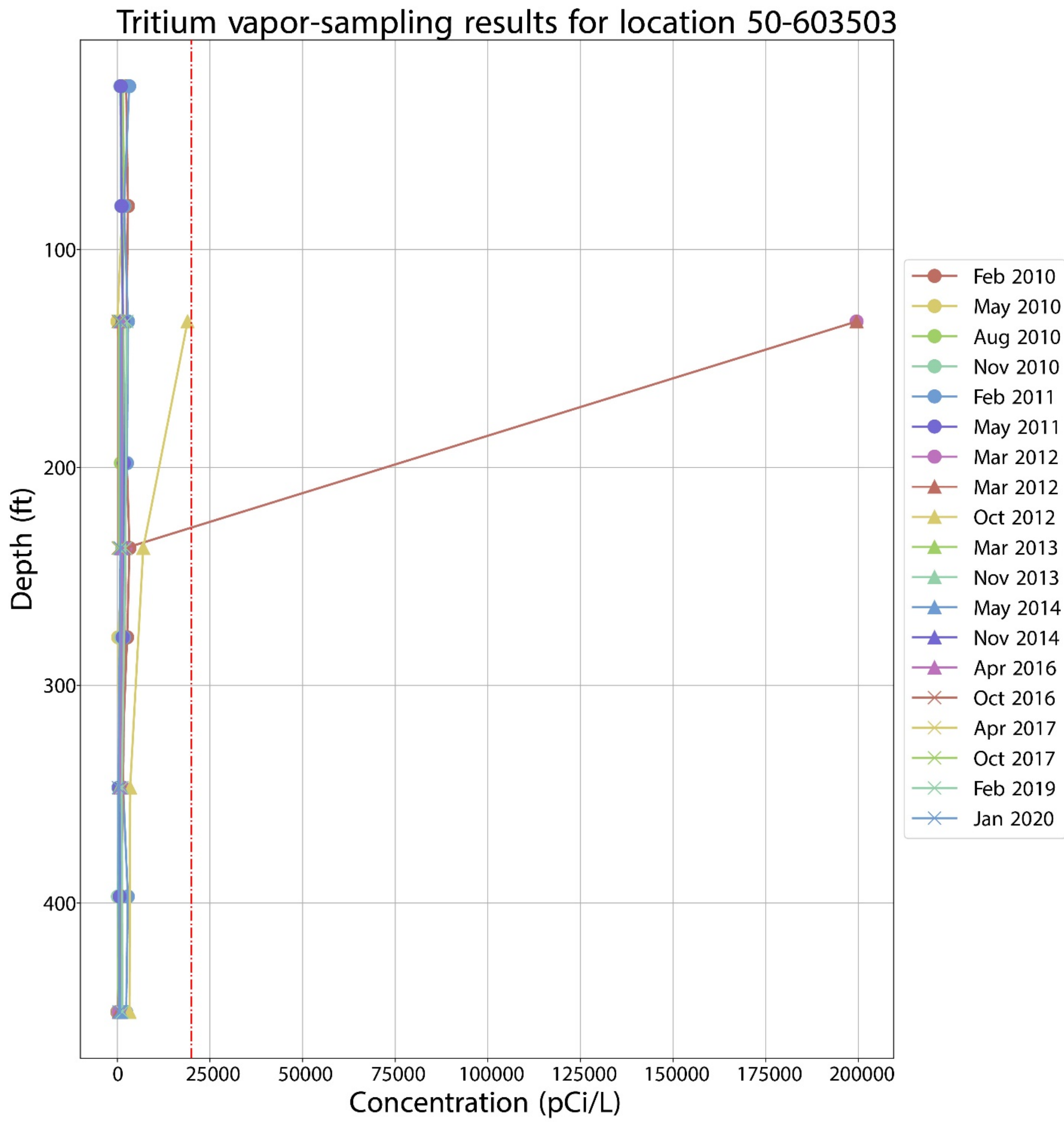


Figure F-3.2-15 Tritium vapor-sampling results for location 50-603503

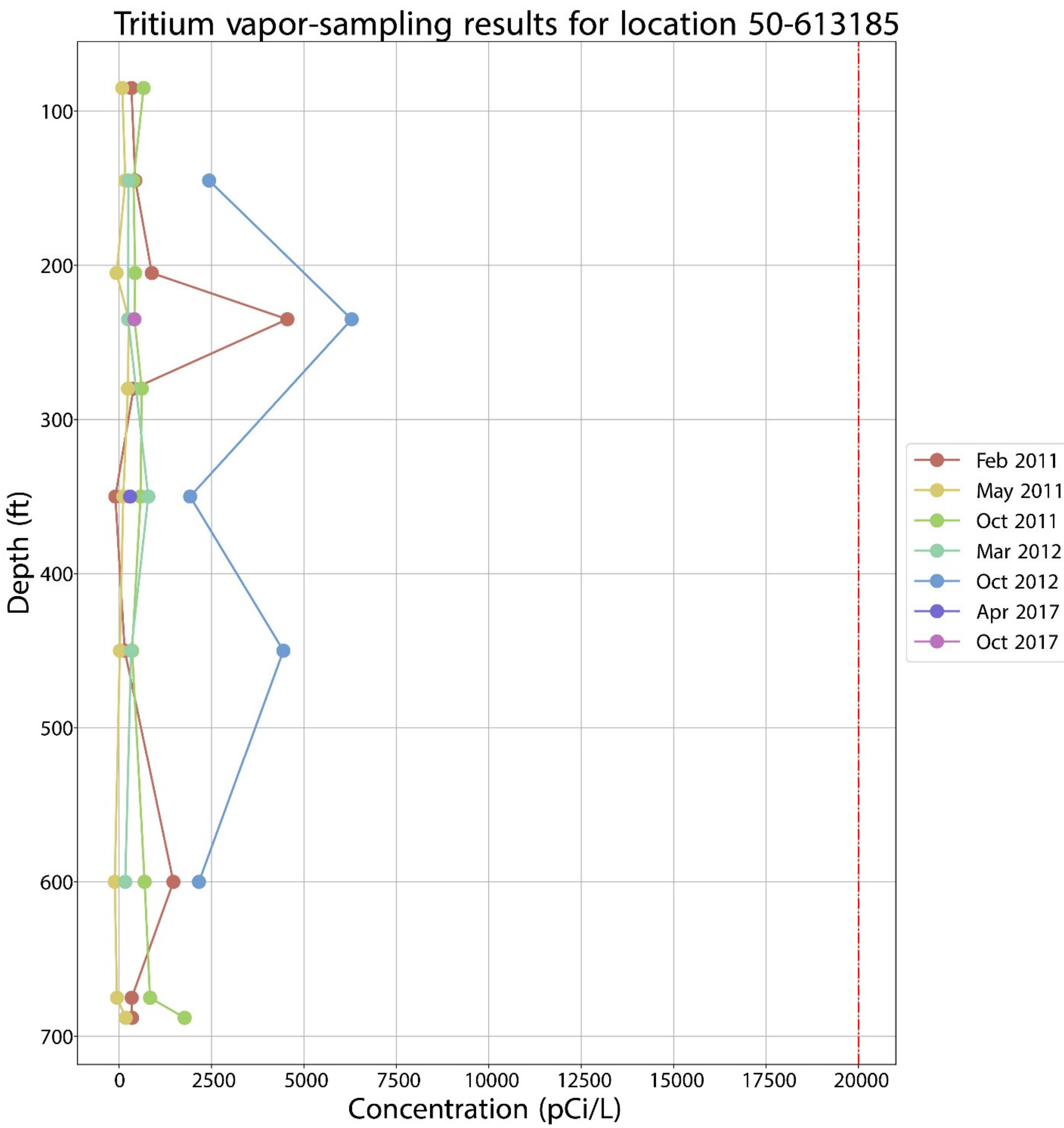


Figure F-3-2.16 Tritium vapor-sampling results for location 50-613185

Table F-3.2-1
Summary of Pore Gas Detection Status for Tritium

Sampling Event	Number of Analyses	Number of Detects	Number of Detected Locations	Activity Range	Location and Depth of Maximum Detection	Maximum Detected Result	Tier 1 SL
October 2012–November 2012	80	72	17	[-131.658] to 2,834,900	50-603470 (83 ft)	**2,834,900**	20,000
March 2013–April 2013	80	56	16	[15.6185] to 3,235,070	50-603470 (83 ft)	**3,235,070**	20,000
November 2013–December 2013	80	45	13	[-604.979] to 3,202,520	50-603470 (83 ft)	**3,202,520**	20,000
April 2014–May 2014	81	55	16	[-60.075] to 2,119,240	50-603383 (139 ft)	**2,119,240**	20,000
October 2014–November 2014	80	47	14	[-363.869] to 2,728,890	50-603470 (83 ft)	**2,728,890**	20,000
March 2015–April 2015	80	47	13	[-276.111] to 3,478,570	50-603470 (83 ft)	**3,478,570**	20,000
October 2015–November 2015	80	47	14	[-397.799] to 1,291,780	50-603470 (83 ft)	**1,291,780**	20,000
April 2016	80	47	13	[-117.74] to 2,984,470	50-603470 (83 ft)	**2,984,470**	20,000
October 2016	80	39	12	[-546.024] to 2,596,820	50-603470 (83 ft)	**2,596,820**	20,000
April 2017	80	46	16	[-1.444] to 730,930	50-603383 (139 ft)	**730,930**	20,000
October 2017	80	53	15	[-93.916] to 1,326,830	50-603470 (83 ft)	**1,326,830**	20,000
January 2019–February 2019	80	44	12	[-284.145] to 673,577	50-603470 (83 ft)	**673,577**	20,000
January 2020–February 2020	80	59	16	[-83.582] to 882,380	50-603470 (83 ft)	**882,380**	20,000

Notes: Units in pCi/L. Brackets indicate nondetected result. Bold indicates maximum concentration greater than Tier 1 SL.

Table F-3.2-2
Tier 1 and 2 Screening of Tritium Vapor Data at MDA C

Location ID	Depth (ft bgs)	October–November 2012		March–April 2013		November–December 2013		April–May 2014		October–November 2014	
		Sample ID	Result	Sample ID	Result	Sample ID	Result	Sample ID	Result	Sample ID	Result
50-24784	155	MD50-13-24032	4759	MD50-13-28927	2705	MD50-14-45789	2317	MD50-14-75350	776	MD50-14-87677	2093
50-24784	244	MD50-13-24033	2178	MD50-13-28928	1690	MD50-14-45788	**20,884**	MD50-14-75349	1124	MD50-14-87678	1566
50-24784	362	MD50-13-24034	4175	MD50-13-28929	1057	MD50-14-45787	1070	MD50-14-75348	511	MD50-14-87679	1228
50-24784	450	MD50-13-24035	534	MD50-13-28930	15.6 (U)	MD50-14-45786	1045	MD50-14-75347	414	MD50-14-87680	680
50-24813	25	MD50-13-24038	481	MD50-13-28931	569	MD50-14-45795	15.9 (U)	MD50-14-75356	544	MD50-14-87681	368 (U)
50-24813	150	MD50-13-24040	**164,506**	MD50-13-28932	**198,426**	MD50-14-45794	**142,621**	MD50-14-75355	**157,608**	MD50-14-87682	**179,410**
50-24813	241	MD50-13-24041	2305	MD50-13-28933	1665	MD50-14-45793	1418	MD50-14-75354	2492	MD50-14-87683	1601
50-24813	358	MD50-13-24036	388 (U)	MD50-13-28934	353 (U)	MD50-14-45792	313 (U)	MD50-14-75353	731	MD50-14-87684	269 (U)
50-24813	450	MD50-13-24037	777	MD50-13-28935	378 (U)	MD50-14-45791	-49.3 (U)	MD50-14-75352	744	MD50-14-87685	2492
50-24813	600	MD50-13-24039	680	MD50-13-28936	192 (U)	MD50-14-45790	-8.04 (U)	MD50-14-75351	101 (U)	MD50-14-87686	5307
50-24822	25	MD50-13-24042	7026	MD50-13-28937	930	MD50-14-45800	790	MD50-14-75361	1087	MD50-14-87687	714
50-24822	142	MD50-13-24046	2963	MD50-13-28938	568	MD50-14-45796	489	MD50-14-75357	452 (U)	MD50-14-87688	532 (U)
50-24822	235	MD50-13-24044	6694	MD50-13-28939	1012	MD50-14-45797	518	MD50-14-75358	483 (U)	MD50-14-87689	645
50-24822	351	MD50-13-24045	5843	MD50-13-28940	995	MD50-14-45798	549	MD50-14-75359	121 (U)	MD50-14-87690	860
50-24822	450	MD50-13-24043	5141	MD50-13-28941	1016	MD50-14-45799	543	MD50-14-75360	403 (U)	MD50-14-87691	444 (U)
50-603061	25	MD50-13-24051	673	MD50-13-28942	275 (U)	MD50-14-45801	1731	MD50-14-75362	357 (U)	MD50-14-87692	471 (U)
50-603061	128	MD50-13-24047	15,293	MD50-13-28943	1500	MD50-14-45802	5221	MD50-14-75363	800	MD50-14-87693	740
50-603061	228	MD50-13-24048	3091	MD50-13-28944	1520	MD50-14-45803	1971	MD50-14-75364	**30,609**	MD50-14-87694	2011
50-603061	347	MD50-13-24049	3062	MD50-13-28945	3614	MD50-14-45804	3169	MD50-14-75365	7160	MD50-14-87695	3266
50-603061	450	MD50-13-24050	2344	MD50-13-28946	570	MD50-14-45805	221 (U)	MD50-14-75366	551 (U)	MD50-14-87696	475 (U)
50-603062	122	MD50-13-24052	4307	MD50-13-28947	185 (U)	MD50-14-45806	230 (U)	MD50-14-75367	220 (U)	MD50-14-87697	1794
50-603062	217	MD50-13-24053	7365	MD50-13-28948	405	MD50-14-45807	51.5 (U)	MD50-14-75368	0 (U)	MD50-14-87698	160 (U)
50-603062	337	MD50-13-24054	4793	MD50-13-28949	2618	MD50-14-45809	158 (U)	MD50-14-75370	427 (U)	MD50-14-87699	6912
50-603062	450	MD50-13-24055	10,177	MD50-13-28950	2375	MD50-14-45808	347 (U)	MD50-14-75369	657	MD50-14-87700	52.9 (U)
50-603063	25	MD50-13-24060	697	MD50-13-28951	900	MD50-14-45814	142 (U)	MD50-14-75375	990	MD50-14-87701	531 (U)
50-603063	128	MD50-13-24056	2409	MD50-13-28952	1328	MD50-14-45813	1109	MD50-14-75374	1041	MD50-14-87702	1338
50-603063	228	MD50-13-24057	2027	MD50-13-28953	1499	MD50-14-45812	3618	MD50-14-75373	3802	MD50-14-87703	1373
50-603063	347	MD50-13-24058	1428	MD50-13-28954	1630	MD50-14-45811	919	MD50-14-75372	2255	MD50-14-87704	1651
50-603063	450	MD50-13-24059	2241	MD50-13-28955	2243	MD50-14-45810	3050	MD50-14-75371	1616	MD50-14-87705	3213
50-603064	113	MD50-13-24061	7896	MD50-13-28956	1661	MD50-14-45815	1000	MD50-14-75376	1433	MD50-14-87706	1049
50-603064	214	MD50-13-24062	8380	MD50-13-28957	1892	MD50-14-45816	442	MD50-14-75377	1377	MD50-14-87707	520 (U)
50-603064	332	MD50-13-24063	3327	MD50-13-28958	987	MD50-14-45817	882	MD50-14-75378	1063	MD50-14-87708	810
50-603064	500	MD50-13-24064	5412	MD50-13-28959	347 (U)	MD50-14-45818	40.5 (U)	MD50-14-75379	884	MD50-14-87709	-16.4 (U)
50-603383	26	MD50-13-24157	**248,542**	MD50-13-28960	**248,873**	MD50-14-45819	**206,010**	MD50-14-75380	**187,020**	MD50-14-87710	**192,891**
50-603383	139	MD50-13-24153	**1,554,510**	MD50-13-28961	**2,166,610**	MD50-14-45820	**2,289,520**	MD50-14-75381	**2,119,240**	MD50-14-87711	**2,537,390**
50-603383	244	MD50-13-24154	**290,803**	MD50-13-28962	**280,727**	MD50-14-45821	**596,944**	MD50-14-75382	**154,443**	MD50-14-87712	**421,384**

Table F-3.2-2 (continued)

Location ID	Depth (ft bgs)	October–November 2012		March–April 2013		November–December 2013		April–May 2014		October–November 2014	
		Sample ID	Result	Sample ID	Result	Sample ID	Result	Sample ID	Result	Sample ID	Result
50-603383	359	MD50-13-24155	**363,969**	MD50-13-28963	**108,848**	MD50-14-45822	**356,461**	MD50-14-75383	5098	MD50-14-87713	**501,111**
50-603383	450	MD50-13-24156	**340,920**	MD50-13-28964	**489,395**	MD50-14-45823	**420,900**	MD50-14-75384	**661,098**	MD50-14-87714	**452,668**
50-603467	143	MD50-13-24066	9316	MD50-13-28965	698	MD50-14-45824	157 (U)	MD50-14-75385	730	MD50-14-87715	528 (U)
50-603467	244	MD50-13-24070	8536	MD50-13-28966	1032	MD50-14-45825	197 (U)	MD50-14-75386	1128	MD50-14-87716	751
50-603467	360	MD50-13-24068	3811	MD50-13-28967	20 (U)	MD50-14-45826	55.3 (U)	MD50-14-75387	865	MD50-14-87717	227 (U)
50-603467	500	MD50-13-24069	3671	MD50-13-28968	330 (U)	MD50-14-45827	84.1 (U)	MD50-14-75388	6157	MD50-14-87718	492 (U)
50-603467	600	MD50-13-24067	6052	MD50-13-28969	1562	MD50-14-45828	0 (U)	MD50-14-75389	236 (U)	MD50-14-87719	381 (U)
50-603468	142	MD50-13-24159	6636	MD50-13-28970	193 (U)	MD50-14-45831	-135 (U)	MD50-14-75392	107 (U)	MD50-14-87720	323 (U)
50-603468	233	MD50-13-24158	1175	MD50-13-28971	314 (U)	MD50-14-45830	-120 (U)	MD50-14-75391	174 (U)	MD50-14-87721	147 (U)
50-603468	354	MD50-13-24160	2246	MD50-13-28972	210 (U)	MD50-14-45829	70.1 (U)	MD50-14-75390	72.1 (U)	MD50-14-87722	386 (U)
50-603468	403	MD50-13-24161	1738	MD50-13-28973	140 (U)	MD50-14-45832	-231 (U)	MD50-14-75393	2199	MD50-14-87723	244 (U)
50-603470	83	MD50-13-24077	**2,834,900**	MD50-13-28977	**3,235,070**	MD50-14-45847	**3,202,520**	MD50-14-75403	**960,960**	MD50-14-87727	**2,728,890**
50-603470	203	MD50-13-24078	1946 (U)	MD50-13-28978	1398	MD50-14-45846	964	MD50-14-75402	490	MD50-14-87728	653
50-603470	278	MD50-13-24079	1655 (U)	MD50-13-28979	1542	MD50-14-45845	688	MD50-14-75401	568	MD50-14-87729	2302
50-603470	351	MD50-13-24080	1693 (U)	MD50-13-28980	816	MD50-14-45844	523	MD50-14-75400	618	MD50-14-87730	2157
50-603470	450	MD50-13-24081	894 (U)	MD50-13-28981	289 (U)	MD50-14-45843	40.5 (U)	MD50-14-75399	387	MD50-14-87731	167 (U)
50-603470	600	MD50-13-24075	531	MD50-13-28982	472	MD50-14-45842	-110 (U)	MD50-14-75398	227 (U)	—[a]	—
50-603470	650	MD50-13-24076	-132 (U)	MD50-13-28983	591	MD50-14-45841	-237 (U)	MD50-14-75397	102 (U)	MD50-14-87733	-21 (U)
50-603471	90	MD50-13-24082	**52,232**	MD50-13-28984	**39,694**	MD50-14-45852	**42,534**	MD50-14-75408	9523	MD50-14-87734	12,352
50-603471	209	MD50-13-24083	3309	MD50-13-28985	**23,788**	MD50-14-45851	2263	MD50-14-75407	2719	MD50-14-87735	6343
50-603471	288	MD50-13-24084	11,255	MD50-13-28986	2842	MD50-14-45850	2706	MD50-14-75406	38.7 (U)	MD50-14-87736	9698
50-603471	360	MD50-13-24085	4089	MD50-13-28987	1657	MD50-14-45849	2113	MD50-14-75405	2936	MD50-14-87737	11,494
50-603471	450	MD50-13-24086	5157	MD50-13-28988	1550	MD50-14-45848	2006	MD50-14-75404	4646	MD50-14-87738	19,632
50-603471	na[b]	—	—	—	—	—	—	MD50-14-75754	15,679	MD50-14-90318	**34,706**
50-603472	27	MD50-13-24143	**608,131**	MD50-13-28991	**543,802**	MD50-14-45859	**628,078**	MD50-14-75415	**315,002**	MD50-14-87741	**646,712**
50-603472	146	MD50-13-24144	2405	MD50-13-28992	1708	MD50-14-45855	2230	MD50-14-75411	712	MD50-14-87742	2028
50-603472	292	MD50-13-24147	4006	MD50-13-28993	3263	MD50-14-45856	3499	MD50-14-75412	950	MD50-14-87743	3821
50-603472	364	MD50-13-24145	3356	MD50-13-28994	978	MD50-14-45857	1392	MD50-14-75413	492	MD50-14-87744	1143
50-603472	450	MD50-13-24146	7015	MD50-13-28995	318 (U)	MD50-14-45858	1007	MD50-14-75414	5839	MD50-14-87745	8163
50-603503	133	MD50-13-24094	18,944	MD50-13-28998	1656	MD50-14-45862	1288	MD50-14-75418	1289	MD50-14-87748	739
50-603503	237	MD50-13-24093	6981	MD50-13-28999	1214	MD50-14-45863	748	MD50-14-75419	1342	MD50-14-87749	1199
50-603503	347	MD50-13-24092	3442	MD50-13-29000	490	MD50-14-45864	137 (U)	MD50-14-75420	1057	MD50-14-87750	316 (U)
50-603503	450	MD50-13-24091	3279	MD50-13-29001	297 (U)	MD50-14-45865	197 (U)	MD50-14-75421	1016	MD50-14-87751	-26.7 (U)
50-613182	550	MD50-13-24089	659	MD50-13-28996	703	MD50-14-45860	849	MD50-14-75416	974	MD50-14-87746	2877
50-613182	632.5	MD50-13-24090	2725	MD50-13-28997	779	MD50-14-45861	419 (U)	MD50-14-75417	596	MD50-14-87747	3058
50-613183	550	MD50-13-24087	307 (U)	MD50-13-28989	2736	MD50-14-45853	2617	MD50-14-75409	132 (U)	MD50-14-87739	264 (U)
50-613183	642.5	MD50-13-24088	172 (U)	MD50-13-28990	179 (U)	MD50-14-45854	-260 (U)	MD50-14-75410	3203	MD50-14-87740	440 (U)
50-613184	500	MD50-13-24074	1156	MD50-13-28974	2627	MD50-14-45833	272 (U)	MD50-14-75394	48 (U)	MD50-14-87724	278 (U)

Table F-3.2-2 (continued)

Location ID	Depth (ft bgs)	October–November 2012		March–April 2013		November–December 2013		April–May 2014		October–November 2014	
		Sample ID	Result	Sample ID	Result	Sample ID	Result	Sample ID	Result	Sample ID	Result
50-613184	600	MD50-13-24073	1204	MD50-13-28975	309 (U)	MD50-14-45834	-88 (U)	MD50-14-75395	-60.1 (U)	MD50-14-87725	126 (U)
50-613184	664.5	MD50-13-24072	2145	MD50-13-28976	18.6 (U)	MD50-14-45835	-90.2 (U)	MD50-14-75396	-57.5 (U)	MD50-14-87726	-53.9 (U)
50-613185	145	MD50-13-24099	2435	MD50-13-29002	226 (U)	MD50-14-45870	-269 (U)	MD50-14-75426	36.9 (U)	MD50-14-87752	-227 (U)
50-613185	235	MD50-13-24098	6291	MD50-13-29003	75.8 (U)	MD50-14-45869	-122 (U)	MD50-14-75425	189 (U)	MD50-14-87753	-364 (U)
50-613185	350	MD50-13-24095	1922	MD50-13-29004	292 (U)	MD50-14-45868	-261 (U)	MD50-14-75424	740 (U)	MD50-14-87754	-179 (U)
50-613185	450	MD50-13-24096	4445	MD50-13-29005	82.6 (U)	MD50-14-45867	-605 (U)	MD50-14-75423	118 (U)	MD50-14-87755	-115 (U)
50-613185	600	MD50-13-24097	2160	MD50-13-29006	78.2 (U)	MD50-14-45866	-286 (U)	MD50-14-75422	201 (U)	MD50-14-87756	-281 (U)

Table F-3.2-2 (continued)

Location ID	Depth (ft bgs)	March–April 2015		October 2015		April 2016		October 2016	
		Sample ID	Result	Sample ID	Result	Sample ID	Result	Sample ID	Result
50-24784	155	MD50-15-92946	2813	MD50-15-105183	649	MD50-16-115112	2142	MD50-16-126487	482
50-24784	244	MD50-15-92947	3293	MD50-15-105184	503	MD50-16-115113	1938	MD50-16-126488	522
50-24784	362	MD50-15-92948	1861	MD50-15-105185	611	MD50-16-115114	2960	MD50-16-126489	247
50-24784	450	MD50-15-92949	1270	MD50-15-105186	298	MD50-16-115115	2540	MD50-16-126490	263
50-24813	25	MD50-15-92950	136 (U)	MD50-15-105187	684	MD50-16-115116	991	MD50-16-126491	231 (U)
50-24813	150	MD50-15-92951	**157,943**	MD50-15-105188	**114,583**	MD50-16-115117	**108,124**	MD50-16-126492	**132,949**
50-24813	241	MD50-15-92952	1849	MD50-15-105189	2212	MD50-16-115118	1730	MD50-16-126493	963
50-24813	358	MD50-15-92953	685	MD50-15-105190	1082	MD50-16-115119	810	MD50-16-126494	321 (U)
50-24813	450	MD50-15-92954	394 (U)	MD50-15-105191	690	MD50-16-115120	530 (U)	MD50-16-126495	400 (U)
50-24813	600	MD50-15-92955	143 (U)	MD50-15-105192	338 (U)	MD50-16-115121	449 (U)	MD50-16-126496	7.94 (U)
50-24822	25	MD50-15-92956	796	MD50-15-105193	829	MD50-16-115122	432	MD50-16-126497	224 (U)
50-24822	142	MD50-15-92957	688	MD50-15-105194	304 (U)	MD50-16-115123	183 (U)	MD50-16-126498	620
50-24822	235	MD50-15-92958	845	MD50-15-105195	491 (U)	MD50-16-115124	314	MD50-16-126499	50.1 (U)
50-24822	351	MD50-15-92959	820	MD50-15-105196	293 (U)	MD50-16-115125	177 (U)	MD50-16-126500	-143 (U)
50-24822	450	MD50-15-92960	256 (U)	MD50-15-105197	256 (U)	MD50-16-115126	112 (U)	MD50-16-126501	-283 (U)
50-603061	25	MD50-15-92961	435 (U)	MD50-15-105198	903	MD50-16-115127	351 (U)	MD50-16-126502	314 (U)
50-603061	128	MD50-15-92962	1041	MD50-15-105199	1661	MD50-16-115128	1113	MD50-16-126503	928
50-603061	228	MD50-15-92963	2372	MD50-15-105200	2682	MD50-16-115129	2076	MD50-16-126504	2148
50-603061	347	MD50-15-92964	3349	MD50-15-105201	16,243	MD50-16-115130	2647	MD50-16-126505	2616
50-603061	450	MD50-15-92965	345 (U)	MD50-15-105202	19,275	MD50-16-115131	387 (U)	MD50-16-126506	367 (U)
50-603062	122	MD50-15-92966	51.1 (U)	MD50-15-105203	-28.6 (U)	MD50-16-115132	171 (U)	MD50-16-126507	-347 (U)
50-603062	217	MD50-15-92967	892	MD50-15-105204	54.6 (U)	MD50-16-115133	1659	MD50-16-126508	-123 (U)
50-603062	337	MD50-15-92968	-84.2 (U)	MD50-15-105205	138 (U)	MD50-16-115134	-28.8 (U)	MD50-16-126509	-61.9 (U)
50-603062	450	MD50-15-92969	148 (U)	MD50-15-105206	114 (U)	MD50-16-115135	1089	MD50-16-126510	-176 (U)
50-603063	25	MD50-15-92970	686	MD50-15-105207	430 (U)	MD50-16-115136	678	MD50-16-126511	513 (U)
50-603063	128	MD50-15-92971	2127	MD50-15-105208	2133	MD50-16-115137	**57,423**	MD50-16-126512	1013
50-603063	228	MD50-15-92972	2435	MD50-15-105209	2302	MD50-16-115138	1476	MD50-16-126513	826
50-603063	347	MD50-15-92973	3497	MD50-15-105210	8134	MD50-16-115139	2727	MD50-16-126514	607
50-603063	450	MD50-15-92974	3375	MD50-15-105211	2070	MD50-16-115140	3989	MD50-16-126515	1676
50-603064	113	MD50-15-92975	1548	MD50-15-105212	404	MD50-16-115141	2022	MD50-16-126516	142 (U)
50-603064	214	MD50-15-92976	1345	MD50-15-105213	324	MD50-16-115142	1096	MD50-16-126517	363 (U)
50-603064	332	MD50-15-92977	1222	MD50-15-105214	1096	MD50-16-115143	2017	MD50-16-126518	1236
50-603064	500	MD50-15-92978	514 (U)	MD50-15-105215	76.6 (U)	MD50-16-115144	349 (U)	MD50-16-126519	-114 (U)
50-603383	26	MD50-15-92979	**234,977**	MD50-15-105216	**110,335**	MD50-16-115145	**190,954**	MD50-16-126520	**164,789**
50-603383	139	MD50-15-92980	**3,006,620**	MD50-15-105217	**1,047,890**	MD50-16-115146	**2,070,170**	MD50-16-126521	**2,088,090**
50-603383	244	MD50-15-92981	**609,378**	MD50-15-105218	**226,926**	MD50-16-115147	**375,777**	MD50-16-126522	**432,558**

Table F-3.2-2 (continued)

Location ID	Depth (ft bgs)	March–April 2015		October 2015		April 2016		October 2016	
		Sample ID	Result	Sample ID	Result	Sample ID	Result	Sample ID	Result
50-603383	359	MD50-15-92982	**618,200**	MD50-15-105219	**219,380**	MD50-16-115148	**581,957**	MD50-16-126523	**414,190**
50-603383	450	MD50-15-92983	**626,713**	MD50-15-105220	**176,804**	MD50-16-115149	**502,209**	MD50-16-126524	**452,293**
50-603467	143	MD50-15-92984	467 (U)	MD50-15-105221	129 (U)	MD50-16-115150	423 (U)	MD50-16-126525	-420 (U)
50-603467	244	MD50-15-92985	232 (U)	MD50-15-105222	-61 (U)	MD50-16-115151	632 (U)	MD50-16-126526	22 (U)
50-603467	360	MD50-15-92986	-46.8 (U)	MD50-15-105223	155 (U)	MD50-16-115152	151 (U)	MD50-16-126527	-377 (U)
50-603467	500	MD50-15-92987	-71.5 (U)	MD50-15-105224	-87 (U)	MD50-16-115153	501 (U)	MD50-16-126528	-243 (U)
50-603467	600	MD50-15-92988	-235 (U)	MD50-15-105225	-251 (U)	MD50-16-115154	31 (U)	MD50-16-126529	-383 (U)
50-603468	142	MD50-15-92989	282 (U)	MD50-15-105226	392 (U)	MD50-16-115155	551 (U)	MD50-16-126530	-445 (U)
50-603468	233	MD50-15-92990	480 (U)	MD50-15-105227	616	MD50-16-115156	100 (U)	MD50-16-126531	316 (U)
50-603468	354	MD50-15-92991	583 (U)	MD50-15-105228	483 (U)	MD50-16-115157	512 (U)	MD50-16-126532	-546 (U)
50-603468	403	MD50-15-92992	431 (U)	MD50-15-105229	417 (U)	MD50-16-115158	331 (U)	MD50-16-126533	-441 (U)
50-603470	83	MD50-15-92996	**3,478,570**	MD50-15-105233	**1,291,780**	MD50-16-115162	**2,984,470**	MD50-16-126537	**2,596,820**
50-603470	203	MD50-15-92997	1742	MD50-15-105234	299	MD50-16-115163	1199	MD50-16-126538	1366
50-603470	278	MD50-15-92998	1095	MD50-15-105235	270	MD50-16-115164	908	MD50-16-126539	718
50-603470	351	MD50-15-92999	801	MD50-15-105236	269	MD50-16-115165	954	MD50-16-126540	764
50-603470	450	MD50-15-93000	342 (U)	MD50-15-105237	5.58 (U)	MD50-16-115166	529 (U)	MD50-16-126541	627
50-603470	600	—	—	—	—	—	—	—	—
50-603470	650	MD50-15-93002	50.2 (U)	MD50-15-105239	67.1 (U)	MD50-16-115168	-118 (U)	MD50-16-126542	0 (U)
50-603471	90	MD50-15-93003	15,389	MD50-15-105240	6401	MD50-16-115169	14,855 (J)	MD50-16-126543	11,572
50-603471	209	MD50-15-93004	14,912	MD50-15-105241	4079	MD50-16-115170	10,864 (J)	MD50-16-126544	5048
50-603471	288	MD50-15-93005	11,387	MD50-15-105242	3252	MD50-16-115171	10,804 (J)	MD50-16-126545	6328
50-603471	360	MD50-15-93006	**23,817**	MD50-15-105243	6665	MD50-16-115172	12,479 (J)	MD50-16-126546	10,363
50-603471	450	MD50-15-93007	17,055	MD50-15-105244	5722	MD50-16-115173	15,070 (J)	MD50-16-126547	14,613
50-603471	na	MD50-15-93331	**49,510**	MD50-15-105398	**22,311**	MD50-16-115192	**39,284 (J)**	MD50-16-126582	**39,024**
50-603472	27	MD50-15-93010	**893,484**	MD50-15-105247	**565,730**	MD50-16-115176	**931,818**	MD50-16-126550	**374,060**
50-603472	146	MD50-15-93011	2113	MD50-15-105248	430	MD50-16-115177	4197	MD50-16-126551	1203
50-603472	292	MD50-15-93012	3328	MD50-15-105249	2700	MD50-16-115178	4172	MD50-16-126552	7789
50-603472	364	MD50-15-93013	1955	MD50-15-105250	1200	MD50-16-115179	4402	MD50-16-126553	1486
50-603472	450	MD50-15-93014	11,874	MD50-15-105251	239	MD50-16-115180	4116	MD50-16-126554	1582
50-603503	133	MD50-15-93017	1009	MD50-15-105254	1823	MD50-16-115183	1063	MD50-16-126557	264
50-603503	237	MD50-15-93018	1459	MD50-15-105255	1739	MD50-16-115184	1149	MD50-16-126558	269
50-603503	347	MD50-15-93019	470 (U)	MD50-15-105256	481 (U)	MD50-16-115185	812	MD50-16-126559	166 (U)
50-603503	450	MD50-15-93020	290 (U)	MD50-15-105257	-162 (U)	MD50-16-115186	355 (U)	MD50-16-126560	136 (U)
50-613182	550	MD50-15-93015	1460	MD50-15-105252	15,177	MD50-16-115181	1678 (U)	MD50-16-126555	786
50-613182	632.5	MD50-15-93016	618	MD50-15-105253	45.5 (U)	MD50-16-115182	683	MD50-16-126556	106 (U)
50-613183	550	MD50-15-93008	8.93 (U)	MD50-15-105245	328	MD50-16-115174	1235 (U)	MD50-16-126548	-191 (U)
50-613183	642.5	MD50-15-93009	-121 (U)	MD50-15-105246	-39.6 (U)	MD50-16-115175	934 (U)	MD50-16-126549	-317 (U)
50-613184	500	MD50-15-92993	99.9 (U)	MD50-15-105230	341 (U)	MD50-16-115159	184 (U)	MD50-16-126534	-421 (U)

Table F-3.2-2 (continued)

Location ID	Depth (ft bgs)	March–April 2015		October 2015		April 2016		October 2016	
		Sample ID	Result	Sample ID	Result	Sample ID	Result	Sample ID	Result
50-613184	600	MD50-15-92994	8.08 (U)	MD50-15-105231	459 (U)	MD50-16-115160	155 (U)	MD50-16-126535	-313 (U)
50-613184	664.5	MD50-15-92995	174 (U)	MD50-15-105232	424 (U)	MD50-16-115161	62.2 (U)	MD50-16-126536	-441 (U)
50-613185	145	MD50-15-93021	-210 (U)	MD50-15-105258	-398 (U)	MD50-16-115187	334 (U)	MD50-16-126561	-40.5 (U)
50-613185	235	MD50-15-93022	21.9 (U)	MD50-15-105259	-149 (U)	MD50-16-115188	322 (U)	MD50-16-126562	-11.5 (U)
50-613185	350	MD50-15-93023	7.69 (U)	MD50-15-105260	-352 (U)	MD50-16-115189	453 (U)	MD50-16-126563	-29 (U)
50-613185	450	MD50-15-93024	-37.6 (U)	MD50-15-105261	-384 (U)	MD50-16-115190	212 (U)	MD50-16-126564	-17.3 (U)
50-613185	600	MD50-15-93025	-276 (U)	MD50-15-105262	-352 (U)	MD50-16-115191	628 (U)	MD50-16-126565	-26 (U)

Table F-3.2-2 (continued)

Location ID	Depth (ft bgs)	April 2017		October 2017		January–February 2019		January–February 2020	
		Sample ID	Result	Sample ID	Result	Sample ID	Result	Sample ID	Result
50-24784	155	MD50-17-131652	488	MD50-17-146521	934	MD50-19-166032	925	MD50-20-191448	2077
50-24784	244	MD50-17-131653	1008	MD50-17-146522	670	MD50-19-166033	923	MD50-20-191449	1860
50-24784	362	MD50-17-131654	821	MD50-17-146523	573	MD50-19-166034	673	MD50-20-191450	2318
50-24784	450	MD50-17-131655	1031	MD50-17-146524	596	MD50-19-166035	269	MD50-20-191451	1041
50-24813	25	MD50-17-131656	111 (U)	MD50-17-146525	564	MD50-19-166036	2800	MD50-20-191458	636
50-24813	150	MD50-17-131657	**42,245**	MD50-17-146526	**46,251**	MD50-19-166037	**38,745**	MD50-20-191459	**33,642**
50-24813	241	MD50-17-131658	505	MD50-17-146527	450	MD50-19-166038	558	MD50-20-191460	1874
50-24813	358	MD50-17-131659	176 (U)	MD50-17-146528	396	MD50-19-166039	118 (U)	MD50-20-191461	702
50-24813	450	MD50-17-131660	38.8 (U)	MD50-17-146529	315	MD50-19-166040	146 (U)	MD50-20-191462	573
50-24813	600	MD50-17-131661	81.9 (U)	MD50-17-146530	318	MD50-19-166041	88.3 (U)	MD50-20-191463	100 (U)
50-24822	25	MD50-17-131662	184 (U)	MD50-17-146531	450	MD50-19-166042	659	MD50-20-191469	247
50-24822	142	MD50-17-131663	136 (U)	MD50-17-146532	430	MD50-19-166043	596 (U)	MD50-20-191470	527
50-24822	235	MD50-17-131664	139 (U)	MD50-17-146533	293	MD50-19-166044	739 (U)	MD50-20-191471	387
50-24822	351	MD50-17-131665	268	MD50-17-146534	224	MD50-19-166045	780	MD50-20-191472	233 (U)
50-24822	450	MD50-17-131666	182 (U)	MD50-17-146535	284	MD50-19-166046	403 (U)	MD50-20-191473	-48.7 (U)
50-603061	25	MD50-17-131667	141 (U)	MD50-17-146536	119 (U)	MD50-19-166047	104 (U)	MD50-20-191573	204 (U)
50-603061	128	MD50-17-131668	422	MD50-17-146537	317	MD50-19-166048	1367	MD50-20-191574	81.9 (U)
50-603061	228	MD50-17-131669	722	MD50-17-146538	712	MD50-19-166049	1363	MD50-20-191575	701
50-603061	347	MD50-17-131670	975	MD50-17-146539	1114	MD50-19-166050	1551	MD50-20-191576	821
50-603061	450	MD50-17-131671	213	MD50-17-146540	181 (U)	MD50-19-166051	578 (U)	MD50-20-191577	257
50-603062	122	MD50-17-131672	42 (U)	MD50-17-146541	31.7 (U)	MD50-19-166052	5.99 (U)	MD50-20-191582	1594
50-603062	217	MD50-17-131673	17.7 (U)	MD50-17-146542	-41.4 (U)	MD50-19-166053	-24.1 (U)	MD50-20-191583	198 (U)
50-603062	337	MD50-17-131674	80.7 (U)	MD50-17-146543	-93.9 (U)	MD50-19-166054	26.9 (U)	MD50-20-191584	63.2 (U)
50-603062	450	MD50-17-131675	56.3 (U)	MD50-17-146544	12.7 (U)	MD50-19-166055	112 (U)	MD50-20-191585	3773
50-603063	25	MD50-17-131676	-1.44 (U)	MD50-17-146545	151 (U)	MD50-19-166056	5360	MD50-20-191479	331
50-603063	128	MD50-17-131677	3460 (J+)	MD50-17-146546	342	MD50-19-166057	10,760	MD50-20-191480	1311
50-603063	228	MD50-17-131678	707 (J+)	MD50-17-146547	677	MD50-19-166058	10,227	MD50-20-191481	2420
50-603063	347	MD50-17-131679	1966 (J+)	MD50-17-146548	474	MD50-19-166059	2219	MD50-20-191482	25,875
50-603063	450	MD50-17-131680	534 (J+)	MD50-17-146549	393	MD50-19-166060	5894	MD50-20-191483	1442
50-603064	113	MD50-17-131681	441	MD50-17-146550	182 (U)	MD50-19-166061	281	MD50-20-191488	**113,187**
50-603064	214	MD50-17-131682	342	MD50-17-146551	175 (U)	MD50-19-166062	698	MD50-20-191489	588
50-603064	332	MD50-17-131683	529	MD50-17-146552	635	MD50-19-166063	262 (U)	MD50-20-191490	327
50-603064	500	MD50-17-131684	85.9 (U)	MD50-17-146553	50.8 (U)	MD50-19-166064	103 (U)	MD50-20-191491	59.4 (U)
50-603383	26	MD50-17-131685	**89,829**	MD50-17-146554	**111,753**	MD50-19-166065	**68,652**	MD50-20-191497	**50,560**
50-603383	139	MD50-17-131686	**730,930**	MD50-17-146555	**698,136**	MD50-19-166066	**175,629**	MD50-20-191498	**168,348**
50-603383	244	MD50-17-131687	**95,567**	MD50-17-146556	**100,398**	MD50-19-166067	**92,722**	MD50-20-191499	**46,297**

Table F-3.2-2 (continued)

Location ID	Depth (ft bgs)	April 2017		October 2017		January–February 2019		January–February 2020	
		Sample ID	Result	Sample ID	Result	Sample ID	Result	Sample ID	Result
50-603383	359	MD50-17-131688	**194,954**	MD50-17-146557	**128,701**	MD50-19-166068	**107,526**	MD50-20-191500	**70,424**
50-603383	450	MD50-17-131689	**160,498**	MD50-17-146558	**108,054**	MD50-19-166069	**88,638**	MD50-20-191501	**73,487**
50-603467	143	MD50-17-131690	188 (U)	MD50-17-146559	165 (U)	MD50-19-166070	99.1 (U)	MD50-20-191507	198 (U)
50-603467	244	MD50-17-131691	119 (U)	MD50-17-146560	262	MD50-19-166071	141 (U)	MD50-20-191508	269
50-603467	360	MD50-17-131692	121 (U)	MD50-17-146561	221	MD50-19-166072	69.1 (U)	MD50-20-191509	369
50-603467	500	MD50-17-131693	102 (U)	MD50-17-146562	156 (U)	MD50-19-166073	90 (U)	MD50-20-191510	109 (U)
50-603467	600	MD50-17-131694	76.6 (U)	MD50-17-146563	216 (U)	MD50-19-166074	3.14 (U)	MD50-20-191511	538
50-603468	142	MD50-17-131695	678	MD50-17-146564	314	MD50-19-166075	70.4 (U)	MD50-20-191516	98.6 (U)
50-603468	233	MD50-17-131696	346	MD50-17-146565	222	MD50-19-166076	522 (U)	MD50-20-191517	306
50-603468	354	MD50-17-131697	116 (U)	MD50-17-146566	182 (U)	MD50-19-166077	185 (U)	MD50-20-191518	363
50-603468	403	MD50-17-131698	12.1 (U)	MD50-17-146567	239	MD50-19-166078	495 (U)	MD50-20-191519	517
50-603470	83	MD50-17-131702	279	MD50-17-146571	**1,326,830**	MD50-19-166082	**673,577**	MD50-20-191532	**882,380**
50-603470	203	MD50-17-131703	227	MD50-17-146572	366	MD50-19-166083	420	MD50-20-191533	823
50-603470	278	MD50-17-131704	216 (U)	MD50-17-146573	222	MD50-19-166084	831	MD50-20-191534	4041
50-603470	351	MD50-17-131705	385	MD50-17-146574	255	MD50-19-166085	1757	MD50-20-191535	633
50-603470	450	MD50-17-131706	27.3 (U)	MD50-17-146575	146 (U)	MD50-19-166086	207 (U)	MD50-20-191536	468
50-603470	600	—	—	—	—	—	—	—	—
50-603470	650	MD50-17-131707	681	MD50-17-146576	-9.27 (U)	MD50-19-166087	120 (U)	MD50-20-191537	-33.7 (U)
50-603471	90	MD50-17-131708	4903	MD50-17-146577	5058	MD50-19-166088	3674	MD50-20-191545	4948
50-603471	209	MD50-17-131709	1701	MD50-17-146578	2495	MD50-19-166089	2099	MD50-20-191546	3384
50-603471	288	MD50-17-131710	**25,076**	MD50-17-146579	2933	MD50-19-166090	1915	MD50-20-191547	4171
50-603471	360	MD50-17-131711	3574	MD50-17-146580	**52,970**	MD50-19-166091	1139	MD50-20-191548	2344
50-603471	450	MD50-17-131712	4096	MD50-17-146581	4740	MD50-19-166092	**51,742**	MD50-20-191549	4848
50-603471	na	MD50-17-131731	17,599	MD50-17-147715	17,518	MD50-19-166130	4296	MD50-20-191544	11,825
50-603472	27	MD50-17-131715	**318,329**	MD50-17-146585	**595,093**	MD50-19-166098	**135,699**	MD50-20-191559	**473,917**
50-603472	146	MD50-17-131716	992	MD50-17-146586	503	MD50-19-166099	567	MD50-20-191560	893
50-603472	292	MD50-17-131717	1247	MD50-17-146587	1263	MD50-19-166100	511	MD50-20-191561	2512
50-603472	364	MD50-17-131718	512	MD50-17-146588	605	MD50-19-166101	427	MD50-20-191562	1330
50-603472	450	MD50-17-131719	885	MD50-17-146589	3241	MD50-19-166102	411	MD50-20-191563	824
50-603503	133	MD50-17-131722	700	MD50-17-146592	451	MD50-19-166105	2562	MD50-20-191590	827
50-603503	237	MD50-17-131723	548	MD50-17-146593	432	MD50-19-166106	2169	MD50-20-191591	820
50-603503	347	MD50-17-131724	355 (U)	MD50-17-146594	78.5 (U)	MD50-19-166107	1205	MD50-20-191592	300
50-603503	450	MD50-17-131725	212 (U)	MD50-17-146595	213 (U)	MD50-19-166108	1331	MD50-20-191593	444
50-613182	550	MD50-17-131720	484	MD50-17-146590	487	MD50-19-166103	161 (U)	MD50-20-191566	472
50-613182	632.5	MD50-17-131721	71.4 (U)	MD50-17-146591	236	MD50-19-166104	727	MD50-20-191567	492
50-613183	550	MD50-17-131713	179 (U)	MD50-17-146583	87.9 (U)	MD50-19-166093	-60.9 (U)	MD50-20-191552	317
50-613183	642.5	MD50-17-131714	**39,738**	MD50-17-146584	28.6 (U)	MD50-19-166094	-69.4 (U)	MD50-20-191553	-83.6 (U)
50-613184	500	MD50-17-131699	269	MD50-17-146568	162 (U)	MD50-19-166079	149 (U)	MD50-20-191523	6.46 (U)

Table F-3.2-2 (continued)

		April 2017		October 2017		January–February 2019		January–February 2020	
Location ID	Depth (ft bgs)	Sample ID	Result	Sample ID	Result	Sample ID	Result	Sample ID	Result
50-613184	600	MD50-17-131700	42.8 (U)	MD50-17-146569	131 (U)	MD50-19-166080	133 (U)	MD50-20-191524	114 (U)
50-613184	664.5	MD50-17-131701	67.9 (U)	MD50-17-146570	140 (U)	MD50-19-166081	-284 (U)	MD50-20-191525	49.2 (U)
50-613185	145	MD50-17-131726	84.7 (U)	MD50-17-146596	43.3 (U)	MD50-19-166109	62.2 (U)	MD50-20-191599	-63.3 (U)
50-613185	235	MD50-17-131727	62.4 (U)	MD50-17-146597	413	MD50-19-166110	-30.7 (U)	MD50-20-191600	77.9 (U)
50-613185	350	MD50-17-131728	297	MD50-17-146598	215 (U)	MD50-19-166111	18.4 (U)	MD50-20-191601	-19.4 (U)
50-613185	450	MD50-17-131729	166 (U)	MD50-17-146599	109 (U)	MD50-19-166112	-24.8 (U)	MD50-20-191602	152 (U)
50-613185	600	MD50-17-131730	92.1 (U)	MD50-17-146600	-3.09 (U)	MD50-19-166113	90.1 (U)	MD50-20-191603	155 (U)

Note: Units are pCi/L. Data qualifiers are defined in Appendix A. Bold indicates result exceeds Tier 1 SL. Shading indicates value exceeds Tier 2 SL.

[a] — = Not sampled.

[b] na = Not available.

Table F-3.3-1
Radionuclides Detected in MDA C Monitoring Wells

Sample ID	Sample Date	Radium-226	Radium-228	Tritium	Uranium-234	Uranium-235/236	Uranium-238
Screening Value[a]		**na[b]**	**na**	**na**	**0.715**	**na**	**0.336**
R-14							
CAMO-10-9333	2/3/2010	—[c]	—	—	0.51	—	0.335
CAMO-10-22851	7/1/2010	—	—	—	0.534	—	0.263
CAMO-12-1526	11/8/2011	0.458	0.751	—	0.45 (J+)	—	0.225 (J+)
R-46							
CAMO-10-9358	2/5/2010	—	—	—	0.304	—	0.155
CAMO-10-16830	5/7/2010	—	—	37.0622	0.32	—	0.165
CAMO-10-22890	7/1/2010	—	—	—	0.364	—	0.146
CAMO-12-1530	11/8/2011	—	—	—	0.323 (J+)	—	0.157 (J+)
R-60							
CAPA-11-2810	12/16/2010	—	—	—	0.555	0.0356	0.3
CAPA-11-3055	1/24/2011	—	—	—	0.468	—	0.211
CAPA-11-9591	4/27/2011	—	—	—	0.441	—	0.218
CAPA-11-23020	7/26/2011	—	—	—	0.505	—	0.209
CAMO-12-1522	11/22/2011	—	0.764	—	0.526	—	0.206

Note: Units are pCi/L. Data qualifiers are defined in Appendix A.

[a] Screening values from LANL (2016, 601920), Table 4.2-4.

[b] na = Not available.

[c] — = Not detected.

Table F-4.0-1
Summary of Results of Preliminary Radiological Dose Assessment

Scenario	Maximum Dose to On-Site Industrial Worker (mrem/yr)	Maximum Dose to Off-Site Resident (mrem/yr)
Dose Limit (mrem/yr)	**25**	**100**
ET Cover in Place	2.717E-03 (1030 yr)	0 (0 yr)
No ET Cover	7.075 (0 yr)	0 (0 yr)

Attachment F-1

Preliminary Radiological Dose Assessment for Material Disposal Area C Waste Inventory

F1-1.0 INTRODUCTION

Material Disposal Area (MDA) C is an inactive waste disposal site located in Technical Area 50 (TA-50) at Los Alamos National Laboratory (LANL or the Laboratory). MDA C was used to dispose of wastes containing hazardous constituents regulated by the Resource Conservation and Recovery Act (RCRA), as well as radionuclides regulated under the Atomic Energy Act (AEA). MDA C is subject to the corrective action requirements of RCRA for hazardous constituents, as implemented through a Compliance Order on Consent (Consent Order) with the State of New Mexico. The Laboratory has prepared a corrective measures evaluation (CME), as required by the Consent Order, to evaluate alternatives for corrective actions needed to protect human health and the environment from risks from the hazardous constituents disposed of at MDA C. RCRA does not regulate radionuclides, and the CME does not consider radiological exposure or risk.

The U.S. Department of Energy (DOE) is required under the AEA and its implementing regulations and orders to protect occupational workers, the public, and the environment from radiological exposure from DOE facilities and operations. Any corrective measure alternative implemented at MDA C under the Consent Order, therefore, must also comply with DOE radiological-protection requirements. The purpose of this preliminary radiological-dose assessment is to evaluate the corrective measure alternative recommended for MDA C to determine whether it would be capable of meeting dose limits for workers and the public. The assessment also considers long-term dose based on current conditions.

F1-2.0 BACKGROUND

MDA C was established in May 1948 as a disposal area for radioactively contaminated waste and was 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 RCRA facility investigation work plan for Operable Unit 1147 (LANL 1992, 007672) and the approved investigation work plan (LANL 2005, 091493). In 1984, a surface cover was emplaced, and the area was recontoured and seeded.

F1-2.1 Site Description

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 existing contamination. Contaminants may have been released to the subsurface once wastes were deposited within the pits and shafts. Waste previously emplaced remains, and no additional waste has been added since decommissioning. The site is fenced, posted as a radiological control area (RCA)/underground radiological materials area, and only Laboratory employees or contractors enter for management operations, such as emplacing erosion controls or collecting environmental samples.

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 starting in 1984, after fill and a topsoil cover was placed over the pits and shafts, along with various native forbs and shrubs.

F1-2.2 Waste Inventory Determination

To assess potential radiological dose to on-site personnel and members of the public from the release of waste buried at MDA C over time, it is necessary to estimate, to the extent possible, the waste inventory of the pits and shafts by radionuclide. Appendix J of the MDA C investigation report (LANL 2006, 094688) provided these inventory estimates and was used as the radionuclide activity basis in this dose assessment. Shaft inventories are based on MDA C disposal logbooks and a draft inventory report. Furthermore, because of limited information in the disposal logbooks for the pits, activity estimates for the pits were developed by extrapolating early waste disposal activities at TA-54, Area G, to MDA C. In addition, shaft disposal inventories for early reactor experiments were estimated using historical information for the MDA C shaft disposals for the Omega West Reactor and the Los Alamos Molten Plutonium Reactor Experiment.

F1-3.0 CONCEPTUAL EXPOSURE PATHWAY MODEL

F1-3.1 Receptors and Exposure Pathways

The conceptual site model for human receptors is based on both an on-site industrial and an off-site residential scenario. The industrial scenario assumes the exposure of adult human receptors directly on site through direct contact with contaminated soil or suspended particulate material by ingestion, inhalation, and external irradiation pathways. In addition, a drinking-water exposure pathway is included for this particular exposure scenario by virtue of assuming that contaminants migrate through the contaminated zone, through the vadose zone, and then into the regional aquifer. Water is then pumped to the surface from the regional aquifer via the Los Alamos County PM-5 drinking water supply well and ingested.

The residential scenario assumes exposure through similar mechanisms as well as ingestion of homegrown produce, all at the closest residential location off-site and downwind from MDA C at the southeast corner of Elk Ridge.

F1-3.2 Comparison of Proposed Corrective Measures

The recommended corrective measure alternative for MDA C in the CME is to leave the waste in place and construct and maintain an evapotranspiration (ET) cover with a rock/soil admixture layer along with soil-vapor extraction, and institutional controls. The ET cover acts to retain moisture in the shallow soil profile until it is removed through ET, thereby minimizing the movement of water down through the waste and into the underlying vadose zone. In addition, native vegetation would be maintained on the surface treatment of the cover to minimize erosion and promote ET. The ET cover would be 1.4 m (4.7 ft.) thick and is comprised of rock mixed into the original operational cover that is approximately 0.6 m (2 ft.) thick. Further information regarding the design of the ET cover proposed for MDA C may be found in Appendix I of the CME report.

F1-4.0 DOSE MODELING APPROACH

F1-4.1 Introduction

The modeling approach for this particular preliminary dose assessment is for an on-site industrial scenario and an off-site residential scenario. A 1000-yr exposure period was considered for consistency with the performance assessment requirements of DOE Order 435.1, “Radioactive Waste Management” (MDA C is not subject to regulation under DOE Order 435.1 based on its dates of operation).

F1-4.2 Industrial Scenario

The industrial scenario assumes that a Laboratory employee spends their entire working time outdoors on the MDA C site. The worker ingests drinking water from water-supply well PM-5, which is downgradient of MDA C (Figure F1-4.2-1) but otherwise ingests foodstuffs obtained from off-site sources. This scenario is therefore based on the inhalation of local dust, the ingestion of drinking water, the ingestion of soil, and direct penetrating radiation exposure from radionuclides within the contaminated zone.

F1-4.3 Residential Scenario

The residential scenario assumes that a family resides within a home located on the southeast corner of Elk Ridge, located off of East Jemez Road. This location is downwind of MDA C at approximately 1350 m (4430 ft) almost directly due north (353 degrees). The family gardens and eats entirely homegrown produce. Drinking water is obtained from the PM-5 well. All meat and other foodstuffs are obtained from off-site sources. This scenario is therefore based on the inhalation of dust blown downwind from the MDA C site, the ingestion of homegrown produce, the ingestion of drinking water, the ingestion of soil, and direct penetrating radiation exposure from contaminated dust again transported from the MDA C site and deposited at the residential location.

F1-4.4 Dose Conversion Factor Selection

The selection of appropriate dose conversion factor libraries, which are drawn from the radionuclide transformations found in the International Commission on Radiation Protection Publication 107 and used according to appropriate DOE guidance.

F1-4.5 Exposure Factor Selection

Receptor exposure factors, such as annual ingestion and inhalation rates, were selected from the Environmental Protection Agency (EPA) Exposure Factors Handbook (EPA 2011, 208374) (see also https://www.epa.gov/expobox/about-exposure-factors-handbook) according to appropriate DOE guidance.

F1-4.6 Site Parameter Selection

For both the industrial and residential scenarios, site-specific parameters are used to the extent possible. These parameters control the transport of radionuclides through all defined pathways and environmental media within user-specified time spans. These parameters include such things as contaminated zone area; soil density; element-specific partition coefficients for the contaminated zone, unsaturated zones, and saturated zone; local meteorological conditions; ET rates; hydrogeologic factors; and erosivity factors.

To date, dose modeling at the Laboratory has used site parameters that maximize retention of contaminants in the contaminated zone because it has been assumed that drinking water is obtained from uncontaminated sources. This approach is conservative for those pathways that include direct-penetrating radiation exposure, inhalation of local dust, ingestion of local produce, and ingestion of soil. This involves setting the ET rate to its maximum value of 0.999, using a historic 5% cumulative frequency rainfall rate of 0.29 m/yr (Bowen 1990, 006899), and setting the runoff coefficient to its near allowed maximum value. Thus, the selection of these parameter values in the simulations promotes the retention of radionuclides in the contaminated zone and they are not transported through infiltration of water down into the vadose and saturated zones. The use of these parameters results in the “base” dose assessment case.

However, because the drinking water pathway is included in both the industrial and residential scenarios, there is a need to separately assess the dose impacts from varying the above parameters to minimize retention of radionuclides in the contaminated zone and maximize transport through the vadose and saturated zones. This has been accomplished by running another case with these parameters set to promote the infiltration of water and is known as the “hydro” case. In particular, the “hydro” case without the ET cover uses an ET coefficient of 0.99, which represents a realistic value for crushed tuff with vegetation, uses a realistic runoff coefficient of 0.25, but also uses a precipitation rate of 0.49 m/yr, which is the historical 50% cumulative frequency annual rainfall value (Bowen 1990, 006899). The “hydro” case with an ET cover uses the same parameters, except that the ET coefficient is increased to the near maximum value allowed of 0.998, which is realistic for an engineered ET cover.

Previous dose modeling efforts at the Laboratory also usually set the erosion rate to zero to maximize retention of radionuclides in the contaminated zone. It should be noted, however, that the soil erodibility factor for the contaminated zone and cover is set to the default of 0.4 tons/acre for all cases to allow for erosion of the operational cover and ET cover over the assessment period.

F1-5.0 HUMAN DOSE ASSESSMENT RESULTS

F1-5.1 Interpretation

In all, eight separate dose assessment cases were developed, run, and the results analyzed. There were four industrial scenario cases, “base” and “hydro” conditions with and without an ET cover over the waste. There were also four residential scenario cases, “base” and “hydro” conditions with and without an ET cover over the waste. The numerical dose results for each of these cases are reported as the maximum dose and the year this peak dose occurred. The industrial “base” and “hydro” cases without an ET cover resulted in a dose of 7.075 mrem/yr at yr 0 and 7.075 mrem/yr at yr 0, respectively. The “base” and “hydro” industrial cases with an ET cover resulted in doses of 2.717E-03 at yr 1030 and 2.716E-03 at yr 1030, respectively. All the residential cases resulted in 0 mrem/yr over the entire 1000-yr simulation.

The dose limits considered in this assessment were the 100-mrem/yr dose limit for members of the public and nonradiological workers contained in DOE Order 458.1, the 25-mrem/yr waste disposal site dose limit in DOE Order 458.1 (although not applicable to MDA C), and the EPA 4-mrem/yr drinking water dose limit for the public (40 Code of Federal Regulations 141.66). These dose limits were not exceeded at any time in the 1000-yr simulation for the four industrial scenario cases. The lack of an ET cover for both the “base” and “hydro” cases resulted in an estimated peak dose of approximately 7 mrem/yr at yr 0 for an industrial worker on-site. This dose was primarily because of penetrating external radiation from aluminum-26, a radionuclide with an extremely long half-life of 740,000 yr that emits an energetic gamma photon of 1.8 MeV. The presence of the ET cover reduced the estimated dose for this particular scenario by virtue of its external radiation shielding effect for both cases. There was no dose impact from the water-related pathways for all four industrial scenario cases over the 1000-yr evaluation period.

The four residential scenario cases presented no dose impacts for receptors in Elk Ridge over the 1000-yr evaluation period. Elk Ridge is downwind from MDA C, but any clean cover over the waste is sufficient to prevent the resuspension and transport of contaminated dust from MDA C to Elk Ridge. Therefore, there are no dose impacts from the summed contributions of the direct-penetrating radiation pathway, the inhalation pathway, the soil-ingestion pathway, or plant-ingestion pathway (from foliar deposition). Additionally, there was no dose impact from the water-related pathways for these cases.

While the assessment period only covered 1000 yr to demonstrate equivalence with DOE Order 435.1 (although not a requirement for this site), it is important to note that estimated doses would continue to increase over time for the industrial scenario with an on-site receptor. This is expected due to the gradual removal of the ET cover and operational cover from erosion with concomitant loss of external radiation shielding. Doses would not increase for the residential scenario until the waste was exposed and dispersed downwind toward Elk Ridge. This would be on the order of at least 100,000 yr with the default soil erodibility factor.

F1-5.2 Sensitivity Analysis

Because this dose assessment is site-specific, it is not necessary to perform a sensitivity analysis for those parameters that are fixed and known quantities for the site, such as the contaminated zone area and thickness. However, certain parameters are not as well characterized and can potentially drastically change the dose outcome for specific pathways, particularly those parameters that either minimize or maximize retention of radionuclides in the contaminated zone or those that affect the transport rate of radionuclides in the vadose zone. Aside from the ET coefficient, runoff coefficient, and precipitation rate, which were evaluated via the “base” case and “hydro” case as described above for both the industrial and residential scenarios, the parameters that most likely affect retention or transport through the vadose zone and the saturated zone are the element-specific distribution coefficients (also known as K_d values). These values are widely reported in the literature and have wide ranges depending on soil type and certain chemical attributes associated with the soil type (such as pH, and oxidizing versus reducing environments) as well as the compound associated with the radionuclide (e.g., salts versus oxides).

Because of the need to evaluate the infiltration of water with subsequent transport of radionuclides through the vadose and saturated zones for the drinking water pathway in lieu of retaining radionuclides in the contaminated zone, a sensitivity analysis was performed on those element-specific distribution coefficients associated with those radionuclides resulting in the highest doses for the water-related pathways. The sensitive radionuclides (plutonium and uranium isotopes) and pathways (drinking water and water uptake by plants) were identified from earlier runs with higher infiltration rates not associated with this report.

The results of the sensitivity analysis demonstrated that the dose outcomes for each case and the water-specific pathways were not sensitive to varying the distribution coefficients because the water-specific pathways do not contribute any appreciable dose. Additionally, the external gamma pathway was also examined for distribution coefficient sensitivity, particularly for aluminum-26, and was found not to be sensitive.

F1-6.0 CONCLUSIONS

The dose results indicate that the presence of an operational cover alone is sufficient for protection of both industrial workers at the MDA C site and residents at Elk Ridge during the evaluation period of 1000 yr. The industrial scenario doses are approximately 7 mrem/yr without the ET cover and essentially zero for all pathways with an ET cover. The peak dose time is a function of the erosion rate coupled with the depth of the cover over the waste. Based on the assumption that the radioactive material is uniformly distributed throughout the contaminated zone, it would be necessary to maintain at least the operational cover throughout the assessed 1000-yr time period to avoid the peak doses for each case on site.

With regard to the residential scenario, there are no doses at Elk Ridge at any time during the evaluation period of 1000 yr with the presence of a 0.6-m (2-ft) operational cover alone or with the ET cover.

The results of the assessment show that the presence of a cover over the waste in MDA C is necessary to meet dose limits beyond 1000 yr, particularly for the industrial scenario because of the presence of the very long-lived aluminum-26 coupled with the potential for erosion of the cover. In reducing dose, the primary function of the cover is to act as a radiation-shielding barrier, thus the operational cover and ET cover achieve similar results. Because dose from water-related pathways is nonexistent, the ability of the ET cover to minimize infiltration does not result in a dose reduction compared with the operational cover. Because the ET cover is specifically engineered to retain moisture and support vegetation, however, it should be less susceptible to erosion and, therefore, is more reliable than the operational soil cover over long periods of time. Although institutional controls, including inspections and maintenance, are assumed to be in place for an indefinite period, the ET cover would provide greater assurance of meeting dose limits in the event that institutional controls are no longer in place.

In conclusion, the ET cover recommended as the corrective measure alternative in the MDA C CME report appears capable of meeting DOE requirements for radiological protection of occupational workers and the public.

F1-7.0 REFERENCES

The following reference list includes documents cited in this attachment. Parenthetical information following each reference provides the author(s), publication date, and ERID, ESHID, or EMID. This information is also included in text citations. ERIDs were assigned by the Laboratory's Associate Directorate for Environmental Management (IDs through 599999); ESHIDs were assigned by the Laboratory's Associate Directorate for Environment, Safety, and Health (IDs 600000 through 699999); and EMIDs are assigned by Newport News Nuclear BWXT-Los Alamos, LLC (N3B) (IDs 700000 and above). IDs are used to locate documents in N3B's Records Management System and in the Master Reference Set. The NMED Hazardous Waste Bureau and N3B maintain copies of the Master Reference Set. The set ensures that NMED has the references to review documents. The set is updated when new references are cited in documents.

Bowen, B.M., May 1990. "Los Alamos Climatology," Los Alamos National Laboratory report LA-11735-MS, Los Alamos, New Mexico, pp. 89-93. (Bowen 1990, 006899)

EPA (U.S. Environmental Protection Agency), September 2011. "Exposure Factors Handbook: 2011 Edition," EPA/600/R-09/052F, Office of Research and Development, Washington, D.C. (EPA 2011, 208374)

LANL (Los Alamos National Laboratory), May 1992. "RFI Work Plan for Operable Unit 1147," Los Alamos National Laboratory document LA-UR-92-969, Los Alamos, New Mexico. (LANL 1992, 007672)

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, 091493)

LANL (Los Alamos National Laboratory), December 2006. "Investigation Report for Material Disposal Area C, Solid Waste Management Unit 50-009, at Technical Area 50," Los Alamos National Laboratory document LA-UR-06-8096, Los Alamos, New Mexico. (LANL 2006, 094688)

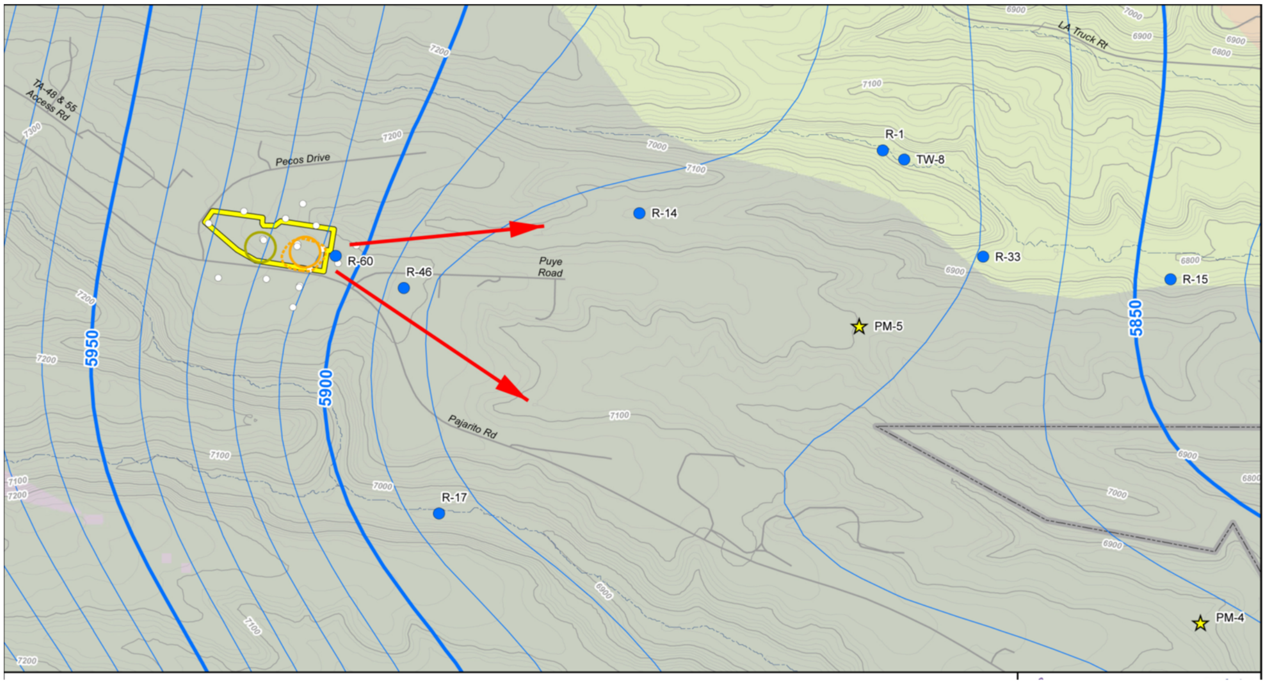


Figure F1-4.2-1 Groundwater flow direction from MDA C to production well PM-5

Appendix G

Conceptual Design for Soil-Vapor Extraction and Long-Term Vapor-Monitoring Plan for Material Disposal Area C

G-1.0 INTRODUCTION

This appendix describes the conceptual soil vapor extraction (SVE) design and operations plan, and the long-term vapor-monitoring plan for the vadose zone in and around Material Disposal Area (MDA) C in Technical Area 50 at Los Alamos National Laboratory (LANL or the Laboratory).

Results of passive SVE testing at MDAs C, H, and J (SEA 1997, 076055) in combination with numerical and analytical analysis of passive venting data (Neeper 2003, 098640; Neeper and Stauffer 2012, 601587; Neeper and Stauffer 2012, 601588) demonstrate that passive SVE can be used to remove volatile organic compound (VOC) mass from the subsurface plume at MDA C.

The results and conclusions of the SVE pilot tests conducted at MDA L in 2006 and 2014–2017 (LANL 2006, 094152; N3B 2018, 700039) and MDA G in 2008 and 2010 (LANL 2009, 105112; LANL 2010, 109657) can be used to infer that a contingent active SVE system is a viable technology for removing VOCs from the subsurface at MDA C in the event of future leakage.

G-2.0 CONCEPTUAL SVE DESIGN

This section presents a preliminary conceptual design of an SVE system to be implemented as part of the corrective measures alternatives for MDA C. The final design of the system will be provided as part of the corrective measures implementation (CMI) plan.

G-2.1 Performance Objectives

SVE will be performed to remove VOC vapors from the subsurface. The objective of removing VOCs is to prevent their migration to the regional aquifer at concentrations that could result in groundwater contamination in excess of the groundwater-quality standards in Section VIII.A of the Compliance Order on Consent (the Consent Order).

The Consent Order does not specify any screening or cleanup levels for VOCs in pore gas. For this corrective measures evaluation (CME), a two-tiered approach to evaluate vapor-phase VOCs and the potential impact to groundwater has been applied. The approach and screening values are discussed in section 3.2.4 of the report. For the Tier 1 screen, Henry's law is used to identify the VOC vapor-phase concentration threshold that has to be exceeded for a given VOC to potentially impact groundwater above the applicable standard. The Tier 2 evaluation is less conservative than the Tier 1 screen. The Tier 2 evaluation considers the migration of the VOCs to the water table and their subsequent mixing with groundwater. As described in section 3.2.4 of this report, Tier 2 screening levels (SLs) were developed based on vadose zone transport through fractures as well as vadose zone transport through porous media. The Tier 2 SLs based on porous media transport are more representative of conditions at MDA C. The SVE performance objective is to reduce VOC pore-gas concentrations to less than Tier 2 SLs based on porous media transport, which defines the target plume for remediation.

During the first round of sampling in fiscal year (FY) 2019, two VOCs exceeded Tier 1 SLs and four VOCs exceeded Tier 1 SLs in the second sampling round. These VOCs are methylene chloride, propanol[2-], trichloroethane[1,1,2-], and trichloroethene (TCE). Because some groundwater SLs were exceeded, further screening was performed using the concentrations from the deepest pore-gas sample (i.e., the sample collected closest to the regional aquifer). These deepest ports are found at 600 ft below ground surface (bgs) and deeper in monitoring wells 50-24813 (600 ft), 50-603467 (600 ft), 50-603470 (650 ft), 50-613182 (632.5 ft), 50-613183 (642.5 ft), 50-613184 (600 and 664.5 ft), and 50-613185 (600 ft). Of the four compounds exceeding Tier 1 SLs in FY 2019, only TCE was detected in the deepest part of the plume. None of the values of TCE from these deep ports exceed the Tier 2 porous flow SLs; thus, current deep measurements are below the SVE performance objective. Based on this evaluation, the concentrations of VOCs in pore gas at MDA C do not pose an immediate potential source of groundwater contamination.

The results of this screening show that all concentrations from the deep sample resulted in concentrations below the Tier 1 groundwater SL. Based on this evaluation, the concentrations of VOCs in pore gas at MDA C do not pose an immediate potential source of groundwater contamination. Tier 1 screening is well below Tier 2 screening for both porous and fracture cases; thus, current deep measurements are below the SVE performance objective.

G-2.2 Passive SVE

As discussed in section 7.1.3, a passive SVE (passive venting) system will initially be employed to remove VOCs from the subsurface of MDA C. VOC trends for TCE from 2012 through 2019 show that VOC concentrations at MDA C are consistent with a diffusive plume, similar to findings at MDA L (N3B 2018, 700039; N3B 2021, 701220). Concentrations are increasing slowly at the edges of the plume, both laterally and at depth. Concentrations in the center of the plume peak are at depths of approximately 200–300 ft bgs (Figure G-2.2-1), well below possible source areas, and appear to be either stable or decreasing slowly with time. Concentrations in the source area show no signs of significant continued releases of VOCs. With expected low probability of further releases, the existing mass in the VOC plume will continue to diffuse, with a trend of decreasing concentrations in the source area and spreading at the edges of the plume. In the absence of any remediation, the large volume of high-porosity rock with high diffusivity for gas found in the Bandelier Tuff will eventually spread the plume, such that gas concentrations fall below Tier 2 SL values. Migration laterally within the Bandelier Tuff is favored because the fractured Tschicoma dacite and Puye formations found beneath the Bandelier Tuff are likely to impede diffusion because of low porosity and higher saturation.

The proposed passive SVE system will help to accelerate the rate at which plume concentrations fall. Natural atmospheric pressure changes will help to pull VOCs from depth through 22 open boreholes. Data collected during passive SVE can then be used to estimate how effective the system is operating. In the following sections background material is presented on why passive SVE is recommended for this site.

G-2.2.1 Measurements Supporting Passive SVE at MDA C

A total of 22 boreholes at MDA C (Table G-2.2-1), not associated with the semiannual sampling plan, are cased to shallow depth (20 ft) and open to depths ranging from 77.8 ft to 620 ft bgs (Figure G-2.2-2). Existing data suggest that these boreholes may be useful for passive SVE. In February 2020, 16 boreholes were sampled for VOCs during a barometric low-pressure event when the boreholes should have been exhaling gases to the surface (Figure G-2.2-3). Measurements using a handheld photoionization detector (PID) sensitive to acetone, benzene, and butanone detected total concentrations in the range of approximately 10 to 30 ppmv (Table G-2.2-2). Several boreholes at MDA C were measured in the 1990s to assess their passive SVE potential and produced instantaneous flow rates in the range of 0.2 to 2 ft^3/min (SEA 1997, 076055, p.6). The combination of measurable VOC concentrations and measurable exhalation volumetric flow rates suggests that passive SVE at MDA C will be successful in removing VOC mass from the subsurface. Any VOC mass removal through passive SVE, in the absence of ongoing leakage from the source, will help to reduce concentrations in the subsurface more quickly than diffusion alone.

G-2.2.2 Supporting Data on Passive SVE

Specific construction details for the passive SVE system will be based on publications in the literature, LANL site data, and experience with passive SVE at MDA L (Neeper and Stauffer 2012, 601587; Neeper and Stauffer 2012, 601588). Ellerd et al. (1999, 701422) and other researchers (Neeper 2002, 098639; Rossabi and Falta 2002, 701423; Neeper 2003, 098640) reviewed passive SVE and barometric pressure propagation in soils. Results from Jennings and Patil (2011, https://www.researchgate.net/publication/237369523_Feasibility_modeling_of_passive_soil_vapor_extraction) show that under appropriate conditions, passive SVE can be competitive with active SVE. Extraction rates will be lower but may be achieved at significantly lower cost. Rossabi (2006, 701424) reviewed barometric pumping with an emphasis on determining subsurface parameters. You et al. (2010, 701425) presented a two-dimensional solution for gas flow during passive SVE. You et al. (2011, 701426) reviewed analytical methods for passive SVE and presented an analysis of gas flow when controlled by a check valve. The two studies by You et al. (2010, 2011) did not include contaminant transport. Neeper and Stauffer (2012 601587; 2012 601588) validated passive SVE data from MDA L at the Laboratory, where simulation based on the mobile-immobile model of oscillatory transport closely matched the produced gas concentration at a passive extraction well at MDA L during a 107-day interval.

G-2.2.3 Reconsidering SVE at MDA C

Because the plume at MDA C appears to be slowly diffusing from high-concentration areas to low-concentration areas with no significant leakage within the source region, previous plans to install active SVE have been revisited.

Applying the logic of MDA L to MDA C, active SVE should be considered if there is a probability of continued leakage in the source region or if the current plume is of concentrations high enough to cause concern about impacts to groundwater.

In the scenario with no additional source leakage, the only rationale for the active SVE system previously presented in the MDA C CME (LANL 2012, 222830) is to quickly reduce concentrations in the depth range of 200–350 ft bgs.

The previous SVE plan for MDA C from the 2012 CME does not target the source region but rather focuses on removing the existing plume at depth. Such a configuration is not recommended, because if new leakage occurs, the deep suction and steep concentration gradient would pull mass down from the source region toward the 200–300 ft depth. If active SVE is kept as a phased corrective measure, the active SVE system should be designed to target the relatively shallow source region with a goal of quickly removing mass from any significant future leaks.

G-2.2.4 Passive SVE Proposal

The preferred corrective measure for the VOC plume at MDA C relies on passive SVE to remediate the subsurface plume over time. There is sufficient existing data to suggest that passive SVE will be successful in reducing plume concentrations at MDA C. Once implemented, the passive SVE system will operate continuously, driven by changes in atmospheric pressure. The passive SVE system's primary function is to remove contaminant plume mass from deep within the mesa. The effectiveness of the passive SVE system on the plume will be determined by analysis of the semiannual monitoring data.

G-2.2.5 Contingent Active SVE

In addition to passive SVE, a more aggressive active SVE system will be designed based on data and experience from SVE operations at MDA L. The active SVE system will be installed and activated only if increases in source concentrations show significant leakage, i.e., if values in any of the monitoring wells in the sampling plan approved by the New Mexico Environment Department (NMED) detect VOC concentrations that are increasing dramatically. Analysis related to MDA L has shown that there is a window of time of 2–3 yr to install and activate an SVE system, once a potential leak is detected, to be protective of the aquifer in the event of a large 10-drum failure (Behar et al. 2019, 700854).

G-2.2.6 Decision Support

During the CMI Design Phase, simulations using the MDA C specifics (plume concentrations, geology, and geometry) will be conducted to explore what probability the current plume, in the absence of increased leakage, has of impacting groundwater. Passive SVE simulations will be used to predict the impact on the timing of mass removal and provide understanding of the performance of the passive SVE system. Simulations of future leakage at MDA C, using a site-specific model, can be used to design an active SVE system. Newport News Nuclear BWXT-Los Alamos, LLC (N3B) is eager to work with NMED to ensure agreement on risks from the current plume at MDA C and on assumptions that should be used to simulate hypothetical future plume behavior. Through iterative data analysis and simulation, N3B and NMED can gain confidence in understanding plume evolution under varying future scenarios, allowing decisions to be based on sound science.

G-2.3 Passive Extraction-Wells Specifications

A set of up to 22 existing boreholes listed in Table G-2.2-1 and shown in Figures G-2.2-2 and G-2.2-4 will be retrofitted for passive SVE. The 22 open boreholes (Figure G-2.2-4), or some subset of these boreholes, can be upgraded for passive SVE by fitting them with rainproof and animal-proof covers, borehole casing extensions, and one-way valves that permit flow only out of the boreholes. Monitoring data collected after installation of the passive SVE system will be used to demonstrate the effectiveness of passive SVE. Monitoring to determine the effectiveness of the passive SVE boreholes at MDA C will be done using a LumaSense Photoacoustic Gas Analyzer to measure primary plume contaminant concentrations (TCE, trichloroethane [TCA], tetrachloroethene [PCE]) being exhaled during a barometric low (e.g., Figure G-2.2-3). Simultaneously, flow rates out of the borehole will be measured. These data will be used to calculate the time-varying mass removal rate (kg/day) from the passive SVE boreholes. Flow measurements will be continuous while concentration data will be collected less frequently.

G-2.4 Active Extraction-Wells Specifications

The active SVE system will be designed to remediate leakage in the source region. System design will rely on simulations of SVE based on MDA L with modifications for the geology and plume characteristics at MDA C. The active system would likely target the depth of the disposal pits and be completed in the Qbt 3. An example of such a system, with two wells completed to a total depth of 100 ft bgs, is included in Figure G-2.2-5. This example targets a post-remedy release from the disposal units near the east end of Pits 1–5. Note that in this example, the eastern half of the highest concentrations in map view of the existing plume shown in Figure G-2.2-4 lie within the radius of influence. Thus, if a post-remedy release from the disposal units originates in the same region of the map where the historic leakage originated, the example active system would be well suited to capture the leak.

If the contingent active SVE system is required, design will depend on the location of any future observations of significant leakage. Drilling at MDA C is complicated by the presence of buried waste and the evapotranspiration cover. The contingency plan for active SVE design will need to consider drilling angled and/or directional boreholes from outside the perimeter of the pits after installation of the final cover to target capture within the Qbt 3 unit. Capturing any future leakage near the source is preferred to ensure that the deeper subsurface is protected.

G-2.5 SVE Unit and Off-Gas Treatment Specifications

For the passive SVE unit, concentrations and mass removal rates are expected to be quite low requiring no treatment. This will be confirmed with the NMED Air Quality Bureau. The passive system also requires no SVE unit.

The proposed contingent active SVE system is similar in features to the system used during the SVE Interim Measure at MDA L (N3B 2018, 700039; Behar et al. 2019, 700854). The SVE system will be a single portable, skid-mounted unit utilizing a 15-horsepower blower motor, providing up to 320 standard cubic feet per minute (scfm) at a vacuum of 120 in. of water. Based on the air permeabilities observed in previous SVE pilot tests, the extraction rate from the Qbt 3 unit is expected to be approximately 160 scfm per well. Extracted air will be directed from the boreholes through a liquid/vapor separator, an in-line filter, a vacuum blower, and a heat exchanger. N3B will work with NMED Air Quality to ensure that New Mexico air quality standards are not exceeded and will implement granular activated carbon (GAC) for off-gas treatment, if required.

G-2.6 Passive SVE Monitoring Requirements

Monitoring to determine the effectiveness of the passive SVE boreholes at MDA C will be done using a LumaSense Photoacoustic Gas Analyzer to measure primary plume contaminant concentrations (TCE, TCA, PCE) being exhaled during a barometric low (e.g., Figure G-2.2-3). Simultaneously, flow rates out of the borehole will be measured. These data will be used to calculate the time-varying mass removal rate (kg/day) from the passive SVE boreholes. Flow measurements will be continuous while concentration data will be collected less frequently.

G-2.7 Contingent Active SVE Monitoring Requirements

Performance monitoring will be carried out in several ways.

- Differential pressure values will be collected from selected pore-gas monitoring borehole sampling ports using an OMEGA pressure sensor, a Dwyer Series 475 Mark III Digital manometer, or equivalent. Differential pressure will be recorded at the select monitoring boreholes with a Campbell Scientific data logger Model CR1000 or equivalent.
- Extraction air flow will be determined using a Dwyer Series PE in-line orifice plate flow meter and a Dwyer Model 677-8 differential pressure transducer or equivalent. The air flow rate will be established by closing the SVE system’s dilution valve to the differential pressure corresponding with the desired flow rate (calculated per equations provided by Dwyer [www.dwyer-inst.com]).
- Extracted air temperature and relative humidity will be collected using a Viasala HMP45AC humidity and temperature probe or equivalent. Vacuum at the top of the extraction borehole will be monitored using a 0–150 in. water vacuum gauge or equivalent.
- Differential pressure, extraction air temperature, and relative humidity measured at the extraction wellhead will be recorded using a Campbell Scientific CR1000 data logger or equivalent.

- A LumaSense Photoacoustic Gas Analyzer, or equivalent, will be used to monitor concentrations of PCE, TCE, carbon dioxide, oxygen, and water vapor in the extracted air.
- A vapor sample will be collected from the extracted air using a SUMMA canister for VOC analysis. All samples will be collected in accordance with the current version of N3B-SOP-ER-2008, “Sampling Subsurface Vapor.” These samples will be collected weekly during the SVE operational cycle.

If required, extracted air will be directed through GAC canisters for treatment and the effluent monitored for emissions compliance. Waste GAC containers will be managed in accordance with an approved waste management plan. All waste generated from sampling activities will be handled in accordance with N3B-EP-DIR-SOP-10021, “Characterization and Management of Environmental Program Wastes.”

Vapor monitoring for rebound effects for Alternatives 3A and 3B will be performed at vapor-monitoring wells 50-24813, 50-603470, and 50-603471 (Figure G-2.2-1). The selected rebound monitoring wells and sampling ports are provided in Table G-2.2-3. These wells and ports were chosen for rebound sampling because they are located within the extraction zone and average TCE concentrations exceeded or approached the depth-dependent, porous-media Tier 2 SLs. Sampling will include field screening and VOC sample collection with SUMMA canisters. For Alternative 4, it is assumed that some of the wells in Table G-2.2-3 will be removed during waste excavation. Replacement wells will be installed as close as possible to the original locations with identical sample port depths.

G-2.8 Operational Schedule—Alternatives 3A and 3B

Passive SVE will operate continuously and be evaluated for effectiveness over the next 10–30 yr.

Under the case of observations of significant leakage, the contingent active SVE system will be initiated. Operational details of the active SVE system will be based on the location and size of a post-remedy release from the disposal units.

G-2.9 Operational Schedule—Alternative 4

Replacement boreholes will be installed to monitor the VOC plume beneath the excavated pits and shafts (source area) to determine if the VOCs have the potential to affect groundwater. If this determination is positive, then a passive SVE system will be designed, installed, and operated.

G-2.10 Shutdown Parameters for the Passive SVE System

The passive system is considered complete when concentrations in the plume fall below the depth-dependent, porous-media Tier 2 screening limits for TCE.

G-2.11 Shutdown Parameters for the Contingent Active SVE System

The following shutdown parameters are proposed for the operation of the active SVE system.

- The first parameter is the depth-dependent, porous-media Tier 2 screening limit for TCE. Remedial activities are considered successful as concentrations are reduced below these limits.

- The second parameter is a follow-up to the first parameter. Mass removed during operational intervals can be calculated using vapor concentrations and flow-rate measurements taken at the manifold. The continuous and cumulative mass removal is plotted versus time. As the mass is depleted, these curves begin to exhibit asymptotic behavior. This behavior is an indicator that the retrievable VOC mass has been removed.
- After the first two parameters have been met, a 6-month rebound period will be observed. If sampling indicates that concentrations have rebounded to above Tier 2 limits, operations will continue. If sampling indicates that key VOC concentrations are still below their respective Tier 2 evaluation limits, then primary operations will be considered complete and long-term vapor monitoring will be initiated for Alternatives 3A and 3B. Long-term vapor monitoring will not be required for Alternative 4 because no additional releases will occur following excavation.
- The SVE extraction boreholes will be maintained for Alternatives 3A and 3B in the event long-term vapor monitoring identifies a post-remedy release from the disposal units. Additional operation of SVE will be performed as necessary.

G-2.12 Reporting

SVE activities and results will be detailed in an annual report. Interim status and results can be provided as necessary. The report format will be provided with the CMI plan.

G-3.0 LONG-TERM VAPOR MONITORING

Vapor-monitoring activities have been conducted at MDA C since completion of the Phase III investigation in 2011. The existing vapor-monitoring program has been successful in defining the nature and extent of the vapor-phase VOC plume at MDA C. The conceptual SVE design described above is intended to remove VOC vapors from the subsurface. The long-term vapor-monitoring program is designed to ensure the passive SVE system has performed as planned and to provide a monitoring system for Alternatives 3A and 3B to trigger the contingent active SVE system in the event an additional release of VOCs from the source areas occurs. Long-term vapor monitoring will also be implemented for Alternative 2, which includes natural attenuation of the VOC plume rather than SVE.

Long-term monitoring in Alternative 4 will ensure that passive SVE installed after excavation is meeting remediation goals. Extraction wells and vapor-monitoring wells will be abandoned after the remediation goals have been met.

G-3.1 Monitoring Distribution and Frequency—Alternatives 2, 3A and 3B

The long-term monitoring distribution and frequency have been developed to assess the long-term performance of the passive SVE system and identify potential new releases from the source regions (i.e., disposal units) that would trigger the contingent active SVE system. If evaluation of vapor-monitoring data indicates changes to the nature and extent of the vapor plume (e.g., increasing VOC concentrations), NMED will be informed of the change. The long-term monitoring distribution and frequency may be modified if VOC concentrations are found to be increasing during the monitoring period.

Long-term subsurface vapor-monitoring activities will be conducted for a total of 100 yr for Alternatives 2, 3A, and 3B. Vapor monitoring will be conducted once per year at the monitoring borehole locations and sampling ports identified in Table G-2.2-3. These locations and ports correspond to those specified by NMED in the approval of the Phase III investigation report for MDA C (LANL 2011, 204370; NMED 2011, 208797).

G-3.2 Monitoring Methods—Alternatives 2, 3A, and 3B

Monitoring activities will be conducted in accordance with the N3B's current revision of N3B-ER-SOP-2008, "Sampling Subsurface Vapor," or equivalent.

G-3.3 Reporting—Alternatives 2, 3A, and 3B

Pore-gas monitoring activities and results will be provided in an annual report in accordance with the requirements of section XI.D of the Consent Order.

G-4.0 REFERENCES

The following reference list includes documents cited in this appendix. Parenthetical information following each reference provides the author(s), publication date, and ERID, ESHID, or EMID. This information is also included in text citations. ERIDs were assigned by the Laboratory's Associate Directorate for Environmental Management (IDs through 599999); ESHIDs were assigned by the Laboratory's Associate Directorate for Environment, Safety, and Health (IDs 600000 through 699999); and EMIDs are assigned by Newport News Nuclear BWXT-Los Alamos, LLC (N3B) (IDs 700000 and above). IDs are used to locate documents in N3B's Records Management System and in the Master Reference Set. The New Mexico Environment Department (NMED) Hazardous Waste Bureau and N3B maintain copies of the Master Reference Set. The set ensures that NMED has the references to review documents. The set is updated when new references are cited in documents.

Behar, H.R., E.E. Snyder, S. Marczak, L.J. Salazar, B. Rappe, G.F. Fordham, S.P. Chu, D.M. Strobridge, K.H. Birdsell, T.A. Miller, K.C. Rich, and P.H. Stauffer, February 2019. "An Investigation of Plume Response to Soil Vapor Extraction and Hypothetical Drum Failure," *Vadose Zone Journal,* Vol. 18, No. 1. (Behar et al. 2019, 700854)

Ellerd, M.G., J.W. Massmann, D.P. Schwaegler, and V.J. Rohay, May-June 1999. "Enhancements for Passive Vapor Extraction: The Hanford Study," *Ground Water,* Vol. 37, No. 3, pp. 427-437. (Ellerd et al. 1999, 701422)

LANL (Los Alamos National Laboratory), November 2006. "Summary Report: 2006 In Situ Soil Vapor Extraction Pilot Study at Material Disposal Area L, Technical Area 54, Los Alamos National Laboratory," Los Alamos National Laboratory document LA-UR-06-7900, Los Alamos, New Mexico. (LANL 2006, 094152)

LANL (Los Alamos National Laboratory), January 2009. "Pilot Test Report for Evaluating Soil-Vapor Extraction at Material Disposal Area G at Technical Area 54, Revision 1," Los Alamos National Laboratory document LA-UR-09-0565, Los Alamos, New Mexico. (LANL 2009, 105112)

LANL (Los Alamos National Laboratory), May 2010. "Report for Supplemental Soil-Vapor Extraction Pilot Test at Material Disposal Area G, Technical Area 54," Los Alamos National Laboratory document LA-UR-10-3409, Los Alamos, New Mexico. (LANL 2010, 109657)

LANL (Los Alamos National Laboratory), June 2011. "Phase III Investigation Report for Material Disposal Area C, Solid Waste Management Unit 50-009, at Technical Area 50," Los Alamos National Laboratory document LA-UR-11-3429, Los Alamos, New Mexico. (LANL 2011, 204370)

LANL (Los Alamos National Laboratory), September 2012. "Corrective Measures Evaluation Report for Material Disposal Area C, Solid Waste Management Unit 50-009 at Technical Area 50," Los Alamos National Laboratory document LA-UR-12-24944, Los Alamos, New Mexico. (LANL 2012, 222830)

N3B (Newport News Nuclear BWXT-Los Alamos, LLC), August 2018. "Interim Measures Final Report for Soil-Vapor Extraction of Volatile Organic Compounds from Material Disposal Area L, Technical Area 54," Newport News Nuclear BWXT-Los Alamos, LLC, document EM2018-0008, Los Alamos, New Mexico. (N3B 2018, 700039)

N3B (Newport News Nuclear BWXT-Los Alamos, LLC), February 2021. "Periodic Monitoring Report for 2019 Vapor-Sampling Activities at Material Disposal Area C, Solid Waste Management Unit 50-009, at Technical Area 50, Revision 1," Newport News Nuclear BWXT-Los Alamos, LLC, document EM2021-0041, Los Alamos, New Mexico. (N3B 2021, 701220)

Neeper, D.A., 2002. "Investigation of the Vadose Zone Using Barometric Pressure Cycles," *Journal of Contaminant Hydrology,* Vol. 54, pp. 59-80. (Neeper 2002, 098639)

Neeper, D.A., 2003. "Harmonic Analysis of Flow in Open Boreholes Due to Barometric Pressure Cycles," *Journal of Contaminant Hydrology,* Vol. 60, pp. 135-162. (Neeper 2003, 098640)

Neeper, D.A., and P.H. Stauffer, May 2012. "Transport by Oscillatory Flow in Soils with Rate-Limited Mass Transfer: 1. Theory," *Vadose Zone Journal,* Vol. 11, No. 2. (Neeper and Stauffer 2012, 601587)

Neeper, D.A., and P.H. Stauffer, May 2012. "Transport by Oscillatory Flow in Soils with Rate-Limited Mass Transfer: 2. Field Experiment," *Vadose Zone Journal,* Vol. 11, No. 2. (Neeper and Stauffer 2012, 601588)

NMED (New Mexico Environment Department), December 8, 2011. "Approval, Phase III Investigation Report for Material Disposal Area C, Solid Waste Management Unit 50-009, at Technical Area 50," New Mexico Environment Department letter to G.J. Rael (DOE-LASO) and M.J. Graham (LANL) from J.E. Kieling (NMED-HWB), Santa Fe, New Mexico. (NMED 2011, 208797)

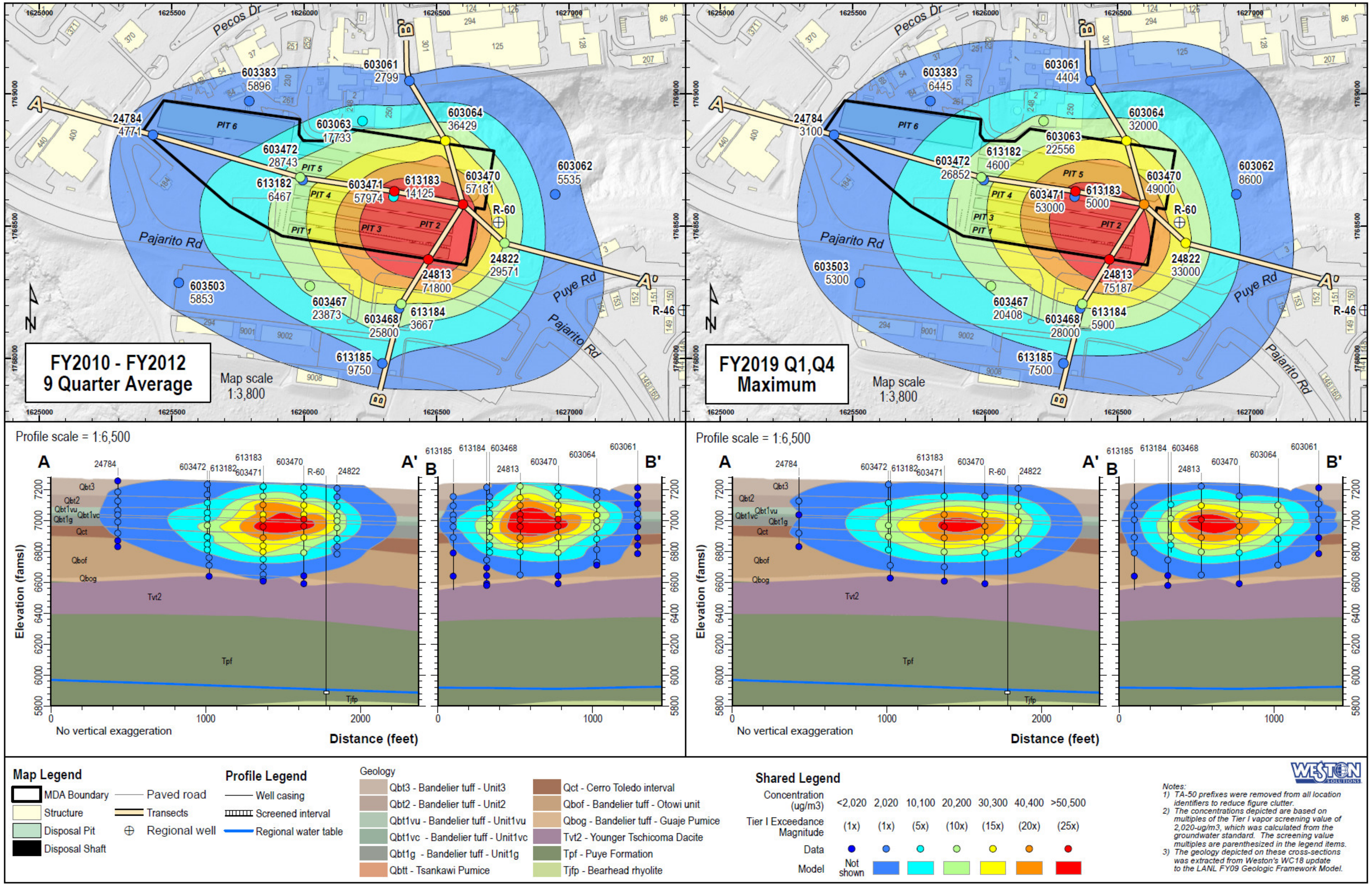
Rossabi, J., 2006. "Analyzing Barometric Pumping to Characterize Subsurface Permeability," Chapter 16 of *Gas Transport in Porous Media*, Springer, The Netherlands. (Rossabi 2006, 701424)

Rossabi, J., and R.W. Falta, January-February 2002. "Analytical Solution for Subsurface Gas Flow to a Well Induced by Surface Pressure Fluctuations," *Ground Water,* Vol. 40, No. 1, pp. 67-75. (Rossabi and Falta 2002, 701423)

SEA (Science & Engineering Associates, Inc.), October 1997. "Brief Tests of Passively Vented Boreholes at TA-54, MDA H, MDA J, and TA-50, MDA C during 1995 and 1996," Science & Engineering Associates report SEA-SF-TR-97-171, Santa Fe, New Mexico. (SEA 1997, 076055)

You, K., H. Zhan, and J. Li, December 2010. "A New Solution and Data Analysis for Gas Flow to a Barometric Pumping Well," *Advances in Water Resources,* Vol. 33, No. 12, pp. 1444-1455. (You et al. 2010, 701425)

You, K., H. Zhan, and J. Li, May 2011. "Gas Flow to a Barometric Pumping Well in a Multilayer Unsaturated Zone," *Water Resources Reseach,* Vol. 47. (You et al. 2011, 701426)



Note: Figure shows the maximum plume from 2019 compared with the average plume from 2010–2012.

Figure G-2.2-1 Three-dimensional representation of TCE vapor plume beneath MDA C

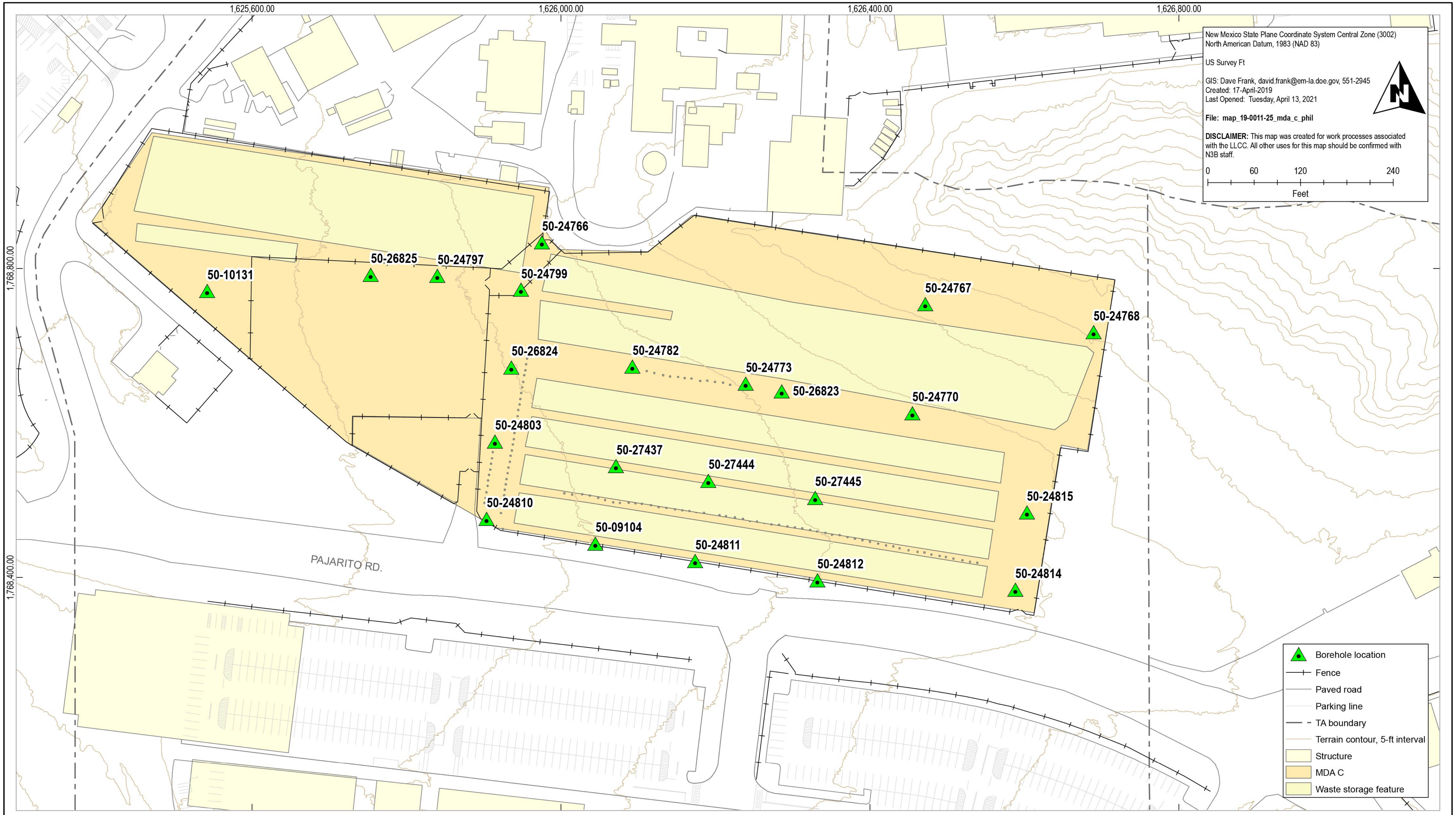


Figure G-2.2-2 Locations of possible passive SVE boreholes at MDA C

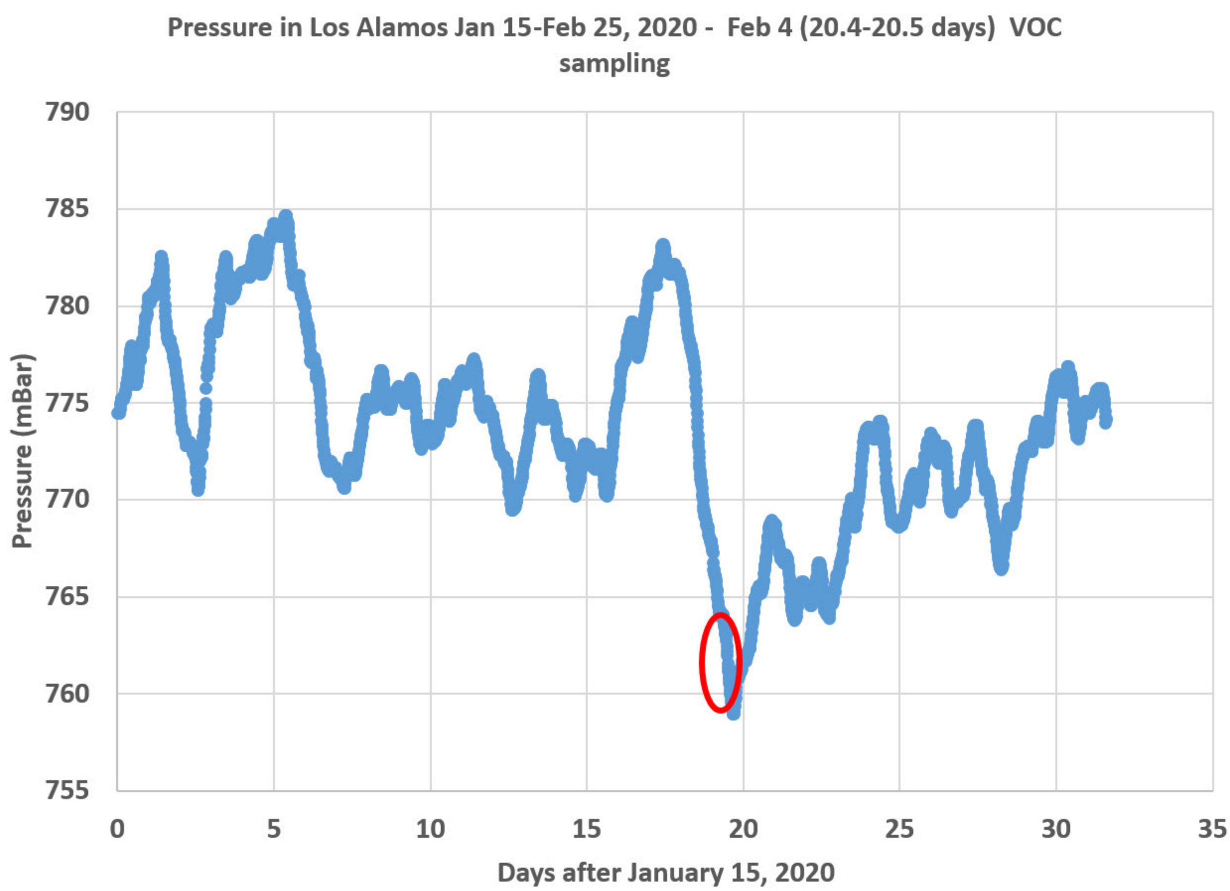


Figure G-2.2-3 Pressure data at the time of sampling on February 4, 2020 (red circle) showing barometric low that corresponds to gases exhaling from the open boreholes

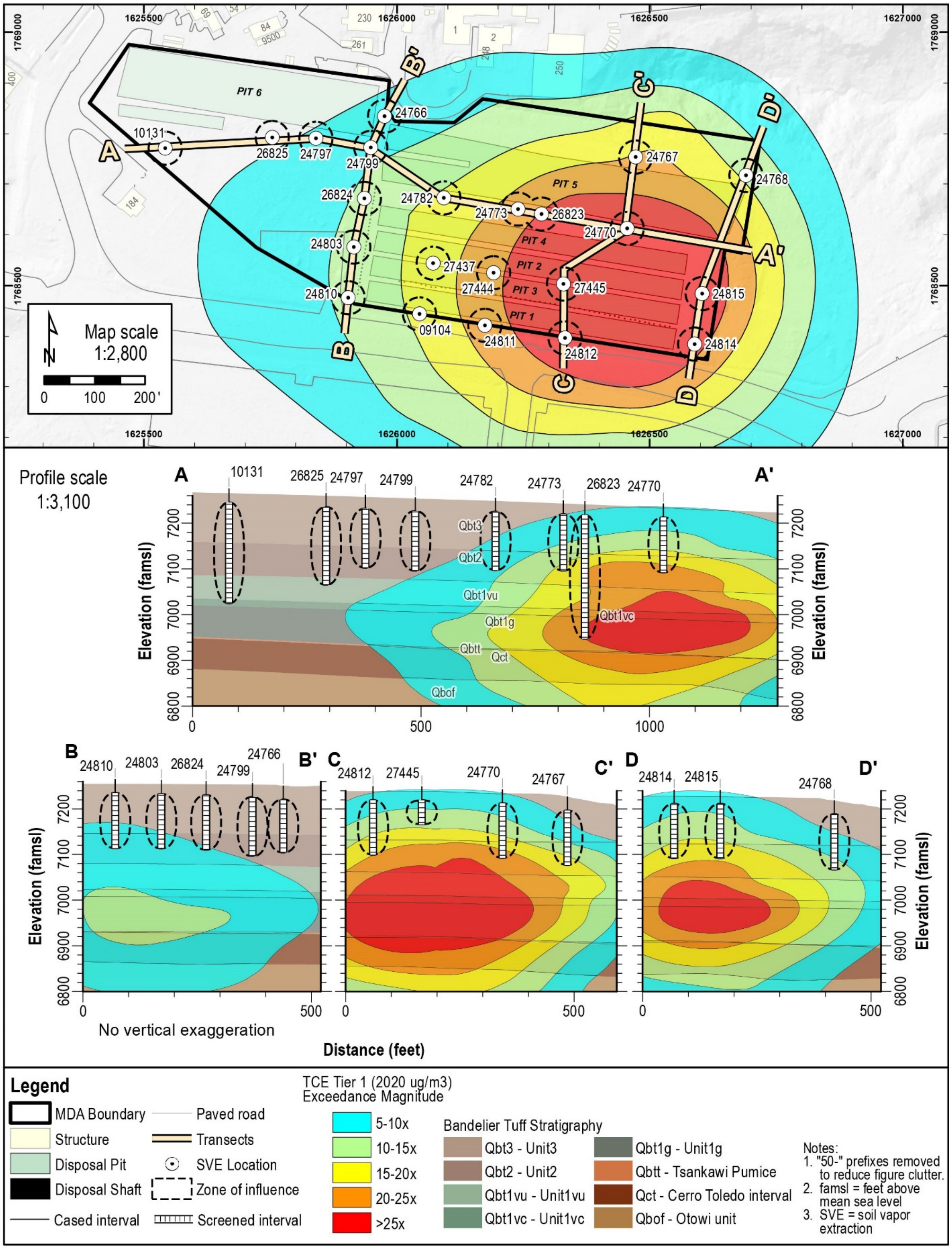


Figure G-2.2-4 Proposed system of up to 22 passive SVE boreholes at MDA C

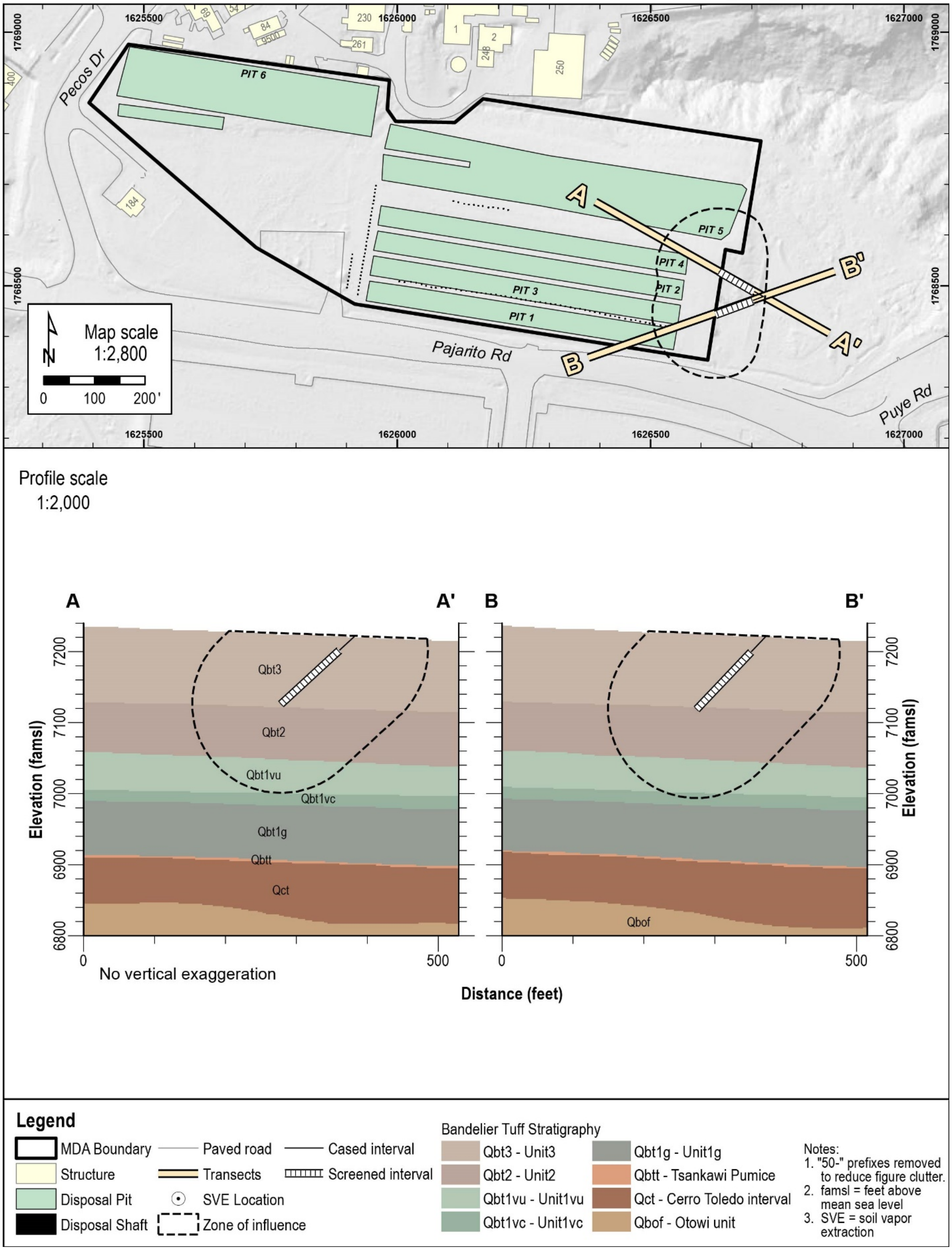


Figure G-2.2-5 Example of a contingent active SVE system targeting a post-remedy release from the disposal units near the eastern end of MDA C

Table G-2.2-1
22 Open Boreholes at MDA C with Potential for Passive SVE

Borehole Location ID	Measurement Time	Measured Concentration[a]	Comments
50-09104	1100	29.9 ppm	Meter readings fluctuated.
50-10131	—[b]	—	Well cap stuck, could not sample.
50-24766	1020	23.0 ppm	Meter readings fluctuated.
50-24767	1050	17.9 ppm	
50-24768	1055	21.8 ppm	
50-24770	1047	17.4 ppm	
50-24773	1044	24.4 ppm	
50-24782	1041	32.6 ppm	Meter readings fluctuated.
50-24797	1025	26.9 ppm	Meter readings fluctuated.
50-24799	1017	15.8 ppm	
50-24803	—	—	Well cap stuck, could not sample.
50-24810	1005	11.2 ppm	
50-24811	1002	12.9 ppm	
50-24812	—	—	Well cap missing, so no sample taken.
50-24814	952	18.4 ppm	
50-24815	958	23.6 ppm	
50-26823	1045	23.5 ppm	
50-26824	—	—	Well cap stuck, could not sample.
50-26825	1029	28.9 ppm	Meter readings fluctuated.
50-27437	—	—	Not found on this trip, Feb 4, 2020.
50-27444	—	—	Not found on this trip, Feb 4, 2020.
50-27445	—	—	Not found on this trip, Feb 4, 2020.

[a] As measured by a PID, which is sensitive to acetone, benzene, and butanone.

[b] — = Not sampled.

Table G-2.2-2
Concentration of PID-Sensitive VOCs
Measured in Open Boreholes, February 2020

Borehole	Depth (ft bgs)	Sample Concentration* (ppm)
50-09102	77.8	29.9
50-24766	146.5	23
50-24767	149.8	17.9
50-24768	151.5	21.8
50-24770	150	17.4
50-24773	152.8	24.4
50-24782	157.5	32.6
50-24797	159	26.9

Table G-2.2-2 (continued)

Borehole	Depth (ft bgs)	Sample Concentration* (ppm)
50-24799	160	15.8
50-24810	151.7	11.2
50-24811	151.6	12.9
50-24814	149.5	18.4
50-24815	149.7	23.6
50-24818	620	23.9
50-26823	300	23.5
50-26825	200	28.9

* Sum of acetone, benzene, and butanone.

Table G-2.2-3
Proposed MDA C Long-Term Subsurface
Vapor-Monitoring Locations, Borehole Status, and Port Depths

Borehole ID	Borehole Status	Port Depths
50-24784	Annual Vapor-Monitoring Program	155, 244, 362, 450
50-24813	Annual Vapor-Monitoring Program; SVE Rebound Monitoring	25, 150, 241, 358, 450, 600
50-24822	Annual Vapor-Monitoring Program	25, 142, 235, 351, 450
50-603061	Annual Vapor-Monitoring Program	25, 128, 228, 347, 450
50-603062	Annual Vapor-Monitoring Program	122, 217, 337, 450
50-603063	Annual Vapor-Monitoring Program	25, 128, 228, 347, 450
50-603064	Annual Vapor-Monitoring Program	113, 214, 332, 500
50-603383	Annual Vapor-Monitoring Program	26, 139, 244, 359, 450
50-603467	Annual Vapor-Monitoring Program	143, 244, 360, 500, 600
50-603468/50-613184	Annual Vapor-Monitoring Program	142, 233, 354, 403, 500, 600, 664.5
50-603470	Annual Vapor-Monitoring Program; SVE Rebound Monitoring	83, 203, 278, 351, 450, 600, 650
50-603471/50-613183	Annual Vapor-Monitoring Program; SVE Rebound Monitoring	90, 209, 288, 360, 450, 550, 642.5
50-603472/50-613182	Annual Vapor-Monitoring Program	27, 146, 292, 364, 450, 550, 632.5
50-603503	Annual Vapor-Monitoring Program	133, 237, 347, 450
50-613185	Annual Vapor-Monitoring Program	142, 235, 350, 450, 600

Appendix H

Supporting Information for
Cost Estimates for Material Disposal Area C

H-1.0 INTRODUCTION

This appendix provides the basis for the cost estimates, summary cost information, assumptions, estimate details, and material and labor pricing data used in developing the cost estimates for corrective measures evaluation (CME) alternatives for Material Disposal Area (MDA) C at Technical Area 50 (TA-50) at Los Alamos National Laboratory (LANL or the Laboratory). The estimates are intended to be consistent with U.S. Environmental Protection Agency (EPA) guidance on developing and documenting costs estimated during feasibility studies (EPA 2000, 071540). Cost estimates are expected to be within the accepted standard accuracy range of +50% to –30% established by EPA for remedial alternative estimates at the alternatives screening stage (EPA 2000, 071540, p. 2-4).

In addition to the no-action alternative, four corrective measures alternatives were retained and have been brought forward for cost-estimating purposes.

H-1.1 Compliance Order on Consent Requirements

Section XVI.D.5 of the Compliance Order on Consent (hereafter, the Consent Order) requires the following: capital costs shall include, without limitation, construction and installation costs; equipment costs; land development costs; and indirect costs, including engineering costs, legal fees, permitting fees, startup and shakedown costs, and contingency allowances. Operations and maintenance (O&M) costs shall include, without limitation, operating labor and materials costs; maintenance labor and materials costs; replacement costs; utilities; monitoring and reporting costs; administrative costs; indirect costs; and contingency allowances. All costs shall be calculated based on their net present value (PV).

As presented in guidance documents, confusion often exists with the terms “direct” and “indirect” costs. Therefore, in this report the term “capital” costs include planning, design, construction, management-related activities, and both labor and professional services for installing the remedial alternative. Recurring operations, maintenance, and monitoring costs, including regular annual costs and periodic costs, are separated out from capital costs. Periodic costs include 5-yr reviews, equipment replacement, and major repairs.

H-2.0 METHOD

LANL estimates were performed in 2012 for the four alternatives: 2, 3A, 3B, and 4. The design of Alternatives 2, 3A, and 4 are considered reasonable alternatives and are not changed for this report. However, design of Alternative 3B changed significantly. Therefore, the LANL estimates for the alternatives with no overall design changes are used as a basis with some minor modifications as shown in a comparison table for each alternative, removal of the New Mexico gross receipts tax and general and administrative tax, and escalated to PV. A new bottom-up estimate was developed for Alternative 3B. The LANL cost estimates were developed based on a bottom-up approach using WINEST cost estimating software. The assumptions used in the calculations are discussed below. The construction pricing is based on the 2012 RS Means Database for equipment and materials, quotes from outside vendors, and the current Davis Bacon wage rates for construction in Los Alamos. RS Means is a comprehensive database of industry averages for materials, labor, and equipment. Line items contain descriptions of appropriate materials, labor, and equipment to successfully perform particular tasks.

A labor factor was used to increase the project cost on labor because of the remote location of the site or for additional rigor for a site. The basic estimating units generally reflect a normal standard for construction costs. Many special work situations and job conditions may require additional material or labor work hours. The actual design and operations costs will likely vary from these estimates when the corrective measures implementation (CMI) is completed.

The bottom-up estimate for Alternative 3B was based on Newport News Nuclear BWXT-Los Alamos, LLC (N3B) staff augmentation rates for contractor labor rates and vendor quotes. Equipment rates were based on the rates developed by the Department of Transportation for the State of California. Middle DP Road project experience was used as a pattern to develop crew and equipment compliments and durations.

H-2.1 Capital Costs

Capital costs include both direct and indirect costs. The capital costs consist of construction and installation costs; equipment costs; land development costs; and indirect costs, including engineering design costs, legal fees, permitting fees, professional management startup and shakedown costs, and contingency allowances. Detailed estimates of capital costs in calendar year 2021 dollars are provided below and in tables in section 8 of the CME report.

The distributable costs include craft distributable-labor and craft distributable-materials. For the cover alternatives, craft distributable-labor was calculated as 25% of direct job hour cost. Craft distributable-materials was calculated as a $7 per direct job hour cost to account for the nonlabor costs associated with temporary utilities/services, small tools, consumables, construction equipment not specifically identified in direct work line items, and training costs. For the excavation alternative, a lump sum of $5,000,000 was assumed for total craft distributable costs.

The design costs were calculated as 6% of the total direct capital costs for the cover alternatives and 3% of total direct capital costs for the excavation alternative.

Professional management costs include project management and construction management. Project management costs were calculated as 5% of the total direct capital costs and design costs. Construction management costs were calculated as 6% of total direct capital costs.

Management reserve costs were calculated as 50.8%–50.9% of the total direct capital costs, plus design and professional management costs, depending on the results of the cost and schedule uncertainty analysis.

H-2.2 Operations and Maintenance Costs

The O&M costs include both direct and indirect costs. The O&M costs include operating labor and materials costs, maintenance labor and materials costs, replacement costs, utilities, monitoring and reporting costs, administrative costs, and O&M associated indirect costs. Estimates of O&M costs in 2021 dollars are provided below and in tables in section 8 of the CME report.

Professional management costs include project management and construction management. These costs were calculated as 5% and 6% of the total direct O&M costs, respectively, before PV analysis. The costs were then discounted based on the PV analysis discussed below in section H-2.3.

H-2.3 PV Analysis

Costs were discounted to a 2021 PV in order to compare one alternative’s costs with other alternatives’ costs over different periods, as recommended in “A Guide to Developing and Documenting Cost Estimates During the Feasibility Study” (EPA 2000, 071540). PV costs for a technology are the sum of all capital costs and continuing costs. Presentation of capital and O&M costs as PV is consistent with the

CME requirements contained in Section VII.D.4.b.v of the Consent Order. The principle is also embraced for federal programs. The Office of Management and Budget circular A-94 states, “The standard criterion for deciding whether a government program can be justified on economic principles is net present value” (Office of Management and Budget 1992, 094804, p. 3). Consistent with EPA guidance, a discount rate of 7% was used (EPA 2000, 071540).

Net PV was calculated according to the following formula:

$$PV_{total} = \sum_{t=1}^{t=n} \frac{1}{(1+i)^t} \cdot C_t$$

where PV_{total} = present single sum of money,

t = specific year,

n = final project year,

i = the discounted interest rate, and

C_t = cost in year t in base-year dollars.

The PV analyses are presented in the cost estimate tables in section 8 of the CME report.

H-2.4 General Assumptions

The estimates are based on an 8-hr work day and 5-day work week. No overtime is included. On-site activities will be conducted under hazardous waste operations and emergency response requirements. Safety levels are based on the Occupational Safety and Health Administration regulations in 29 Code of Federal Regulations Part 1910. Most activities are set to safety level D. All appropriate site-related plans (e.g., general safety plan, quality assurance plan, waste management plan, work plan, hoisting and rigging plan, and health and safety plan) will be prepared and submitted by the subcontractor. All plans will be reviewed and approved by the Laboratory as necessary so as not to adversely impact the project schedule.

Alternatives 2 and 4 are assumed to require vapor monitoring for 10 yr. Alternative 2 is assumed to require a capital improvement every 100 yr to replace 4 in. of soil lost due to erosion because the soil has not been hardened similarly to the soil portrayed in Alternatives 3A and 3B. The preparation and application of soil for Alternative 2 were estimated in a manner similar to that used for Alternative 3B. Alternatives 3A and 3B are assumed to require vapor monitoring and passive soil-vapor extraction (SVE) for 10 yr.

For Alternatives 2, 3A, and 4, labor rates, waste disposal rates, and material pricing were based on 2012 RS Means rates escalated to PV. Escalation consisted of 2.8% through 2020 and 2.3% through 2021.

To provide an accurate comparison among the different alternatives, no burdens were applied to the estimates.

The project was assumed to be a U.S. Department of Energy on-site project and not a Defense Program project, and escalation was applied to LANL estimates and vendor quotes as appropriate to approximate 2021 costs.

H-3.0 MDA C ALTERNATIVES

Four corrective measures alternatives, plus the no-action alternative, are described below.

H-3.1 Alternative 1: No Action

This alternative involves leaving the site as is. No costs are involved with this alternative.

H-3.2 Alternative 2: Soil Barrier and Institutional Controls

This technology includes the following tasks:

- vapor monitoring for 10 yr
- maintenance of the cover and institutional controls for 100 yr
- preparation of an annual long-term monitoring report for 100 yr

Assumptions

The following assumptions were used to develop the cost estimate for this technology:

- A new bottom-up estimate was performed that included the necessary surface preparations but did not provide any armoring to mitigate long-term soil erosion. Therefore, periodic maintenance is required to ensure an adequate covering to preclude buried contaminated waste exposure to the environment.
- The project schedule start date of December 4, 2023, is assumed to allow scheduling of events in the proper sequence and timing of the year to ensure minimal delays by known climate conditions. The actual start date will be based on regulatory and funding approvals by state and federal authorities.
- Existing surface conditions will require removal of existing debris and grading to allow for minimal long-term maintenance.
- At least 4 in. of topsoil will be required to ensure minimum cover after grading.
- No retaining walls will be needed.
- No contaminated waste material will be generated for disposal.
- Work will not be self-performed by N3B except for some site preparation activities.
- Vapor monitoring will be performed each year for 10 yr after surface preparations are completed.
- Estimated costs are unburdened with no tax or fees.
- Management reserve is assumed to be 30% of total unburdened cost based on the uncertainty of long-term maintenance requirements to ensure adequate protection to the public from erosion rate uncertainties.
- Estimated costs are based on fiscal year (FY) 2021 prices.
- Estimated costs include hydroseeding after surface preparation and every 10 yr thereafter for 100 yr.

- At least 4 in. of top soil will need to be added every 100 yr to replace soil that has eroded. Only one application of 4 in. of soil is assumed in the estimate to ensure a uniform top layer after grading to start the 100-yr period.
- Yearly groundwater monitoring will be performed as part of the Laboratory's long-term stewardship program and is not included in the cost estimate.

H-3.3 Alternative 3A: Multilayer Cover, SVE, and Institutional Controls

This technology includes the following tasks:

- site preparation of the existing soil surface and installation of a multilayer cover (Resource Conservation and Recovery Act [RCRA] Subtitle C cover) over the shafts and pits
- SVE to remove volatile organic compounds (VOCs)
- vapor and groundwater monitoring for 100 yr
- maintenance of the cover and institutional controls for 100 yr
- preparation of an annual long-term monitoring report for 100 yr

Assumptions

The following assumptions were used to develop the cost estimate for this technology:

- Area to be covered by the multilayer (RCRA) cover is 11 acres.
- Construction of the multilayer (RCRA) cover will consist of
  - ❖ site preparation of the existing soil surface and cover preparation, which includes 3 ft of operational cover above the waste material;
  - ❖ a 2-ft layer of compacted natural or amended soil with a maximum saturated hydraulic conductivity of 1×10^{-7} cm/s;
  - ❖ an 80-mil flexible geomembrane liner, such as high-density polyethylene, to limit downward moisture movement;
  - ❖ a 1-ft drainage layer of sand having a minimum saturated hydraulic conductivity of 1×10^{-2} cm/s, or geonet;
  - ❖ a 2-ft soil and vegetation layer graded at slopes between 3% and 5%; and
  - ❖ a total 1400 linear ft of retaining walls along the northwest and southeast sides of the site, reaching to the top of the cover.
- Time to complete construction will be 18 months; irrigation will continue for 1 yr.
- The 22 boreholes will be extended through the added cover material and retrofitted for passive SVE monitoring. Each borehole retrofit is estimated at $15,000 per borehole.
- If active SVE monitoring is required later, this is considered an additional cost associated with the management reserve.
- Vapor monitoring will be performed each year for 10 yr after cover installation instead of the 15 months assumed for the LANL estimate.
- Management reserve is assumed to be 50.9% of total unburdened cost based on the LANL estimate uncertainty.

- Estimated costs include hydroseeding after cover installation and thereafter every 10 yr for 100 yr.
- No radioactively contaminated soil will be present down to 2 ft below ground surface (bgs).
- Some field maintenance will be performed for 2 days every 5 yr.
- Yearly vapor and groundwater monitoring will be performed as part of the Laboratory's long-term stewardship program and are not included in the cost estimate.
- Materials for 5 ft of clay, drainage soil, and topsoil will be obtained from within a 25-mi radius (50-mi round trip). Over 11 acres, a total of 5916 trucks (assuming 15 yd^3/truck) will be required. Total mileage is approximately 296,000 mi.

H-3.4 Alternative 3B: ET Cover, SVE, and Institutional Controls

This technology includes the following tasks:

- site preparation of the existing soil surface and installation of an evapotranspiration (ET) cover over the shafts and pits
- SVE to remove VOCs
- vapor and groundwater monitoring for 100 yr
- maintenance of the cover and institutional controls for 100 yr
- preparation of an annual long-term monitoring report for 100 yr

Assumptions

The following assumptions were used to develop the cost estimate for this technology:

- Area to be covered by the ET cover will be 11.8 acres.
- Following site preparation, 8 in. of 2.5-in. D50 basalt rock meeting durability requirements will be rototilled to a 2-ft depth into the existing cover soil.
- The project schedule start date of December 4, 2023, will allow scheduling of events in the proper sequence and timing of the year to ensure minimal delays by known climate conditions. The actual start date will be based on regulatory and funding approvals by state and federal authorities.
- The entire ET cover will be sloped uniformly to eliminate the need for channelized flow.
- Minimal grading will be required to meet the slope criteria for the ET cover.
- No retaining walls will be needed.
- The 22 boreholes will be extended through the added cover material and retrofitted for passive SVE monitoring. Each borehole retrofit is estimated at $15,000 per borehole.
- If active SVE monitoring is required later, this is considered an additional cost associated with the management reserve.
- No contaminated waste material will be generated for disposal.
- Work will not be self-performed by N3B except for some site preparation activities.
- Vapor monitoring will be performed each year for 10 yr after ET cover installation.
- Estimated costs are unburdened with no tax or fees.

- Management reserve is assumed to be 20% of total unburdened cost based on an estimated 20% estimate uncertainty. The lack of project complexity and negligible to no radioactive contamination minimizes the significant risk potential.
- Estimated costs are based on FY 2021 prices.
- The ET cover is effectively 8 in. of 2.5-in. basalt rock rototilled to a 2-ft depth.
- The basalt rock is assumed to meet all durability test requirements for 1000 yr.
- Estimated costs include hydroseeding after cover installation and thereafter every 10 yr for 100 yr.
- No radioactively contaminated soil will be present down to 2 ft bgs.
- Some field maintenance will be performed for 2 days every 5 yr.
- Yearly groundwater monitoring will be performed as part of the Laboratory's long-term stewardship program and is not included in the cost estimate.

H-3.5 Alternative 4: Excavation, SVE, and Institutional Controls

This technology includes the following tasks:

- excavation, analysis, and segregation of the waste in the MDA C pits and shafts using standard excavation methods
- construction of three temporary excavation enclosures with supplied air and high-efficiency particulate air filters to control releases and for weather protection
- construction of an on-site waste analysis and segregation facility
- on-site treatment of corrosive wastes by elementary neutralization
- off-site disposal of wastes
- SVE to remove VOCs
- institutional controls for 100 yr

H-3.5.1 Assumptions

The following assumptions were used to develop the cost estimate for this technology:

- Excavation of both pits and shafts will use standard excavation equipment.
- Excavation will be performed under an enclosure (three total for estimating purposes) to maintain control of airborne particulates, avoid storm water infiltration, and reduce downtime because of the weather. The scope to erect and move these structures is captured in the excavation site preparation portion of the detailed estimate in Appendix H, Attachment H-1.
- Excavation, segregation, analysis, treatment, and disposal activities will be complete within a 3-yr period.
- Backfilling the excavation will require clean fill to be imported from TA-61 to completely fill the excavation. At 16-mi round trip with a 15-yd^3 truck capacity, truck miles will be 307,800.
- Estimated excavation and waste quantities are presented in Table H-3.5-1.

- For purposes of the cost estimate, all wastes excavated from MDA C are assumed to be low-level radioactive waste (LLW). Based on the characteristics of the waste excavated during the remediation of MDA B (LANL 2012, 215119), only very minor amounts of RCRA hazardous waste and mixed LLW are expected to be generated.
- Transporting the excavated LLW to Clive, Utah (1450-mi round trip), assuming 15-yd^3 truck capacity, will result in 23,643,000 truck miles.
- Overburden material will be suitable for backfill.
- All waste will be disposed of off-site.
- Corrosive waste will be treated on-site using elementary neutralization. All other waste treatment will be off-site.
- The excavated area will be graded and seeded.
- Vapor monitoring will be performed each year for 10 yr after cleanup.
- Management reserve is assumed to be 50.9% of total unburdened cost based on the LANL estimate uncertainty.
- Seven of the 22 boreholes will need to be replaced with each hole being cased with polyvinyl chloride to a 6-in. diameter and 150-ft length.
- The average high cost per foot of a borehole is $30. Because of the contaminated conditions and equipment decontamination, assume $75/ft cost.

H-4.0 REFERENCES

The following reference list includes documents cited in this appendix. Parenthetical information following each reference provides the author(s), publication date, and ERID, ESHID, or EMID. This information is also included in text citations. ERIDs were assigned by the Laboratory's Associate Directorate for Environmental Management (IDs through 599999); ESHIDs were assigned by the Laboratory's Associate Directorate for Environment, Safety, and Health (IDs 600000 through 699999); and EMIDs are assigned by N3B (IDs 700000 and above). IDs are used to locate documents in N3B's Records Management System and in the Master Reference Set. The NMED Hazardous Waste Bureau and N3B maintain copies of the Master Reference Set. The set ensures that NMED has the references to review documents. The set is updated when new references are cited in documents.

EPA (U.S. Environmental Protection Agency), July 2000. "A Guide to Developing and Documenting Cost Estimates During the Feasibility Study," EPA 540-R-00-002, prepared by the U.S. Army Corps of Engineers and the U.S. Environmental Protection Agency Office of Emergency and Remedial Response, Washington, D.C. (EPA 2000, 071540)

LANL (Los Alamos National Laboratory), April 2012. "Investigation/Remediation Report for Material Disposal Area B, Solid Waste Management Unit 21-015, Revision 1," Los Alamos National Laboratory document LA-UR-12-20089, Los Alamos, New Mexico. (LANL 2021, 215119)

Office of Management and Budget, October 29, 1992. "Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs," Circular No. A-94, Washington, D.C. (Office of Management and Budget 1992, 094804)

Table H-3.5-1
Excavation and Waste Volumes for Pits and Shafts

Pit/Shaft No.	Dimensions (ft)	Pit/Shaft Volume (yd^3)	Excavated Volume* (yd^3)	Estimated Total Waste Volume (yd^3)	Estimated Overburden Volume (yd^3)
Pits	**(Length × Width × Depth)**				
1	610 × 40 × 25	22,590	30,750	28,700	2050
2	610 × 40 × 25	22,590	30,750	28,700	2050
3	610 × 40 × 25	22,590	30,750	28,700	2050
4	610 × 40 × 25	22,590	30,750	28,700	2050
5	705 × 110 × 18	51,700	69,560	63,510	6050
6	505 × 100 × 25	46,760	59,500	55,530	3970
Chemical	180 × 25 × 12	2000	3490	3080	410
Shafts	**(Diameter × Depth)**				
1–55	2 × 15	96	1567	1564	3
56–67	2 × 10	14	256	253	3
68–107	2 × 25	116	1710	1707	3
Sr-90	4 × 4	2	27	21	6
	Total	**191,048**	**259,110**	**240,465**	**18,645**

* Assumes 5-ft overexcavation on sides and bottom.

Attachment H-1

Detailed Cost Estimate Reports
(on DVD included with this document)

Appendix I

Conceptual Design and Preliminary Specifications for Evapotranspiration Cover at Material Disposal Area C

I-1.0 INTRODUCTION

This appendix presents a preliminary conceptual design of the evapotranspiration (ET) cover for Material Disposal Area (MDA) C and preliminary specifications of the cover components. This material presented in this appendix includes descriptions of the general site grading plan, the purpose of each layer of the proposed ET cover, the design methodology used, and the results of calculations and modeling that validate the design.

The general methodology for developing the conceptual design of the ET cover is presented in the conceptual cover design report for MDA C (Attachment I-1). It is assumed that the interim cover soil shall serve as the final cover with the addition of a rock/soil admixture surface layer incorporated to mitigate erosion. It is assumed that rock will be purchased from off-site and transported on-site to be used to construct the surface layer of the ET cover at MDA C. This rock will then be uniformly mixed into the top 2-ft (0.6 m) of the interim cover. The conceptual profile of the ET cover for MDA C is shown in Figure I-1.0-1. The conceptual design includes a minimum 4.7-ft (1.4-m) cover depth that includes a 2-ft (0.6-m) soil-gravel admixture to minimize flux through the cover. Burrowing animals in the area will be discouraged by the inclusion of rock in the surface admixture layer.

Site-grading and storm water-management considerations are discussed in section I-2.0. Brief descriptions of each layer in the cover profile are presented in Table I-1.0-1. More complete descriptions, preliminary specifications, and placement methods are presented in section I-3.0.

I-2.0 SITE GRADING AND STORM WATER MANAGEMENT

I-2.1 Preliminary Grading Plan

The preliminary cover grading plan is presented in Figure I-2.1-1. This grading plan was developed based on the goals of minimizing erosion and promoting cover longevity. Erosion from storm water runoff is one of the primary factors affecting the longevity of the ET cover. As discussed in Appendix F, a cover over the disposed-of waste is needed to meet long-term U.S. Department of Energy (DOE) radiation protection requirements. For consistency with DOE requirements for operational low-level radioactive waste disposal facilities, a 1000-yr performance period was assumed.

Developing a cover layout that provides for dispersed overland flow of storm water presents advantages in assuring the longevity of the ET cover. Eliminating conventional storm water control systems that use conveyance channels on the cover to route storm water to detention basins precludes the need to address the following storm water issues, all of which represent potential obstacles to meeting the 1000-yr criterion:

- Conveyance channels and detention basins must be sized for a 1000-yr or greater design storm.
- Synthetic materials for piping and channel liners cannot be used under the longevity criteria.
- Concrete structures cannot be used because exposed concrete will degrade over time.
- Structures must be oversized to the extent necessary to accommodate sedimentation.
- Routine maintenance, typical of most engineered storm water systems, cannot be planned for the 1000-yr time frame.

The preliminary cover layout provides general accommodation of existing storm water drainage features. The layout preserves existing drainage ditches outside the waste disposal areas and provides sufficient areas at the cover perimeter to allow future design of storm water diversion systems.

The cover is sloped to shed storm water relatively uniformly around the entire ET cover, eliminating focused or channelized flow. The cover grading provides for overland flow from the cover that is dispersed to surrounding areas without contacting waste materials or residual contaminants. The surface admixture layer of the ET cover is designed to prevent rill and gully formation while mitigating soil loss due to erosion.

The cover layout assumes other Los Alamos National Laboratory (LANL or the Laboratory) facilities, such as buildings, roadways, and utilities, are maintained in their current locations and configurations. The cover layout at MDA C requires setbacks from existing roads as well as drainage channels from the radioactive liquid waste line and from the pump house and influent storage facility.

MDA C has an existing vegetated soil cover that gently slopes toward the northeast. The slopes are graded on relatively uniform planes, with distinct slope breaks over different portions of the waste trenches. The existing soil cover at MDA C contains moderate vegetation and does not show evidence of significant erosion or gully development. The existing grades generally meet the slope criteria for the ET cover, and the cover can be constructed without changing the existing grades (Figure I-2.1-2).

Several constraints exist at the perimeter of the cover, including buildings, roadways, existing drainage channels, temporary storage containers, and buried utilities. The final design will consider these constraints with respect to runoff. The following perimeter facilities are addressed in the preliminary cover layouts:

- *Technical Area 50 (TA-50) pump house and influent storage facility*. This building is located approximately 30 ft north of the MDA C boundary. A retaining wall is provided at a 10-ft setback inside the fence line.
- *Radioactive liquid waste line*. A buried radioactive liquid waste line is located approximately 10 ft outside the western half of the northern MDA C boundary (Figure I-2.1-1). A retaining wall is provided at a 5-ft setback from the radioactive liquid waste line.
- *TA-50 roadways*. Roads to TA-50 facilities are located within approximately 10 ft to 20 ft of the MDA C western and northern boundaries. The cover layout provides retaining walls to maintain these existing roadways. Retaining walls are provided at a 10-ft setback from existing roadways.
- *Pajarito Road*. Along the southern boundary of MDA C, the cover potentially encroaches on Pajarito Road. To avoid impacting this primary roadway, the preliminary layout sets the cover limit north of Pajarito Road, preserving an existing drainage ditch that runs between MDA C and the roadway, a retaining wall is provided at a 10-ft setback from the existing roadway.
- *MDA C boundaries*. Around portions of the MDA C perimeter, waste trenches and shafts are located very near the site boundary fence line. As a result, the cover extends beyond the existing boundary (Figure I-2.1-1). To minimize the cover’s extension beyond the boundary, side slopes were set at less than 25% in these areas. At the northeast corner of the site, the cover extends just to the TA-50 boundary with TA-63.

The design issues related to perimeter facilities will need to be addressed during future cover design efforts.

I-3.0 PRELIMINARY SPECIFICATIONS FOR COVER COMPONENTS

The following sections describe the preliminary specifications for components of the ET cover, including materials and placement methods. The cover components consist of vegetation, surface treatment, and operational cover.

I-3.1 Vegetation

I-3.1.1 Vegetation Type

Seed and/or live plants used to revegetate disturbed areas at the Laboratory will be native to the Los Alamos vicinity. Table I-3.1-1 lists the seed mix proposed for use for the cover system at MDA C.

I-3.1.2 Seed Application

Seeding of native vegetation on the cover systems will be performed in the spring after the last frost of the season and before the arrival of the summer rains that typically occur in July and August. Seeding will not be done after August 1 to avoid germination too close to the first frost, which can kill the new seedlings.

Revegetation will be done by drill-seeding and applying fertilizer as required. Care will be taken to ensure the rock-soil surface treatment maintains the desired ratio during this activity. Care will also be taken to ensure the rock-soil surface treatment layer is not mixed deeper into the cover profile.

Slow-release organic fertilizers can be applied as necessary to eliminate any nutrient deficiencies of the topsoil. Table I-3.1-2 lists the recommended levels of available plant nutrients. Analyses of cover soils used will dictate the actual fertilizer rate required. Organics may be applied, depending on analysis of the cover soil, and may include such things as granular humate. Application rates of composted manure vary depending on the source (chicken, horse, etc.) and the type of materials (wood chips, paper, soil, etc.) used to compost. If composted manure is to be applied, the nutrient content will be tested and interpreted before it is used. It is recommended that the cover soil not have too much salt. Salts tend to limit vegetation establishment and growth and can be more prone to erosion. Table I-3.2-1 lists recommended tests and criteria for salt content in the cover soil.

Drill-seeding will be the method used to apply the seed mix. Drilling introduces seed directly into the prepared seedbed by machine. Seeding will be performed by drilling at a minimum rate of 25 lb of pure live seed (PLS) per acre. In areas that limit equipment access, broadcast seeding may be used at a rate of 40 lb of PLS per acre.

I-3.2 Surface Treatment

I-3.2.1 Surface Treatment Material Description

To address potential erosion of the cover system, a surface treatment composed of a mixture of rock and cover soil will be used. The approach to designing the admixture is presented in Attachment I-1 to this appendix. This design procedure is also described in Dwyer et al. (1999, 099309, p. 9; 2007, 096232, pp. 5-19–5-25).

The rock-to-soil ratio and rock size were determined based on the most critical drainage section of the proposed cover for MDA C. With the addition of the rock-soil admixture to the surface, annual soil loss due to wind and runoff was estimated to be minimal. The rock-soil admixture will include a mixture of

33% rock by volume. The cover soil will exhibit the storage capacity and soil nutrients, as described in section I-3.3. Salts in this soil will also be limited in the cover soil, as described in Table 1.3.2-1.

The technical approach presented in Attachment I-1 was applied using site-specific slopes and slope lengths for MDA C, which were taken from the proposed cover grading plan (Figure I-2.1-1). A summary of the gravel admixture calculations is presented in Table I-3.2-2. The critical rock size was determined to have a d50 (median rock size) of 2.5 in. (6.4 cm), and the total rock-soil admixture thickness is to be no less than 2 ft. (0.6 m). The admixture design will be updated during final design in the corrective measures implementation phase of the project.

Because the rock is used to control erosion and is subject to weathering, weathering may affect the longevity of the cover. Therefore, it is required that the rock meet the durability requirements described in the U.S. Nuclear Regulatory Commission Regulation report, “Design of Erosion Protection for Long-Term Stabilization” (NRC 2002, 097900, Appendix D) (Table I-3.2-3).

I-3.2-2 Surface Material Placement

The rock-soil admixture used as a surface treatment will be uniformly mixed. One of the best means of achieving a uniform mixture is to place the required rock in a single layer on top of the interim cover soil after the cover surface meets grade requirements and blend the rock into the soil (Figure I-3.2-1).

I-3.3 Cover Soil

I-3.3.1 Cover Soil Material Description

The approach to specifying the thickness of cover soil needed to control infiltration is presented in Attachment I-1 to this appendix. The minimum total cover thickness is 4.7 ft (1.4 m) including a rock-soil admixture that will be a minimum of 2 ft (0.6 m). The cover soil, including the soil in the surface treatment layer (rock-soil admixture), is that from the existing interim cover. This soil will provide a quality rooting medium to maintain native vegetation.

The depth of the cover soil was determined to minimize flux; in this case, the net annual flux is estimated to be zero. Modeling using UNSAT-H (Fayer 2000, 072734) was performed to determine the minimum thickness required to provide adequate storage capacity for the beyond-worst case infiltration scenario that included applying the wettest year on record in two consecutive years. Furthermore, the precipitation rate was applied at a slow rate that allowed for complete infiltration, thus adding conservatism to the design since it is likely that much of this precipitation would run off. Details of the modeling performed, including specific input and output parameters, are included in Attachment I-1.

I-3.4 Biobarrier

Biointrusion is not a performance objective at MDA C because the associated risk is very low. This statement is based on results of the preliminary radiological dose assessment for the MDA C CME (Appendix F) that reveal doses from the upward biotic pathway are very low for exposure scenarios that do not include human intrusion into the waste cover. As long as there is institutional control, which is assumed for the entirety of the 1000-yr performance period of MDA C, then there will be no inadvertent human intrusion and doses will thus be very low. The MDA C CME preliminary radiological dose assessment doses for both industrial on-site and residential off-site are well below the applicable regulatory limits.

Furthermore, the preliminary radiological dose assessment for MDA C CME calculates doses without any waste cover (current conditions), and those doses are also well below applicable regulatory limits. Therefore, it is reasonable to conclude that as long as there is institutional control at MDA C, doses via biointrusion pose minimal risk.

The surface layer composed of a mixture of rock and soil will serve to discourage burrowing animal activity. Post-closure monitoring performed at sites with similar cover profiles in New Mexico (San Mateo uranium mine site closure and Farmington superfund hazardous waste site closure).have shown that the addition of rock to the surface layer discourages the burrowing of animals

I-3.5 Interim Cover Preparation

MDA C currently has an interim (operational) soil cover over it. This site will require clearing, grubbing, and some regrading before placement of the rock for the surface rock-soil admixture. The elevations and grades will comply with those shown on the project drawings.

I-4.0 REFERENCES

The following reference list includes documents cited in this appendix. Parenthetical information following each reference provides the author(s), publication date, and ERID, ESHID, or EMID. This information is also included in text citations. ERIDs were assigned by the Laboratory's Associate Directorate for Environmental Management (IDs through 599999); ESHIDs were assigned by the Laboratory's Associate Directorate for Environment, Safety, and Health (IDs 600000 through 699999); and EMIDs are assigned by Newport News Nuclear BWXT-Los Alamos, LLC (N3B) (IDs 700000 and above). IDs are used to locate documents in N3B's Records Management System and in the Master Reference Set. The New Mexico Environment Department (NMED) Hazardous Waste Bureau and N3B maintain copies of the Master Reference Set. The set ensures that NMED has the references to review documents. The set is updated when new references are cited in documents.

DOE (U.S. Department of Energy), December 1989. "Technical Approach Document," report no. DOE/UMTRA-050425-002, DE91-005807, Washington, D.C. (DOE 1989, 099296)

Dwyer, S.F., May 2003. "Water Balance Measurements and Computer Simulations of Landfill Covers," Ph.D. dissertation, University of New Mexico, Albuquerque, New Mexico. (Dwyer 2003, 097902)

Dwyer, S.F., May 2007. "Conceptual Cover Design Report for the Corrective Measures Evaluation for Closure of MDA G," report prepared for Los Alamos National Laboratory by Dwyer Engineering, LLC, Albuquerque, New Mexico. (Dwyer 2007, 098276)

Dwyer, S.F., R.E. Rager, and J. Hopkins, April 2007. "Cover System Design Guidance and Requirements Document," Los Alamos National Laboratory document LA-UR-06-4715, Los Alamos, New Mexico. (Dwyer et al. 2007, 096232)

Dwyer, S.F., J.C. Stormont, and C.E. Anderson, October 1999. "Mixed Waste Landfill Design Report," report SAND99-2514, Sandia National Laboratories, Albuquerque, New Mexico. (Dwyer et al. 1999, 099309)

Fayer, M.J., June 2000. "UNSAT-H Version 3.0: Unsaturated Soil Water and Heat Flow Model, Theory, User Manual, and Examples," document PNNL-13249, Pacific Northwest National Laboratory, Richland, Washington. (Fayer 2000, 072734)

Gonzales, G.J., M.T. Saladen, and T.E. Hakonson, 1995. "Effects of Pocket Gopher Burrowing on Cesium-133 Distribution on Engineered Test Plots," *Journal of Environmental Quality,* Vol. 24, pp. 1056-1062. (Gonzales et al. 1995, 073708)

Hakonson, T.E., February 15, 2002. "Review of Sandia National Laboratories/New Mexico Evapotranspiration Cap Closure Plans for the Mixed Waste Landfill," Environmental Evaluation Services, LLC, Daniel, Wyoming. (Hakonson 2002, 099469)

LANL. 2008. Performance Assessment and Composite Analysis for Los Alamos National Laboratory, Technical Area 54, Area G, Revision 4, LA-UR-08-06764, prepared for United States Department of Energy, Los Alamos National Laboratory, Los Alamos NM, October 2008.

Neptune and Company, Inc., 2020. Final Report for the Area G Radiological Risk Assessment Model v1.1. Prepared for U.S. Department of Energy Environmental Management Los Alamos Field Office, Neptune Report number NAC-0144_R0.

NRC (U.S. Nuclear Regulatory Commission), September 2002. "Design of Erosion Protection for Long-Term Stabilization," Final Report, report no. NUREG-1853, Washington, D.C. (NRC 2002, 097900)

Shaw Environmental Inc., February 2006. "Geotechnical and Hydraulic Characterization at the Technical Area 61 Borrow Area," report prepared for Los Alamos National Laboratory, Albuquerque, New Mexico. (Shaw Environmental, Inc. 2006, 091368)

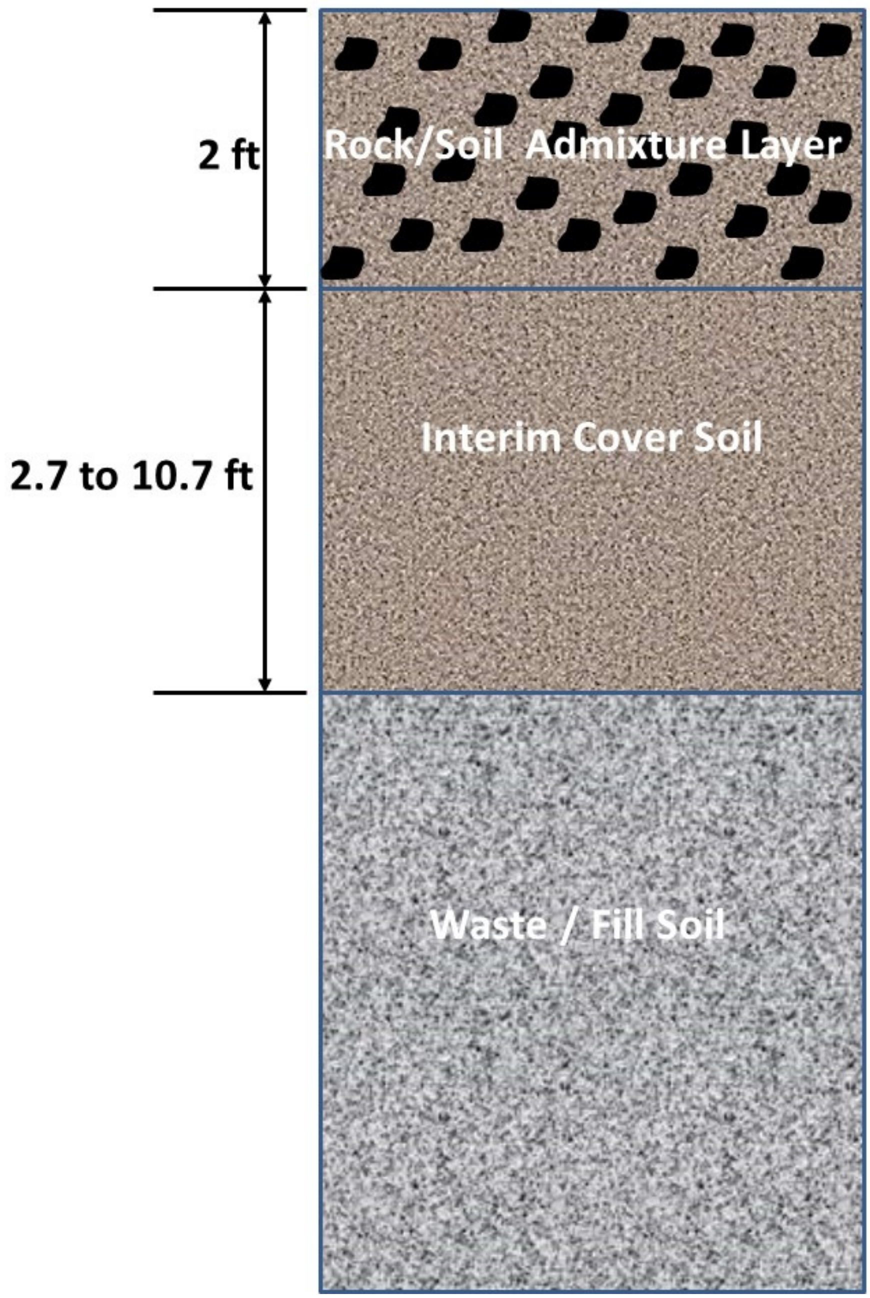


Figure I-1.0-1 MDA C CME conceptual ET cover profile

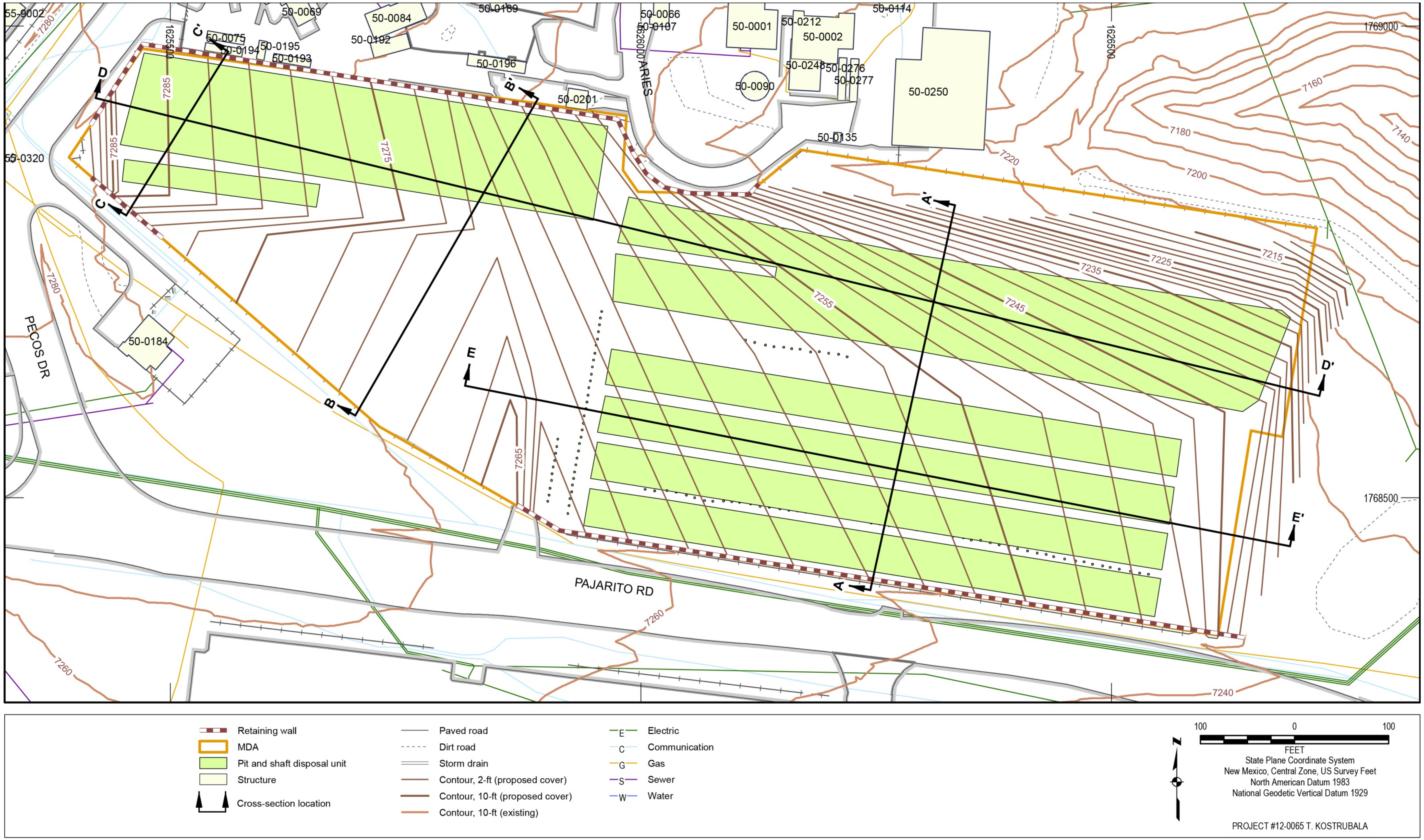


Figure I-2.1-1 Preliminary grading plan for MDA C ET cover

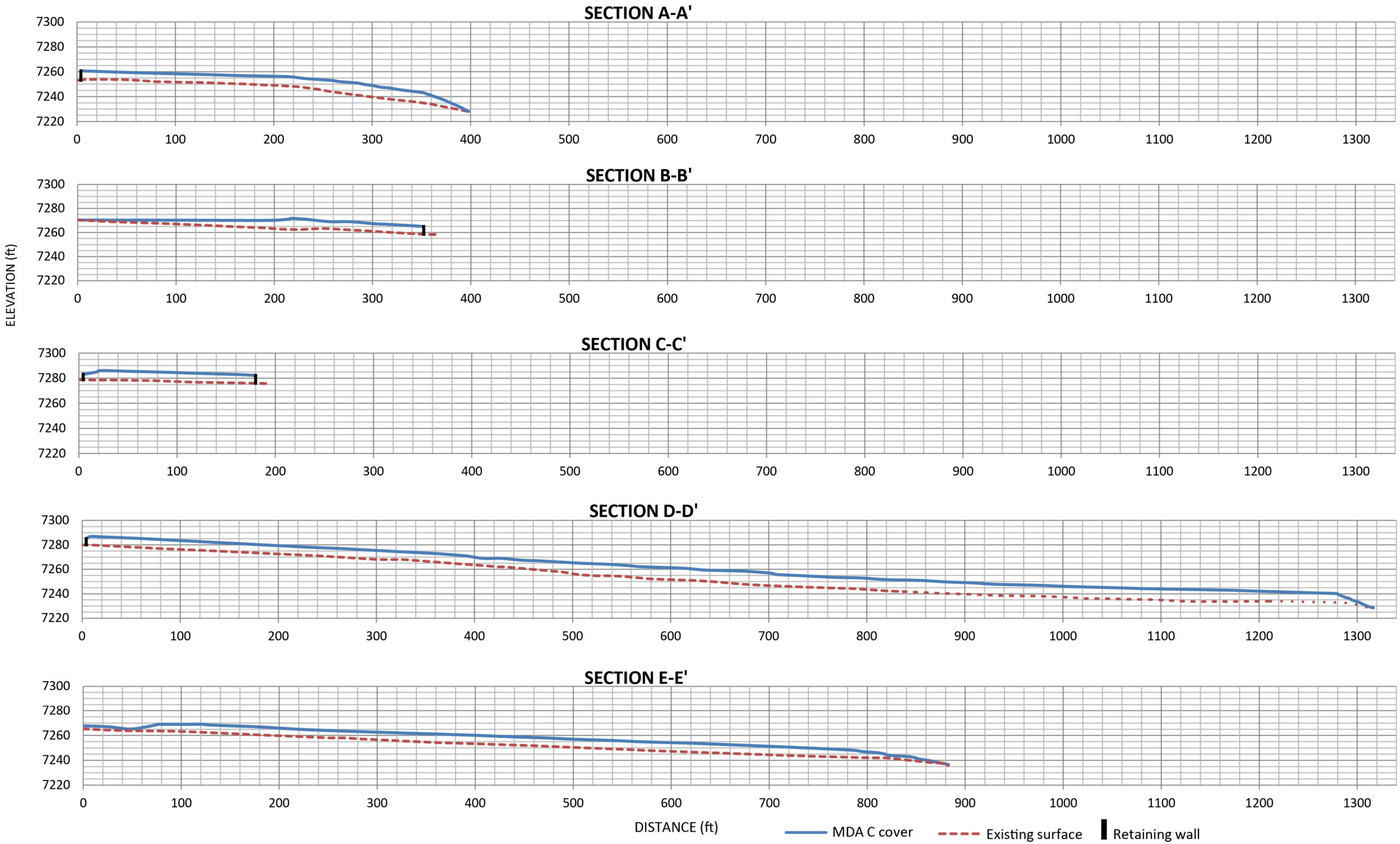


Figure I-2.1-2 Preliminary cross-section of MDA C ET cover

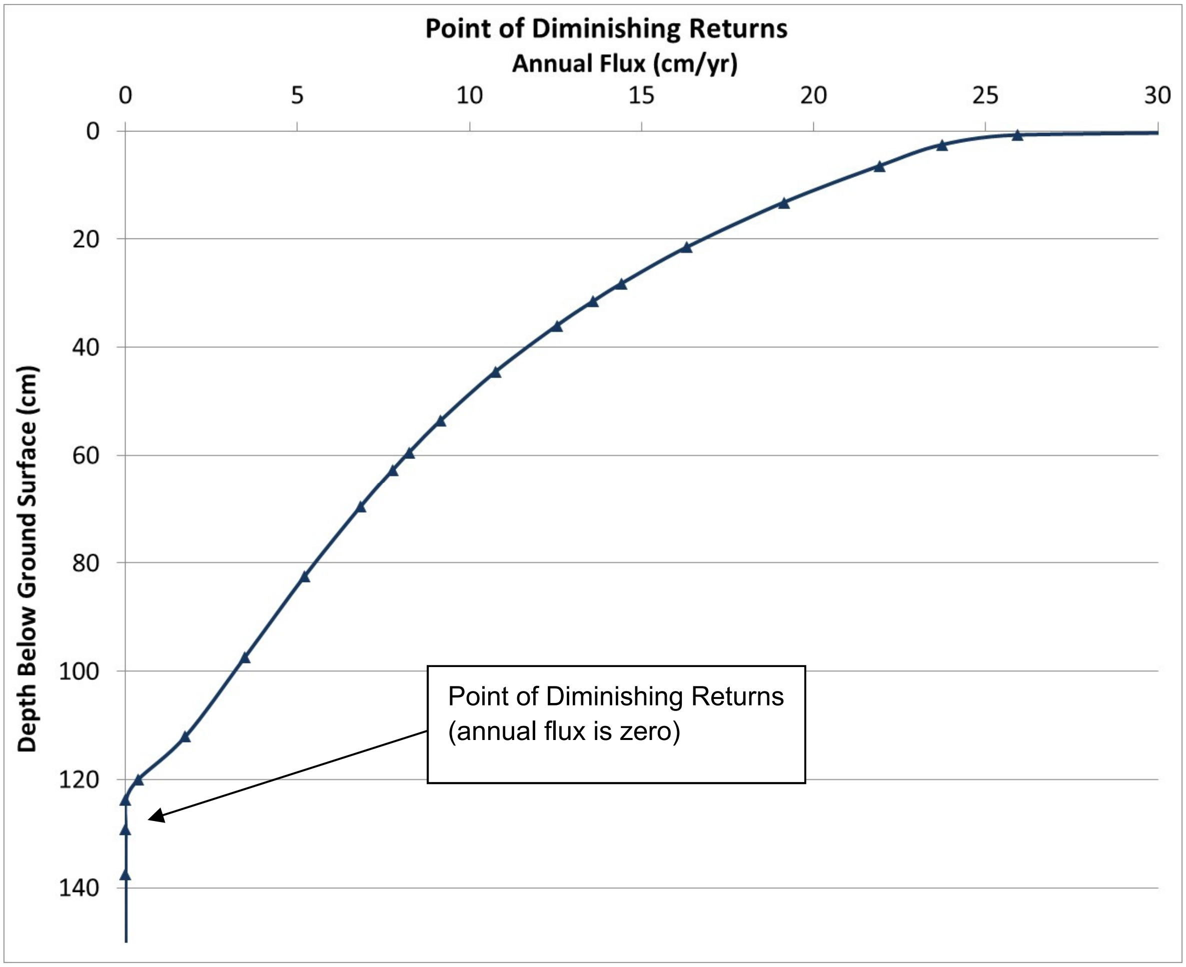


Figure I-3.2-1 Cover depth: point of diminishing returns achieved at less than cover thickness (1.4 m)

Table I-1.0-1
MDA C CME Conceptual Cover Profile Layer Specifics and Justification

Cover System Layer	Design Specifics	Design Justification
Vegetation	The site is to be seeded with native vegetation composed of both cool and warm weather species (grasses). Table J-3.1-1 lists the recommended seed mix.	The vegetation will help stabilize the cover surface, minimize erosion, and remove infiltrated water via transpiration.
Surface Treatment	Mixture of cover soil and rock. The rock is to be mixed into the cover soil at a rate of 33% by weight. The gravel will have a D50 of 2.5 in. (6.4 cm) in diameter. The cover soil will be capable of maintaining native vegetation with adequate storage capacity and nutrient availability. This layer will be a minimum of 2 ft (0.6 m) thick.	The gravel-soil admixture is designed to minimize erosion because of both wind and surface runoff.
Cover Soil	The minimum total cover depth will be 4.7 ft (1.4 m). The layer will consist of interim cover soil mixed with rock in the upper 2 ft (0.6 m). The cover soil will be capable of maintaining native vegetation with adequate storage capacity and nutrient availability.	Hydraulic characteristics of a typical sandy loam were used to determine the required soil depth. The soil depth was determined using modeling where a depth of soil was determined to minimize flux. The modeling used the wettest year on record for two consecutive years as the upper boundary condition.

Table I-3.1-1
Seed Mix

Common Name	Scientific Name	Percentage of Mix	PLS (lb/acre)
Sideoats grama	Bouteloua curtipendula	15%	3.75
Blue grama	Bouteloua gracilis	15%	3.75
Indian ricegrass	Oryzopsis hymenoides	10%	2.5
Western wheatgrass	Agropyron smithii	15%	3.75
Sand dropseed	Sporobolus cryptandrus	10%	2.5
Sheep fescue	Festuca ovina	20%	5
Firewheel	Gaillardia pulchella	3%	.75
Western yarrow	Achillea millefolium	2%	.5
Prairie coneflower	Ratibida columnifera	4%	1
Blue flax	Linum perenne lewisii	6%	1.5
Total			25

Source: Dwyer et al. 2007, 096232.

Table I-3.1-2
Recommended Available Plant Nutrients for Cover Soil

Test	Limits
CEC*	Greater than 15
Percent organic matter	Greater than 2% (g/g)
Nitrogen	Greater than 6 ppm
Phosphorus	4 to 7 ppm
Potassium	61 to 120 ppm

*CEC = Cation exchange capacity.

Table I-3.2-1
Recommended Limitations of Salt in Cover Soil

Test	Limits
Electrical Conductivity	Less than 8 µS/cm
Sodium Adsorption Ratio	Less than 6
Exchangeable Sodium Percentage	Less than 15% (g/g)
Calcium Carbonate	Less than 15% (g/g) – to 3-ft (91-cm) depth of cover; no limit below 3 ft (91 cm)

Table I-3.2-2
Summary of Gravel Admixture Calculations

Rainfall Intensity (in./hr)	Cover Slope (%)	Slope Length (ft)	Peak Flow (cfs[a])	Mean Annual Flow (cfs)	Percentage Silt/Clay[b]	Critical Gravel Size (in.)	Percentage Gravel	Total Required Depth (in.)
3.05	6.3	857	13.64	2.05	36.4	2.5	33	24

[a] cfs = Cubic feet per second.

[b] Assumed value prior to addition of rock.

Table I-3.2-3
Scoring Criteria for Determining Rock Quality

	Weighting Factor			Score										
	Limestone	Sandstone	Igneous	10	9	8	7	6	5	4	3	2	1	0
Specific Gravity (SSD*)	12	6	9	2.75	2.70	2.65	2.60	2.55	2.50	2.45	2.40	2.35	2.40	2.25
Absorption (%)	13	5	2	0.1	0.3	0.5	0.67	0.83	1.0	1.5	2.0	2.5	3.0	3.5
Sodium Sulfate (%)	4	3	11	1	3	5	6.7	8.3	10	12.5	15	20	25	30
Abrasion (%)	1	8	1	1	3	5	6.7	8.3	10	12.5	15	20	25	30
Schmidt Hammer	11	13	1	70	65	60	54	47	40	32	24	16	8	0
Tensile Strength (psi)	5	4	10	1400	1200	1000	833	666	500	400	300	200	100	<100

Source: Modified from NUREG (NRC 2002, 097900).

* SSD = Saturated surface dry.

Attachment I-1

Material Disposal Area (MDA) C Cover System Design Report

MATERIAL DISPOSAL AREA (MDA) C COVER SYSTEM DESIGN REPORT

4/13/2021

TA 50, MDA C Site Closure, Los Alamos, NM

Prepared by:
Dwyer Engineering LLC
Stephen F Dwyer, PhD, PE
1813 Stagecoach Rd. SE
Albuquerque, NM 87123

Prepared for:
Newport News Nuclear BWXT Los Alamos (N3B)
1200 Trinity Drive, Suite 150
Los Alamos, NM 87544

EXECUTIVE SUMMARY

A soil cover referred to as an Evapotranspiration (ET) Cover has been designed utilizing the existing interim cover to meet applicable regulatory criteria and performance objectives for the closure of Material Disposal Area (MDA) C in Los Alamos, NM. The analyses summarized in this report demonstrates that the existing interim soil cover with the addition of rock mixed into the upper 2-ft of the interim cover meets all applicable performance objectives and regulatory criteria for the final cover system.

Rock shall be uniformly mixed into the upper 2-ft of interim cover soil at the rate of 33 percent by volume. This surface rock/soil admixture also referred to as a 'desert pavement' was designed to minimize erosion while discouraging burrowing animals. The final cover system is a minimum 4.7-ft thick (152 cm) including the 2-ft thick surface rock/soil admixture.

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Acronyms and Abbreviations

A	Surface Area
ALARA	As Low As Reasonably Achievable
A_s	Average annual soil loss
ARAR	Applicable or Relevant and Appropriate Requirements
ASTM	American Society for Testing and Materials
B	Width of Flow
BGS	Below ground surface
C	Vegetative cover and management factor
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CFS	Cubic Feet per Second
cm	Centimeter
D_{50}	Mass Median Diameter
D_c	Incipient particle size
d_h	Hydraulic depth
DOE	Department of Energy
E_p	Potential evaporation
EPA	Environmental Protection Agency
ET	Evapotranspiration
F	Width to Depth Ratio
F_r	Froude Number
F_s	Shield’s dimensionless shear stress
ft	Feet
HELP	Hydrologic Evaluation of Landfill Performance
I	Rainfall Intensity
in	Inch
ITRC	Interstate regulatory Commission
K	Soil erodibility factor
K_b	Satuarted hydraulic conductivty, bulk
K_s	Satuarted hydraulic conductivty, soil
L	Slope Length
LAI	Leaf Area Index
LANL	Los Alamos National Laboratory
LS	Slope length and steepness factor

M	Percent fines
m	van Genuchten parameter
MDA	Material Disposal Area
NOAA	National Oceanic and Atmospheric Administration
NUREG	US Nuclear Regulatory Commission Regulation
NWS	National Weather Service
P_c	Conservation support practice factor
p_c	Decimal fraction of material coarser than the incipient particle size
PCF	Pounds per Cubic Foot
pCi/L	Picocuries per Liter
pCi/m2s	Picocuries per square meter second
PET	Potential Evapotranspiration
PODR	Point of Diminishing Returns
Q	Runoff
Q_m	Mean Annual Flow
Ra	Radium
RCRA	Resource Conservation and Recovery Act
R_e	Rainfall energy/erosivity factor
RLD	Root Length Density
RRA	Radiological Risk Assessment
RUSLE	Revised Uniform Soil Loss Equation
S	Slope
S_s	Maximum stable slope
SVOC	Semi-volatile Organic Compound
SWMU	Solid Waste Management Unit
TA	Technical Area
t_c	Time of Concentration
T_p	potential transpiration.
USDA	United States Department of Agriculture
UMTRA	Uranium Mill Tailings Remedial Action
V_r	Volume of Rock
VOC	Volatile Organic Compound
WEPS	Wind Erosion Prediction System
Y_a	Armor layer thickness;
Yr	Year
Y_s	Scour depth

θ_b	Bulk volumetric moisture content
θ_s	Saturated volumetric moisture content
γ	Water density
γ_s	Specific weight of soil
τ	Total average shear stress

1.0 INTRODUCTION

Material Disposal Area (MDA) C is located within Technical Area 50 (TA 50) at Los Alamos National Laboratory (LANL) and is designated as solid waste management unit (SWMU) 50-009. MDA C is an inactive disposal site established in May 1948 to replace MDA B (SWMU 21-015). MDA C is located at the head of Ten Site Canyon at an elevation of approximately 7200 ft (2667 m). The depth to groundwater below MDA C is approximately 1175 feet (353 m) and runoff from this site enters Ten Site Canyon, which is in the Mortandad Canyon watershed. MDA C covers 11.8 acres and consists of 7 pits, 107 shafts, and 1 unnumbered shaft used for a single strontium-90 disposal (Figure 1).

Pits and shafts were used for burial of hazardous chemicals, uncontaminated classified materials, and radioactive materials. Most disposal activities at MDA C occurred prior to 1968 and MDA C received waste only intermittently from 1968 to 1974. Constituents present in the wastes disposed of at MDA C include inorganic chemicals, VOCs, SVOCs, and radionuclides. The present-day (decay-corrected from "as disposed of" activities to January 2021) estimated total activity for MDA C shafts plus pits is 8,390 Ci. The present-day activity consists primarily of tritium (32.8%), plutonium-238 (27.8%), plutonium-239 (19.8%), plutonium-240 (5.1%), cesium-137 (4.5%), plutonium-241 (3.8%), americium-241 (3.1%) and aluminum-26 (1.6%). The rest of the activities are less than 1% (LANL, *in print*).

Pits 1 through 5 are in the eastern half of MDA C. Pits 1 through 4 are approximately 610 ft x 40 ft x 25 ft deep; pit 5 is 705 ft x 110 ft x 18 ft deep. Pit 1 operated from 1948 to 1951, pit 2 operated from 1950 to 1951, pit 3 operated from 1951 to 1953, pit 4 operated from 1951 to 1955, and pit 5 operated from 1953 to 1959. Pit 6 and the Chemical Pit are in the northwestern part of MDA C. Pit 6 is 505 ft x 100 ft x 25 ft deep and operated from 1956 to 1959. The Chemical Pit is 180 ft x 25 ft x 12 ft deep and operated from 1960 to 1964. The Chemical Pit was created because of chemical fires, first at MDA B and later at MDA C. The pit was fenced off from the rest of MDA C and was used to bury chemicals, pyrophoric metals, natural uranium powders and hydrides, sealed vessels containing sodium-potassium alloy, compressed gases, and unspecified equipment (LANL 2015).

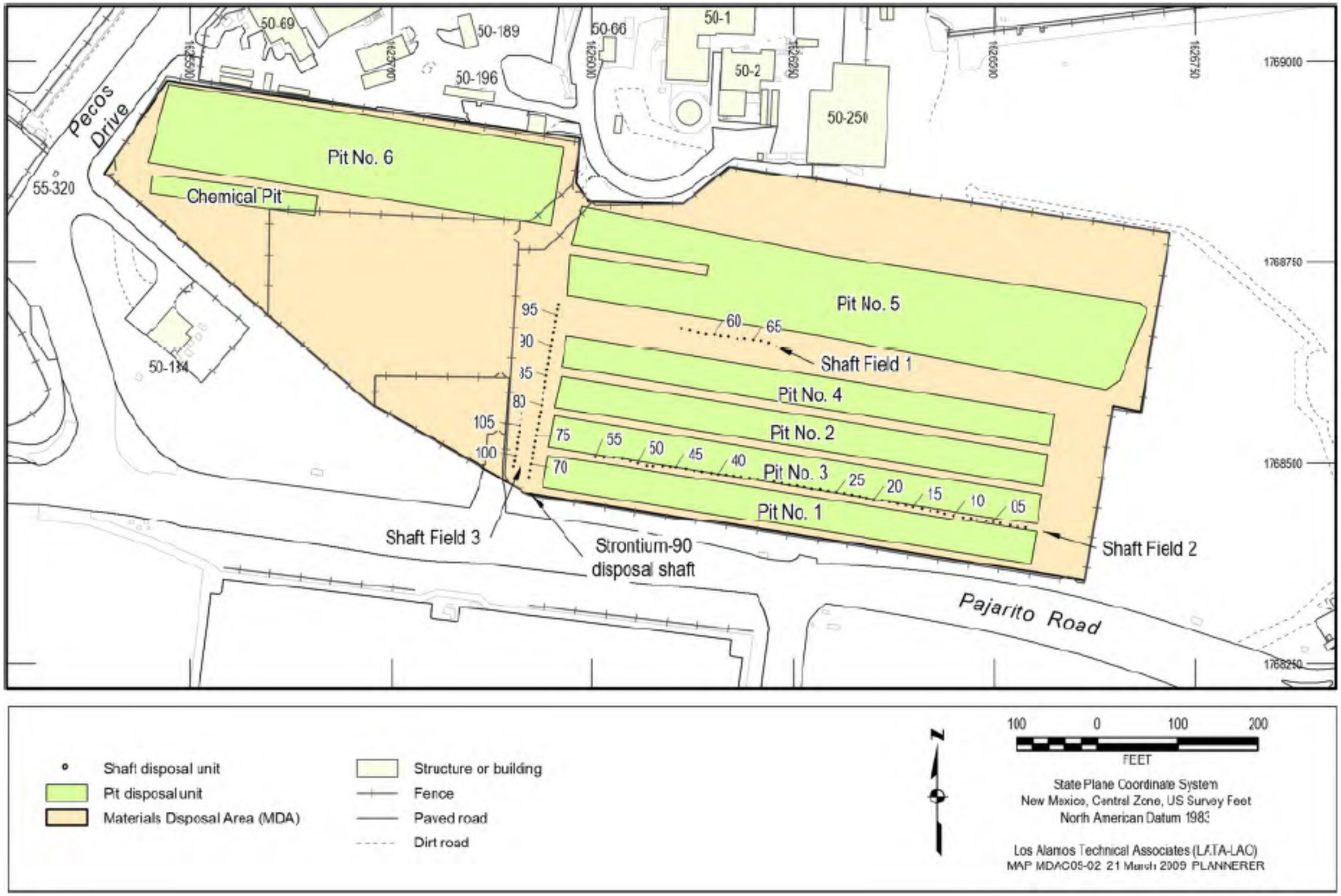


Figure 1. MDA C Configuration (LANL 2012)

2.0 COVER PROFILE DEVELOPMENT

This report describes a final cover system referred to as an Evapotranspiration (ET) Cover System that enhances the existing MDA C interim soil cover to meet the applicable performance objectives and regulatory criteria (Table 1). This report provides a detailed summary of the unsaturated flow modeling, surface admixture design and analyses, erosion analysis, radon attenuation analysis and applicable calculations demonstrating the effectiveness of the cover profile for the MDA C site closure. The following table (Table 1) summarizes the list of performance objectives and regulatory criteria applicable to the design of the cover system for MDA C.

Table 1. Performance Objectives & Regulatory Criteria for MDA C Cover System

No.	Performance Objectives	Regulatory Criteria	Guidance
1	Minimize risk to 'As Low As Reasonably Achievable' ALARA	DOE 458	
2	Long-term effectiveness with design life of 1000 years, but not less than 200 years	40CFR192.02	DOE Technical Approach Document 1989 Dwyer et al 2006
3	Provide reasonable assurance that releases of radon-222 from residual radioactive material to the atmosphere will not exceed an average release rate of 20 picocuries per square meter per second.	40CFR192.02	RAECOM code
4	All plans for the management and disposal of wastes must provide for institutional controls and long-term stewardship of the disposal facility necessary to ensure continued performance.	DOE 458	
5	The Consent Order specifies the factors that are to be considered in evaluating corrective measure alternatives. All alternatives must be able to meet the following four threshold criteria: • Be protective of human health and the environment; • Attain media cleanup standards; • Control the source or sources of releases so as to reduce or eliminate, to the extent possible, further releases of	Consent Order	All listed

No.	Performance Objectives	Regulatory Criteria	Guidance
	contaminants that may pose a threat to human health and the environment; and • Comply with applicable standards for management of wastes. Alternatives that meet these four criteria are then given a comparative evaluation against the following five balancing criteria to recommend a preferred alternative: • long-term reliability and effectiveness; • reduction of contaminant toxicity, mobility, or volume; • short-term effectiveness; • implementability; and • cost.		
6	Covers shall be designed to minimize to the extent practicable water infiltration, to direct percolating or surface water away from the disposed waste, and to resist degradation by surface geologic processes and biotic activity	20.3.13.1313 NMAC 10CFR61.51	DOE Technical Approach Document 1989 Dwyer et al 2006
7	Surface features shall direct surface water drainage away from disposal units at velocities and gradients which will not result in erosion that will require ongoing active maintenance in the future.	20.3.13.1313 NMAC 10CFR61.51	DOE Technical Approach Document 1989 Dwyer et al 2006
8	The disposal site shall be designed to complement and improve, where appropriate, the ability of the disposal site's natural characteristics to assure that the performance objectives will be met.	20.3.13.1313 NMAC 10CFR61.51	DOE Technical Approach Document 1989 Dwyer et al 2006
9	Surface features shall direct surface water drainage away from disposal units at velocities and gradients which will not result in erosion that will require ongoing active maintenance in the future	20.3.13.1313 NMAC 10CFR61.51	DOE Technical Approach Document 1989 Dwyer et al 2006
10	The disposal site shall be designed to minimize to the extent practicable the contact of water with waste during	20.3.13.1313 NMAC 10CFR61.51	DOE Technical Approach Document 1989

No.	Performance Objectives	Regulatory Criteria	Guidance
	storage, the contact of standing waste with water during disposal and the contact of percolating or standing water with wastes after disposal		Dwyer et al 2006
11	The cover shall have soil/gravel admixture designed to minimize erosion	ALARA & NUREG 1623	DOE Technical Approach Document 1989 Dwyer et al 2006
12	Soil loss less than 2 tons/acre/year		EPA. 1991. Environmental Protection Agency, Seminar Publication: Design and Construction of RCRA/CERCLA Final Covers. EPA/625/4-91/025.
13	1000-year performance period	DOE Order 435	
14	100-year institutional control	DOE Order 435	
15	100-year maintenance period – assumed under 100-year institutional control	DOE Order 435	
16	100-year monitoring period - assumed under 100-year institutional control	DOE Order 435	

The following sections demonstrate that the existing soil cover system with the addition of the surface admixture layer satisfies all applicable performance objectives (Table 1). The cover profile includes a rock/soil admixture surface layer designed to provide erosion resistance. Section 3.0 describes the surface layer designed to minimize soil loss and mitigate the formation of rills and gullies. The existing interim cover soil is adequate to minimize infiltration of water into the buried waste. Sections 4.0 and 5.0 describe the water balance modeling of the cover system that demonstrates the interim cover thickness is adequate to minimize flux (Dwyer et al 2006, EPA 2011) due to meteoric water. Section 6.0 describes the analysis that demonstrates the ability of the cover profile to limit radon flux. The cover profile limits the release of radon-222 from residual radioactive material to the atmosphere to less than the average release rate of 20 picocuries per square meter per second. Section 7.0 discusses the minimal risk of significant releases from MDA C associated with biointrusion. Finally, Section 8.0 summarizes recommendations to be followed for the design of the final cover system.

3.0 EROSION

The existing interim soil cover shall be modified with the addition of a uniform mixture of rock into the upper 2-ft (61 cm) to resist erosion. A top surface composed of a mixture of rock and cover soil was designed to mitigate the potential for rill and/or gully formation as well as reduce soil loss due to both surface runoff and wind erosion. Rock will be transported to the site and uniformly mixed into the upper 2-ft (61 cm) of the existing cover to create an erosion resistant layer referred to as a 'desert pavement'. This layer will also provide a rooting medium for native vegetation and remain conductive to allow the ET processes to remove infiltrated water from the cover profile as demonstrated in Section 4.0.

The following subsections summarize the design methodology and calculations performed to satisfy all performance objectives related to erosion (Table 1). Section 3.1 summarizes the design of the rock/soil admixture. Section 3.2 summarizes the long-term stability of the final slope as a rocky soil (NUREG 1623, 1999). Finally, section 3.3 summarizes the compliance of annual soil loss to less than 2 tons/acre/year as recommended by EPA (1991).

3.1 DESIGN OF COVER SURFACE LAYER (ROCK/SOIL ADMIXTURE)

Rock/soil admixtures provide excellent means to minimize erosion while allowing for vegetation establishment without a significant reduction in evaporation (Waugh et al 1994, Dwyer 2003, Dwyer et al 2006, EPA 2011). Erosion (Ligotke 1994) and water balance studies (Waugh 1994) suggest that moderate amounts of gravel mixed into the cover topsoil will control both water and wind erosion. As wind and water pass over the landfill cover surface, some winnowing of fines from the admixture is expected, creating a vegetated erosion-resistant surface sometimes referred to as a "desert pavement".

3.1.1 DESIGN RAINFALL EVENT

The rainfall intensity value used to calculate the runoff volume was determined using data supplied by the National Oceanic and Atmospheric Administration (NOAA) National Weather Service (NWS) Hydrometerological Design Studies Center. The data from NOAA Atlas 14, Volume 1, Version 5 for Los Alamos, NM was used whereby the 1-hour precipitation frequency estimate for a 1000 return period is 3.05 inches (7.75 cm). The 1-hour time of concentration is conservative for any contributory area less than 50 acres (20 hectares) (Lindeburg 1989).

3.1.2 RUNOFF PREDICTION

The "rational method" was used to estimate runoff volumes. This method is commonly used in civil engineering applications and is a method suggested by DOE (1989) for design of cover systems for sites regulated by the Uranium Mill Tailings Radiation Control Act of 1978 (i.e., UMTRA sites). The rational method assumes that rainfall occurs uniformly over the watershed at a constant intensity for the duration equal to the time of concentration.

Using the rational method, the peak rate of runoff, (Q), in cubic feet per second (cfs) (runoff is in acre-inches/hour but is rounded to cfs) is given by the following expression:

$$Q = C\ I\ A \qquad \text{Equation 1}$$

where:

C = Runoff coefficient (dimensionless) = 0.3 (Lindbergh 1989)

I = Rainfall intensity (in/hr)

A = Surface area that contributes to runoff (acres) = $L^2/4$

The time of concentration was calculated based on the following equation (DOE 1989):

$$t_c = c*(L/S*i^2)^{1/3} \qquad \text{Equation 2}$$

where:

c = Coefficient = 1.0 bare area;

L = slope length (ft = 857 ft);

S = slope (ft/ft) = 0.063; and

i =rainfall intensity (in/hr) = 3.05 in/hr.

The resulting time of concentration (t_c) is 11.35 minutes. The incremental rainfall duration percentage based on this computed time of concentration is 66.9% (Table 4.1, DOE 1989).

The adjusted rainfall intensity is based on the following equation (DOE 1989):

$$I = i_{t_c} * \frac{60}{t_c} \qquad \text{Equation 3}$$

Therefore, the adjusted rainfall intensity is 10.8 in/hr.

The contributory surface area was calculated based on the assumed runoff configuration shown in Figure 2 where L is the critical slope length.

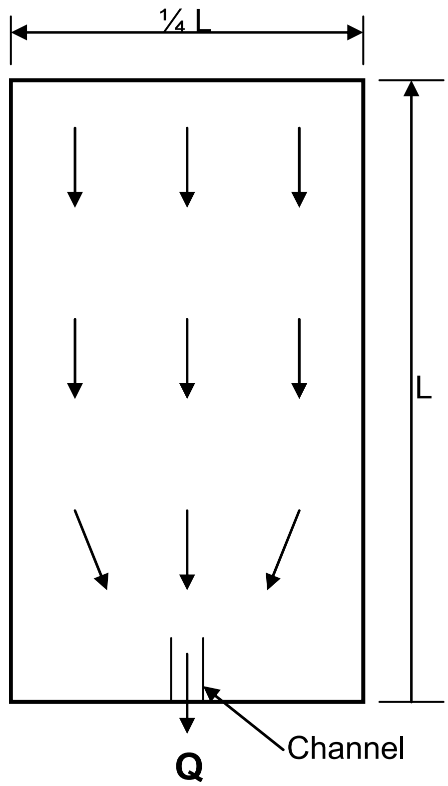


Figure 2. Contributory area for gully formation

The worst-case erosion scenario utilized for the erosion analysis/design includes the longest (857 ft) and steepest (6.3%) drainage pattern across MDA C (Figures 3 and 4).

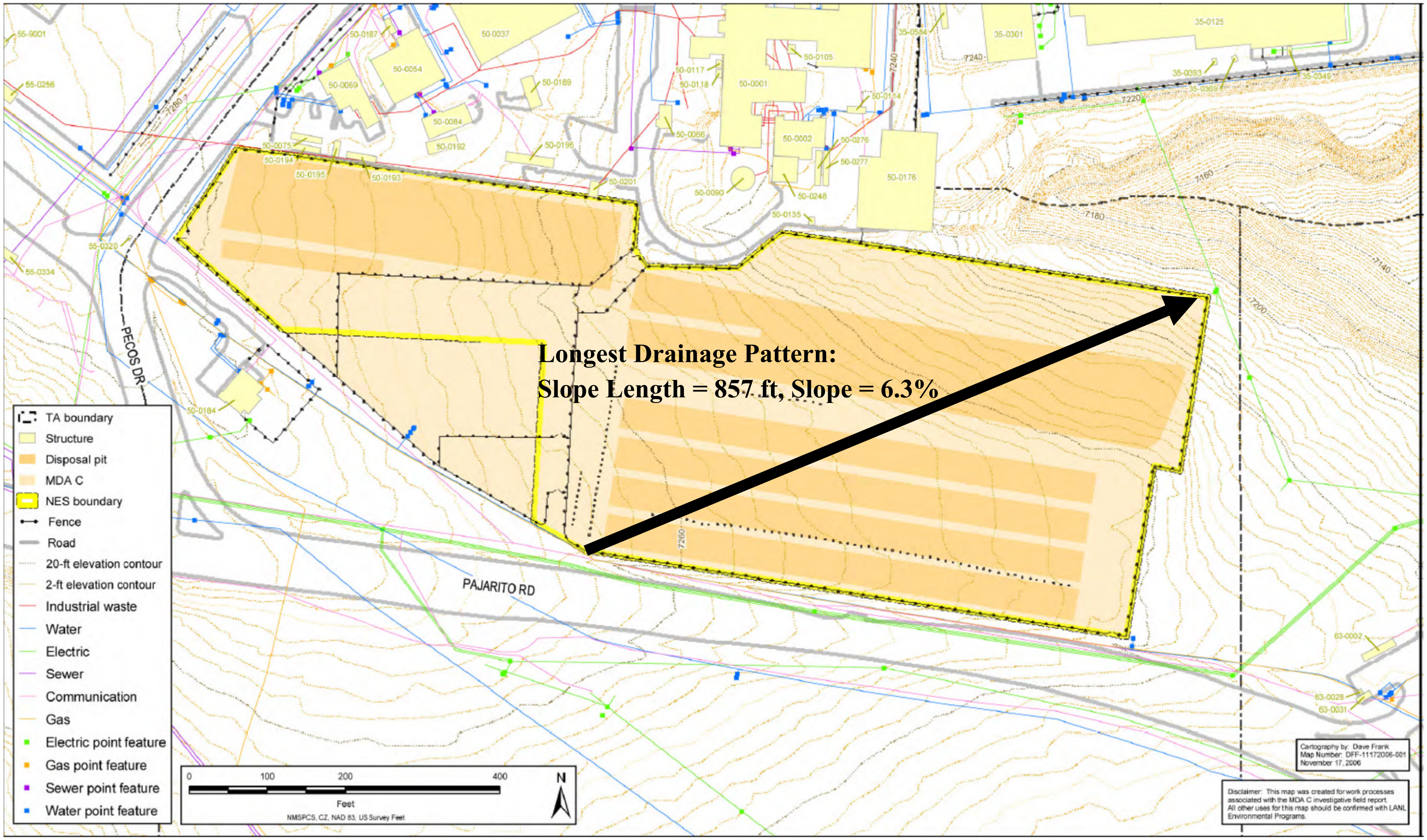


Figure 3. Plan View of MDA C with Contours Showing Existing Slopes (LANL 2012)

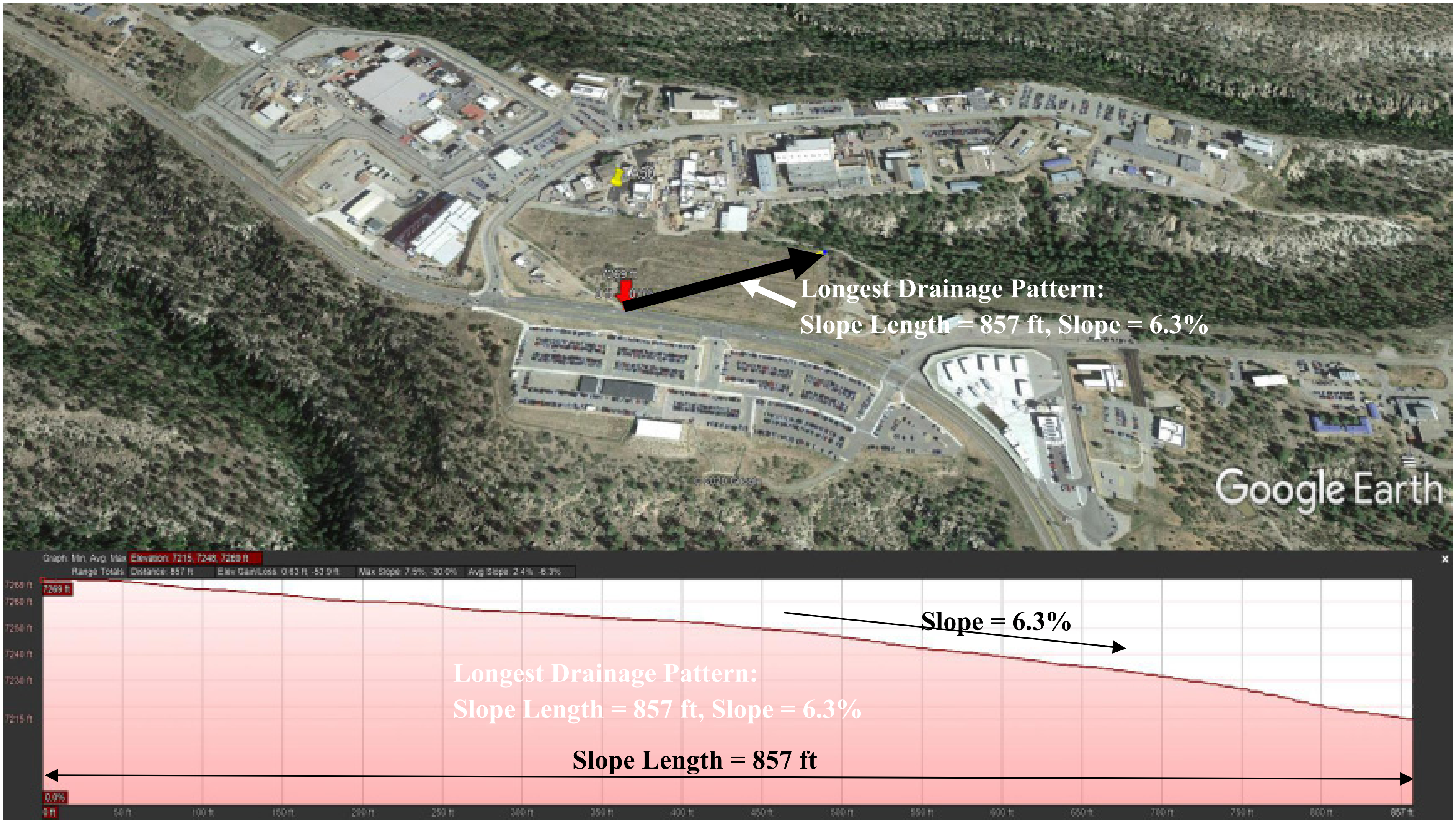


Figure 4. Plan View and Cross Section of Slope and Slope Length Analyzed for MDA C

3.1.2 Channel Geometry

The channel geometry shown in Figure 5 is that assumed for the gully formation.

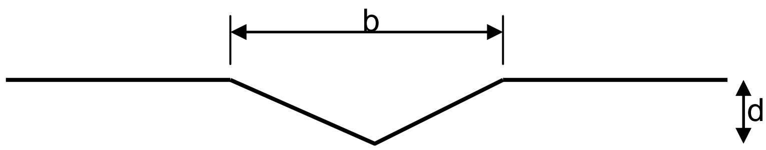


Figure 5. Channel geometry

The geometry of the channel that forms is based on regression equations developed from analysis of many channels (Simon, Li & Assoc. 1982). The channel width is given by:

$b = 37(Q_m^{0.38} / M^{0.39})$ Equation 4

where:

b = width of flow (ft);

Q_m = mean annual flow (cfs);

M = percentage of silts and clays in soils (36.4% for applicable soil less added rock).

The mean annual flow (Q_m) is assumed to be between 10% and 20% of the peak rate of runoff (Q) (Dwyer et al. 2006). In this case 15% was used.

For the given discharge point of geometry, the hydraulic depth (d_h), defined as the flow cross-sectional area divided by the width of water surface, is half of the gully depth (d).

For flows at the critical slope:

$b = 0.5\ F^{0.6}\ F_r^{-0.4} Q^{0.4}$ Equation 5

where:

F = width to depth ratio = b/dh;

F_r = Froude Number ≈ 1.0.

4.1.3 Incipient Particle Size

The incipient particle size is the particle that is on the brink of movement at the assumed conditions. Any increase in the erosional forces acting on the particle, due to an increase in velocity or slope, for example, will cause its movement. This incipient particle size (D_c) was calculated using the Shield's Equation:

$D_c = \tau/F_s(\gamma_s - \gamma)$ Equation 6

where:

τ = total average shear stress (pcf);

F_s = Shield's dimensionless shear stress = 0.047;

γ_s = specific weight of soil (2.65 g/cm^3 = 165.43 pcf);

γ = water density = 62.4 pcf.

The total average shear stress is given by:

$\tau = \gamma\ d_h\ S$ Equation 7

where:

S = slope (ft/ft).

d_h = hydraulic depth (ft)

3.1.4 Depth of Scour and Armoring Required

The incipient particle size defines the maximum size of particle that will be eroded for a given set of conditions. The material larger than the incipient particle size will not be displaced or eroded and can form an armoring that will protect the channel from further erosion from similar or lesser storm events.

The depth of scour (Y_s) to establish an armor layer is given by (Pemberton and Lara 1984):

$Y_s = Y_a\ [(1/P_c)-1]$ Equation 8

where:

Y_s = scour depth;

Y_a = armor layer thickness;

P_c = decimal fraction of material coarser than the incipient particle size.

3.1.5 Rock/Soil Summary

An excel spreadsheet was utilized to simultaneously solve the multiple equations. Table 2 presents the calculated results for the surface layer's rock/soil admixture.

Table 2. Rock/Soil Admixture Summary

Q (cfs)	Qm (cfs)	b (in)	dH (in)	τ (psf)	Dc (in)	use D50 (in)	% rock (Vol.)	Y_a (in)	Y_s (in)	total depth (in)
13.64	2.05	168.0	3.07	1.01	2.49	2.5	33	8	16	24

3.2 LONG-TERM STABILITY OF ROCKY SOIL COVER

The long-term stability of the cover surface with the addition of the rock/soil admixture can be determined by the following equation (NUREG 1623):

$S_s^{7/6} = [65*t^{5/3}]/[P*L*F*n]$ Equation 9

where:

S_s = maximum stable slope (%);

t = 0.4*D75 = 1.0 in;

P = rainfall intensity = 10.8 in/hr;

L = slope length = 857 ft;

F= 3 (NUREG 1623);

n = 0.03.

solving, S_s = 11.24%

Since S_s = 11.24% is greater than the actual slope of 6.3%, the slope surface is stable for the long-term.

3.3 Soil Loss

The soil loss computed utilizing the Revised Universal Soil Loss Equation (RUSLE) and the Wind Erosion Prediction System or 'WEPS' (USDA 2020) is included to satisfy the USEPA (1991) recommendation to limit soil loss to less than 2 tons/acre/year. It is recognized that these tools were developed by the USDA to provide an approximation of soil loss on farmlands with very fine-grained soils (USDA 1997, USDA 2010). However, it is a common means utilized to satisfy the soil loss requirement per USEPA (1991). It does not infer that the computed soil loss is an estimate of expected continued soil loss given that the cover system includes a top layer composed of a mixture of rock and gravel design to minimize soil loss. The rock size or incipient particle size defines the maximum size of particle that will be eroded for a given set of conditions. Material larger than the incipient particle size will not be displaced or eroded, and will form an armoring to protect the surface from further erosion from similar or lesser storm events.

3.3.1 Soil Loss due to Surface Water Runoff

RUSLE represents a revision of the USLE technology in how the factor values in the equation are determined. RUSLE is explained in the U.S. Department of Agriculture Handbook 703 (USDA1997), "Predicting Soil Erosion by Water: A Guide to Conservation Planning with the Revised Universal Soil Loss Equation (RUSLE)." The RUSLE is expressed as:

$$A_s = R_e*K*(LS)*C*P_c \quad \text{Equation 10}$$

Where:

A_s = average annual soil loss by sheet and rill erosion in tons per acre;

R_e = rainfall energy/erosivity factor (dimensionless) = 25 (Figure 7);

K = soil erodibility factor (dimensionless) = 0.15 (Figure 6);

LS = slope length and steepness factor (dimensionless) = 1.43 (Figure 8);

C = vegetative cover and management factor (dimensionless); and

P_c = conservation support practice factor (dimensionless) = 1.

The following figures are derived from Agriculture Handbook 703 (USDA 1997).

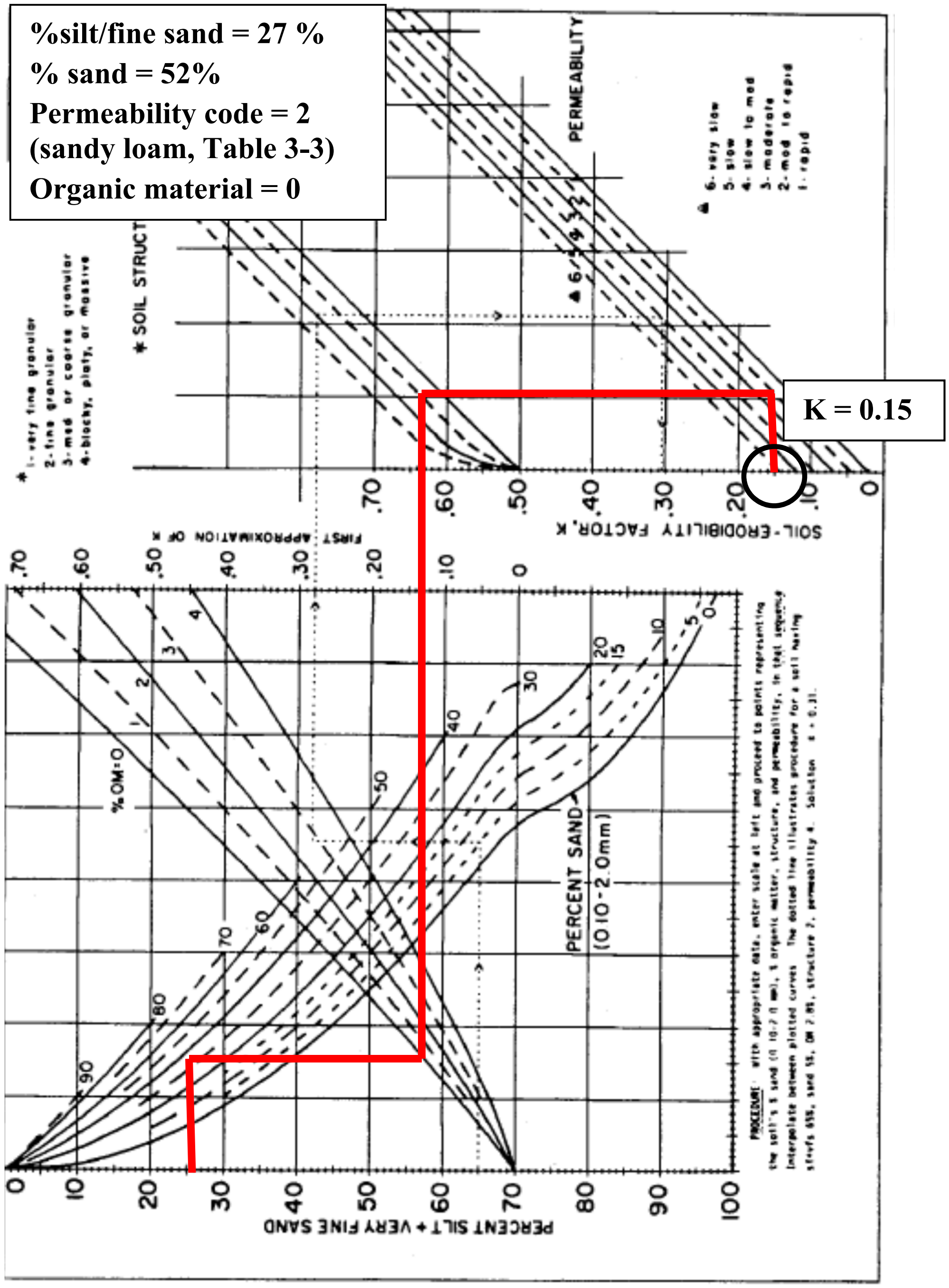


Figure 6. RUSLE K Factor, Ag Handbook 703

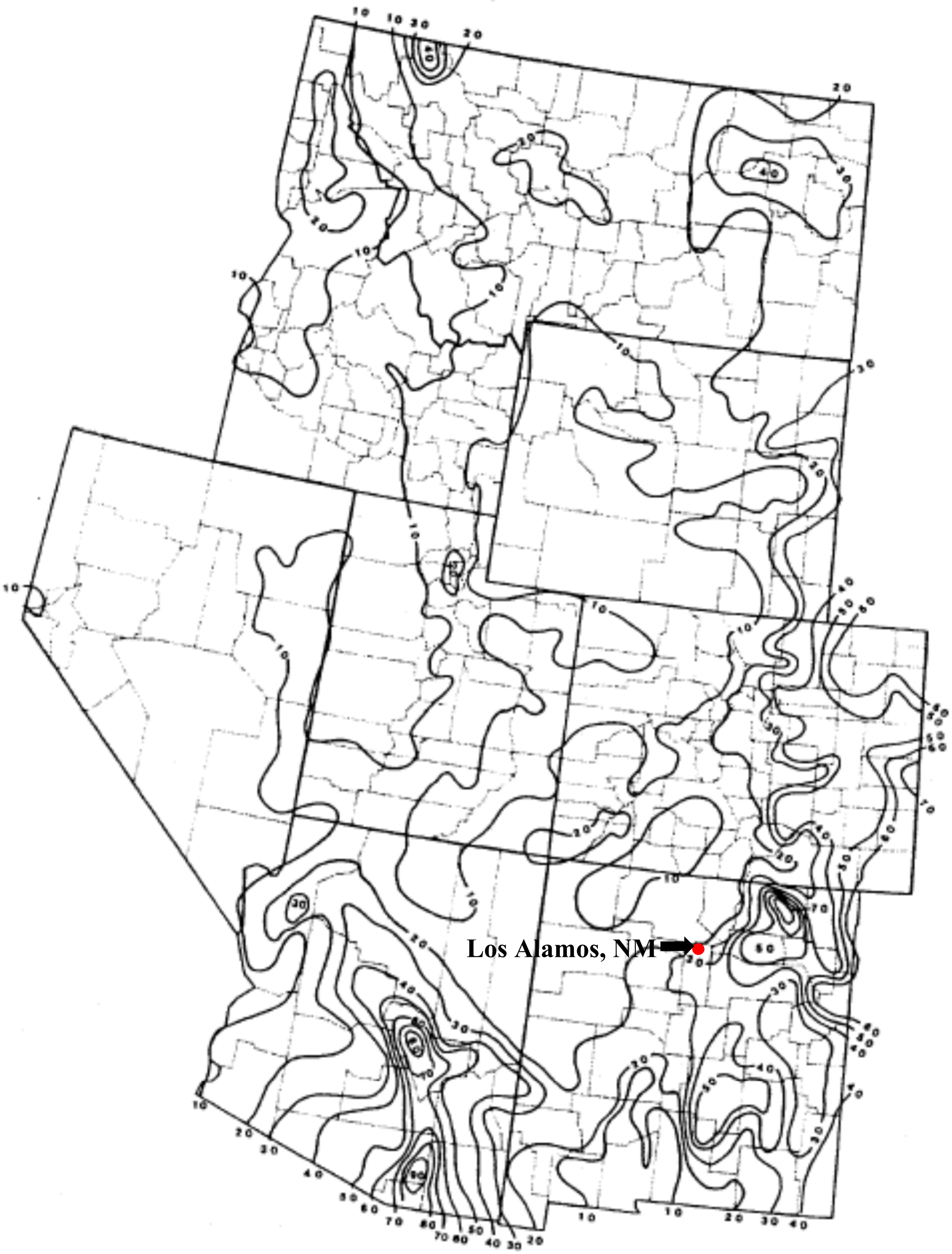


Figure 2-2. Isoerodent map of western United States. Units are hundreds ft·tonf·in(ac·h·yr)$^{-1}$.

Figure 7. RUSLE R Factor, Ag Handbook 703

Values for topographic factor, LS, for low ratio of rill to interrill erosion.[1]

Slope (%)	Horizontal slope length (ft) <3	6	9	12	15	25	50	75	100	150	200	250	300	400	600	800	1000
0.2	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
0.5	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09
1.0	0.12	0.12	0.12	0.12	0.12	0.13	0.13	0.14	0.14	0.15	0.15	0.15	0.15	0.16	0.16	0.17	0.17
2.0	0.20	0.20	0.20	0.20	0.20	0.21	0.23	0.25	0.26	0.27	0.28	0.29	0.30	0.31	0.33	0.34	0.35
3.0	0.26	0.26	0.26	0.26	0.26	0.29	0.33	0.36	0.38	0.40	0.43	0.44	0.46	0.48	0.52	0.55	0.57
4.0	0.33	0.33	0.33	0.33	0.33	0.36	0.43	0.46	0.50	0.54	0.58	0.61	0.63	0.67	0.74	0.78	0.82
5.0	0.38	0.38	0.38	0.38	0.38	0.44	0.52	0.57	0.62	0.68	0.73	0.78	0.81	0.87	0.97	1.04	1.10
6.0	0.44	0.44	0.44	0.44	0.44	0.50	0.61	0.68	0.74	0.83	0.90	0.95	1.00	1.08	1.21	1.31	1.40
8.0	0.54	0.54	0.54	0.54	0.54	0.64	0.79	0.90	0.99	1.12	1.23	1.32	1.40	1.53	1.74	1.91	2.05
10.0	0.60	0.63	0.65	0.66	0.68	0.81	1.03	1.19	1.31	1.51	1.67	1.80	1.92	2.13	2.45	2.71	2.93
12.0	0.61	0.70	0.75	0.80	0.83	1.01	1.31	1.52	1.69	1.97	2.20	2.39	2.56	2.85	3.32	3.70	4.02
14.0	0.63	0.76	0.85	0.92	0.98	1.20	1.58	1.85	2.08	2.44	2.73	2.99	3.21	3.60	4.23	4.74	5.18
16.0	0.65	0.82	0.94	1.04	1.12	1.38	1.85	2.18	2.46	2.91	3.28	3.60	3.88	4.37	5.17	5.82	6.39
20.0	0.68	0.93	1.11	1.26	1.39	1.74	2.37	2.84	3.22	3.85	4.38	4.83	5.24	5.95	7.13	8.10	8.94
25.0	0.73	1.05	1.30	1.51	1.70	2.17	3.00	3.63	4.16	5.03	5.76	6.39	6.96	7.97	9.65	11.04	12.26
30.0	0.77	1.16	1.48	1.75	2.00	2.57	3.60	4.40	5.06	6.18	7.11	7.94	8.68	9.99	12.19	14.04	15.66
40.0	0.85	1.36	1.79	2.17	2.53	3.30	4.73	5.84	6.78	8.37	9.71	10.91	11.99	13.92	17.19	19.96	22.41
50.0	0.91	1.52	2.06	2.54	3.00	3.95	5.74	7.14	8.33	10.37	12.11	13.65	15.06	17.59	21.88	25.55	28.82
60.0	0.97	1.67	2.29	2.86	3.41	4.52	6.63	8.29	9.72	12.16	14.26	16.13	17.84	20.92	26.17	30.68	34.71

[1]Such as for rangeland and other consolidated soil conditions with cover (applicable to thawing soil where both interrill and rill erosion are significant).

LS = 1.43, extrapolating between 6 to 8% and 800 to 1000 ft

Figure 8. RUSLE LS Factor, Ag Handbook 703

The RUSLE C factor (C = 0.16) was derived using the RUSLE2 software available through the USDA and a gravel admixture with 33% rock by volume. The RUSLE P factor is 1 since no conservation support practice is utilized.

Solving for A = 25*0.15*1.43*0.16*1 = 0.86 tons/acre/year. Since the annual soil loss is less than 2 tons/acre/year, the performance criteria (EPA 1991) is satisfied.

3.3.2 Wind Erosion Soil Loss

The Wind Erosion Prediction System or 'WEPS' (USDA 2020) is a process-based, daily time-step, wind erosion simulation model. It represents the latest in wind erosion prediction technology and is designed to provide wind erosion soil loss estimates from cultivated, agricultural fields. WEPS 1.0 consists of the computer implementation of the WEPS science model with a graphical user interface designed to provide easy-to-use methods of entering inputs to the model and obtaining output reports. WEPS was developed by the Engineering and Wind Erosion Research Unit (EWERU) of the United States Department of Agriculture, Agricultural Research Service. The WEPS model is now recommended by the USDA in lieu of the previously used Wind Erosion Equation (WEQ).

WEPS is a model developed primarily for use by the USDA, Natural Resources Conservation Service (NRCS). As such, many capabilities of WEPS reflect the needs of NRCS for use in cultivated agricultural systems. However, WEPS has capabilities used in many other situations where wind affected soil movement is a problem.

The WEPS model is set up to determine wind erosion for agriculture fields and not necessarily a final cover system such as that described in this report. However, the gravel/soil admixture design is intended to mitigate soil loss due to water runoff and wind erosion (Dwyer et al. 2006, USEPA 2011).

Input for the WEPS inherent to the model include the local wind data generated by the USDA. The user defined input included selection of the area (State: New Mexico, County: Los Alamos, Latitude: 35.87N, Longitude: 106.31W, and Elevation: 6099.1-ft). User designated physical data included shape of region (rectangular) and size of area shown on output (Figure 9). The soil chosen was sandy loam (specific soil properties included within the software library of data). Other user defined input parameters for the WEPS model includes the volume percent of rock fragments in the soil (0.33 ft^3/ft^3), any barriers included to disrupt the wind (none chosen), and any management techniques to assist the soil resist erosion (none chosen).

Figure 9 represents the output from the computer simulation representing the final cover system for the NECR closure whereby the initial estimated wind erosion is 0 tons/acre/year. This value is based on no blockage of wind by surrounding terrain or vegetation.

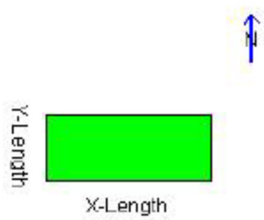
Run Summary

NRCS Natural Resources Conservation Service

MDA C_2

Run Date:	Wednesday, January 06, 2021, 04:05 PM
Client Name:	Los Alamos MDA C
Farm No:	--- **Tract No:** --- **Field No:**---
Run Location:	Runs
Management:	MDA C.man
Soil:	Sandy_Loam_NA_100_SL.ifc

Location Site Information



X-Length:	1299.9 ft
Y-Length:	500.0 ft
Area:	14.9 ac
Elevation:	6099.1 ft
Orientation:	0.0 °

Mode:	NRCS
Soil Loss Tolerance (T):	5.0 t/ac/yr
Site:	UNITED STATES NEW MEXICO LOS ALAMOS
Location:	35.8693° N, 106.30731° W
Cligen:	JEMEZ SPRINGS
Windgen:	LOS ALAMOS

Erosion

		Gross Loss	Net Soil Loss From Field (t/ac)			
Period	**Crop/Residue**	t/ac	**Total**	**Creep/Salt.**	**Suspen.**	**PM10**
Rot. year: 1		Trace	Trace	Trace	Trace	Trace
Ave. Annual		Trace	Trace	Trace	Trace	Trace

SCI Summary

Soil Conditioning Index:	0.6	**SCI Subfactors**	
Energy Calculator:	1.3 gal diesel/ac	**OM:**	0.35
Average Annual STIR:	29.0	**FO:**	0.71
Wind Erosion Soil Loss:	0.0 t/ac	**ER:**	0.64
Water Erosion Soil	0.9 t/ac		

Rotation Stir Energy

Date	**Operation**	**Fuel**	**Stir**	**Energy** Btu/ac	**Cost** USD/ac
Jan 01, 01	Drill or air seeder, combo field cult, dd openers	Diesel	29.0	163,738	4.68

Figure 9. Soil Loss due to Wind Erosion per WEPS (USDA 2020)

Since the annual soil loss of both wind and surface water is 0.86 tons/acre/year, which is less than 2 tons/acre/year, the performance criteria (USEPA 1991) is satisfied.

4.0 UNSATURATED MODELING OF COVER SYSTEM

Unsaturated flow modeling of a cover profile is a useful tool to help develop a minimum cover thickness as well as evaluate the cover profile subjected to a variety of conditions represented by input and boundary sensitivities. Modeling was performed to evaluate an ET Cover profile (Section 4.1) utilizing native soil, vegetation, and climate data for the site. The computer simulations described below demonstrate that the recommended soil cover profile will minimize flux and meet applicable performance objectives and regulatory criteria (Table 1).

This section summarizes the modeling performed in support of the design of the profile for the final cover system for the MDA C site closure. The average precipitation for the site is about 18.8-in (47.8 cm). The typical climatic year used in the computer simulations consists of 18.5 in (46.9 cm) with the annual potential evapotranspiration (PET) of 57.2-in (145.2 cm) per year distributed as shown in Figure 10. For every month of the year (Figure 10), the climate's demand for water (PET) exceeds the actual supply of water (precipitation). The climate's annual demand for water referred to as PET is about 3 times more than the actual supply of water (precipitation). Consequently a "store and release" type cover designed to take advantage of variances between the demand for water and actual supply of water such as an ET Covers is well suited for this climate.

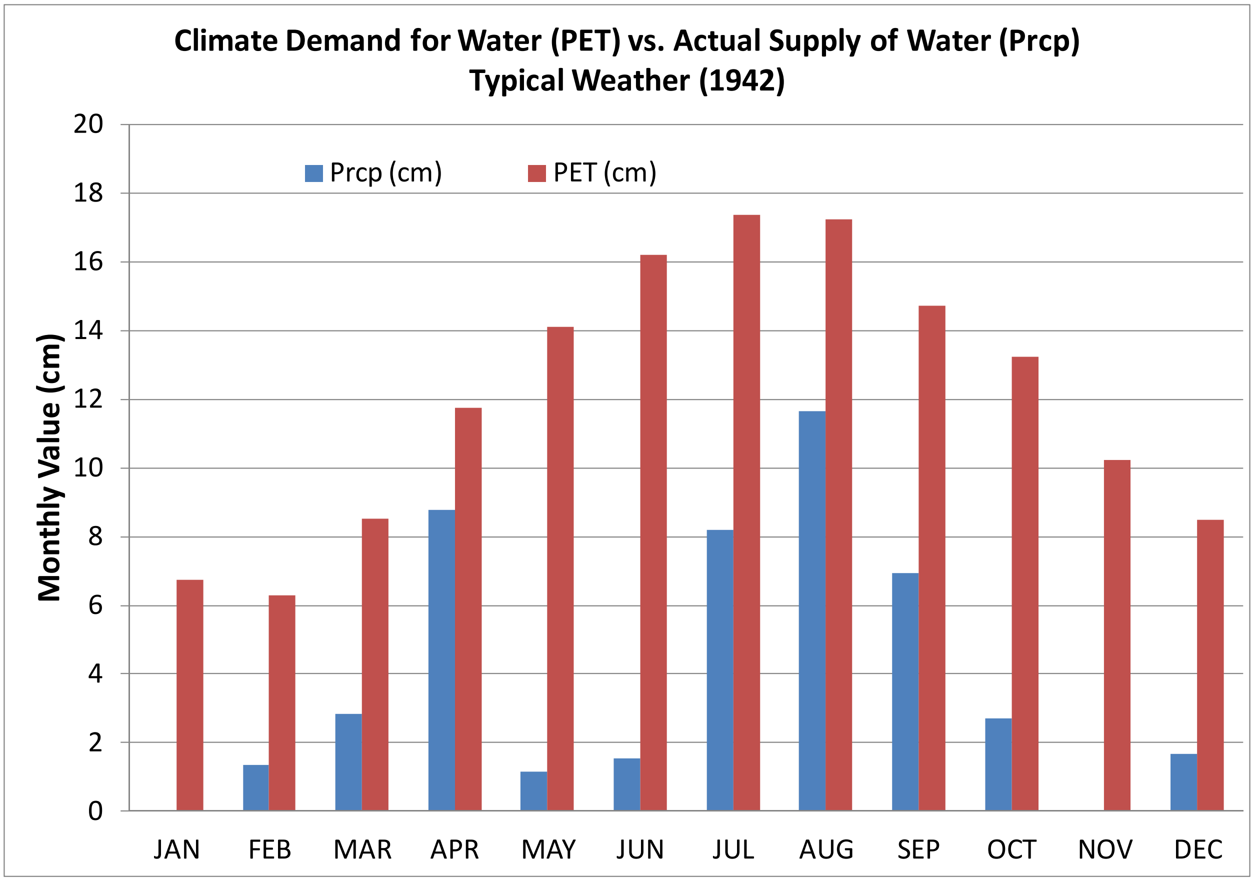


Figure 10. Typical Climate Demand for Water (PET) vs. Actual Supply of Water (Precipitation) for Los Alamos, NM (year 1942)

Historically, EPA's Hydrologic Evaluation of Landfill Performance (HELP) (Schroeder et al, 1994) has been the software utilized to predict water balance in landfill systems including the final cover. However, it is now recognized that this software has its limitations (ITRC 2003). Software more applicable for the analyses of water flow within an alternative earthen cover system is based on the Richard's Equation (ITRC 2003). One of the most common software (ITRC 2003) that is based on the Richard's equation used today is UNSAT H (Fayer 2000). This unsaturated modeling software was designed specifically for earthen covers. It has been recommended for use on alternative earthen covers in the ITRC (2003) design guidance documents. Consequently, UNSAT H was used on this project.

4.1.1 OVERVIEW OF UNSAT-H

UNSAT-H has been used to design many recent alternative earthen cover designs (Dwyer 2003). UNSAT-H is a one-dimensional, finite-difference computer program developed at the Pacific Northwest National Laboratory by Fayer and Jones (1990). UNSAT-H can be used to simulate the water balance of earthen covers as well as soil heat flow (Fayer 2000). UNSAT-H simulates water flow through soils by solving Richards' equation and simulates heat flow by solving Fourier's heat conduction equation.

A schematic illustration showing how UNSAT-H computes the water balance is shown in Figure 11. UNSAT-H separates precipitation falling on an earthen cover into infiltration and overland flow. The quantity of water that infiltrates depends on the infiltration capacity of the soil profile immediately prior to rainfall (e.g., total available porosity). Thus, the fraction of precipitation shed as overland flow depends on the saturated and unsaturated hydraulic conductivities of the soil's characteristic of the final cover. If the rate of precipitation exceeds the soil's infiltration capacity, the extra water is shed as surface runoff. UNSAT-H does not consider absorption and interception of water by the plant canopy, or the effect of slope and slope-length when computing surface runoff. This allows for conservative infiltration and percolation estimates since landfill cover systems are generally sloped to encourage runoff.

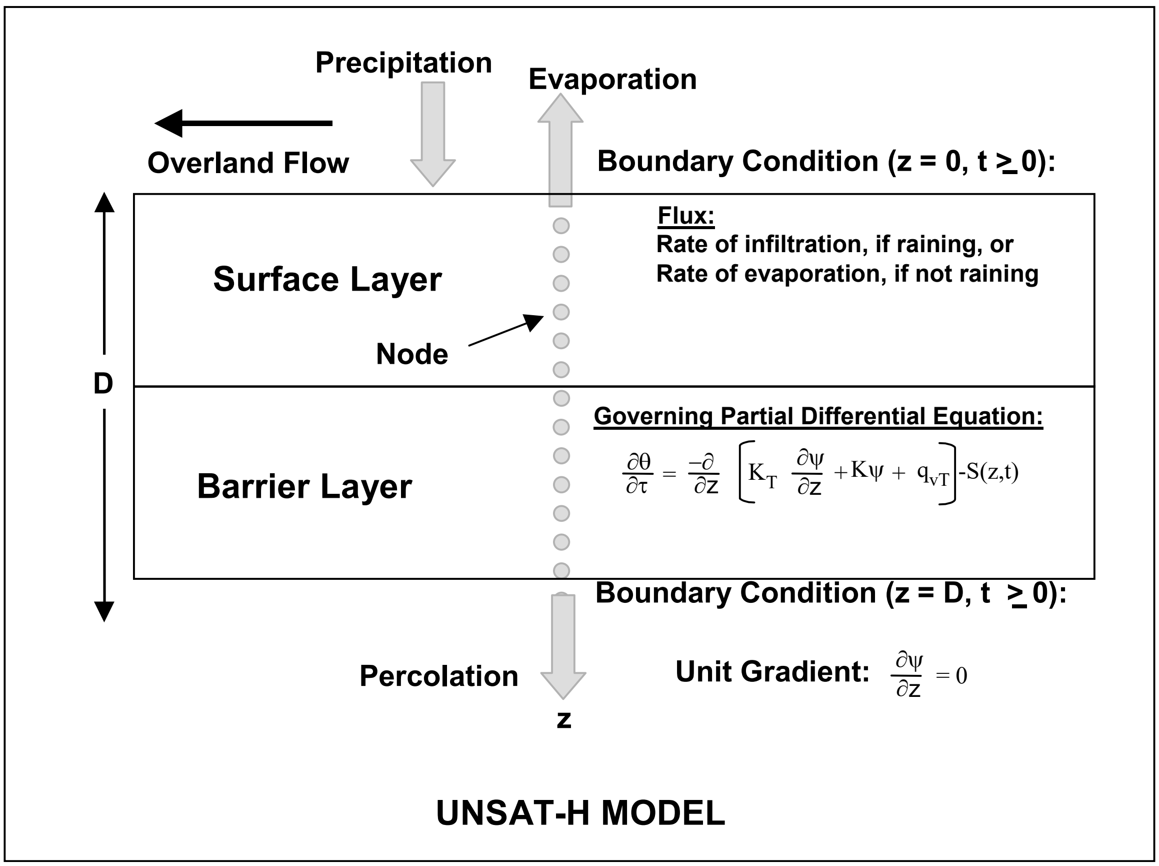


Figure 11. Schematic Representation of Water Balance Computation by UNSAT-H

Water that has infiltrated a soil profile during an UNSAT-H simulation moves upward or downward because of gravity and matric potential gradients. Evaporation from the cover surface is computed using Fick's law. Water removal by transpiration of plants is treated as a sink term in Richards' equation. Potential evapotranspiration (PET) is computed from the daily wind speed, relative humidity, net solar radiation, and daily minimum and maximum air temperatures using a modified form of Penman's equation given by Doorenbos and Pruitt (1977). Soil water storage is computed by integrating the water content profile. Flux from the lower boundary is via percolation. UNSAT-H, being a one-dimensional program, does not compute lateral drainage.

4.1.2 UNSAT-H INPUT PARAMETERS

Input parameters were developed for simulations using UNSAT-H for the ET cover. These parameters were developed based on field and laboratory measurements, values from the literature, and expert opinion.

4.1.3 MODEL GEOMETRY

The model geometry was based on the expected depth of the cover system. The nodal spacing was set at a range narrow enough to accurately represent the modeled cover profile. A general summary of the profile model is included in Figure 12. The rock/soil admixture is 33% rock to 67% soil (by volume) based on the design presented in Section 3.0. Figure 12 is a summary of existing interim coil soil depths across MDA C. The minimum existing cover soil depth over buried waste is 4-ft (Figure 12). The planned addition of 8-inches of rock to compose the surface rock/soil admixture will increase this depth to a minimum of 4.7-ft (Figure 13).

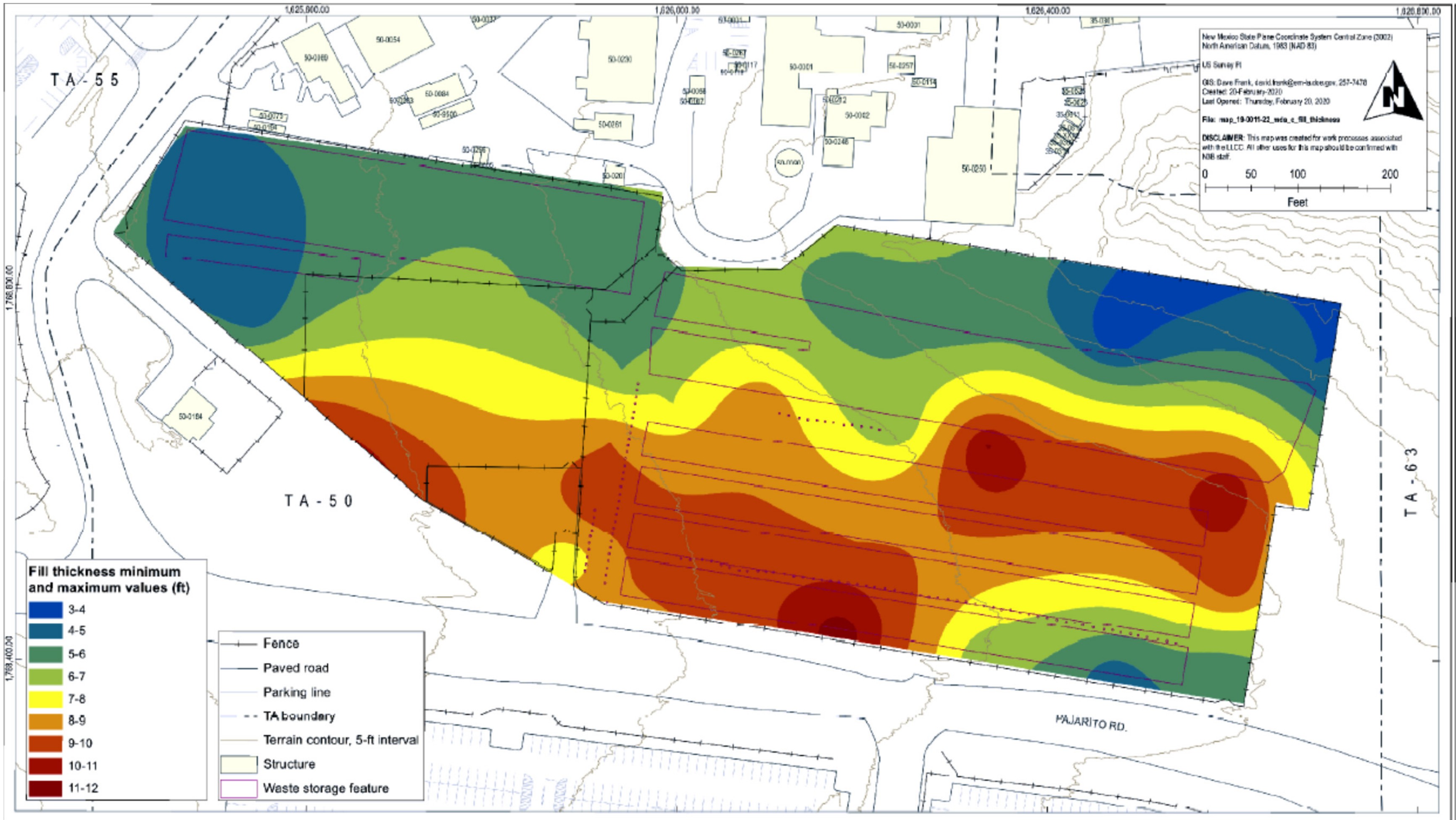


Figure 12. Interim Soil Cover Existing Thickness

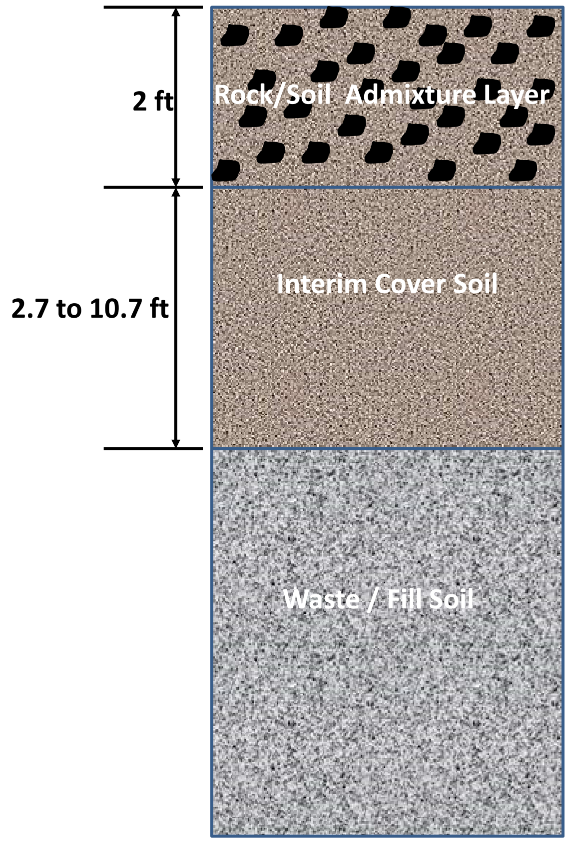


Figure 13. Cover Profile (includes 8-in additional rock mixed into admixture layer)

4.1.4 BOUNDARY CONDITIONS

Weather from Los Alamos, NM was utilized as the upper boundary condition. Historical weather data for Los Alamos was evaluated from 1910 to present. A typical climatic year was used to evaluate the modeled profiles. The specific year used to evaluate the profiles under typical conditions was 1942 with an annual precipitation of 18.45 in (46.9 cm) with the annual PET of 57.2-in (145.2 cm) per year distributed as shown in Figure 10. Extreme climatic conditions were also evaluated. The year of 1941 was the wettest on record with an annual precipitation of 30.3 in (77 cm). The monthly precipitation and PET are presented in Figure 14 for the wettest year on record.

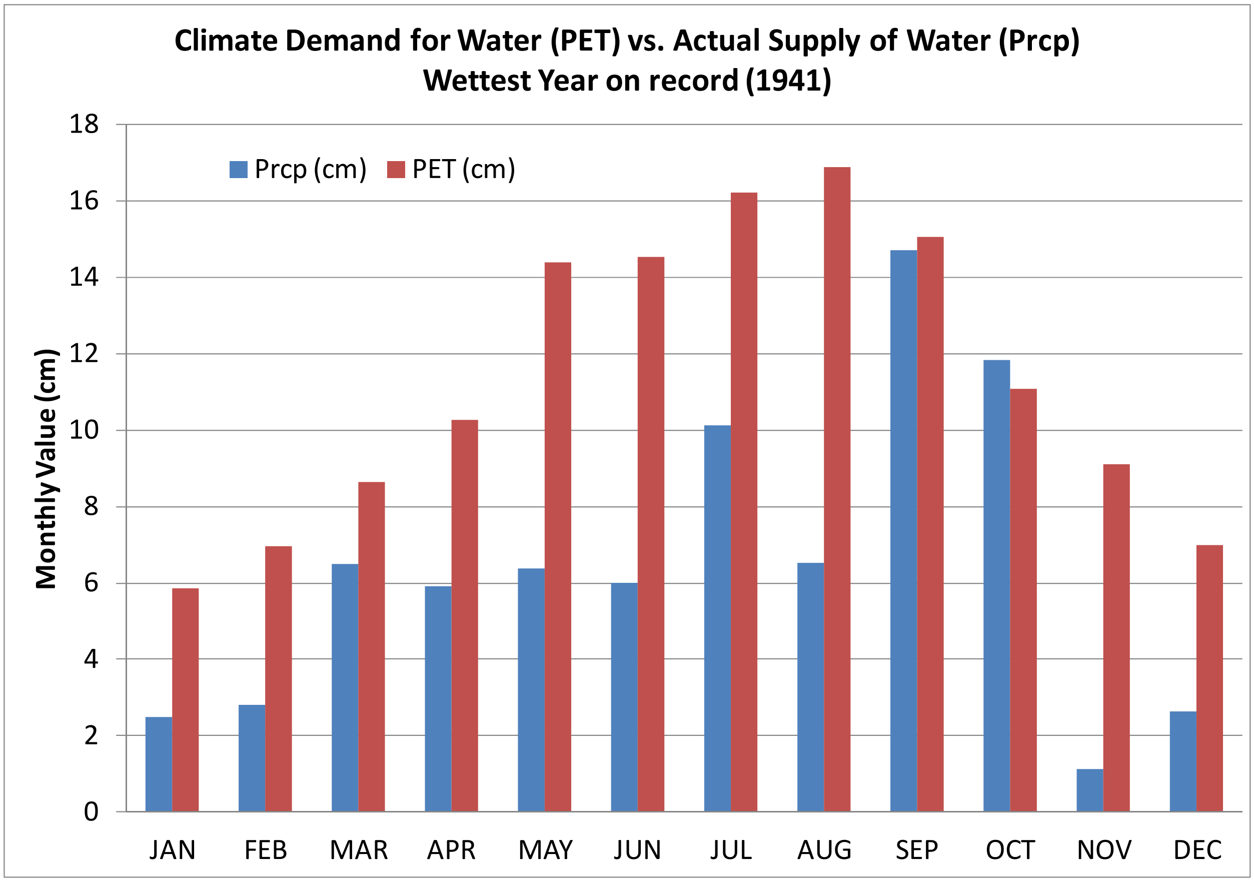


Figure 14. Climate Demand for Water vs. Supply of Water for the Wettest Year on Record

The flow of water across the surface and lower boundary of the cover profile of interest is determined by boundary condition specifications. For infiltration events, the upper boundary was conservatively set to a maximum hourly flux for these computer simulations of 0.4 inches (1 cm) per hour that effectively produced no runoff while maximizing infiltration. This is conservative because it is expected at the site given the designed slopes that a significant percentage of precipitation will runoff the site without infiltrating into the cover profile.

The UNSAT-H program partitions PET into potential evaporation (E_p) and potential transpiration (T_p). Potential evaporation is estimated or derived from daily weather parameters (Fayer 2000). Potential transpiration is calculated using a function (Equation 1) that is based on the value of the assigned leaf area index (LAI) and an equation developed by Ritchie and Burnett (1971) as follows:

$T_p = PET\ [a + b(LAI)^c]$ where $d \leq LAI \leq e$ **Equation 1**

where:

a,b,c,d, and e are fitting parameters;

a = 0.0, b = 0.52, and c = 0.5, d = 0.1, and e = 2.7 (Fayer 2000)

The maximum and minimum daily temperatures and site latitude were input parameters used to calculate PET (Samani and Pessarkli, 1986). The Samani method used to calculate PET correlates very well with the Penman method utilized within UNSAT H (Samani and Pessarkli, 1986). The UNSAT-H program then partitioned the daily PET values into E_p and T_p. T_p was calculated using a function developed by Equation 1 above. The PET or climatic demand for water versus the amount of rain is graphically presented for a typical year above in Figure 10 and wettest year on record in Figure 14.

Two separate files were written for each year modeled: one file represented the daily PET values and the other file consisted of the daily precipitation values. The model run consisted of ten consecutive typical years followed by the wettest year on record, two successive years. This allowed for nine consecutive typical years in front of the selected model years to establish appropriate antecedent conditions.

The lower boundary condition was set as a unit gradient. With the unit gradient, the calculated drainage flux depended upon the hydraulic conductivity of the lower boundary node. The unit gradient corresponded to gravity-induced drainage and was most appropriate when drainage was not impeded. The base of the modeled profile was well below transient activity and in steady state conditions to ensure that the unit gradient bottom boundary condition used did not affect the output.

4.1.5 VEGETATION DATA

Vegetation will generally increase ET from the cover because a plant's matric potential or suction can be orders of magnitude higher than that of the soil (Figure 15).

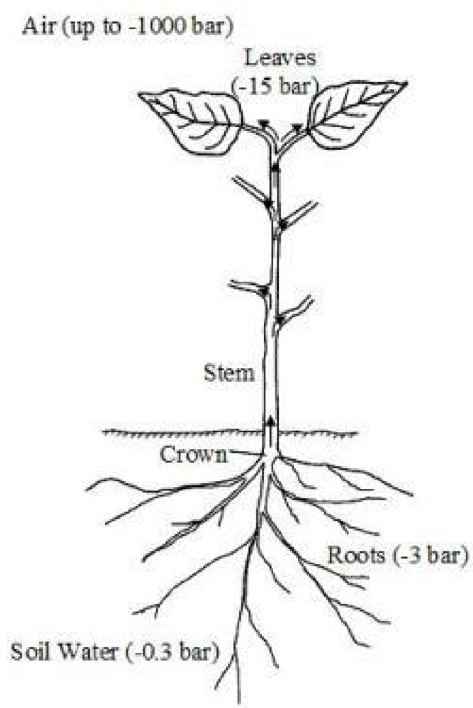


Figure 15. Typical Soil-Plant-Atmosphere Water Potential Variation (Hillel 1998)

The input parameters representing vegetation include the leaf area index (LAI), rooting depth and density, root growth rate, the suction head values that corresponds to the soil's field capacity, wilting point, and water content above which plants do not transpire because of anaerobic conditions. The onset and termination of the growing season for the site are defined in terms of Julian days. The maximum rooting depth is based on expected vegetation characteristics. The root length density (RLD) is assumed to follow an exponential function such as that defined in Equation 2:

$$RLD = a \exp(-bz) + c \quad \textbf{Equation 2}$$

where:

a, b, and c are fitting parameters

z = depth below surface

The cover profile (Figure 13) was modeled with vegetation on the surface. The parameters used for the RLD functions in Equation 2 are summarized in Table 3. The time required for maximum rooting depth establishment was set at full depth beginning on day 1. The maximum rooting depth is also summarized in Table 3. This rooting depth is conservative given native grasses can reach depths up to 9-ft (2.74 m) (Foxx et al 1984). An average LAI of 1.1 was used based on measurements made at a similar Los Alamos site with similar native vegetation (Simonton et al 1985).

An applicable vegetation analog study intended to represent a natural plant succession in New Mexico (data from Cedar Creek 2014) was utilized to establish model input parameters to define rooting parameters. The study included measured root length density and rooting depth for vegetation in a reclaimed community, undisturbed grassland, and undisturbed shrubland community. The reclaimed community of vegetation represents vegetation in a disturbed area and generally considered from seeding upon construction completion up to about 50 years. The grassland community represents undisturbed vegetation and is assumed to represent vegetation on the cover from about 25 to 100 years after construction. The shrubland community represents vegetation in an undisturbed setting and is assumed to represent vegetation on the cover from about 50 to 1,000 years.

Table 3. Vegetation Parameters

Vegetation Stage	Root Length Density parameters (Cedar Creek 2014)			Max Rooting Depth (Cedar Creek 2014)	LAI (Simonton et al 1985)
	a	b	c		
Reclaimed Vegetation	261.39	5.43e-6	-261.21	147 cm	1.1
Grassland Vegetation	0.19	0.071	0.074	142 cm	1.1
Shrubland Vegetation	0.20	0.034	0.044	155 cm	1.1

The onset and termination of the growing season for the site were Julian days 83 and 335, respectively (Figure 16). The LAI was transitioned from 0 to 1.1 starting with Julian day 83 to 167. Day 167 through 211, the full LAI equal to 1.1 was utilized. The LAI was then transitioned down from 1.1 to 0 from Julian day 211 to 335 (Figure 16). This was conservative since it is realistic that plants can transpire longer than indicated at this site. An average percent bare area of 37% was used (Simonton et al 1985). That is, vegetation coverage was only 63%. The assumed percent bare area of 37% reduces the maximum LAI to 0.69 (63% of 1.1).

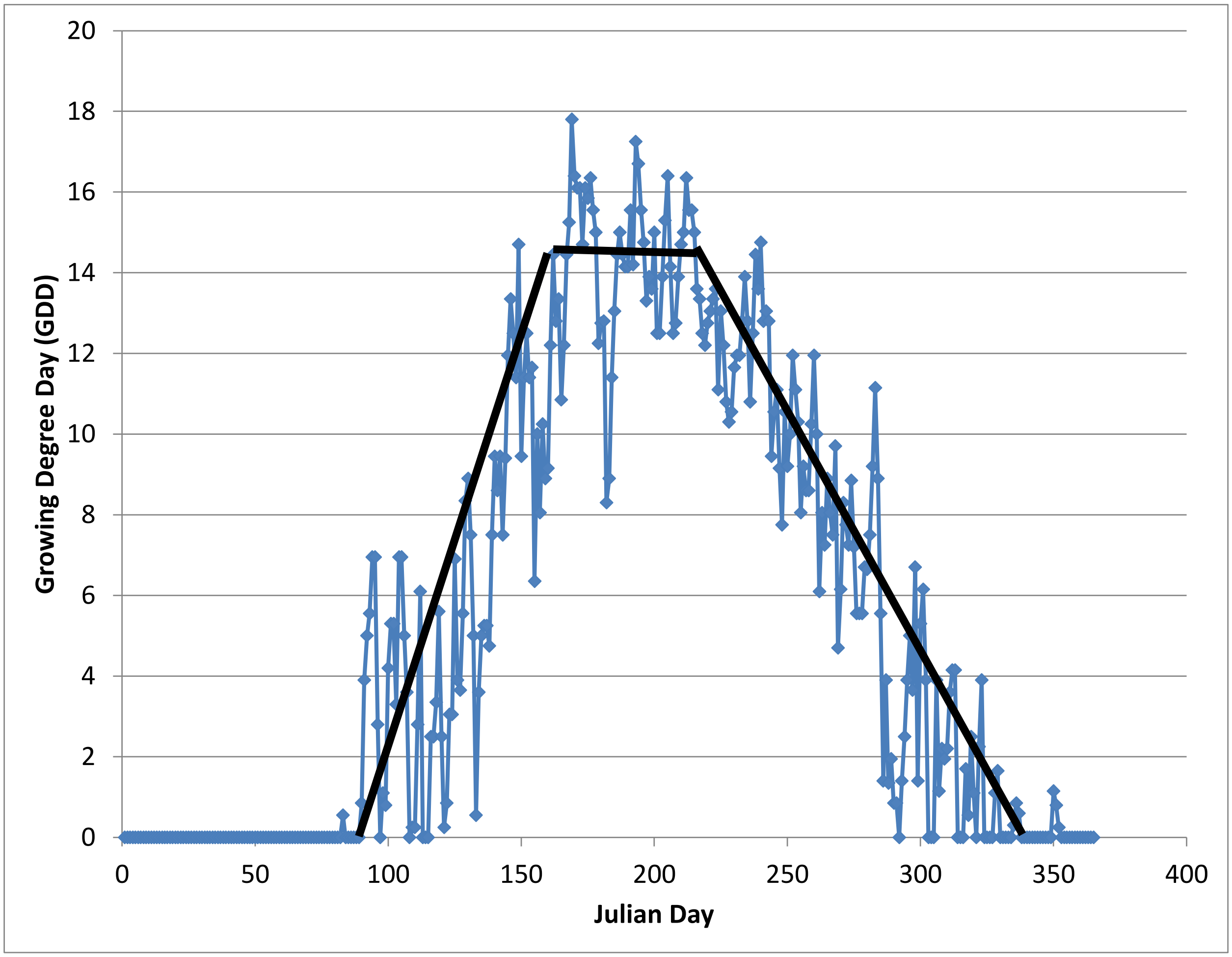


Figure 16. Growing Degree Day Transition during Calendar Year (Los Alamos, NM 1942)

4.1.6 SOIL PROPERTIES RELATED TO VEGETATION

Suction head values corresponding to the wilting point, field capacity, and a head value corresponding to the water content above which plants do not transpire because of anaerobic conditions were defined. Matric potential or suction heads are generally written as positive numbers but are negative values. Consequently, the higher the value - the greater the soil suction.

Not all the water stored in the soil can be removed via transpiration. Vegetation is generally assumed to reduce the soil moisture content to the permanent wilting point. The wilting point for these computer simulations was set at 40,000 cm for reclaimed vegetation and grassland and 70,000 for shrubland vegetation (Fayer and Walters 1995). This was conservatively used although some shrubs near the site could remove water from the soil to a suction of 100,000 cm (Hillel 1998). Evaporation from the soil surface can further reduce the soil moisture below the wilting point approaching the residual saturation, which is the water content at an infinite matric potential. The head corresponding to the water content below which plant transpiration starts to decrease was defined as 32.2 feet (1000 cm) (Fayer and Walters 1995, Fayer 2000). The head value corresponding to the water content above which plants do not transpire because of anaerobic conditions was defined at 4 inches (30 cm) (Fayer and Walters 1995).

4.1.7 SOIL PROPERTIES

Soil mechanical and hydraulic properties were obtained from a combination of laboratory testing and assumed literature values. The upper 2-ft (61 cm) rock/soil admixture will be composed of a uniform mixture of durable rock from an approved vendor mixed with the existing interim cover soil.

The hydraulic properties of the interim cover soil modeled were obtained from Abeele (1979), Abeele (1984), Rogers and Gallaher (1995). Additionally, the grain size distribution and soil classification of crushed tuff as measured in Stephens (2005) was determined to be a sandy loam soil. Literature values for sandy loam were also modeled (Rawls et al 1982).

The upper 2-ft (61 cm) of the surface layer cover profile will have rock mixed into it at a volumetric ratio of 33% rock to 67% soil. The rock size will have a D_{50} of 2.5-in (6.4 cm). The mixture of rock into the soil effectively alters its hydraulic properties. Consequently, the modeled hydraulic properties were altered for this upper 2-ft (61 cm) layer (ASTM D4718). The following equation (Equation 3) was used to adjust the saturated hydraulic conductivity based on the addition of rock (Peck and Watson 1979).

$$K_b = [K_s * 2(1 - V_r)]/(2 + V_r) \qquad \text{Equation 3}$$

where: K_b = satuarted hydraulic conductivty, bulk

K_s = satuarted hydraulic conductivty, soil

V_r = volume of rock

For the computer simulations, the calculated bulk saturated hydraulic conductivity was then increased an order of magnitude in the top foot (31 cm) of the modeled cover system to account for dynamic processes such as freeze/thaw cycles, wet/dry cycles, and biointrusion (Dwyer 2014).

The moisture retention data for the cover soil was also altered to reflect the addition of the rock. The measured volumetric moisture content was reduced per Equation 4 [ASTM 4718 and Bouwer & Rice 1984].

$$\theta_b = (1 - V_r)\theta_s \qquad \text{Equation 4}$$

where: θ_b = bulk volumetric moisture content

θ_s = saturated volumetric moisture content

V_r = volume of rock

The Mualem conductivity function (m) was used to describe the unsaturated hydraulic conductivity of the soils (van Genuchten et al 1991). The van Genuchten 'm' parameter for this function is assumed to be '1-1/n'; 'n' being one of the established van Genuchten parameters. The initial soil conditions were expressed in terms of suction head values that correspond to the average moisture content between each soil layer's field capacity and permanent wilting point determined from each respective soil layer's moisture characteristic curve.

A summary of the soil input parameters for the UNSAT H computer simulations are summarized in Table 4. The layers correspond to the profile shown in Figure 13.

Table 4. Soil Input Parameters

Soil	Depth BGS[1]	K_{sat}[2, 3]	Van Genuchten Parameters[3]				Reference
			θ_s[3]	θ_r[3]	α (1/cm)	n	
Rock/Soil Admixture	0 to 1.0-ft (0 to 31 cm)	2.07E-04 in/sec (5.26E-04 cm/sec)	0.2667	0.0	0.04490	1.38	Crushed tuff, Abeele 1979
Rock/Soil Admixture	0 to 1.0-ft (0 to 31 cm)	3.15E-04 in/sec (1.4E-04 cm/sec)	0.2667	0.0	0.04493	1.33	Crushed tuff, Abeele 1984
Rock/Soil Admixture	0 to 1.0-ft (0 to 31 cm)	1.62E-03 in/sec (4.11E-03 cm/sec)	0.2747	0.0273	0.068	1.322	Sandy Loam (Rawls et al 1982)
Rock/Soil Admixture	1.0 to 2.0-ft (0 to 46 cm)	2.07E-05 in/sec (5.26E-05 cm/sec)	0.2667	0.0	0.04490	1.38	Crushed tuff, Abeele 1979
Rock/Soil Admixture	1.0 to 2.0-ft (0 to 46 cm)	3.15E-05 in/sec (1.4E-05 cm/sec)	0.2667	0.0	0.04493	1.33	Crushed tuff, Abeele 1984
Rock/Soil Admixture	1.0 to 2.0-ft (0 to 46 cm)	1.62E-04 in/sec (4.11E-04 cm/sec)	0.2747	0.0273	0.068	1.322	Sandy Loam (Rawls et al 1982)
Interim Cover Soil	Beneath 2.0-ft (61 cm)	5.51E-05 in/sec (1.4E-04 cm/sec)	0.4	0.0	0.04490	1.38	Crushed tuff, Abeele 1979
Interim Cover Soil	Beneath 2.0-ft (61 cm)	5.51E-05 in/sec (1.4E-04 cm/sec)	0.4	0.0	0.04493	1.33	Crushed tuff, Abeele 1984
Interim Cover Soil	Beneath 2.0-ft (61 cm)	2.83E-04 in/sec (7.19E-04 cm/sec)	0.412	0.041	0.068	1.322	Sandy Loam (Rawls et al 1982)

[1] below ground surface (BGS)

[2] saturated hydraulic conductivity increased one order of magnitude due to biointrusion, freeze/thaw, wet/dry cycles in top foot of cover soil

[3] saturated hydraulic conductivity and van Genuchten parameters adjusted for rock content in rock/soil admixture

5.0 UNSATURATED MODELING OUTPUT

A series of computer simulations were performed to complete a sensitivity analyses that utilized the envelope of soil, vegetation, and climate parameters to identify the worst-case combination of parameters. This worst-case scenario was then used to develop the cover profile. That is, the worst-case combination of input parameters and boundary conditions that produce the thickest required cover profile to minimize flux was identified. This cover profile includes the upper surface layer composed of rock mixed into the existing interim cover soil described in Section 3.0.

Conservatism was incorporated into the simulations in the form of limiting the precipitation rate to encourage 100% infiltration of precipitation into the cover profile. Furthermore, the modeling is 1-dimensional and thus there was no runoff due to slope. The upper 1-ft (31 cm) of the cover profile with the rock/soil admixture had its saturated hydraulic conductivity increased for the computer simulations by an order of magnitude to take into account potential changes to the soil hydraulic properties due to such things as freeze/thaw cycles, wet/dry cycles, biointrusion, and uncertainty in rock mixtures (Dwyer 2014).

The sensitivity analyses evaluated three different soil textures for the cover soil (crushed tuff - Abeele 1979; crushed tuff - Abeele 1984; and sandy loam - Rawls et al 1982); vegetation stages as the vegetation matures over the performance period; and climate from typical to extreme (wettest year on record) to beyond extreme (wettest year two years in a row). Dry years were not modeled as they would not stress the cover profile. Dry conditions (no vegetation) were considered for erosion control as described in section 3.

As previously described, an applicable vegetation analog study that represent a natural plant succession in New Mexico (Cedar Creek 2014) was utilized in the computer modeling sensitivity analyses. The reclaimed community of vegetation represents vegetation in a disturbed area and generally considered from seeding upon construction completion up to about 50 years. The grassland community represents undisturbed vegetation and is assumed to represent vegetation on the cover from about 25 to 100 years after construction. The shrubland community represents vegetation in an undisturbed setting and is assumed to represent vegetation on the cover from about 50 to 1,000 years.

The computer simulations involved running 10 typical years in a row to mitigate any biases from assumed initial soil conditions, followed by the wettest year on record two years in a row. The tables below contain the tenth year of the typical consecutive modeled years and the two wettest years on record. The following variables are summarized for each year: (1) applied precipitation; (2) applied potential evapotranspiration (PET); (3) calculated transpiration; (4) calculated evaporation; (5) calculated runoff; and (6) calculated percolation at the base of the cover.

Following the tables (Tables 5 to 8) is a graphical summation (Figures 17 to 19) of the soil depth versus annual flux for the typical climate year and wettest year on record two years in a row. This depth of cover soil where flux is minimized is referred to as the Dwyer (et al 2006) Point of Diminishing Returns (PODR) Method. The PODR is defined as the depth at which flux is effectively minimized; that is, the depth at which an additional increment of soil will no longer significantly reduce the flux – in all cases modeled this flux is zero.

5.1 OUTPUT – RECLAIMED VEGETATION

Table 5 and Figure 17 provide a summary of the computer simulations output that evaluated the various soil textures with vegetation representative of a reclaimed site. The combination of input parameters and climate that require the thickest cover profile to minimize flux (zero flux) included the sandy loam soil with reclaimed vegetation and the beyond worst-case climate of two consecutive wettest year on record. The PODR for this set of sensitivity analyses is 3.8-ft (114 cm). The thinnest existing cover given the addition of rock in the surface admixture is 4.7 ft (142 cm). Thus, the PODR is achieved well within the existing interim cover and thus no flux is expected to reach the buried waste.

Table 5. Water Balance Output (Reclaimed Vegetation)

Soil	Year	Precip.	PET	Transp.	Evap.	Runoff	Perc.[1]
Crushed Tuff (Abeele 1979)	Typical Climate	45.2 cm (17.8 in)	145.2 cm (57.2 in)	15.5 cm (6.1 in)	29.0 cm (11.4 in)	0.03 cm (0.01 in)	0
	Wet Year 1	77.0 cm (30.3 in)	136.3 cm (53.6 in)	18.5 cm (7.3 in)	48.1 cm (18.9 in)	0.002 cm (0.0008 in)	0
	Wet Year 2	77.0 cm (30.3 in)	136.3 cm (53.6 in)	25.0 cm (9.8 in)	50.5 cm (19.9 in)	0.001 cm (0.0004 in)	0
Crushed Tuff (Abeele 1984)	Typical Climate	45.2 cm (17.8 in)	145.2 cm (57.2 in)	15.3 cm (6.0 in)	29.3 cm (11.5 in)	0	0
	Wet Year 1	77.0 cm (30.3 in)	136.3 cm (53.6 in)	18.5 cm (7.3 in)	48.6 cm (19.1 in)	0	0
	Wet Year 2	77.0 cm (30.3 in)	136.3 cm (53.6 in)	24.4 cm (9.6 in)	51.1 cm (20.1 in)	0	0
Sandy Loam (Rawls et al 1982)	Typical Climate	45.2 cm (17.8 in)	145.2 cm (57.2 in)	15.8 cm (6.2 in)	28.8 cm (11.4 in)	0	0
	Wet Year 1	77.0 cm (30.3 in)	136.3 cm (53.6 in)	20.0 cm (7.9 in)	48.1 cm (18.9 in)	0	0
	Wet Year 2	77.0 cm (30.3 in)	136.3 cm (53.6 in)	24.6 cm (9.7 in)	50.4 cm (19.8 in)	0	0

[1]@ Base of Cover (defined as base of existing interim cover)

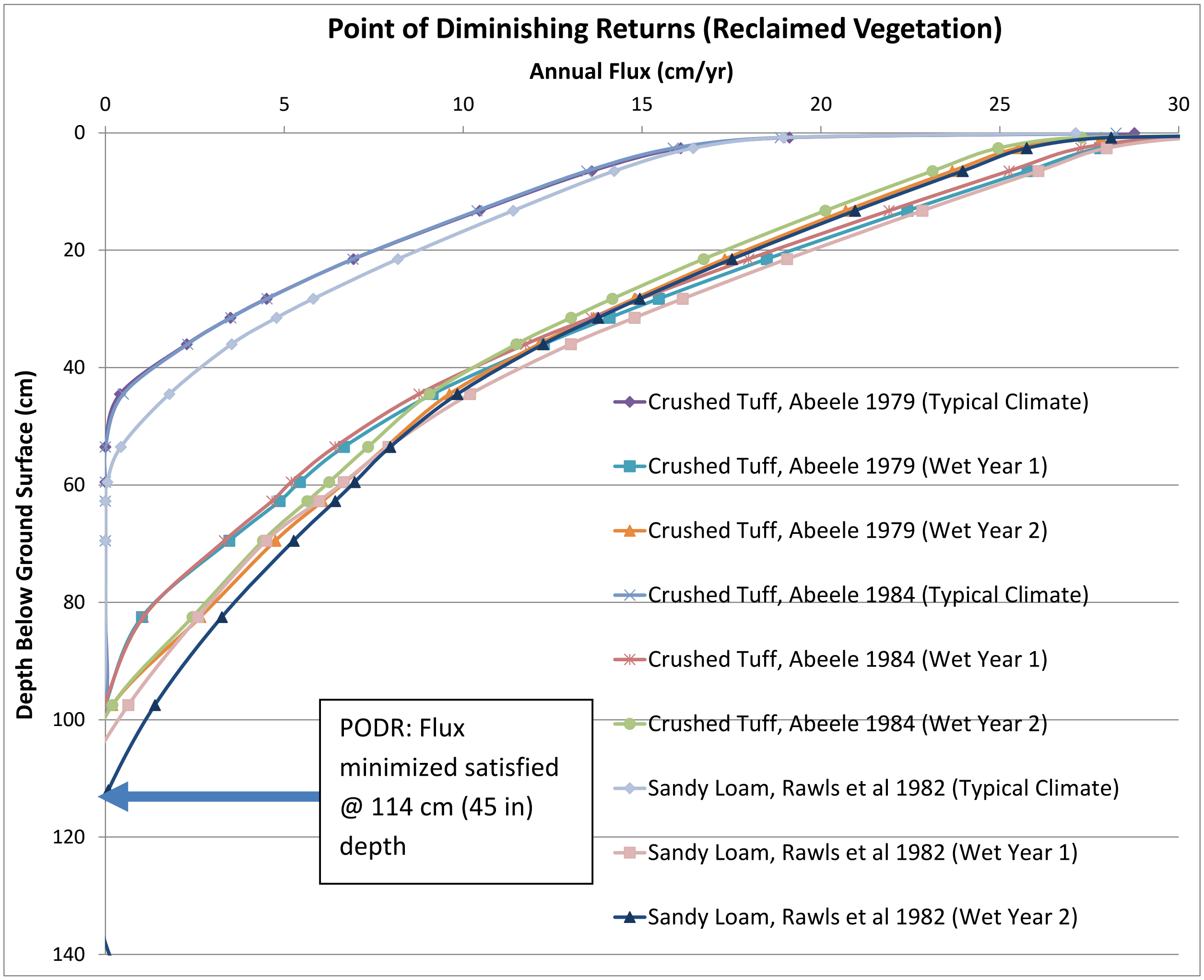


Figure 17. Computer Simulation Results

5.2 OUTPUT – GRASSLAND VEGETATION

Table 6 and Figure 18 provide a summary of the computer simulations output that evaluated the various soil textures with vegetation representative of an undisturbed grassland site. The combination of input parameters and climate that require the thickest cover profile to minimize flux (zero flux) included the sandy loam soil with grassland vegetation and the beyond worst-case climate of two consecutive wettest year on record. The PODR for this set of sensitivity analyses is 4.2-ft (128 cm). The thinnest existing cover given the addition of rock in the surface admixture is 4.7-ft (142 cm). Thus, the PODR is achieved well within the existing interim cover and thus no flux is expected to reach the buried waste.

Table 6. Water Balance Output (Grassland Vegetation)

Soil	Year	Precip.	PET	Transp.	Evap.	Runoff	Perc.[1]
Crushed Tuff (Abeele 1979)	Typical Climate	45.2 cm (17.8 in)	145.2 cm (57.2 in)	14.2 cm (5.6 in)	31.1 cm (12.3 in)	0.02 cm (0.006 in)	0
	Wet Year 1	77.0 cm (30.3 in)	136.3 cm (53.6 in)	15.3 cm (6.0 in)	50.8 cm (20.0 in)	0.02 cm (0.009 in)	0
	Wet Year 2	77.0 cm (30.3 in)	136.3 cm (53.6 in)	22.0 cm (8.6 in)	52.9 cm (20.8 in)	0.03 cm (0.01 in)	0
Crushed Tuff (Abeele 1984)	Typical Climate	45.2 cm (17.8 in)	145.2 cm (57.2 in)	13.8 cm (5.4 in)	31.4 cm (12.4 in)	0	0
	Wet Year 1	77.0 cm (30.3 in)	136.3 cm (53.6 in)	15.3 cm (6.0 in)	51.5 cm (20.3 in)	0	0
	Wet Year 2	77.0 cm (30.3 in)	136.3 cm (53.6 in)	21.6 cm (8.5 in)	53.7 cm (21.1 in)	0	0
Sandy Loam (Rawls et al 1982)	Typical Climate	45.2 cm (17.8 in)	145.2 cm (57.2 in)	14.2 cm (5.6 in)	31.1 cm (12.2 in)	0	0
	Wet Year 1	77.0 cm (30.3 in)	136.3 cm (53.6 in)	16.8 cm (6.6 in)	51.2 cm (20.1 in)	0	0
	Wet Year 2	77.0 cm (30.3 in)	136.3 cm (53.6 in)	22.7 cm (9.0 in)	53.4 cm (21.0 in)	0	0

[1]@ Base of Cover (defined as base of existing interim cover)

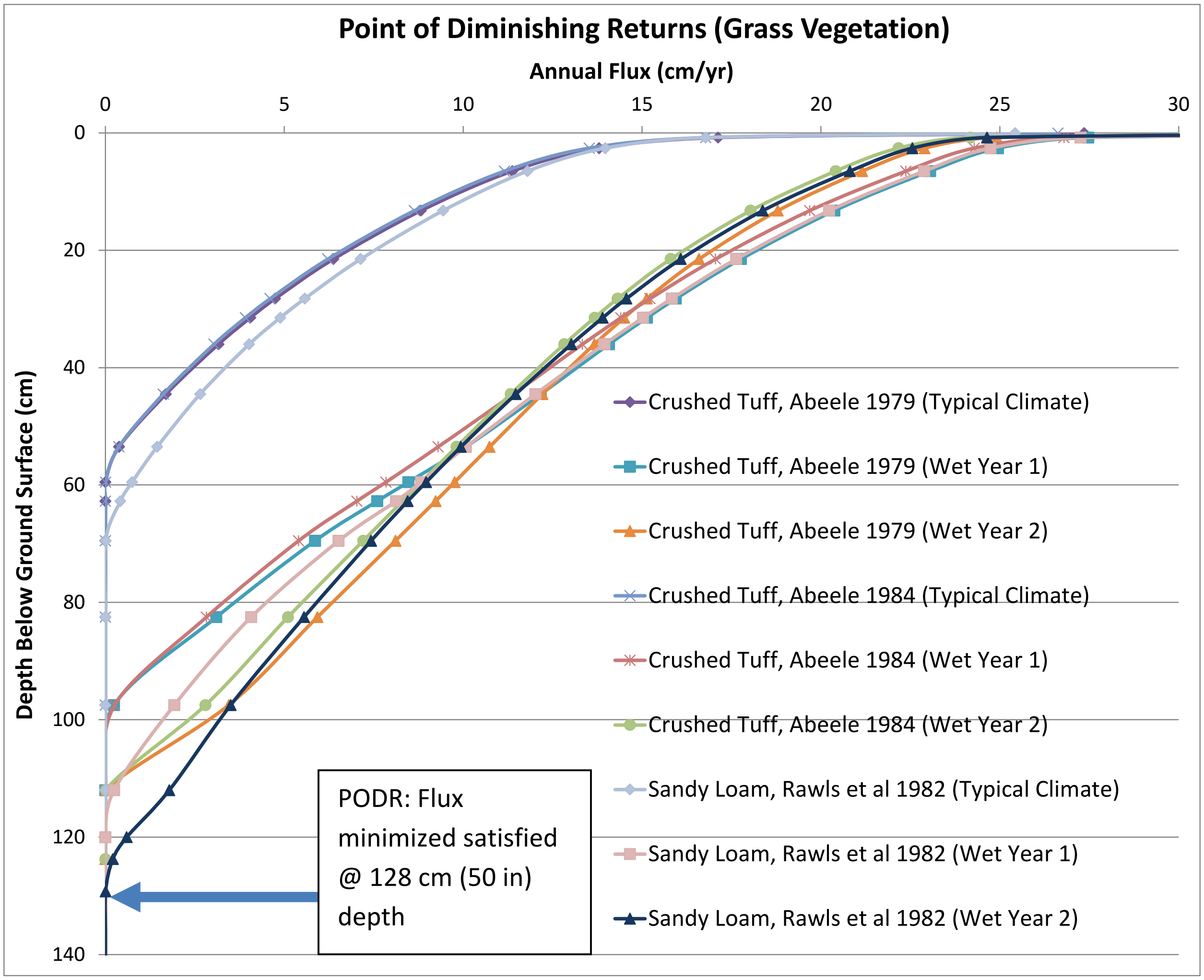


Figure 18. Computer Simulation Results

5.3 OUTPUT – SHRUBLAND VEGETATION

Table 7 and Figure 19 provide a summary of the computer simulations output that evaluated the various soil textures with vegetation representative of a an undisturbed shrubland site. The combination of input parameters and climate that require the thickest cover profile to minimize flux (zero flux) included the sandy loam soil with shrubland vegetation and the beyond worst-case climate of two consecutive wettest year on record. The PODR for this set of sensitivity analyses is 4.6-ft (140 cm). The thinnest existing cover given the addition of rock in the surface admixture is 4.7-ft (142 cm). Thus, the PODR is achieved within the existing interim cover and thus no flux is expected to reach the buried waste.

Table 7. Water Balance Output (Shrubland Vegetation)

Soil	Year	Precip.	PET	Transp.	Evap.	Runoff	Perc.[1]
Crushed Tuff (Abeele 1979)	Typical Climate	45.2 cm (17.8 in)	145.2 cm (57.2 in)	15.2 cm (6.0 in)	30.1 cm (11.9 in)	0.01 cm (0.005 in)	0
	Wet Year 1	77.0 cm (30.3 in)	136.3 cm (53.6 in)	16.7 cm (6.6 in)	49.7 cm (19.6 in)	0.02 cm (0.006 in)	0
	Wet Year 2	77.0 cm (30.3 in)	136.3 cm (53.6 in)	22.2 cm (8.7 in)	52.0 cm (20.5 in)	0.02 cm (0.006 in)	0
Crushed Tuff (Abeele 1984)	Typical Climate	45.2 cm (17.8 in)	145.2 cm (57.2 in)	14.9 cm (5.9 in)	30.4 cm (12.0 in)	0	0
	Wet Year 1	77.0 cm (30.3 in)	136.3 cm (53.6 in)	16.7 cm (6.6 in)	50.3 cm (19.8 in)	0	0
	Wet Year 2	77.0 cm (30.3 in)	136.3 cm (53.6 in)	22.0 cm (8.6 in)	52.7 cm (20.7 in)	0	0
Sandy Loam (Rawls et al 1982)	Typical Climate	45.2 cm (17.8 in)	145.2 cm (57.2 in)	15.3 cm (6.0 in)	30.0 cm (11.8 in)	0	0
	Wet Year 1	77.0 cm (30.3 in)	136.3 cm (53.6 in)	18.0 cm (7.1 in)	49.9 cm (19.7 in)	0	0
	Wet Year 2	77.0 cm (30.3 in)	136.3 cm (53.6 in)	23.2 cm (9.1 in)	52.3 cm (20.6 in)	0	0

[1]@ Base of Cover (defined as base of existing interim cover)

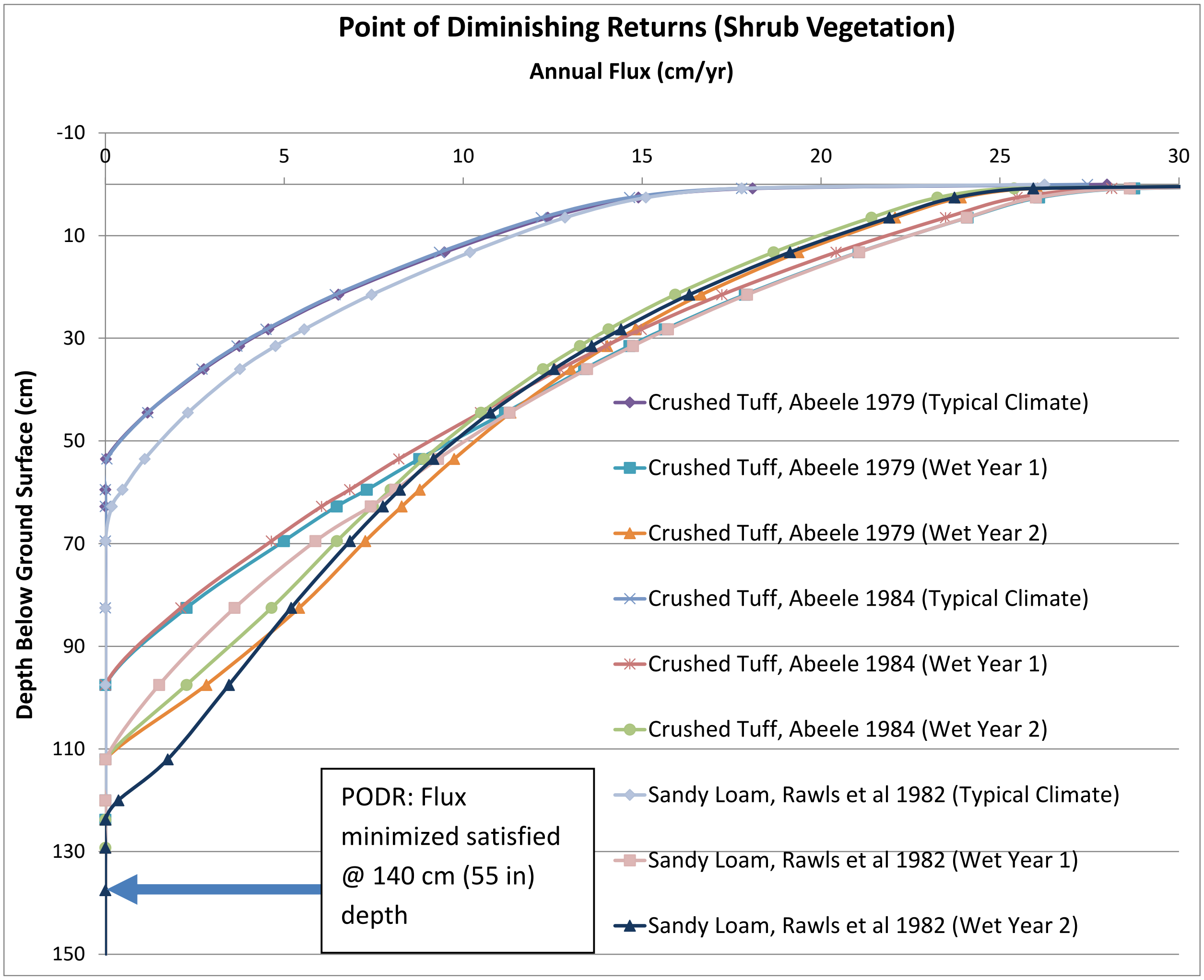


Figure 19. Computer Simulation Results

6.0 Radon Attenuation

Some radioactive wastes emit radon-222 (222Rn) in the form of a heavier-than-air gas. Inhalation of radon gas at sufficient concentrations is a human health hazard. Federal regulations limiting radon releases to the atmosphere are contained in 40 CFR §192.02. The regulations are also typically applied as an ARAR to DOE sites undergoing remediation (Section 8). These regulations require that release of 222Rn to the atmosphere not exceed: (i) an average release rate of 20 picocuries per square meter per second; or (ii) increase the annual average concentration of 222Rn in the air at or above any location outside of the disposal site by more than one-half picocurie per liter. While the half-life of 222Rn is short (3.8 days), radon is a part of the uranium-238 (238U) decay series. Uranium-238 has a half-life of about 4.5 billion years.

The soil cover functions as an effective barrier to gas diffusion, air-filled voids in the soil must be discontinuous. Gas diffuses very slowly through wet soils that contain only occasional, unconnected air bubbles. The radon flux through the cover soil was calculated using the RAECOM code (Radiation Attenuation Effectiveness and Cover Optimization with Moisture Effects), as described in [Rogers 1984 a&b]. It performs one-dimensional, steady-state radon diffusion calculations for a multi-layer system.

6.1 Input Data for Radon Flux Modeling

- **Layer Data:** The profile was modeled with a bottom layer of uranium contaminated waste and soil capped with a two layered cover system (Table 8). The uranium contamination was assumed to be 6 m thick (LANL 2003). This correlates with the average shaft depth. The cover profile is 1.37 m thick (Figure 13). This is conservative given the cover thickness varies from 1.37 m to about 4 m (Figure 12).
- **Ra-226 Activity Concentration [pCi/g]:**_Activity concentration of Radium-226 in each respective layer. The Ra-226 activity concentration for the existing waste and surrounding soil is based on the following information and calculations (Table 8). The total estimate of uranium (i.e., uranium-233, uranium-234, uranium-235, uranium-236, and uranium-238) is 28 Ci (LANL 2003). The average depth of disposal shafts is 20 ft (6m) (LANL 2003). The MDA C site is 11.8 acres (LANL 2003). Thus, the volume of contaminated soil/waste is 10,280,202 cubic feet. The typical dry bulk density of the soil is 1.5 g/cm3. The average concentration across the MDA C given the depth of shafts is then computed as 6.41 pCi/g. The background value for Uranium-238 at MDA C is reported as 2.29 pCi/g (LANL 2003).
-

Table 8. Radon Flux Input Parameters

Layer	Thickness	Ra-226 Activity Conc.	Ra-226 Emanat	Porosity	Moisture	Rn-222 Diff. Coeff -- calculated
No.	[m]	[pCi/g]			[dry wt_%]	[m2/s]
1	6.0	6.41	0.35	0.412	13.37	1.112E-6
2	0.76	2.29	0.35	0.412	13.37	1.112E-6

Layer	Thickness	Ra-226 Activity Conc.	Ra-226 Emanat	Porosity	Moisture	Rn-222 Diff. Coeff - - calculated
No.	[m]	[pCi/g]			[dry wt_%]	[m2/s]
3	0.61	2.29	0.35	0.275	8.91	372.1E-9

- **Rn-222 Emanation Fraction** is a fraction of the total amount of radon-222 produced by radium decay that escapes from the soil particles and gets into the pores of the soil. It depends on the soil material and the moisture content. It varies over a range of 0.1 - 0.4 or more. The default value of 0.35 was used.
- **Porosity** is the ratio of the pore volume (air- and water-filled) to the total volume of the soil. Refer to Table 8 for the porosity values for each layer. The porosity is conservatively assumed to equal the saturated moisture content for each soil layer. The largest porosity values produce the more conservative results consequently, the largest porosity value for each layer (0.275 for top admixture layer, 0.412 for remaining interim cover soil, and 0.412 for crushed tuff surrounding waste) was conservatively utilized in the calculations.
- **Moisture Contents [dry wt_%]** is the percentage of water weight to dry soil weight. The empirical relationship (Rawls and Brankensiek, 1982) as recommended in NUREG 1620 was used to compute the long-term moisture content.

$$c = 0.026 + 0.005x + 0.0158y$$ **Equation 5**

where:

c = predicted 15-bar soil water-retention value (volumetric moisture content)

x = percent clay in the soil

y = percent organic matter in the soil

Crushed tuff soil samples were tested for various properties including grain size distribution (Stephens 2005). The average clay content in these samples was calculated to be 22.74%. The organic matter is assumed to be zero for this calculation. This is conservative because the higher the moisture content is in the soil the lower the radon flux is. Solving equation 5, the long-term moisture content (c) is computed to be 13.37%. utilizing equation 4 for the soil/rock admixture in layer 3 this value is reduced to 8.91%.

- **Rn-222 Effective Diffusion Coefficient [m^2/s]** defined from Fick's equation as the ratio of the diffusive flux density of radon activity across the pore area to the gradient of the radon activity concentration in the pore or interstitial space. This value was calculated based on the other input parameters identified.

6.2 Output for Radon Flux Modeling

The computed radon flux was 1.344 pCi/m^2/sec (Table 9). This value is significantly less than the maximum allowable of 20 pCi/m^2/sec per 40CFR192.02. Thus, the radon flux criterion defined in 40CFR192.02 is satisfied.

Table 9. Radon Flux Calculation Output

Layer No.	Thickness [m]	Exit Flux [pCi/m2/s]	Exit Conc. [pCi/L]
1	6	1.614	6.085E3
2	0.76	0.228	4.683E3
3	0.61	1.344	0

6.3 Validation

Sections 6.1 and 6.2 demonstrate that the proposed final cover system adequately reduces the release of radon flux to meet the applicable regulatory criterion of less than 20 pCi/m^2/sec (40CFR192.02). To provide additional confidence in the acceptable long-term risk posed from the potential release of radon gas from MDA C, the results provided in Table 9 were compared to the radon gas emissions computed in the Area G Radiological Risk Assessment (RRA) (Neptune 2020). Area G contains significantly more total uranium than MDA C. The average peak radon flux (computed over 1000 years) for all waste disposal regions across Area G is about 2.6 pCi/m^2/sec. This radon flux is for the worst-case scenario – it assumes there is no cover over MDA G and simply assumes current conditions with no improvement. Consequently, the Area G RRA calculates low radon flux (well below the regulatory requirement of 20 pCi/m^2/sec per 40CFR192.02) with no cover despite having a significantly higher total uranium inventory than MDA C.

7.0 BIOINTRUSION

7.1 Low Risk

Biointrusion is not a performance objective at MDA C because the associated risk is very low. This statement is based on results from the LANL Technical Area 54, MDA G Performance Assessment and Composite Analysis (LANL 2008) and the Area G RRA (Neptune 2020) that reveal doses from the upward biotic pathway are very low (for exposure scenarios that do not include human intrusion into the waste cover). As long as there is Institutional Control, which is assumed for the entirety of the 1000-yr performance period of MDA C, then there will be no inadvertent human intrusion, and thus doses will be very low. For example, LANL (2008), Table ES-1 provides the 'All Pathways' doses for all exposure scenarios. All doses are well below any regulatory limits.

The Area G RRA (Neptune 2020) calculates doses without any waste cover (current conditions), and those doses are well below regulatory limits for all regions, except for the two shaft fields where doses are about one order of magnitude above regulatory limits. Area G has a much larger inventory than MDA C (by about two orders of magnitude), and inventory is higher in the shafts than the pits. Therefore, it is reasonable to conclude that as long as there is Institutional Control at MDA C, doses via biointrusion pose minimal risk.

7.2 Biointrusion Protection Included in Surface Layer

The surface layer composed of a mixture of rock and soil will serve to discourage burrowing animal activity. Post-closure monitoring performed at sites with similar cover profiles within New Mexico have shown that the addition of rock into the surface layer discourages the burrowing of animals [San Mateo, NM (uranium mine site closure) and Farmington, NM (superfund hazardous waste site closure)].

The typical biointrusion layer included in an UMTRA cover system includes a 6-inch-thick layer of rock (FRAP 2008) within the cover profile (Figure 20). The planned ET Cover profile shall have an 8-in depth of rock mixed into the upper 2-ft (Figure 13). Thus, the planned ET Cover profile has more rock than the biointrusion layer in a typical UMTRA cover profile to discourage burrowing.

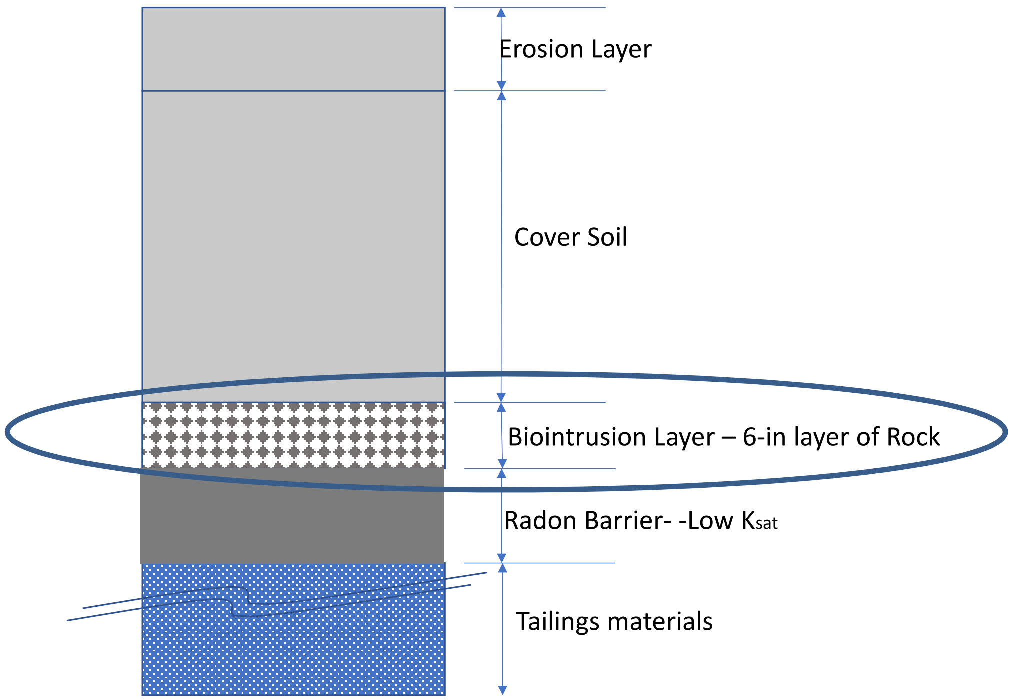


Figure 20. Typical UMTRA Cover (FRAP 2008)

The 8-inch layer of rock shall be mixed into the upper 2-ft of interim cover soil rather than placed deep in the profile. Thus, any burrowing animals will be discouraged at the surface rather than turned away deeper in the profile.

8.0 FINAL DESIGN RECOMMENDATIONS

The analyses of the cover profile contained in this report for the MDA C corrective measures evaluation (CME) is based on available information. It is recommended after the CME is approved and the cover profile progresses to final design, several issues be resolved to replace assumed values with measured values. These are summarized in the following subsections.

8.1 COVER MATERIALS

The final cover system will be composed of soil from the existing cover and imported rock. The cover soil may require amendment depending on the available nutrients and organic content.

8.1.1 SOIL PROPERTIES

The cover soil properties in these analyses were those from both field/laboratory measurements of similar soil texture (Abeele 1979, 1984) and assumed values from the literature (Rawls et al 1982) based on applicable grain size distribution measurements (Stephens 2005). It is important to note that for the final design of the cover system for MDA C, actual soil measurements from the interim cover soil should be measured at the *in-situ* density (density the soil will reside at long-term). These measured soil properties should then serve as the input parameters throughout the design methodology (modeling and erosion analysis) utilized in this report to adjust the cover profile accordingly.

8.1.2 ROCK PROPERTIES

Rock will be the only cover material required to be purchased and transported to the site. Because the cover design life must last for 1000 years, but not less than 200 years per 40 CFR §192.02; the rock to be mixed into the cover system must be durable. Local vendors in the Los Alamos and Espanola areas have been contacted about available rock. Currently they have granite and sandstone readily available but may not have the durable rock required. This will require the selected vendor to identify and test available rock borrow sources. Typically, a hard limestone or basalt is required to meet durability requirements.

The contractor chosen to provide rock for the project shall have the rock tested utilizing the criteria provided in NUREG 1623 (Table 10) for recommended durability testing, a minimum score of 80 is recommended without over-sizing. It is desirable the durable rock be identified and used to eliminate or minimize any oversizing required. Should oversizing be required, the admixture design developed in section 3.0 will require adjustment based on the adjusted rock size as will the geometry utilized for the cover profile in the modeling summarized in Sections 4 and 5.

Table 10. Scoring criteria for determining rock quality (NUREG 1623)

	Weighting Factor			Score										
	Limestone	Sandstone	Igneous	10	9	8	7	6	5	4	3	2	1	0
Specific Gravity (SSD)	12	6	9	2.75	2.70	2.65	2.60	2.55	2.50	2.45	2.40	2.35	2.40	2.25
Absorption (%)	13	5	2	0.1	0.3	0.5	0.67	0.83	1.0	1.5	2.0	2.5	3.0	3.5
Sodium Sulfate (%)	4	3	11	1	3	5	6.7	8.3	10	12.5	15	20	25	30
Abrasion (%)	1	8	1	1	3	5	6.7	8.3	10	12.5	15	20	25	30
Schmidt Hammer	11	13	1	70	65	60	54	47	40	32	24	16	8	0
Tensile Strength (psi)	5	4	10	1400	1200	1000	833	666	500	400	300	200	100	<100

Notes: 1. Scores derived from Tables 6.2 and 6.7 of NUREG/CR-2642.

2. Any rock to be used must be qualitatively rated at least "fair" in a petrographic examination conducted by a geologist experienced in petrographic analysis.

3. Weighting Factors are derived from Table 7 of (DePuy, 1965), based on inverse of ranking of test methods for each rock type.

4. Test methods shall be standardized (e.g., ASTM) and shall be those in (DePuy, 1965).

8.2 FIELD CONDITIONS

It is recommended the existing interim cover thickness shown in Figure 12 be field verified prior to the final design of the cover system. Specifically, the soil texture, soil hydraulic properties, and minimum interim cover soil depth should be field verified.

9.0 REFERENCES

1. 10 CFR Part 61. Licensing Requirements for Land Disposal of Radioactive Waste.
2. 40 CFR Part 191. Environmental Radiation Protection Standards for Management and Disposal of Spent Nuclear Fuel, High-Level and Transuranic Radioactive Wastes.
3. 40 CFR Part 192. Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings.
4. 40 CFR Part 192. Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings.
5. 40 CFR Part 264.310 Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities; Closure and Post-Closure Care
6. Abeele, WV. 1979. Determination of Hydraulic Conductivity in Crushed Bandelier Tuff, pp. 5. Los Alamos Scientific Laboratory report LA-8147-MS, November 1979.
7. Abeele, WV. 1984. Hydraulic Testing of Crushed Bandelier Tuff, pp. 21. Los Alamos Scientific Laboratory report LA-10037-MS, March 1984.
8. ASTM D4718/D4718M-15. Standard Practice for Correction of Unit Weight and water Content for Soils Containing Oversize Particles.
9. Bouwer H. and R. Rice, 1984. Hydraulic Properties of Stony Vadose Zones. Ground Water, 22 (6) (1984), pp. 696–705.
10. Cedar Creek. 2014. Vegetation Characterization and Biointrusion Surveys for Church Rock Mill Site. July 2014.
11. DOE (U.S. Department of Energy) 1989. (DOE), Technical Approach Document Revision II, UMTRA–DOE/AL 050425.0002, Albuquerque Operations Office, Albuquerque, New Mexico.
12. DOE (U.S. Department of Energy) 1989. (DOE), Technical Approach Document Revision II, UMTRA–DOE/AL 050425.0002, Albuquerque Operations Office, Albuquerque, New Mexico.
13. DOE 435. Radioactive Waste Management.
14. DOE 458. Radiation Protection of the Public and the Environment.
15. Doorenbos, J. and W.O. Pruitt. 1977. Guidelines for prediction crop water requirements. FAO Irrig. and Drain. Paper No. 24, 2nd ed., FAO Rome, Italy.
16. Dwyer, SF, R Rager, J Hopkins. 2006. Cover System Design Guidance and Requirements Document. Los Alamos National Laboratory report LA-UR-06-4715.
17. Dwyer, SF. 2003. Water Balance Measurements and Computer Simulations of Landfill Closures. PhD Dissertation. University of New Mexico, Albuquerque, NM.
18. Dwyer, SF. 2014. Natural Analog Study of Cover Soil Borrow Sources Using a Tension Infiltrometer. Northeast Churchrock Mine, Gallup, NM. August 20.
19. EPA 2011. Closing Small Tribal Landfills and open Dumps. How to design Environmentally safe Covers Including Additional Design Guidance for Arid Regions. EPA-909-R-11-007.

20. EPA. 1991. Environmental Protection Agency, Seminar Publication: Design and Construction of RCRA/CERCLA Final Covers. EPA/625/4-91/025.
21. EPA. 1991. Environmental Protection Agency, Seminar Publication: Design and Construction of RCRA/CERCLA Final Covers. EPA/625/4-91/025.
22. Fayer, M. J. and T. B. Walters, 1995, Estimated Recharge Rates at the Hanford Site, PNL-10285, Pacific Northwest Laboratory.
23. Fayer, M. J., and T. L. Jones. 1990. UNSAT-H version 2.0: Unsaturated soil water and heat flow model. PNL-6779, Pacific Northwest Laboratory, Richland, WA.
24. Fayer, M.J. 2000. UNSAT-H Version 3.0: Unsaturated Soil Water and Heat Flow Model, Theory, User Manual, and Examples. Pacific Northwest Lab*oratory, Richland, WA.
25. Final Remedial Action Plan (FRAP). 2008. Final Remedial Action Plan and Site Design Stabilization of Moab Title I Uranium Mill Tailings at the Crescent Junction, Utah Disposal Site. July 2008. Office of Environmental Management – Grand Junction, US Department of Energy.
26. Foxx, T.S., G.D. Tierney, and J.M. Williams. 1984. Rooting depths of plants relative to biological and environmental factors. Los Alamos National Laboratory Report, LA-10254-MS.
27. Hillel, D. 1998. Environmental Soil Physics. Academic Press, San Diego, CA.
28. ITRC. 2003. Technical and Regulatory Guidance for Design, Installation, and Monitoring of Alternative Final Landfill Covers. Interstate Technology and Regulatory Council, Alternative Landfill Technologies Team, Washington DC.
29. LANL 2003. Los Alamos National Laboratory Report LA-UR-03-8201. Investigation Work Plan for Material Disposal Area C (MDA C), Revision 1 Los Alamos National Laboratory (LANL) Environmental protection Agency (EPA) ID#NM0890010515. November 2003.
30. LANL. 2012. Corrective Measures Evaluation report for Material Disposal Area C, Solid Waste Management Unit 50-009, at Tech Area 50. EP2012-94. September 2012.
31. LANL. 2015. Los Alamos National Laboratory (LANL) Fact Sheet for Technical Area 50, Material Disposal Area C.
32. LANL. *In print*. Corrective Measures Evaluation Report for Material Disposal Area C, Solid Waste Management Unit 50-009 at Technical Area 50; Appendix F; Attachment 1.
33. LANL. 2008. Performance Assessment and Composite Analysis for Los Alamos National Laboratory, Technical Area 54, Area G, Revision 4, LA-UR-08-06764, prepared for United States Department of Energy, Los Alamos National Laboratory, Los Alamos NM, October 2008.
34. LANL. 2008. Performance Assessment and Composite Analysis for Los Alamos National Laboratory, Technical Area 54, Area G, Revision 4, LA-UR-08-06764, prepared for United States Department of Energy, Los Alamos National Laboratory, Los Alamos NM, October 2008.

35. Ligotke, M. W. 1994. Control of Eolian Soil Erosion from Waste-Site Surface Barriers, in In-Situ Remediation: Scientific Basis for Current and Future Technologies, edited by G. W. Gee, G. W. and N. R. Wing, Battelle Press, Richland, Washington, pp. 545-559.

36. Lindeburg, M. (editor) 1989. Civil Engineering Reference Manual, 5th ed. Professional Publications, Belmont, CA.

37. National Oceanic and Atmospheric Administration. NOAA Atlas 14, Volume 1, Version 5; Semiarid Southwest (Arizona, Southeast California, Nevada, New Mexico, Utah).

38. Neptune and Company, Inc., 2020. Final Report for the Area G Radiological Risk Assessment Model v1.1. Prepared for U.S. Department of Energy Environmental Management Los Alamos Field Office, Neptune Report number NAC-0144_R0.

39. Neptune and Company, Inc., 2020. Final Report for the Area G Radiological Risk Assessment Model v1.1. Prepared for U.S. Department of Energy Environmental Management Los Alamos Field Office, Neptune Report number NAC-0144_R0.

40. NUREG 1620. 2003. Standard Review Plan for the Review of a Reclamation Plan for Mill Tailings Sites Under Title II of the Uranium Mill Tailings Radiation Control Act of 1978. Final Report. U.S. Nuclear Regulatory Commission, Office of Nuclear Material Safety and Safeguards, Washington, DC.

41. NUREG 2642. 1982. Long-Term Survivability of Riprap for Uranium-Mill tailings and Covers: A Literature Review. U.S. Nuclear Regulatory Commission, Office of Nuclear Material Safety and Safeguards, Washington, DC.

42. NUREG-1623, 1999, Design of Erosion Protection for Long-Term Stabilization: U.S. Nuclear Regulatory Commission, Office of Nuclear Material Safety and Safeguards, Washington, DC.

43. NUREG-1623. 1999. Design of Erosion Protection for Long-Term Stabilization: U.S. Nuclear Regulatory Commission, Office of Nuclear Material Safety and Safeguards, Washington, DC.

44. Peck, A.J., and J.D. Watson. 1979. Hydraulic Conductivity and Flow in Non-uniform Soil. In Workshop on Soil Physics and Field Heterogeneity. CSIRO Division of Environmental Mechanics, Canberra, Australia.

45. Pemberton, E. L. and Lara, J. M., 1984, Computing degradation and local scour: U.S. Bureau of Reclamation, Technical Guideline, 48 p.

46. Rawls, WJ, DL Brakensiek, KE Saxton. 1982. Estimation of Soil Water Properties. Transactions of American Society of Agricultural Engineers (Vol. 25, No. 5, pp. 1316-1320 & 1328).

47. Ritchie, J.T., and E. Burnett. (1971). Dryland Evaporative Flux in a Semi-humid Climate, 2, Plant Influences. Agron. J. 63:56-62.

48. Rogers and Associates Engineering (1984a). “Radon Attenuation Effectiveness and Cover Optimization with Moisture Effects (RAECOM),” computer program, U.S. Nuclear Regulatory Commission, Washington, DC.

49. Rogers and Associates Engineering (1984b). "Radon Attenuation Handbook for Uranium Mill Tailings Cover System," NUREG/CR-3533, U.S. Nuclear Regulatory Commission, Washington, DC.

50. Rogers, D.B., and B.M. Gallaher. 1995. Unsaturated Hydraulic Characteristics of the Bandelier Tuff.

51. Samani, Z. A. and M. Pessarakli, 1986: Estimating Potential Crop Evapotranspiration with Minimum Data in Arizona, Transactions of the ASAE Vol. 29, No. 2, pp. 522-524.

52. Schroeder, P., C. Lloyd, and P. Zappi. 1994. The Hydrologic Evaluation of Landfill Performance (HELP) Model User's Guide for Version 3.0. U.S. Environmental Protection Agency, EPA/600/R-94/168a, Cincinnati, OH.

53. Simon, Li & Associates. 1982. Engineering Analysis of Fluvial Systems, Ft. Collins, CO.

54. Simonton, JR, CW Johnson, JW Nyhan, and EM Romney. 1985. Rainfall Simulation on rangeland Erosion Plots. Proceedings of the Rainfall simulator Workshop, January 14-15, 1985, Tucson, AZ.

55. Stephens. 2005. Borrow Source Survey for Evapotranspiration Covers at Los Alamos National Laboratory.

56. USDA. 1997. Predicting Soil erosion by Water: A Guide to Conservation Planning With the Revised Universal Soil Loss Equation (RUSLE). United States Department of Agriculture (USDA) - Agriculture Handbook Number 703. January 1997.

57. USDA. 2020. Wind Erosion Prediction System (WEPS): Technical Documentation. United States Department of Agriculture (USDA) - Agriculture Handbook Number 727. August 2020.

58. Van Genuchten, M.Th., F.J. Leij, and S.R. Yates. 1991. The RETC code for quantifying the hydraulic functions of unsaturated soils.

59. Waugh, W. J., K. L. Peterson, S. O. Link, B. N. Bjornstad, and G. W. Gee, 1994. Natural Analogs of the Long-term Performance of Engineered Covers, p. 379-409 In Gee, G. W. and N. R. Wing, editors, 1994, In-Situ Remediation, Scientific Basis for Current and Future Technologies, Part 1, The Thirty-Third Hanford Symposium on Health and the Environment, November 7-11, 1994, Battelle Press, Richland, Washington.

60. Waugh, W. Joseph, 1994. Paleoclimatic Data Application: Long-Term Performance of Uranium Mill Tailings Repositories. Workshop Proceedings: Climate Change in the Four Corners and Adjacent Regions, September 12-14, 1994 in Grand Junction, CO.

Appendix J

Vapor-Monitoring Data Collected after the Phase III Investigation at Material Disposal Area C (on DVD included with this document)

Appendix K

Groundwater Monitoring Data Collected at Material Disposal Area C from November 2012 through November 2020 (on DVD included with this document)