

LA-UR-11-2183
August 2011
EP2011-0273

2011 Interim Facility-Wide Groundwater Monitoring Plan

Prepared by the Environmental Programs Directorate

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

2011 Interim Facility-Wide Groundwater Monitoring Plan

August 2011

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EXECUTIVE SUMMARY

This Interim Facility-Wide Groundwater Monitoring Plan (hereafter, the Interim Plan) fulfills a requirement of the Compliance Order on Consent (hereafter, the Consent Order). Los Alamos National Laboratory (the Laboratory) will collect and analyze groundwater and surface water samples at specific locations and for specific constituents to fulfill the requirements of the Consent Order. Groundwater-level data will also be collected because they are critical to understanding groundwater occurrence and movement. Four types of water are monitored: base flow (persistent surface water), alluvial groundwater, intermediate-perched groundwater, and regional aquifer groundwater. This Interim Plan is updated annually and submitted to the New Mexico Environment Department (NMED) for its approval. The 2011 Interim Plan applies to the monitoring year (MY) from October 1, 2011, to September 30, 2012.

The monitoring conducted under this plan is designed to enhance the general understanding of the groundwater within and beneath the Laboratory. These data are used for characterization purposes to support corrective measures work conducted at numerous sites around the Laboratory and to support ongoing operations. The monitoring is conducted both inside and outside of current Laboratory boundaries. Monitoring within current Laboratory boundaries takes place in seven major watershed groupings: Los Alamos Canyon/Pueblo Canyon, Sandia Canyon, Mortandad Canyon, Pajarito Canyon, Water Canyon/Cañon de Valle, Ancho/Chaquehui/Frijoles Canyons, and White Rock Canyon/Rio Grande.

Most of the monitoring wells discussed in the Interim Plan are assigned to area-specific monitoring groups related to project areas that may be located in more than one watershed. Area-specific monitoring groups are defined for Technical Area 54 (TA-54) in Pajarito and Mortandad Canyons; TA-21, primarily in Los Alamos Canyon; Material Disposal Area (MDA) AB, primarily in Ancho Canyon; MDA C, primarily in Pajarito Canyon; the chromium investigation area in Sandia and Mortandad Canyons; and the TA-16 260 Outfall in Water Canyon/Cañon de Valle. Locations that are not included within one of these six area-specific monitoring groups are assigned to the General Surveillance monitoring group.

Monitoring outside the Laboratory boundaries is conducted in areas (1) where Laboratory operations have been conducted in the past (e.g., Guaje and Rendija Canyons) or (2) that historically have not been affected by Laboratory operations. To ensure water leaving the Laboratory does not pose an unacceptable risk to human and ecological receptors, this plan also includes monitoring in areas downgradient of the Laboratory and outside Laboratory boundaries (e.g., the Rio Grande and springs in White Rock Canyon).

Monitoring locations were initially derived from Table XII-5 of the Consent Order, but the current list of monitoring locations represents the most recent results of subsequent annual updates to the 2005 Interim Plan. The locations, analytical suites, and frequency of monitoring reflect the technical and regulatory status of each area-specific monitoring group.

The monitoring data collected under this plan are published in periodic monitoring reports submitted to NMED and analytical results are made available to the public in the Risk Analysis, Communication, Evaluation, and Reduction database (<http://racernm.com>). In addition, groundwater data collected by the Laboratory are reviewed monthly, and constituents exceeding any of the seven screening criteria laid out in the Consent Order, modified May 13, 2008, are reported monthly to the NMED Hazardous Waste Bureau.

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1.0 INTRODUCTION

This 2011 Interim Facility-Wide Groundwater Monitoring Plan (hereafter, the Interim Plan) for Los Alamos National Laboratory (LANL or the Laboratory) fulfills groundwater monitoring requirement IV.A.3.b of the March 1, 2005, Compliance Order on Consent (hereafter, the Consent Order). Information on radioactive materials and radionuclides, including the results of sampling and analysis of radioactive constituents, is voluntarily provided to the New Mexico Environment Department (NMED) in accordance with U.S. Department of Energy (DOE) policy.

Groundwater monitoring has been conducted at the Laboratory for over 60 yr, starting with U.S. Geological Survey (USGS) water-supply studies in 1945 and Laboratory groundwater quality monitoring in 1949. The first groundwater-monitoring network consisted of water-supply wells, several observation wells, and springs. The monitoring network continued to evolve through the years as various environmental investigations installed additional wells, primarily in the shallow alluvial systems, as potential monitoring points.

Between 1997 and 2005, the Laboratory implemented a sitewide hydrogeologic characterization program, described in the Laboratory's "Hydrogeologic Workplan" (LANL 1998, 059599). The primary objective of this characterization program was to refine the Laboratory's understanding of the area's hydrogeologic systems and to improve its ability to design and implement an integrated sitewide groundwater monitoring plan. Building upon information obtained from this and other programs, the Laboratory has subsequently refined the monitoring-network design and implementation through a series of monitoring-well network evaluation reports and the delineation of area-specific monitoring groups in this plan.

This plan consists of nine sections, including this introduction, with supporting appendixes. Sections 2 through 7 describe the monitoring and site activities conducted in six area-specific monitoring groups: Technical Area 21 (TA-21); chromium investigation; MDA C; MDAs G, H, and L at TA-54; TA-16 260 Outfall; and MDA AB. Section 8 describes general surveillance monitoring in seven major watersheds or watershed groupings: Los Alamos Canyon/Pueblo Canyon, Sandia Canyon, Mortandad Canyon, Pajarito Canyon, Water Canyon/Cañon de Valle, the combined watersheds of Ancho/Chaquehui/Frijoles Canyons, and White Rock Canyon/Rio Grande. Section 9 includes a list of references cited in this report and the map data sources.

Appendix A is the list of acronyms and abbreviations used in the report, a metric conversion table, and the definitions of data qualifiers. Appendix B presents screening results for data collected in the six area-specific monitoring groups and seven watershed groupings. Appendix C summarizes the methods and procedures used to conduct monitoring and the management of investigation-derived waste (IDW). Appendix D presents tables summarizing changes in sampling frequencies and analytical suites in each monitoring group. Appendix E summarizes how field quality assurance (QA)/quality control (QC) results are used and the types of corrective actions that may be taken to address exceedances of target measures for each QA/QC sample type. Appendix F assesses the reliability of water-quality data collected from specific monitoring-network wells. Appendix G presents geologic cross-sections of the watersheds.

1.1 Purpose

The Interim Plan will address monitoring to

- determine the fate and transport of known legacy-waste contaminants,
- quickly detect new releases to ensure groundwater protection,

- evaluate efficacies of corrective-action remedies,
- support proposed corrective measures,
- meet groundwater discharge permit requirements, and
- meet DOE Order 450.1A monitoring requirements.

These objectives collectively assist the Laboratory in determining any potential adverse impacts to surface water and groundwater resulting from Laboratory operations.

In addition, monitoring produces data required to evaluate risk and to assess regulatory compliance. Although the Interim Plan does not specifically address how the data collected will be used in those evaluations, the design of the monitoring network is based on conceptual models of potential sources, hydrogeologic pathways, and receptors. The data collected are intended to be useful in meeting reporting requirements under the Consent Order.

The primary changes in this version of the Interim Plan are the plans for converting or replacing Westbay sampling systems with purgeable sampling systems, increased focus of monitoring activities on area-specific monitoring groups for TA-54, TA-21, MDA AB, MDA C, TA-16 260 Outfall, and the chromium investigation. Section 1.6 summarizes basic sets of analytical suites and frequencies for locations assigned to area-specific monitoring groups or to general surveillance monitoring in each watershed. Updates to monitoring within each watershed or monitoring group, including changes in monitoring frequency, analytical suites, and monitoring locations, are based on the following:

- Summaries of contaminant frequency of detections (FDs) (Attachment B-1 in Appendix B on CD)
- Conceptual models in watershed investigation reports (IRs)
- Reviews of existing analytical data and trends for individual watersheds
- Reviews of water-level data to identify wells that are consistently dry and candidates for removal from the sampling plan (section 1.10)
- Changes to the monitoring-well networks over time, including the addition of newly installed monitoring wells, the rehabilitation and conversion of multiscreen wells impacted by drilling fluids to single or dual screen wells, the inclusion of several piezometers in the sampling plan, and the removal of wells recently plugged and abandoned or planned for plugging and abandonment in the near term
- Assessments of the reliability of water-quality data from selected monitoring wells (Appendix F)
- Monitoring objectives for the area-specific monitoring groups

Tables in Appendix D compare the 2010 and 2011 Interim Plans for monitoring groups, general surveillance locations, and individual sampling locations in each watershed and provide the rationale for any modifications.

1.2 Scope

The Interim Plan describes the objectives for monitoring, the locations of sampling stations, the frequency of sampling, the field measurements taken at each location, and the analytical suites included in the monitoring plan for each watershed or monitoring group.

Four occurrences of water are monitored in this plan:

- Base flow—persistent surface water that is maintained by precipitation, snowmelt, effluent, and other sources
- Alluvial groundwater—water within the alluvium in the bottom of the canyons
- Intermediate-perched groundwater—localized saturated zones within the unsaturated zone
- Regional groundwater—deep, laterally continuous groundwater beneath the Pajarito Plateau

Groundwater will be routinely monitored by collecting samples at wells and springs and by analyzing them for specific constituents. Groundwater monitoring refers to gathering data not only for water-quality analysis but also for water-level measurements. Water-level data are critical to understanding groundwater occurrence and movement and the responses of groundwater levels to recharge and to pumping of water-supply wells.

Surface water at the Laboratory is divided into the following three flow types.

- Base flow—persistent, but not necessarily perennial, stream flow. This stream flow is present for periods of weeks or longer. The water source may be effluent, springs, or shallow groundwater in canyons.
- Snowmelt—flowing water that is present because of melting snow. This type of water often may be present for several weeks or more (persistent) but in some years may not be present at all.
- Storm runoff—flowing water that is present in response to rainfall. These flow events are generally short-lived, with flows lasting from less than an hour to several days.

In some cases, depending on weather conditions, each flow type may be collected at a single location within a time span of a few days. At other times, the flow may represent a combination of these types.

Storm runoff and snowmelt monitoring is not addressed in this plan but rather through the National Pollutant Discharge Elimination System (NPDES) Individual Permit and under DOE Order 450.1A for surveillance. Base flow (persistent water) and, in some cases, persistent flow derived from snowmelt are monitored under the Interim Plan.

Monitoring under the Interim Plan will take place in area-specific monitoring groups within seven major watershed groupings: Los Alamos Canyon/Pueblo Canyon, Sandia Canyon, Mortandad Canyon, Pajarito Canyon, Water Canyon/Cañon de Valle, the combined watersheds of Ancho/Chaquehui/Frijoles Canyons, and White Rock Canyon. Monitoring outside the Laboratory boundary is conducted to collect baseline data in areas that have been affected by past Laboratory operations (e.g., Guaje and Rendija Canyons) or that have not been affected by Laboratory operations. To ensure water leaving the Laboratory boundaries does not pose an unacceptable risk, this plan also includes monitoring in areas off-site that have the potential to be impacted by the Laboratory (e.g., the Rio Grande and springs in White Rock Canyon). Figure 1.2-1 shows the areas included in this Interim Plan.

The Interim Plan is updated annually to incorporate new information collected during the previous year. Locations, analytes, and sampling frequencies will be evaluated and updated as appropriate to ensure adequate monitoring and to ensure monitoring objectives for the individual monitoring groups continue to be met. Information gained through characterization efforts, aquifer test results, water-level monitoring, network assessments, and water-quality data will be used to refine the monitoring plan for each monitoring group. In addition, the need for sampling of analytes previously eliminated from sampling in

various monitoring groups will be reevaluated during the development of the annual updates to the Interim Plan.

1.3 Reporting

The data collected under this Interim Plan are submitted to NMED in periodic monitoring reports (PMRs) in accordance with Section IV.A.6 of the Consent Order and per subsequent agreements with NMED on the frequency of reporting. The data in reports submitted to NMED are independently maintained and are made available to the public in the Risk Analysis, Communication, Evaluation, and Reduction (RACER) database as the data are received from the analytical laboratory (available at <http://racernm.com/>), subject to the protocol stipulated in the memorandum of understanding (MOU) regarding the release of monitoring data collected from locations on Pueblo of San Ildefonso lands.

The PMRs present groundwater and base-flow data and are submitted to NMED in accordance with Consent Order requirements. Each PMR includes all available watershed monitoring data, along with the previous three rounds of data.

1.4 Regulatory Context

This Interim Plan fulfills groundwater monitoring requirements of the Consent Order as described in section 1.0. In addition to the Consent Order, the Laboratory is required to perform groundwater monitoring to satisfy other regulatory requirements, as summarized below. The Laboratory has an integrated approach to monitoring groundwater, and many of the other regulatory requirements discussed below are fulfilled through the implementation of the monitoring performed under the Interim Plan.

1.4.1 New Mexico Water Quality Control Commission Regulations

Currently, the TA-46 Sanitary Wastewater Systems (SWWS) Plant operates under a groundwater discharge permit (discharge plan number DP-857) issued by NMED pursuant to 20.6.2 New Mexico Administrative Code (NMAC). Sampling locations, monitoring frequencies, and reporting requirements are specified in the NMED-approved DP-857, under which the Laboratory conducts quarterly sampling at two NPDES outfalls, the SWWS Plant reuse wet well, and CdBO-6, an alluvial monitoring well located in Cañada del Buey. Monitoring under DP-857 began when the SWWS Plant opened in 1993 and is expected to continue indefinitely, with appropriate modifications made as discharge conditions change over time. The plan was renewed in 1998, and a second request for plan renewal was submitted to the NMED in 2002.

At the request of the NMED Ground Water Quality Bureau, the Laboratory submitted a groundwater discharge plan application (DP-1132) for the TA-50 Radioactive Liquid Waste Treatment (RLWTF) facility in 1996. While NMED's approval of the plan is still pending, since 1999, the Laboratory has conducted voluntary monitoring and quarterly reporting under the pending plan. Sampling locations for monitoring groundwater under DP-1132 are MCO-3, MCO-4B, MCO-6, and MCO-7, alluvial monitoring wells located in Mortandad Canyon.

1.4.2 DOE Environmental Protection Programs

Groundwater monitoring has been conducted in compliance with DOE orders related to environmental protection. DOE Order 450.1A requires an environmental management system at DOE facilities to include surveillance groundwater monitoring and reporting. Surveillance monitoring has been conducted at the Laboratory since the 1970s under previous DOE orders, and the results are documented in annual

reports. Currently, the Laboratory conducts groundwater-surveillance monitoring from wells located within the Laboratory boundary and at off-site locations. These wells include alluvial, perched-intermediate, and regional aquifer wells. Some of the off-site monitoring is performed under cooperative agreements with Los Alamos County, which owns and operates water-supply wells within and near the Laboratory, and with the City of Santa Fe. Additional monitoring is performed under an MOU among DOE, the Bureau of Indian Affairs, and the Pueblo of San Ildefonso. The results of surveillance monitoring are reported in annual environmental reports and the RACER database. The environmental reports contain descriptions of the surveillance monitoring network, key results and trends, and the QA/QC program.

1.4.3 Hazardous Waste Facility Permit

Several waste management units at the Laboratory are regulated units under the Resource Conservation and Recovery Act (RCRA). Because these regulated units are addressed through the alternative requirements provision in 40 Code of Federal Regulations (CFR) 264.110(c), groundwater monitoring is not included under the Laboratory's Hazardous Waste Facility Permit. The groundwater-monitoring requirements for these units are addressed under the groundwater-monitoring provisions of the Consent Order, including implementation of the Interim Plan.

1.5 Integration of Groundwater Monitoring at the Laboratory

All groundwater monitoring under the Interim Plan is conducted as an integrated activity that uses the same operating procedures, field sampling and analytical contracts, and data-management systems. For chemical analysis of water samples, the Laboratory uses commonly accepted analytical methods called for under federal regulations (such as the Clean Water Act) and approved by the U.S. Environmental Protection Agency (EPA). The Laboratory is responsible for obtaining analytical services that support monitoring activities. Samples for laboratory analysis are submitted to accredited contract laboratories. The analytical laboratory statement of work provides contract laboratories the general QA guidelines and includes specific requirements and guidelines for analyzing water samples. The contract laboratories are required to establish method detection limits (MDLs) and practical quantitation limits (PQLs) for target analytes.

Appendix C includes summaries of the procedures followed to measure water levels and collect water samples (sections C-1.0 and C-2.0) and to measure field parameters (section C-3.0). Field procedures follow guidelines from USGS water sample collection methods and industrial standards common to environmental sample collection and field measurements. The analytical methods, PQLs, and applicable background or screening levels used for each analyte are listed in section C-4.0. The management of IDW is discussed in section C-5.0.

1.6 Approach to Monitoring Network Design

The interim nature of this monitoring plan reflects an evolving monitoring network at the Laboratory. The groundwater data collected under this plan are used for subsurface characterization, groundwater monitoring network evaluation, and support of corrective measures.

For the 2010 Interim Plan, monitoring groups were established to address monitoring requirements for locations within specific project areas (LANL 2010, 109830). These monitoring groups are shown in Plate 1 and include the following (the watersheds in which the monitoring area is located are given in parentheses):

- TA-21 (Los Alamos Canyon)
- TA-54 (Pajarito and Mortandad Canyons)

- MDA C (Mortandad Canyon)
- Chromium investigation (Sandia and Mortandad Canyons)
- TA-16 260 Outfall (Pajarito and Water Canyons and Cañon de Valle)
- MDA AB (Ancho and Water Canyons)

Monitoring locations outside of the seven area-specific monitoring groups delineated above are included in a general surveillance monitoring group, which includes locations in all seven major watershed groupings (Los Alamos Canyon/Pueblo Canyon, Sandia Canyon, Mortandad Canyon, Pajarito Canyon, Water Canyon/Cañon de Valle, the combined watersheds of Ancho/Chaquehui/Frijoles Canyons, and White Rock Canyon).

The locations, analytical suites, and frequency of monitoring for each monitoring group reflect the state of knowledge for a given project area, including what contaminants have been released and the nature and extent of the contaminants released. Much of the information underlying the design of the monitoring plan is presented in IRs and is supported by the FD tables in Appendix B of this Interim Plan.

Recommendations for the analytical suites for each watershed and locations within the watershed were determined by evaluating past Laboratory operations, investigation-derived information, and monitoring results. For this Interim Plan, updates to monitoring are made for all monitoring groups based on the adequacy of data to support the modifications to suite and the frequency. Data from 2005 to 2010 were screened to compare with one-half the lowest applicable standard (see Table 1.6-1). This period of record was selected for this version of the plan to provide a sufficiently robust data set to evaluate FD and time-series trends, if applicable. The analytical data screening results are summarized in tables in Attachment B-1 of Appendix B (on CD).

Table 1.6-2 summarizes analytical suites, and sampling frequencies for each type of sampling location (e.g., base flow, alluvial, intermediate, regional, or springs) within each area-specific monitoring group. Table 1.6-3 summarizes the analytical suites and sampling frequencies for general surveillance monitoring locations (locations not assigned to area-specific monitoring groups) within each watershed. The analytical suites and frequencies are tailored to each watershed and sampling location based on the adequacy of the data record, the status of investigations and maturity of the conceptual model, the nature of watershed contaminant sources and the history of detections, as documented in more detail in sections 2 to 8 and in Appendix D. Analytical suites assigned to existing (pre-2010) wells within watersheds and investigation areas are based on the results of applicable IRs and a review of ongoing monitoring data, as presented in the statistical summaries of detections in Attachment B-1 of Appendix B (on CD). The assignment of specific analytical suites to a well also reflects data needs for pending corrective measures evaluations (CMEs). Tables 1.6-2 and 1.6-3 also list characterization suites and sampling frequencies for newly installed wells (wells installed on or after October 1, 2010). New wells will be sampled for at least four quarters for the characterization suite for new wells presented in Tables 1.6-2 and 1.6-3.

Exceptions to the analytical suites and sampling frequencies presented in Tables 1.6-2 and 1.6-3 occur in some cases. These exceptions may be the result of a number of factors such as additional regulatory or permit requirements and sampling commitments outlined in the MOU with the Pueblo of San Ildefonso.

Exceptions to the default analytical suites and sampling frequencies may also be made for wells affected by residual drilling or construction products, recently rehabilitated wells, and other wells known to produce nonrepresentative water-quality data or for which the reliability of the data has not yet been established or may be questioned. These cases are assigned analytical suites based on the results of the reliability assessment protocols described in Appendix F. These results are used to guide the selection of

monitoring suites with respect to well performance for the specific monitoring objectives within the relevant network. For example, if a well shows indications that some or all data may not be adequately representative of actual conditions within the aquifer from the effects of drilling fluids, time-series samples may be collected during an extended purge to provide insights on the nature and extent of in situ conditions. Alternatively, the well may be assigned a limited set of key constituents tailored to address its network monitoring objectives.

Appendix D documents changes in sampling frequencies and analytical suites for each monitoring location in each monitoring group and provides rationales for changes in the 2011 Interim Plan compared with the 2010 Interim Plan (LANL 2010, 109830).

1.7 Data-Screening Process

This section describes the process for screening the monitoring data. The purpose of the screening is to identify analytical parameters that guide the assignment of analytical suites and monitoring frequencies in each monitoring group.

The results of the screening for all locations in each monitoring group are used to update the monitoring for that group. The results of the data-screening process and statistical summaries are presented in Appendix B. The data-screening process consists of compiling the water-quality data set, determining detection status, screening the data against applicable standards, and producing summary statistics to identify constituents of potential concern in each watershed. Table B1-1 (groundwater) and Table B1-2 (surface water) in Attachment B-1 of Appendix B (on CD) present summary statistics for each water type and analytical suites based on data compiled for individual locations in Table B1-3 (groundwater) and Table B1-4 (surface water).

Table 1.6-1 presents the regulatory standards for the various water sample types by screening category. The data results were screened against the lowest applicable regulatory standard or risk-based value in the tables in Attachment B-1 of Appendix B. The standards that apply depend on the type of field preparation conducted during collection (filtered or unfiltered) and the type of the water (i.e., groundwater or persistent surface water). Each combination of water type/field preparation is referred to as a screening category. The standards for filtered samples are those applicable to the dissolved fraction, and standards for unfiltered samples are those applicable to the total concentration in nonfiltered samples. The terms “nonfiltered” and “unfiltered” are used interchangeably in this document.

For screening purposes, laboratory and field QC samples were removed from the statistical analysis. The detection status for an analytical result was established using the combined set of laboratory-assigned validation qualifiers and reason codes assigned during data validation (Appendix E).

The screening tables presented in Attachment B-1 of Appendix B (on CD) were used to identify constituents of potential concern and to optimize the monitoring strategy for each watershed. Groundwater and base-flow data from 2005 to 2010 are screened against one-half the lowest applicable regulatory standards or other risk-based screening levels (presented in Table 1.6-1) and against appropriate groundwater background values, if available. The screening tables are organized by contaminant type in each water type (e.g., spring, perennial base flow, regional aquifer) within each monitoring group.

The screening tables in Attachment B-1 include summary information such as the total number of samples collected for each analyte; the numbers of detections and nondetects; the minimum, mean, and maximum values for detections of each analyte; and comparisons with background values (if available) and with regulatory standards. The tables also list sampling locations where the lowest applicable

regulatory standards are exceeded. Additional details regarding the screening tables are presented in the introduction to Appendix B.

1.8 Sampling Frequency and Schedule

The Interim Plan proposes monitoring frequencies for each monitoring group as described in the sampling tables in sections 2 through 8. For newly installed wells (i.e., those installed on or after October 1, 2010), the monitoring frequency and characterization suite are quarterly for target analyte (TAL) metals, volatile organic compounds (VOCs), radionuclides, tritium, general inorganic chemicals, perchlorate, and field parameters to characterize potential variability in constituent concentrations. Less mobile constituents such as semivolatile organic compounds (SVOCs), pesticides, polychlorinated biphenyls (PCBs), and dioxins/furans may be sampled semiannually in new wells. High explosive (HE) compounds may be sampled quarterly if known or suspected to be present and semiannually if the watershed has a history of nondetects.

Monitoring locations that are being used or are candidates for the determination of background water quality for the regional and perched-intermediate aquifers are indicated as such in the sampling table for each monitoring group. Appendix D documents the rationale for those cases in which the sampling frequency for a background location deviates from the sampling frequency for the monitoring group to which the location belongs.

Wells considered “new wells” in this plan will be monitored quarterly for the full suite of characterization data throughout MY2011, even after four quarters of data have been collected. The sampling frequency and analytical suite for wells no longer considered “new wells” are based on several factors, including the maturity of the characterization within a watershed, the presence of key contaminants, the temporal trends of those contaminants, and the rate of change.

This Interim Plan is implemented from October 2011 to September 2012. Table 1.8-1 presents a proposed sampling schedule. Following submittal of this Interim Plan to NMED, a finalized sampling schedule for each monitoring group or watershed will be established to ensure the monitoring frequency is met during the implementation year of the plan. A PMR for the periodic monitoring event conducted during first quarter of MY2012 (sampling conducted from October to December 2011) will be submitted on May 31, 2012. A PMR for second quarter of MY2012 (sampling conducted from January to March 2012) will be submitted on August 31, 2012. A PMR for the third quarter MY2012 (sampling conducted from April to June 2012) will be submitted on November 30, 2012. A PMR for the fourth quarter MY2012 (sampling conducted from July to September 2012) will be submitted on February 28, 2013.

The Consent Order requires all monitoring wells within a watershed be sampled within 21 d of the start of the groundwater sampling event. For the 2011 Interim Plan, monitoring groups for project areas have effectively replaced the watersheds, and monitoring for the individual monitoring groups, with the exception of the general surveillance monitoring group, will be completed within 21 d.

For monitoring purposes, the general surveillance group has been divided into three subgroups, based on watershed. The general surveillance north group includes locations within Los Alamos, Pueblo, Sandia and Guaje Canyons, while the general surveillance south group includes locations within Mortandad, Pajarito, Water/Cañon de Valle, Ancho, and Frijoles Canyons. Monitoring of the general surveillance north and south groups will be completed within 30 d. Monitoring of the White Rock Canyon general surveillance group will be completed within 21 d.

1.9 Water-Level Monitoring

The majority of monitoring wells sampled are equipped with pressure transducers to measure and record water levels to aid in understanding the hydrologic system. Pressure transducers are typically set to record on an hourly basis. Manual water-level measurements are also collected on a regular basis to verify the pressure transducer data.

The water-level data collected using the automated pressure transducers address the requirement of Section IX.B.2.h.i of the Consent Order to measure groundwater levels in all wells in a given watershed within 24 h. These data are available for any 24-h period and, therefore, meet the requirement for these measurements to be completed across all watersheds within 14 d of the commencement of the specified water-level measuring event as required by the Consent Order. Water levels are monitored in a number of wells and/or well screens that are not sampled under the Interim Plan. In some cases, these locations have historically been dry, but a technical basis may exist for continued monitoring of potential water at the location to develop or confirm conceptual models. In other cases, the wells may have water but no technical rationale exists to collect samples from the wells (for example, other nearby or collocated wells are already being sampled). Groundwater levels are also monitored in Los Alamos County water-supply wells in cooperation with Los Alamos County utilities personnel and in the Buckman Well Field in cooperation with the City of Santa Fe.

Groundwater-level monitoring data for Laboratory wells and for Los Alamos County water-supply wells are published in an annual groundwater-level status report (e.g., Koch and Schmeer 2010, 108926). This report presents time-series hydrographs of groundwater-level data along with pertinent construction and location information for each well.

1.10 Wells That Are Historically Dry

Wells that are historically dry are either checked manually or are monitored with pressure transducers, depending on project requirements or monitoring objectives. Wells that have been dry for 4 yr or more are removed from the list of wells to be monitored, except for a few wells in key locations (Table 1.10-1). Wells that intermittently show water (in response to large snowmelt years or precipitation events) will continue to be monitored for water levels using transducers and will be sampled if sufficient water is present during their respective watershed's sampling campaign. New wells that are dry will be retained in the monitoring plan to evaluate potential wetting responses and temporal changes in water levels. These wells may be sampled if water is present during a scheduled sampling campaign for the monitoring group in which these wells are located. If the wells continue to remain dry during subsequent years of monitoring with transducers, they may be removed from the Interim Plan.

1.11 Stable Isotope Sampling

Samples for analysis of stable isotopes of nitrogen, deuterium, and oxygen have been collected in recent years at many of the locations monitored under the Interim Plan. The data are used to refine conceptual models for groundwater flow and transport.

For the 2011 Interim Plan, stable isotope data for nitrogen, deuterium, and oxygen will be collected for four monitoring groups:

- TA-21 (Los Alamos Canyon)
- TA-54 (Pajarito and Mortandad Canyons)

- Chromium investigation (Sandia and Mortandad Canyons)
- MDA C (Mortandad Canyon)

Stable isotope data for nitrogen, deuterium, and oxygen will be collected for select monitoring locations in these monitoring groups to complement ongoing investigations at these sites. The stable isotope data will generally be collected at locations within these groups where fewer than four rounds of stable isotope data have been collected in the past. Additional isotope data may be collected at select locations within these groups (including those with more than four rounds of data) to further refine the conceptual models for groundwater flow and transport. Stable chromium isotope data will be collected from selected wells in the chromium investigation monitoring group.

2.0 TA-21 MONITORING GROUP

2.1 Introduction

The TA-21 monitoring group is located in and around TA-21 and is primarily located in upper Los Alamos Canyon (Figure 2.1-1). The group includes monitoring wells completed in the perched-intermediate groundwater and in the regional aquifer.

TA-21 is located on the mesa north of Los Alamos Canyon, which is joined by DP Canyon, east of TA-21. TA-21 consists of two historically operational areas, DP West and DP East, both of which produced liquid and solid radioactive wastes. The operations at DP West included plutonium processing, while the operations at DP East included the production of weapons initiators and tritium research.

2.2 Background

The occurrence of surface water and alluvial, perched-intermediate, and regional groundwater in Los Alamos Canyon is discussed in detail in section 7.2 of the Los Alamos and Pueblo Canyons IR (LANL 2004, 087390).

In upper Los Alamos Canyon, perennial flow originates from springs and interflow through hillslope soils. The downgradient extent of perennial flow varies but generally terminates in the upper portions of Los Alamos Canyon west of TA-41. The remainder of upper Los Alamos Canyon down to the confluence with Pueblo Canyon is characterized by intermittent surface water flow that is seasonally dependent. Within the vicinity of TA-21, surface water occurs predominantly as ephemeral flow in Los Alamos and DP Canyons. Ephemeral surface water flows generally occur during runoff associated with thunderstorms and snowmelt.

In the vicinity of TA-21, alluvial groundwater occurs in Los Alamos Canyon and in stretches of DP Canyon. DP Canyon is typical of other dry canyons (Birdsell et al. 2005, 092048) based on its small drainage area and low-elevation headwaters. However, it previously received effluent discharges operations at TA-21 [Solid Waste Management Unit (SWMU) 21-011(k)]. It currently receives surface runoff from paved parking lots and roadways from within the Los Alamos townsite. These townsite runoff sources contribute to locally persistent alluvial groundwater beneath parts of the canyon floor, specifically the portion adjacent to TA-21. There, alluvial deposits are thin (approximately 2 m [6 ft]) and are periodically recharged by surface water flows that reach this part of the canyon. Surface water infiltrates the canyon bottom alluvial sediments until its downward movement is impeded by strata of lower permeability, typically welded tuff at the top of unit Qbt 2 of the Tshirege Member. Despite the episodic nature of surface water flow and thin nature of the alluvial deposits, transducer readings at alluvial well LAUZ-1 indicate the alluvium in this part of the canyon was continuously saturated from January 2008 to

January 2010 (Koch and Schmeer 2010, 108926), suggesting the underlying welded tuffs are an effective perching horizon that inhibits deeper infiltration.

Appendix D of the Technical Area 21 Groundwater and Vadose-Zone Monitoring Well Network Evaluation and Recommendations report (LANL 2010, 109947) describes known occurrences of intermediate-perched water beneath Los Alamos and Pueblo Canyons. Perched-intermediate zones nearest TA-21 are shown on the geologic cross-sections presented in Appendix G.

Perched-intermediate groundwater beneath Los Alamos and Pueblo Canyons results from infiltration of surface water and alluvial groundwater derived from snowmelt and seasonal rainfall. Surface water in Pueblo Canyon was previously augmented by effluent released from the Pueblo Canyon wastewater treatment plant (WWTP) from 1951 to 1991 and the Central WWTP from 1947 to 1961. Perched-intermediate groundwater beneath lower Pueblo Canyon includes contributions of canyon-floor effluent infiltration from the Bayo WWTP that operated from 1963 to 2007 and the Los Alamos WWTP that began operations in 2007.

The most significant perched-intermediate groundwater in the vicinity of TA-21 occurs within the Guaje Pumice Bed and the underlying Puye Formation beneath Los Alamos Canyon. Near TA-21, saturated thicknesses for these occurrences range from about 9 ft at LADP-3 to more than 31 ft at LAOI-3.2a. The depth to perched-intermediate groundwater ranges from 124 ft to 746 ft. These perched groundwater occurrences are probably part of a larger integrated system that extends over 3.5 mi along the axis of Los Alamos Canyon from H-19 to LAOI-3.2 and LAOI-3.2a and may locally extend to the south (Appendix G).

Based on these observations, it appears an important control of intermediate-zone groundwater flow in the vicinity of TA-21 is the contact between the Guaje Pumice Bed and the underlying Puye Formation. Structure contours indicate the downdip direction for the base of the Guaje Pumice Bed is towards the south, southeast, and southwest in the vicinity of TA-21. The control exerted on groundwater flow by the Guaje Pumice Bed suggests that perched water beneath Los Alamos Canyon should move generally southward away from TA-21.

The occurrence of thicker perched-intermediate zones in the eastern part of Los Alamos Canyon may be the result of enhanced infiltration where the canyon floor is underlain by Cerros del Rio basalts rather than by the Bandelier Tuff. Because the Cerros del Rio basalt does not extend as far west as the developed portion of TA-21, it is unlikely the eastern perched zones of Los Alamos Canyon extend beneath the TA-21 area. No perched-intermediate groundwater has been encountered to date during drilling on DP Mesa.

The regional aquifer includes confined and unconfined zones. The shallow portion of the regional aquifer is predominantly unconfined, and the deeper portion of the aquifer is predominantly confined. Groundwater flow in the shallow portion of the regional aquifer generally follows the gradient of the water table. The deep portion of the regional aquifer is predominantly under confined conditions that are affected by Pajarito Plateau water-supply pumping.

In the vicinity of TA-21, the upper surface of the regional aquifer is located in the Puye Formation and in the Santa Fe Group. The depths to water range from 707 ft to 1159 ft below ground surface (bgs) (Koch and Schmeer 2010, 201566). The regional aquifer beneath the east end of DP Mesa occurs at a depth of 1159 ft bgs, based on water levels measured in well R-6. Shallow regional groundwater in the vicinity of TA-21 generally flows to the east-northeast.

Contaminant Sources and Distributions

Primary sources of contaminants in the vicinity of the TA-21 monitoring group include SWMU 21-011(k) and the adsorption beds and disposal shafts at MDA T, DP West, and waste lines and sumps. Other potential sources include DP East and a diesel spill.

Mobile contaminants, such as tritium, nitrate, and perchlorate, released at the SWMU 21-011(k) outfall have dispersed down DP and Los Alamos Canyons by surface water and alluvial groundwater. They are present in perched-intermediate groundwater near the confluence of DP and Los Alamos Canyons (at wells R-6i, LAOI-3.2, and LAOI-3.2a), farther down Los Alamos Canyon (at LAOI-7 and R-9i), and beneath Mesita de Los Alamos (at R-53i).

The lower reach of DP Canyon is the likely infiltration location for mobile contaminants such as tritium, nitrate, and perchlorate that are detected in perched groundwater at R-6i, LAOI-3.2, and LAOI-3.2a. Infiltration at the confluence with DP Canyon (near wells LAOI-3.2/LAOI-3.2a) may be further enhanced by surface water runoff and alluvial groundwater in Los Alamos Canyon, contributing to the deeper, perched-intermediate zones observed beneath the confluence of the two canyons. The zones of perched-intermediate groundwater occur within the Guaje Pumice Bed and the underlying Puye Formation near the confluence of the two canyons.

Contaminant concentrations are at background levels in regional groundwater monitoring wells in the near vicinity of TA-21 (e.g., R-6 and R-8), suggesting deep infiltration through the vadose zone, including migration from perched groundwater, does not reach the regional aquifer near TA-21. This observation is also supported by the absence of tritium in the regional screen in R-7, although the absence of nitrate and perchlorate at this location is not conclusive because of reducing conditions in the screened interval that may be attributed to residual organic drilling products. The regional aquifer at Test Well (TW) 3 shows levels of contamination above background, but this may be related to leakage around the well casing from the absence of annular seal in this older well. The well is scheduled to be plugged and abandoned. Tritium and perchlorate are slightly elevated in the regional aquifer at R-9, which is located farther down Los Alamos Canyon. These far-field contaminants may have originated at SWMU 21-011(k).

2.3 Monitoring Objectives

The monitoring objectives for the TA-21 monitoring group presented in this Interim Plan are based in part on the results and conclusions presented in the Los Alamos and Pueblo Canyons IR (LANL 2004, 087390) as well as on the NMED-approved Los Alamos and Pueblo Canyons Groundwater Monitoring Well Network Evaluation and Recommendations, Revision 1 (LANL 2008, 101330).

Sampling over the last few years has generated a substantial data set from perched-intermediate and regional groundwater wells located in and next to Los Alamos Canyon. Data from these wells indicate the importance of lateral migration of perched-intermediate groundwater and regional groundwater flow directions. This information can lead to a groundwater monitoring domain that may extend beyond the footprint of a watershed where the initial release occurred.

Monitoring for TA-21 is focused on intermediate-perched and regional wells surrounding the TA-21 area that monitor for potential releases from mesa-top sites and the fate of mobile constituents historically released into DP Canyon from SWMU 21-011(k). The key constituents observed in nearby perched-intermediate and regional groundwater wells include nitrate, perchlorate, and tritium. Base-flow and alluvial-groundwater wells near and downgradient of TA-21 are not part of the TA-21 monitoring group because the source(s) of constituents observed in these wells is terminated or controlled and residual concentrations are stable, declining, or no longer present.

2.4 Scope of Activities

Active monitoring locations in the TA-21 monitoring group include intermediate-perched groundwater wells and regional groundwater wells, which are shown in Figure 2.1-1. All the monitoring locations are in the Los Alamos Canyon/Pueblo Canyon watershed.

Table 2.4-1 presents sampling locations, the rationale for these locations, analytical suites, and frequencies for the TA-21 monitoring group. Analytical suites and frequencies assigned to individual locations listed in Table 2.4-1 generally follow the high-level monitoring design presented in Table 1.6-2 for the TA-21 monitoring group. These analytical suites and frequencies are based on the results of applicable IRs and a review of ongoing monitoring data, such as the statistical summaries for locations in the TA-21 monitoring group provided in the FD screening tables in Attachment B-1 of Appendix B (on CD).

Exceptions to the analytical suites and sampling frequencies presented in Table 1.6-2 may occur for some locations listed in Table 2.4-1. The rationale for any exceptions is documented in Table D-2.0-3.

2.5 Modifications to the 2010 Interim Plan

Changes to monitoring locations for the TA-21 monitoring group in the 2011 Interim Plan as compared with the 2010 Interim Plan include the following:

- The sampling frequency for the TA-21 monitoring group was changed from semiannual to annual.
- New regional wells R-64, R-65, and R-66 were added to the TA-21 monitoring group. R-64 was completed July 11, 2011. Scheduled completion dates for R-65 and R-66 are October 30, 2011 and December 20, 2011, respectively. Monitoring well R-5 was added to the TA-21 monitoring group.
- Sampling of well R-7 screen 3 is suspended because of impacts of residual drilling products. TW-3 was removed from the Interim Plan because of its noncompliant construction. This well is scheduled to be plugged and abandoned by December 2011 (LANL 2011, 111605).
- Deep groundwater wells LAOI-7, R-8, R-9, R-9i, and R-12 were moved to the general surveillance monitoring group.

3.0 CHROMIUM INVESTIGATION MONITORING GROUP

3.1 Introduction

The chromium investigation monitoring group is located in Sandia and Mortandad Canyons (Figure 3.1-1). Monitoring focuses on the characterization and fate and transport of chromium contamination in perched-intermediate groundwater and within the regional aquifer. The distribution of wells in the monitoring group also addresses historical releases from the RLWTF in the Mortandad Canyon watershed,

Sandia Canyon heads on Laboratory property within TA-03 at an elevation of approximately 7300 ft and trends east-southeast across the Laboratory, Bandelier National Monument, and San Ildefonso Pueblo. Sandia Canyon empties into the Rio Grande in White Rock Canyon at an elevation of 5450 ft. The area of Sandia Canyon watershed is approximately 5.5 mi². The head of the canyon is located on the Pajarito Plateau at TA-03. Perennial stream flow and saturated alluvial aquifer conditions occur in the upper and middle portions of the canyon system because sanitary wastewater and cooling tower effluent discharge

to the canyon from operating facilities. A wetland of approximately 7 acres has developed as a result of the wastewater and cooling tower effluent discharge. The only known perennial spring in the watershed (Sandia Spring) is located in lower Sandia Canyon near the Rio Grande. TAs located in the Sandia Canyon watershed include TA-03, TA-53, TA-60, TA-61, TA-72, and former TA-20. A total of 264 SWMUs and AOCs are located within these TAs.

Mortandad Canyon is an east-to-southeast trending canyon that heads on the Pajarito Plateau near the main Laboratory complex at TA-03 at an elevation of 7380 ft (Figure 1.2-1). The drainage extends about 9.6 mi from its headwaters to its confluence with the Rio Grande at an elevation of 5440 ft. The canyon crosses Pueblo of San Ildefonso land for several miles before joining the Rio Grande (LANL 1997, 056835). The Mortandad Canyon watershed is located in the central portion of the Laboratory and covers approximately 10 mi². Pueblo of San Ildefonso lies immediately next to a portion of the Laboratory's eastern boundary and includes the eastern end of Mortandad Canyon. The Mortandad Canyon watershed contains several tributary canyons that have received contaminants released during Laboratory operations. The most prominent tributary canyons include Ten Site Canyon, Pratt Canyon, Effluent Canyon, and Cañada del Buey.

3.2 Background

Sources of surface water in the Sandia watershed are currently dominated by effluent releases. Effluent water releases to Sandia Canyon have occurred since the early 1950s and continue today, with the primary sources being treated sanitary wastewater and cooling tower blowdown. Data from 2007 and 2008 indicate the NPDES outfalls contribute approximately 75% of the total surface water flow in Sandia Canyon, with stormwater runoff and snowmelt contributing the remainder (LANL 2008, 102996, Appendix C).

The long-term discharges and runoff support a wetland near the head of Sandia Canyon. Persistent surface flow occurs through the wetland and into the narrow, bedrock portion of the upper canyon. Surface water flows past gage E124 typically only during times of high alluvial groundwater levels, increased effluent volume, or during stormwater runoff events.

Surface water in Mortandad Canyon is ephemeral and occurs infrequently in lower Mortandad Canyon. The lower canyon is characterized by a broad flat canyon floor with an indistinct drainage system. It contains thick alluvial deposits (up to 30 m [100 ft]) that rapidly accommodate the rare surface water flows that reach this part of the canyon. Surface water is rarely observed below the confluence with Ten Site Canyon.

In lower Mortandad Canyon from the San Ildefonso boundary to the Rio Grande, flow originates from local rainfall events and from tributaries entering Mortandad Canyon below the Laboratory boundary. Although no documented flow measurements in this reach are available, the stream channel shows evidence of at least occasional flow in places, and tributaries like Cedro Canyon have likely drained runoff locally into lower Mortandad Canyon. Flow is ephemeral only to the confluence of Cañada del Buey. Intermittent or perennial flow occurs from the Cañada del Buey confluence to the Rio Grande, supported by White Rock WWTP discharges.

Alluvial groundwater in Sandia Canyon is recharged daily by surface-water flow, largely supplied by effluent from Outfall 001 and periodically by stormwater. This groundwater generally accumulates in the lower part of the alluvial deposits that fill the canyon bottom, most often perching on or within shallow bedrock units. The alluvial groundwater body extends farther downcanyon (roughly more than 1 km [0.6 mi] farther east) than do the daily stream-flow events.

Alluvial saturation occurs approximately between alluvial wells SCA-2 and well SCA-5, with the most persistent perched alluvial groundwater occurring between alluvial wells SCA-2 and SCA-4.

In Mortandad Canyon (LANL 2006, 094161), alluvial groundwater storage is limited in the upper reaches but increases downcanyon in wider, thicker alluvial deposits (LANL 2006, 094161). Small outfall and runoff sources in upper Effluent Canyon create localized areas of surface water and possibly minor alluvial groundwater. The extent of alluvial saturation in Mortandad Canyon is historically variable and depends primarily on variations in runoff and effluent volume.

A zone of perched-intermediate groundwater occurs within the Puye Formation on top of the Cerros del Rio basalt between well SCI-1 and borehole SCC-4, where it ranged from approximately 1 ft to 25 ft thick, and generally thinned to the west. This perched zone is probably recharged by percolation of alluvial groundwater through the underlying bedrock units before perching on top of the basalt. The perching layer for this perched-intermediate groundwater is the top of the Cerros del Rio basalt. A local depression occurs in the upper basalt surface in the vicinity of nearby well SCI-2, which may control the accumulation of perched water in this area. The top of the Cerros del Rio basalt also acts as a perching horizon at perched-intermediate wells MCOI-4 and MCOBT-4.4 in Mortandad Canyon, indicating this contact has favorable characteristics for perching groundwater over a wide area.

A second perched-intermediate zone is penetrated by well SCI-2 within fractured lavas and interflow breccias in the lower part of the Cerros del Rio basalt. The thickness of the perched zone is uncertain but ranges between 45 ft and 100 ft. The lava flows hosting the perched groundwater at well SCI-2 were deposited over a south to south-southeast dipping surface that developed on top of the Puye Formation. The nature of the perching horizon at the base of these basalts is poorly understood but may include relatively impermeable sedimentary rock of the Puye Formation and clay altered flow-base volcanic sediment at the base of the Cerros del Rio basalt that occurs at a depth of 629 ft (LANL 2009, 105296).

Lack of perched water in the Cerros del Rio basalt at wells R-28 and R-42 in Mortandad Canyon may indicate that the perched groundwater drained from the basalts and infiltrated the underlying Puye Formation, eventually reaching the regional aquifer in the area between wells SCI-2 and R-28/R-42.

During drilling of well R-10a, intermediate-perched groundwater was encountered between 330 ft and 370 ft depth in silts and arkosic sands sandwiched between thick massive lavas of the Cerros del Rio basalt. The water level in this zone was 304 ft, indicating the groundwater was confined. Well R-10a and its companion well R-10 were completed in the regional aquifer. However, perched-intermediate groundwater was not encountered at regional wells R-11, R-35a, R-35b, R-36, R-28, R-44, or R-45, indicating that the perched zones at wells SCI-1 and SCI-2 are not connected with those observed in R-12 and R-10/10a. The inferred connection between the perched-intermediate systems at wells R-10/10a and R-12 is based on their similar settings within the Cerros del Rio basalt, their similar groundwater elevations, and their relatively close proximity.

The regional aquifer beneath Sandia Canyon (and canyons to the north and south) includes confined and unconfined zones. The shallow portion of the regional aquifer is predominantly unconfined, and the deeper portion of the aquifer is predominantly confined. Groundwater flow in the shallow portion of the regional aquifer generally follows the gradient of the water table. Groundwater flow and water levels within the deeper portion of the regional aquifer are impacted by water-supply pumping, with the largest fluctuations in water levels observed at well R-35a, located close to water supply well PM-3.

In the vicinity of the chromium investigation monitoring group, the water table is located in the Puye Formation and in the Santa Fe Group.

Contaminant Sources and Distributions

Chromium concentrations exceed NMED groundwater standards and EPA maximum contaminant levels (MCLs) in the regional aquifer at wells R-28, R-42, and R-50 located in Mortandad Canyon. Other constituents observed above background in wells in the monitoring group include nitrate, perchlorate, and tritium. A conceptual model for the sources and distribution of these contaminants is presented in the Investigation Report for Sandia Canyon (hereafter, the Sandia Canyon IR) (LANL 2009, 107453). The Sandia Canyon IR presents the results of all the chromium and related studies conducted to date to address the nature and extent and the fate and transport of chromium and other contaminants originating in the Sandia Canyon watershed.

The conceptual model hypothesizes that chromium and other contaminants originate from releases into Sandia Canyon with lateral migration pathways that move contamination to locations beneath Mortandad Canyon. For this reason, some Mortandad Canyon wells are included in the chromium investigation monitoring group. Other sources of contamination beneath Sandia and Mortandad Canyons are from Mortandad Canyon sources, and possibly Los Alamos Canyon sources. These sources and the migration pathways are described in the Sandia Canyon IR (LANL 2006, 094161).

3.3 Monitoring Objectives

The objective of the chromium investigation monitoring group is to further refine the nature and extent of contamination originating from various sources with principally Sandia and Mortandad Canyons, and to monitor the fate and transport of observed contaminants. For the past 6 yr, the monitoring in and beneath Sandia Canyon and adjacent canyons has focused on acquiring a fundamental understanding of the nature and extent of contaminants originating in the Sandia Canyon watershed. This work has been coupled with sediment and biota investigations to refine the conceptual model for the fate and transport of contaminants. Several new wells have also been installed and have been undergoing initial characterization monitoring on a quarterly basis.

Base-flow locations and alluvial wells in Sandia Canyon are excluded from the chromium monitoring group because the primary contaminants of concern are at low and very stable concentrations (LANL 2009, 107453). In Mortandad Canyon, contaminants in the surface water and alluvial groundwater have shown a marked decrease in concentration as a result of improvements in the treatment processes at the TA-50 RLWTF (see Figures 7.2-17, 7.2-18, and 7.2-25 in the MCIR [LANL 2006, 094161]). The steadily decreasing trend of the contaminant concentrations in the surface water and alluvial groundwater supports inclusion of the locations within the general surveillance monitoring group (section 8.0), and monitoring the base-flow and alluvial groundwater locations on an annual frequency. These data should provide sufficient information to continue verifying the decreasing trends in contaminant concentrations in surface water and alluvial groundwater (Appendix D).

Perched-intermediate and regional wells in Mortandad Canyon are included in the chromium investigation monitoring group because they are located along the contaminant-transport pathway that includes the southerly diversion of groundwater within the vadose zone beneath Sandia and Mortandad Canyons. The predominant contaminants monitored in this group of wells include chromium, other metals, nitrate, perchlorate, 1,4-dioxane, and tritium. The monitoring recommendations for perched-intermediate and regional groundwater beneath Mortandad Canyon reflect the updated conceptual model for these zones as presented in the Sandia Canyon IR (LANL 2009, 107453).

3.4 Scope of Activities

Active monitoring locations in the chromium investigation monitoring group include perched-intermediate and regional aquifer wells, which are shown in Figure 3.1-1. The monitoring group includes locations in Sandia Canyon as well as in Mortandad Canyon.

Table 3.4-1 presents sampling locations, the rationale for these locations, analytical suites, and monitoring frequencies. Analytical suites and frequencies assigned to individual locations in Table 3.4-1 generally follow the high-level monitoring design presented in Table 1.6-2 for the chromium investigation monitoring group. These analytical suites and frequencies are based on the results of applicable IRs and a review of ongoing monitoring data, such as the statistical summaries for locations in the Sandia and Mortandad Canyon watersheds provided in the FD screening tables in Attachment B-1 of Appendix B (on CD).

Base-flow and alluvial groundwater monitoring in Sandia Canyon will continue to provide baseline data for water-quality changes associated with variations in effluent volume and quality. Following the Sandia Canyon IR (LANL 2009, 107453), more intensive monitoring is now focused on the perched-intermediate and regional groundwater, with an emphasis on chromium and general inorganic chemicals (particularly nitrate). These constituents are still detected at low and stable concentrations below standards in base-flow and alluvial groundwater. These locations are included in the general surveillance monitoring group to document long-term trends. Exceptions to the analytical suites and sampling frequencies presented in Table 1.6-2 may occur for some locations listed in Table 3.4-1. The rationale for any exceptions is documented in Table D-3.0-3.

3.5 Modifications to the 2010 Interim Plan

Changes to monitoring locations for the chromium investigation monitoring group in the 2011 Interim Plan as compared with the 2010 Interim Plan include the following:

- Regional well R-1 was reassigned from general surveillance to the chromium investigation monitoring group.
- Dual-screen regional well R-50 completed characterization sampling and transitioned to routine analytical suites and frequencies as part of the chromium investigation monitoring group.
- New wells planned or completed: single-screen perched-intermediate well SCI-3 (scheduled to be completed September 30, 2011); dual-screen regional well R-61 (completed May 3, 2011); and dual-screen regional well R-62 (scheduled to be completed September 16, 2011).
- SCI-4 is a placeholder for a new perched-intermediate well. The need for this well is contingent upon findings from the drilling of nearby regional well R-61.

Appendix D documents the rationale for site-specific changes to analytical suites and frequencies, relative to those assigned in the 2010 Interim Plan (LANL 2010, 109830).

4.0 MDA C MONITORING GROUP

4.1 Introduction

The MDA C monitoring group includes nearby regional monitoring wells on the mesa top and in Mortandad Canyon (Figure 4.1-1). MDA C is located on Mesita del Buey in 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.

MDA C is an inactive 11.8-acre landfill consisting of 7 disposal pits and 108 shafts. Solid low-level radioactive wastes and chemical wastes were disposed of in the landfill between 1948 and 1974. The depths of the seven pits at MDA C range from 12 ft to 25 ft below the original ground surface. The depths of the 108 shafts range from 10 ft to 25 ft below the original ground surface. The original ground surface is defined as beneath the cover that was placed over the site in 1984. The pits and shafts are constructed in the Tshirege Member of the Bandelier Tuff. The regional aquifer is estimated to be approximately 1330 ft deep based on the water level in well R-46 (LANL 2009, 105592). 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.

4.2 Background

MDA C is located on a mesa top, so no shallow alluvial groundwater is present in the immediate vicinity. The nearest surface water is found in Effluent Canyon to the north and in Pajarito Canyon and Twomile Canyon to the south.

No perched groundwater or intermediate-depth saturated horizons were encountered during previous investigations at MDA C (LANL 1998, 059599; LANL 2005, 091493, p. 6) or in any of the boreholes drilled during the Phase III investigation at MDA C (LANL 2011, 204370). No perched groundwater was encountered during the drilling of regional wells R-46 or R-60.

Regional monitoring wells R-46 and R-60 were located downgradient of MDA C (Figure 4.1-1) (LANL 2009, 105592; LANL 2011, 111798). The upper surface of the regional aquifer is located within the lower Puye Formation or the upper pumiceous deposits of the Santa Fe Group, and the depths to water range from 1183 ft to 1328 ft bgs (Koch and Schmeer 2010, 201566). Near MDA C, the direction of shallow groundwater flow in the regional aquifer is to the east-southeast.

Contaminant Sources and Distributions

Vapor-phase VOCs and tritium are present beneath MDA C. The primary vapor-phase contaminants beneath MDA C are trichloroethene (TCE), tetrachloroethene, and tritium. There is no evidence of groundwater contamination in the regional aquifer (Attachment B-1 of Appendix B of this report). MDA C is located on a mesa top above thick, unsaturated units of the Bandelier Tuff, and therefore present-day aqueous-phase transport is generally believed to be minimal.

4.3 Monitoring Objectives

Monitoring objectives for the MDA C monitoring group are to supplement existing vadose zone pore-gas monitoring to refine and nature and extent of contamination and assess the fate and transport of the current vadose zone contaminant distribution. The monitoring will also support upcoming CME activities.

4.4 Scope of Activities

The MDA C Area monitoring group consists of three regional groundwater monitoring wells in Mortandad Canyon (R-14, R-46, and R-60), as shown in Figure 4.1-1. Table 4.4-1 presents sampling locations, the rationale for these locations, analytical suites, and frequencies for the MDA C monitoring group. Analytical suites and frequencies assigned to individual locations listed in Table 4.4-1 generally follow the high-level

monitoring design presented in Table 1.6-2 for the MDA C monitoring group. These analytical suites and frequencies are based on the results of applicable IRs and a review of ongoing monitoring data, such as the statistical summaries for locations in the MDA C monitoring group provided in the FD screening tables in Attachment B-1 of Appendix B (on CD).

Exceptions to the analytical suites and sampling frequencies presented in Table 1.6-2 may occur for some locations listed in Table 4.4-1. The rationale for any exceptions is documented in Table D-4.0-3.

4.5 Modifications to the 2010 Interim Plan

Changes to monitoring locations for the MDA C monitoring group in the 2011 Interim Plan as compared with the 2010 Interim Plan include the following:

- New regional monitoring well R-60 was added to the MDA C monitoring group in the Pajarito Canyon watershed. This single-screen well was completed on October 18, 2010.

5.0 TA-54 MONITORING GROUP

5.1 Introduction

At TA-54, groundwater monitoring is being conducted to support both the corrective measures process for SWMUs and areas of concern (AOCs) (particularly the MDAs G, H, and L) under the Consent Order and in support of the RCRA permit. The TA-54 monitoring group was established to address the monitoring requirements for all portions and aspects of TA-54 (Figure 5.1-1). The TA-54 monitoring group includes both perched-intermediate and regional wells in the near vicinity. Other downgradient wells have general relevance to TA-54 and other upgradient sources but are not considered part of the TA-54 monitoring network and are not discussed in this section.

TA-54 is situated in the east-central portion of the Laboratory on Mesita del Buey. TA-54 includes four MDAs designated as G, H, J, and L; a waste characterization, container storage, and transfer facility (TA-54 West); active radioactive waste storage and disposal operations at Area G; hazardous and mixed-waste storage operations at Area L; and administrative and support areas. The transfer facility is located at the western end of TA-54. MDAs H and J are located approximately 500 ft and 1000 ft (150 m and 305 m) southeast of the transfer facility, respectively. MDA L is located approximately 1 mi (1.6 km) southeast of the transfer facility. MDA G subsurface units are located within Area G approximately 0.5 mi (0.8 km) southeast of MDA L.

Mesita del Buey is a 100-ft to 140-ft-high finger-shaped mesa that trends southeast. The elevation of Mesita del Buey ranges from 6750 ft to 6670 ft at Area G. The mesa is approximately 500 ft wide and is bounded by the basin of Cañada del Buey (450 ft to the north) and the basin of Pajarito Canyon (360 ft to the south) (Figure 5.1-1).

5.2 Background

The TA-54 monitoring group is located predominantly in the Pajarito Canyon watershed, and the occurrence of surface water, alluvial groundwater, and perched-intermediate and regional groundwater is discussed in detail in section 7.2 of the Pajarito Canyon IR (LANL 2009, 106939).

Sources of surface water in the Pajarito watershed currently include snowmelt, stormwater runoff, and discharges at several springs. Perennial surface water flow within the TA-54 monitoring group area occurs in within Pajarito Canyon.

The primary alluvial groundwater body in Pajarito Canyon extends east from below the confluence with Twomile Canyon to approximately regional well R-23, a distance of 4.4 mi (7 km). Spatially restricted bodies of alluvial groundwater are also present west of the Twomile Canyon confluence and extend upcanyon to springs in the south fork of Pajarito Canyon (Upper Starmer Spring) and Pajarito Canyon above the south fork confluence (Homestead Spring). The alluvial groundwater is recharged by stream flow and some local precipitation. It accumulates in the alluvial deposits that fill the canyon bottom, often perching on shallow bedrock units. The alluvial groundwater extends farther down canyon than does stream flow because some downcanyon, lateral flow occurs within the alluvium. Alluvial groundwater acts as a source of infiltrating water into the deeper tuff units and transiently into the Cerros del Rio basalt, which is very near the surface at well R-23. The extent of this groundwater helps define deeper infiltration zones within the canyon (Appendix G). Overall, lateral flow within the alluvium and deeper infiltration of alluvial groundwater into underlying bedrock may provide a driving force for subsurface transport of soluble contaminants along the length of the canyon and into the deeper subsurface.

Perched-intermediate groundwater occurs in a variety of settings beneath the Pajarito watershed. Occurrences are known from deep groundwater investigations and from more localized SWMU investigations. Intermediate-perched horizons are present in the Bandelier Tuff in the upper portion of the watershed and in the Cerro Toledo interval, Puye Formation, dacitic lavas, and Cerros del Rio lavas in the middle and lower portions of Pajarito Canyon. The location and nature of most of these occurrences are consistent with, and indicative of, known or suspected canyon reaches with higher infiltration, such as nearby wells R-17 and R-23. At well R-37, relic regional groundwater may have become disconnected or stranded from the current regional groundwater as drawdown associated with water-supply production has occurred. There is no indication that the perched-intermediate zones are laterally continuous over large areas.

In the vicinity of TA-54, perched-intermediate groundwater occurs in wells R-55, R-55i and R-23/R-23i (LANL 2003, 079601; Kleinfelder 2006, 092495; LANL 2011, 111611) at depths ranging from 406 ft to 498 ft bgs. Perched-intermediate groundwater also occurs in wells R-40/40i and R-37 (LANL 2009, 106432; LANL 2009, 107116) at depths ranging from 639 ft to 909 ft. This water is thought to be localized beneath the canyon floor, and to result from localized canyon floor infiltration.

The regional aquifer in the vicinity of TA-54 includes confined and unconfined zones. The shallow portion of the regional aquifer is predominantly unconfined, and the deeper portion of the aquifer is predominantly confined. Groundwater flow in the shallow portion of the regional aquifer is generally eastward beneath the western section of Pajarito watershed and southeastward beneath the eastern section of Pajarito watershed. In the vicinity of TA-54, the upper surface of the regional aquifer is located within the Cerros del Rio basalts and the underlying sediments of the Puye Formation, and the depths to water range from 785 to 1020 ft bgs (Koch and Schmeer 2010, 201566).

Groundwater flow in the upper part of the regional aquifer beneath TA-54 appears to be substantially impacted by the Cerros del Rio lavas (LANL 2010, 111362). These lavas are more than 150 ft thick beneath the regional water table. Groundwater flow in the regional aquifer beneath TA-54 is impacted by (1) water-supply pumping, (2) the local-scale infiltration recharge along Pajarito Canyon, (3) the lateral propagation of large-scale mountain-front aquifer recharge occurring to the west of TA-54, and (4) the discharge of the regional aquifer to the southwest towards the White Rock Canyon springs and the Rio Grande.

Contaminant Sources and Distributions

Pore-gas monitoring data show that vapor-phase transport of contaminants occurs in the upper portion of the unsaturated zone, and that vapor-phase VOCs are present beneath MDAs G and L. The primary contaminants that have transported in the vapor phase at TA-54 are 1,1,1-trichloroethane (1,1,1-TCA); TCE; Freon-113; and tritium (LANL 2005, 090513; LANL 2006, 091888; LANL 2007, 096409).

Data from the groundwater monitoring network around TA-54 show sporadic detections of a variety of contaminants including, most notably, several VOCs. The temporal and spatial nature of the occurrences do not, however, clearly indicate the presence of a source related to potential sources at TA-54 (LANL 2009, 106939). Further evaluations of existing groundwater data near TA-54, and detailed descriptions of organic and inorganic contaminants detected in perched-intermediate and regional groundwater at TA-54 are presented in the CMEs for MDAs G, H, and L (LANL 2010, 110852; LANL 2010, 111362; LANL 2010, 111506).

5.3 Monitoring Objectives

Monitoring at TA-54 focuses on perched-intermediate and regional groundwater zones beneath TA-54 (Figure 5.1-1). The monitoring suite for perched-intermediate and regional groundwater addresses RCRA monitoring requirements and also reflects the data collected to date from wells in the TA-54 network.

Characterization of groundwater under MDAs G, H, and L is underway as data are collected from the completed network of new and existing wells. Groundwater monitoring for TA-54 is conducted with perched-intermediate well screens at R-40i, R-40 screen 1, R-23i, and R-37 screen 1, R-55i and regional wells: R-20, R-21, R-22, R-23, R-32, R-37, R-38, R-39, R-40, R-41, R-49, R-51, R-52, R-53, R-54, R-55, R-56, and R-57 (Figure 5.1-1). R-22 is not currently being sampled. The actively sampled wells have one or two screens, all of which are equipped with purgeable sampling systems.

The monitoring at TA-54 provides the basis for accurately describing the groundwater conditions beneath TA-54. The sampling plan for each of the wells within the TA-54 monitoring group is presented in Table 5.4-1. Base-flow and alluvial groundwater wells near and downgradient of TA-54 are not included in the TA-54 monitoring group because no evidence was found of a hydrologic connection between the subsurface contamination beneath TA-54 and adjacent canyons, as discussed in the Pajarito Canyon and Cañada del Buey IRs (LANL 2009, 106939; LANL 2009, 107497).

The regional monitoring-well network downgradient of the MDAs in TA-54 is a system that includes redundancy and is designed to provide reliable detection of potential contaminants reaching the regional aquifer. The wells are located both near the facility boundary and at more distal locations along the dominant regional flow direction as well as along potential local flow directions to the northeast. The locations of wells also address potential complex pathways for contaminants in the vadose zone. Because of the difficulties associated with monitoring groundwater that occurs in lavas beneath TA-54, the network is made up of two-screen wells with an upper well screen placed as close to the water table as possible to monitor the first arrival of contaminants in the aquifer and a lower screen placed in permeable aquifer sediments to monitor the primary groundwater pathways downgradient of the facility.

5.4 Scope of Activities

Active monitoring locations of the TA-54 monitoring group are focused on intermediate-perched and regional groundwater wells. These locations are shown in Figure 5.1-1.

Sampling locations, frequencies, analytical suites, and the rationale for these locations are presented in Table 5.4-1. The FD screening tables for the TA-54 monitoring group are presented in Attachment B-1 of Appendix B (on CD).

Exceptions to the analytical suites and sampling frequencies presented in Tables 1.6-2 may occur for some locations listed in Table 5.4-1. The rationale for any exceptions is documented in Table D-5.0-3.

5.5 Modifications to the 2010 Interim Plan

Changes to monitoring locations for the TA-54 monitoring group in the 2011 Interim Plan as compared with the 2010 Interim Plan include the following:

- Wells R-23 and R-23i were moved from general surveillance and added to the TA-54 monitoring group.
- New regional aquifer monitoring wells R-52, R-53, and R-57 completed characterization sampling and transitioned to routine analytical suites and frequencies as part of the TA-54 monitoring group in Pajarito watershed.
- New intermediate-perched monitoring well R-55i was completed on January 18, 2011, and is undergoing characterization.
- New regional aquifer monitoring wells R-55, R-56, and R-57 are undergoing characterization sampling.
- Perched-intermediate location R-40 screen 1 will be monitored for water levels only because of its extremely slow recharge rate (2 wk for recovery after purging).

6.0 TA-16 260 MONITORING GROUP

6.1 Introduction

The TA-16 260 monitoring group (Figure 6.1-1) was established for the upper Water Canyon/ Cañon de Valle watershed to detect and monitor contaminants released from Consolidated Unit 16-021(c)-99, the TA-16 260 Outfall (hereafter, the 260 Outfall), and other sites at TA-16. The 260 Outfall is an HE machining outfall that discharged HE-bearing water to Cañon de Valle for almost 50 yr and is the predominant source of contaminants detected in groundwater in the Water Canyon/ Cañon de Valle area. These discharges contaminated soils, sediments, surface waters, spring waters, and deep-perched and regional groundwater at TA-16.

The TA-16 260 monitoring group includes a base-flow location, springs, alluvial wells, and wells completed in several deep perched-intermediate groundwater zones and in the regional aquifer. Shallow monitoring locations such as the springs and alluvial wells were included in this monitoring group because they contain HE, barium, and VOC contamination related to past activities at the 260 Outfall and other sites in the area.

TA-16 is located in the southwest corner of the Laboratory and was established to develop explosive formulations, cast and machine explosive charges, and assemble and test explosive components for the nuclear weapons program. TA-16 is bordered by Bandelier National Monument along NM 4 to the south and by the Santa Fe National Forest along NM 501 to the west. To the north and east, it is bordered by TA-08, TA-09, TA-11, TA-14, TA-15, TA-37, and TA-49. Water Canyon, a 200-ft-deep ravine with steep walls, separates NM 4 from active sites at TA-16. Cañon de Valle forms the northern border of TA-16.

6.2 Background

Surface water in the area consists of stormwater and snowmelt runoff that flows in canyon drainages, including Cañon de Valle, Fishladder Canyon, and Martin Spring (S-Site) Canyon. Fishladder Canyon also receives snowmelt and stormwater runoff. Alluvial groundwater occasionally discharges at Fishladder Spring. The surface flow in Fishladder Canyon decreased significantly once the TA-16 340 Outfall was deactivated. The TA-16 260 monitoring group includes one base-flow location, E256, located in Cañon de Valle below MDA P.

The TA-16 260 monitoring group includes five alluvial monitoring wells in Cañon de Valle (CdV-16-02655, CdV-16-02656, CdV-16-02657, CdV-16-02658, and CdV-16-02659); three wells in Fish Ladder Canyon (FLC-16-25278, FLC-16-25279, and FLC-16-25280); and three wells in Martin Spring Canyon (MSC-16-06293, MSC-16-06294, and MSC-16-06295). Groundwater in these alluvial systems is shallow, and water levels generally show responses to snowmelt runoff.

The vadose zone at TA-16 is approximately 1000 ft to 1300 ft thick and is recharged by mountain-front precipitation and subsequent infiltration along the Pajarito fault zone east of TA-16 and along canyons (e.g., infiltration along upper Cañon de Valle). The vadose zone contains one shallow suite of perched water zones (less than 200 ft depth from the mesa top) and two significant deep- perched-intermediate groundwater zones between approximately 750 ft and 1200 ft bgs. The shallow perched zones are heterogeneous and controlled by fractures and surge beds near the Tshirege unit 3/4 contact. They manifest as three springs (SWSC, Burning Ground and Martin), as intermittently saturated zones in several boreholes in the northern portions of TA-16, and in a continuously-saturated borehole near the 90s Line Pond. The deep perched-intermediate groundwater zones are believed to extend from west to east for more than 6500 ft and from north to south for approximately 3280 ft. Perched-intermediate groundwater was encountered at R-26 screen 1; R-25b, R-25 screens 1, 2, 4; CdV-16-1i; CdV-16-2ir; and R-47i. No perched groundwater was observed at R-18 and R-48, limiting its north-south extent. The low permeability Tschicoma dacite observed in R-48 (approximately 2000 ft south of Cañon de Valle) may impede the southward flow of water in the deep-perched system. The perched zones are present both within the Otowi Member of the Bandelier Tuff (R-25, R-25b, and CdV-16-1[i]) and within the Puye Formation (CdV-16-4ip and CdV-16-2[i]r). In the vicinity of CdV-16-4ip, the two perched zones are separated by a 100 ft to 150 ft of Puye sediments under variable saturation (LANL 2011, 203711) 203711). The degree of hydraulic connection between the perched horizons and the regional aquifer has not been fully analyzed to date, but will be assessed in future reports.

Water-level data indicate groundwater within the perched horizons generally flows from west to east. There is some evidence of a southerly component of flow within the Otowi Member of the Bandelier Tuff in the vicinity of R-25, possibly from recharge along Cañon de Valle. Water-level data from multiple screens in R-25 and from the two screens of CdV-16-4ip indicate water levels within the deep-perched system are lower with depth, suggesting significant vertical anisotropy, with vertical hydraulic conductivities perhaps orders of magnitude lower than horizontal hydraulic conductivities in some strata (LANL 2011, 203711).

The regional aquifer in the vicinity of northern TA-16 is predominantly unconfined, with the water table located within the Puye Formation at a depth of approximately 1108 ft to 1353 ft bgs. Groundwater flow in the shallow portion of the regional aquifer is generally eastward, with some perturbation near R-25, perhaps reflecting local recharge. Downgradient (east) of R-25, the regional groundwater flow direction incorporates a northerly component of flow near R-18 and R-17. Water levels in regional wells near TA-16 show little influence from transient effects of deeper water-supply pumping (LANL 2006, 091450).

Contaminant Sources and Distributions

Discharges from the 260 Outfall during the past 50 yr at Consolidated Unit 16-021(c)-99 served as a primary source of source of HE and inorganic contamination found throughout the site (LANL 1998, 059891; LANL 2003, 085531). Results of the 260 Outfall CME (LANL 2007, 098734) show the drainage channel below the outfall and the canyon bottom as well as surface water, alluvial groundwater, and deep-perched groundwater, are contaminated with explosive compounds, including RDX (hexahydro-1,3,5-trinitro-1,3,5-triazine); HMX (octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine); TNT (2,4,6 trinitrotoluene); and barium. In addition, the VOCs tetrachloroethane and TCE have been detected in springs, alluvial groundwater, and perched-intermediate groundwater. Low concentrations of PCE have also been detected in the regional aquifer in R-25 (screen 5).

The primary migration pathway for these contaminants is believed to consist of (1) discharge as effluent from the 260 Outfall, (2) surface flow to Cañon de Valle via a small tributary drainage, (3) downcanyon transport by surface water flow and alluvial groundwater, (4) and infiltration through the vadose zone as recharge to the deep-perched groundwater zones and potentially into the regional aquifer.

Groundwater in the perched horizons contains the largest inventory of HE in the environment on a mass basis; estimates range from as low as approximately 700 kg of RDX to as high as approximately 8000 kg of RDX. Investigations of vadose zone and regional groundwater at TA-16 have been conducted during the past several years, and the results of these investigations are discussed in several reports (e.g., Longmire 2005, 088510; LANL 2006, 093798; LANL 2007, 096003; LANL 2007, 095787; LANL 2011, 203711).

6.3 Monitoring Objectives

The objective for the TA-16 260 monitoring group is to further refine nature and extent for contamination originating from the area and to monitor fate and transport for observed contaminants. These data will support the pending CME for perched-intermediate and regional groundwater (Plate 1) (LANL 2007, 098734; LANL 2008, 103165). This group's monitoring focuses on HE, barium, and VOC contamination in the upper Cañon de Valle watershed (Table 1.6-2).

Characterization sampling for a wide range of potential contaminants in groundwater from TA-16 (e.g., fission-product radionuclides, SVOCs, pesticides, PCBs, dioxins/furans) has been completed for the majority of wells in the group. These constituents have not been detected beyond sporadic, low-level detections that can be attributed to infrequent but normal analytical issues, as summarized in the FD tables in Attachment B-1 of Appendix B (on CD). Monitoring for these constituents will be conducted at a lower frequency (annually, biennially, or triennially) than monitoring for HE, metals, and VOCs.

6.4 Scope of Activities

Active monitoring locations in TA-16 260 monitoring group include one base-flow station, alluvial groundwater wells, intermediate-perched groundwater wells, regional groundwater wells, and springs. These locations are shown in Figure 6.1-1.

Sampling locations, frequencies, analytical suites, and the rationale for these locations are presented in Table 6.4-1. The FD screening tables for Water Canyon/Cañon de Valle are presented in Attachment B-1 of Appendix B (on CD).

Additional base-flow, spring, and alluvial groundwater monitoring is conducted as general surveillance in the watershed (section 8.6). Monitoring of deep groundwater from the perched-intermediate and regional

aquifers reflects a long-term data set that indicates what constituents are present and their trends and variability. Additional rounds are maintained for some constituents in the perched-intermediate groundwater as an early-detection location for potential migration of those constituents from secondary sources in the vadose zone.

Exceptions to the analytical suites and sampling frequencies presented in Table 1.6-2 may occur for some locations listed in Table 6.4-1. The rationale for any exceptions is documented in Table D-6.0-3.

6.5 Modifications to the 2010 Interim Plan

Changes to monitoring locations for the TA-16 260 monitoring group in the 2011 Interim Plan as compared with the 2010 Interim Plan include the following:

- The monitoring group has been renamed the TA-16 260 monitoring group (instead of the TA-16 260 deep groundwater monitoring group) to reflect that it is no longer limited to deep groundwater wells.
- The following base-flow station, springs, and alluvial wells were reassigned from the general surveillance to the TA-16 260 monitoring group:
 - ❖ Base-flow station: Cañon de Valle below MDA P (E256)
 - ❖ Springs: Burning Ground Spring, Fish Ladder Spring, Martin Spring, Peter Spring, and SWSC Spring
 - ❖ Alluvial groundwater wells (Cañon de Valle): CdV-16-02655, CdV-16-02656, CdV-16-02657, CdV-16-02658, CdV-16-02659
 - ❖ Alluvial groundwater wells (Fishladder Canyon): FLC-16-25278, FLC-16-25279, FLC-16-25280
 - ❖ Alluvial groundwater wells (Martin Spring Canyon): MSC-16-06293, MSC-16-06294, MSC-16-06295
 - ❖ Alluvial well CdV-16-02665 (previously water-level monitoring only) and intermediate well 16-26644 were added to this monitoring group
- New hydro test well CdV-16-4(i)p was completed on August 23, 2010; final configuration of the well will be based on the results of the TA-16 network evaluation. Westbay sampling systems were removed from wells CdV-R-15-3, CdV-R-3-2, and R-26 during the Westbay reliability study. Final configuration of these wells will also be based on the results of the TA-16 network evaluation
- Wells R-48 and R-47i completed characterization sampling and transitioned to routine analytical suites and frequencies.
- R-63 was completed on February 9, 2011, and is undergoing characterization sampling.
- R-25c has moved to water-level monitoring only.

7.0 MDA AB MONITORING GROUP

7.1 Introduction

The MDA AB monitoring group is located in TA-49 and includes one monitoring well completed in perched-intermediate groundwater and three wells completed in the regional aquifer. TA-49, also known

as the Frijoles Mesa Site, is located on a mesa in the upper part of the Ancho Canyon drainage and part of the area drains into Water Canyon. The MDA AB monitoring group is shown in Figure 7.1-1.

TA-49 was used for underground hydronuclear testing in the early 1960s. The testing consisted of criticality, equation-of-state, and calibration experiments involving special nuclear materials. The testing produced large inventories of radioactive and hazardous materials: isotopes of uranium and plutonium, lead, and beryllium; explosives such as TNT, RDX, HMX; and barium nitrate. Much of this material remains in shafts on the mesa top. Further information about activities and SWMUs and AOCs at TA-49 can be found in recent Laboratory reports (LANL 2010, 109318; LANL 2010, 109319). The RCRA facility investigation work plan also describes the planned investigations that focus on identifying and quantifying migration of contaminants from the shafts.

7.2 Background

Both main Ancho Canyon and the north fork of Ancho Canyon head on the Pajarito Plateau in the south-central part of the Laboratory. Approximately 2.2 mi² (5.6 km²) is drained by the north fork of Ancho Canyon and, above the confluence with the north fork, approximately 2.3 mi² (5.8 km²) is drained by main Ancho Canyon. Surface-water flow is ephemeral and occurs as runoff, primarily following infrequent, intense thunderstorms or during snowmelt. Its source is direct precipitation and runoff from surrounding mesa tops. No perennial sources of surface water exist at TA-49.

In 1960, the USGS drilled three deep wells (test wells DT-5A, DT-9, and DT-10) to monitor regional aquifer water quality. No contaminants were found in these wells at concentrations near or above standards. As with other wells installed around the Laboratory using mild carbon steel during that period, samples from these three test wells have shown elevated metals concentrations related to corrosion or flaking of well components. In 2010, the total lead concentration in a sample from test well DT-9 of 20.1 µg/L was above the EPA drinking water system action level of 15 µg/L. Another sample during the year had a total lead result of less than 2 µg/L. Some results during the 1990s were above 50 µg/L.

Several deep mesa-top boreholes and wells have been drilled to intermediate depths of 300 ft to 700 ft bgs (49-CH-1 through 49-CH-4, 49-2-700) and to the regional aquifer (DT-5A, DT-9, DT-10, R-29, and R-30). No perched-intermediate groundwater zones were encountered when these wells were drilled (LANL 2006, 093714; LANL 2010, 110478; LANL 2010, 110518). A moisture profile for the 700-ft deep mesa-top borehole 49-2-700-1 (Figure B-2.0-1) shows low moisture content (<17% by weight) throughout the profile; the profile is similar to those beneath other dry mesas and indicates that infiltration along neighboring canyons does not impact moisture beneath the mesa at TA-49. In addition, 49-Gamma was drilled to 54 ft bgs in upper Ancho Canyon, and wells 49-9M-2 through 49-9M-4 were drilled in the drainage of the upper north fork of Ancho Canyon; these boreholes were dry when drilled. These observations show a lack of shallow perched groundwater in the upper portions of the Ancho watershed.

Perched-intermediate groundwater was encountered in Water Canyon, approximately 3500 ft northeast of MDA AB during the drilling of R-27 in 2005. The perched zone was detected at 628 ft bgs in the Puye Formation immediately above the Cerros del Rio basalt. Monitoring well R-27i was subsequently installed in September 2009 with a single screen to evaluate water quality and measure water levels in the perched zone.

Springs and seeps are known to occur in the lower reaches of Water and Ancho Canyons, far downgradient of TA-49 (near the Rio Grande), but none have been identified within the boundaries of TA-49 (LANL 2007, 098492).

The top of the regional aquifer occurs approximately 1126 ft to 1153 ft bgs, based on water levels in monitoring wells R-29 and R-30. The potentiometric surface of the regional aquifer beneath TA-49 lies completely within the Puye Formation and the Cerros del Rio basalt. Groundwater flow in the upper portion of the regional aquifer at TA-49 is generally eastward.

Contaminant Sources and Distributions

The primary contaminants at MDA AB and other disposal areas in TA-49 include tritium, radionuclides (plutonium-238, plutonium-239/240, americium-241, and cesium-137), arsenic, chromium, copper, lead, and perchlorate. Radionuclides have been detected in canyon sediments, but no elevated levels of contaminants have been detected in groundwater in the wells that comprise the MDA AB monitoring group. Three decades of water-quality records from regional wells in this area (test wells DT-5A, DT-9, and DT-10) show no substantial changes in water chemistry or the presence of Laboratory contaminants in the regional aquifer. Perchlorate has been detected slightly above background in R-27i.

7.3 Monitoring Objectives

The monitoring objectives for the MDA AB monitoring group is to characterize the groundwater beneath MDA AB and ultimately to support the MDA AB CME process. New regional aquifer wells R-29 and R-30 have been drilled immediately downgradient of MDA AB at TA-49. The older test wells, DT-5A, DT-9, and DT-10, will no longer be monitored because of their potential for nonrepresentative data associated with well casing and screen materials, the long well screened intervals (617 ft, 681 ft, and 329.6 ft, respectively) and because they have been effectively replaced by R-29 and R-30.

7.4 Scope of Activities

Frequency, analytical suites, and the rationale for monitoring at each location are presented in Table 7.4-1. Groundwater monitoring for MDA AB has historically been conducted primarily at the DT-series regional aquifer wells. Recently installed wells R-29 and R-30 have been incorporated into the monitoring network for MDA AB and will be monitored semiannually to support the corrective action process for MDA A.

Exceptions to the analytical suites and sampling frequencies presented in Table 1.6-2 may occur for some locations listed in Table 7.4-1. The rationale for any exceptions is documented in Table D-7.0-3.

7.5 Modifications to the 2010 Interim Plan

Changes to monitoring locations for the MDA AB monitoring group in the 2011 Interim Plan as compared with the 2010 Interim Plan include the following:

- Test wells DT-5A, DT-9, and DT-10 were removed from the monitoring group and will no longer be sampled.

8.0 GENERAL SURVEILLANCE MONITORING GROUP

8.1 Overview

Monitoring locations not associated with project-specific monitoring groups are included in the general surveillance monitoring group. This group includes all base-flow locations, alluvial monitoring wells, and springs, except for those assigned to the TA-16 260 monitoring group. The general surveillance group

also includes some wells completed in perched-intermediate zones or in the regional aquifer that are not associated with area-specific monitoring groups.

General surveillance monitoring locations are sited across the Pajarito Plateau in all the major watersheds. Some are upgradient of project specific areas or are in areas where contamination was historically present, but where concentrations have since fallen and are stable and below standards. General surveillance monitoring locations for Los Alamos/Pueblo Canyons, Sandia Canyon, Mortandad Canyon, Pajarito Canyon, Water Canyon/Cañon de Valle, Frijoles, Ancho and Chaquehui Canyons, and White Rock Canyon are shown in Figures 8.1-1 through 8.1-7.

Most general surveillance locations are well-characterized, and have a long history of sampling data. Some locations show little or no contamination, while others show residual contamination from past operations or effluent releases (see Appendix D). The residual contamination may be present in surface water, alluvial groundwater, and occasionally in perched-intermediate groundwater. In many cases, contaminant concentrations at these locations are fairly steady over time or decreasing as a result of reductions in sources over the years.

For monitoring purposes the general surveillance locations are divided into three groups: the northern part of the Plateau (Los Alamos/Pueblo and Sandia Canyons); the southern part of the Plateau (Mortandad, Pajarito, Water/Cañon de Valle, Frijoles, Ancho and Chaquehui Canyons); and White Rock Canyon.

8.2 Monitoring Objectives

The primary monitoring objectives for the general surveillance locations are

- to continue monitoring long-term water quality trends at all general surveillance locations;
- to continue verifying decreasing contaminant trends at general surveillance locations in some watersheds (Los Alamos, Sandia, and Mortandad);
- to monitor for potential impacts from ongoing operations under DOE requirements for environmental surveillance;
- to collect additional water quality data at background locations; and
- to continue surveillance for potential Laboratory impacts to the groundwater, as expressed at the springs in White Rock Canyon.

8.3 Scope of Activities

These objectives can be met at all general surveillance locations through annual monitoring at the majority of all general surveillance locations, with a few exceptions. Semiannual monitoring is proposed at several locations, including monitoring well 03-B-13 (because of elevated and highly variable VOC and SVOC concentrations), and at Basalt Spring (to meet monitoring requirements under the MOU. Quarterly monitoring is proposed at R-34 to meet monitoring requirements under the MOU, and at monitoring wells MCO-3, MCO-4B, MCO-6, MCO-7, and CDBO-6 to meet discharge permit monitoring requirements.

Additional sampling events may be necessary for several White Rock Canyon springs (Spring 2B, 5A, 5B, Ancho, and 9B), should sampling conditions (river flow levels, etc.) prevent samples to be collected during the annual sampling campaign in fall.

Tables 8.3-1 through 8.3-7 list the sampling locations, the rationale for these locations, the analytical suites, and frequencies for the general surveillance group within each watershed. Appendix D-8.0 documents the rationale for site-specific changes to analytical suites and frequencies, relative to those assigned in the 2010 Interim Plan (LANL 2010, 109830).

8.4 Modifications to the 2010 Interim Plan

Changes to locations in the 2011 Interim Plan for general surveillance locations include the following:

- Base-flow monitoring locations and alluvial groundwater wells, which were previously part of the chromium investigation monitoring group, were reassigned to the general surveillance monitoring group:
 - ❖ Sandia right fork at Power Plant (E121);
 - ❖ South fork of Sandia Canyon at E122;
 - ❖ Sandia below wetlands (E123);
 - ❖ Middle Sandia Canyon at terminus of persistent flow; and
 - ❖ Alluvial wells SCA-1-DP, SCA-1, SCA-3, SCA-4, and SCA-5.
- Monitoring well TSCA-6 has been dry since May 2008 and has been removed from the sampling plan.
- Monitoring wells CdBO-4, CdBO-5, CdBO-6, CdBO-7, CdBO-8, and CdBO-9, which were administratively transferred to Pajarito Canyon watershed in the 2010 Interim Plan for logistical purposes, were transferred back into the Mortandad Canyon watershed in which they are physically located. CdBO-4, CdBO-5, CdBO-8, and CdBO-9 are used for water-level monitoring only.
- Sampling of well R-19 screens 5, 6, and 7 was suspended because of impacts from residual drilling products.
- Monitoring wells R-17 and PCI-2 were reassigned from the MDA C monitoring group to the general surveillance monitoring group.
- Monitoring wells LAOI-7, R-8, R-9, R-9i, and R-12 were reassigned from the TA-21 monitoring group to the general surveillance monitoring group.
- The following base-flow station, springs, and alluvial wells were reassigned from general surveillance to the TA-16 260 monitoring group:
 - ❖ Base-flow station: Cañon de Valle below MDA P (E256)
 - ❖ Springs: Burning Ground Spring, Fish Ladder Spring, Martin Spring, Peter Spring, and SWSC Spring;
 - ❖ Alluvial groundwater wells (Cañon de Valle): CdV-16-02655, CdV-16-02656, CdV-16-02657, CdV-16-02658, CdV-16-02659;
 - ❖ Alluvial groundwater wells (Fishladder Canyon): FLC-16-25278, FLC-16-25279, FLC-16-25280;
 - ❖ Alluvial groundwater wells (Martin Spring Canyon): MSC-16-06293, MSC-16-06294, MSC-16-06295.
- Sampling of well R-31 screens 2 and 3 was suspended because of impacts from drilling.

- Spring 2B and Spring 5B were added back to the monitoring plan, with the direction to sample them during low-flow conditions if necessary to avoid mixing of spring water with river water. The same caveat applies to Spring 5A.
- Ancho Spring and Spring 9B may be sampled between December and March when flows are higher and the springs are more accessible, if samples cannot be collected during the annual fall sampling event.
- Springs 7 and 8 are proposed for removal from the monitoring plan because they are located on the east side of the Rio Grande, and they are likely recharged from the Española Basin. Base-flow location Buckman Diversion SW has been removed from the monitoring plan per a cooperative agreement with the City of Santa Fe.

Appendix D documents the rationale for site-specific changes to analytical suites and frequencies, relative to those assigned in the 2010 Interim Plan (LANL 2010, 109830).

9.0 REFERENCES AND MAP DATA SOURCES

9.1 References

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

Copies of the master reference set are maintained at the NMED Hazardous Waste Bureau and the Directorate. The set was developed to ensure that the administrative authority has all material needed to review this document, and it is updated with every document submitted to the administrative authority. Documents previously submitted to the administrative authority are not included.

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)

EPA (U.S. Environmental Protection Agency), 2009. "National Recommended Water Quality Criteria," available online at <http://www.epa.gov/ost/criteria/wqctable/>, Office of Water, Office of Science and Technology, Washington, D.C. (EPA 2009, 109328)

EPA (U.S. Environmental Protection Agency), November 2010. "Regional Screening Level (RSL) Summary Table November 2010," Regional Screening Levels for Chemical Contaminants at Superfund Sites screening level/preliminary remediation goal website, tables available online at http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/index.htm, Washington, D.C. (EPA 2010, 111598)

EPA (U.S. Environmental Protection Agency), June 2011. "Regional Screening Level (RSL) Composite Table June 2011," Regional Screening Levels for Chemical Contaminants at Superfund Sites screening level/preliminary remediation goal website, tables available online at http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/index.htm, Washington, D.C. (EPA 2011, 204336)

- Kleinfelder, March 2006. "Final Completion Report, Intermediate Well R-23i," report prepared for Los Alamos National Laboratory, Project No. 49436, Albuquerque, New Mexico. (Kleinfelder 2006, 092495)
- Koch, R.J., and S. Schmeer, March 2011. "Groundwater Level Status Report for 2010, Los Alamos National Laboratory," Los Alamos National Laboratory report LA-14437-PR, Los Alamos, New Mexico. (Koch and Schmeer 2010, 201566)
- Koch, R.J., and S. Schmeer, March 2010. "Groundwater Level Status Report for 2009, Los Alamos National Laboratory," Los Alamos National Laboratory report LA-14416-PR, Los Alamos, New Mexico. (Koch and Schmeer 2010, 108926)
- LANL (Los Alamos National Laboratory), September 1997. "Work Plan for Mortandad Canyon," Los Alamos National Laboratory document LA-UR-97-3291, Los Alamos, New Mexico. (LANL 1997, 056835)
- LANL (Los Alamos National Laboratory), May 22, 1998. "Hydrogeologic Workplan," Los Alamos National Laboratory document LA-UR-01-6511, Los Alamos, New Mexico. (LANL 1998, 059599)
- LANL (Los Alamos National Laboratory), September 1998. "RFI Report for Potential Release Site 16-021(c)," Los Alamos National Laboratory document LA-UR-98-4101, Los Alamos, New Mexico. (LANL 1998, 059891)
- LANL (Los Alamos National Laboratory), June 2003. "Characterization Well R-23 Completion Report," Los Alamos National Laboratory document LA-UR-03-2059, Los Alamos, New Mexico. (LANL 2003, 079601)
- LANL (Los Alamos National Laboratory), November 2003. "Corrective Measures Study Report for Solid Waste Management Unit 16-021(c)-99," Los Alamos National Laboratory document LA-UR-03-7627, Los Alamos, New Mexico. (LANL 2003, 085531)
- LANL (Los Alamos National Laboratory), April 2004. "Los Alamos and Pueblo Canyons Investigation Report," Los Alamos National Laboratory document LA-UR-04-2714, Los Alamos, New Mexico. (LANL 2004, 087390)
- 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), January 2006. "Investigation Report for the TA-16-340 Complex [Consolidated Units 13-003(a)-99 and 16-003(n)-99 and Solid Waste Management Units 16-003(o), 16-026(j2), and 16-029(f)]," Los Alamos National Laboratory document LA-UR-06-0153, Los Alamos, New Mexico. (LANL 2006, 091450)

- LANL (Los Alamos National Laboratory), March 2006. "Investigation Report for Material Disposal Area L, Solid Waste Management Unit 54-006, at Technical Area 54, Revision 1," Los Alamos National Laboratory document LA-UR-06-1564, Los Alamos, New Mexico. (LANL 2006, 091888)
- LANL (Los Alamos National Laboratory), August 2006. "Investigation Report for Intermediate and Regional Groundwater, Consolidated Unit 16-021(c)-99," Los Alamos National Laboratory document LA-UR-06-5510, Los Alamos, New Mexico. (LANL 2006, 093798)
- LANL (Los Alamos National Laboratory), September 2006. "South Canyons Historical Investigation Report," Los Alamos National Laboratory document LA-UR-06-6012, Los Alamos, New Mexico. (LANL 2006, 093714)
- 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), May 2007. "Groundwater Background Investigation Report, Revision 3," Los Alamos National Laboratory document LA-UR-07-2853, Los Alamos, New Mexico. (LANL 2007, 095817)
- LANL (Los Alamos National Laboratory), April 2007. "Evaluation of the Suitability of Wells Near Technical Area 16 for Monitoring Contaminant Releases from Consolidated Unit 16-021(c)-99," Los Alamos National Laboratory document LA-UR-07-2370, Los Alamos, New Mexico. (LANL 2007, 095787)
- LANL (Los Alamos National Laboratory), May 2007. "Addendum to the Investigation Report for Material Disposal Area L, Solid Waste Management Unit 54-006, at Technical Area 54," Los Alamos National Laboratory document LA-UR-07-3214, Los Alamos, New Mexico. (LANL 2007, 096409)
- LANL (Los Alamos National Laboratory), May 2007. "Corrective Measures Implementation Plan for Consolidated Unit 16-021(c)-99," Los Alamos National Laboratory document LA-UR-07-2019, Los Alamos, New Mexico. (LANL 2007, 096003)
- LANL (Los Alamos National Laboratory), August 2007. "Corrective Measures Evaluation Report, Intermediate and Regional Groundwater, Consolidated Unit 16-021(c)-99," Los Alamos National Laboratory document LA-UR-07-5426, Los Alamos, New Mexico. (LANL 2007, 098734)
- LANL (Los Alamos National Laboratory), October 2007. "Historical Investigation Report for Sites at Technical Area 49 Inside the Nuclear Environmental Site Boundary," Los Alamos National Laboratory document LA-UR-07-6078, Los Alamos, New Mexico. (LANL 2007, 098492)
- LANL (Los Alamos National Laboratory), February 2008. "Los Alamos and Pueblo Canyons Groundwater Monitoring Well Network Evaluation and Recommendations, Revision 1," Los Alamos National Laboratory document LA-UR-08-1105, Los Alamos, New Mexico. (LANL 2008, 101330)
- LANL (Los Alamos National Laboratory), June 2008. "Supplemental Investigation Work Plan for Intermediate and Regional Groundwater at Consolidated Unit 16-021(c)-99," Los Alamos National Laboratory document LA-UR-08-3991, Los Alamos, New Mexico. (LANL 2008, 103165)

- LANL (Los Alamos National Laboratory), July 2008. "Fate and Transport Investigations Update for Chromium Contamination from Sandia Canyon," Los Alamos National Laboratory document LA-UR-08-4702, Los Alamos, New Mexico. (LANL 2008, 102996)
- LANL (Los Alamos National Laboratory), March 2009. "Completion Report for Wells R-43 and SCI-2," Los Alamos National Laboratory document LA-UR-09-1337, Los Alamos, New Mexico. (LANL 2009, 105296)
- 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), June 2009. "Completion Report for Regional Aquifer Well R-40," Los Alamos National Laboratory document LA-UR-09-3067, Los Alamos, New Mexico. (LANL 2009, 106432)
- 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), September 2009. "Completion Report for Regional Aquifer Well R-37," Los Alamos National Laboratory document LA-UR-09-5371, Los Alamos, New Mexico. (LANL 2009, 107116)
- LANL (Los Alamos National Laboratory), October 2009. "Investigation Report for Sandia Canyon," Los Alamos National Laboratory document LA-UR-09-6450, Los Alamos, New Mexico. (LANL 2009, 107453)
- LANL (Los Alamos National Laboratory), November 2009. "Cañada del Buey Investigation Report, Revision 1," Los Alamos National Laboratory document LA-UR-09-7317, Los Alamos, New Mexico. (LANL 2009, 107497)
- LANL (Los Alamos National Laboratory), May 2010. "Investigation Report for Sites at Technical Area 49 Inside the Nuclear Environmental Site Boundary," Los Alamos National Laboratory document LA-UR-10-3304, Los Alamos, New Mexico. (LANL 2010, 109319)
- LANL (Los Alamos National Laboratory), May 2010. "Investigation Report for Sites at Technical Area 49 Outside the Nuclear Environmental Site Boundary," Los Alamos National Laboratory document LA-UR-10-3095, Los Alamos, New Mexico. (LANL 2010, 109318)
- LANL (Los Alamos National Laboratory), June 2010. "2010 Interim Facility-Wide Groundwater Monitoring Plan," Los Alamos National Laboratory document LA-UR-10-1777, Los Alamos, New Mexico. (LANL 2010, 109830)
- LANL (Los Alamos National Laboratory), July 2010. "Technical Area 21 Groundwater and Vadose-Zone Monitoring Well Network Evaluation and Recommendations," Los Alamos National Laboratory document LA-UR-10-3960, Los Alamos, New Mexico. (LANL 2010, 109947)

- LANL (Los Alamos National Laboratory), August 2010. "Completion Report for Regional Aquifer Well R-29," Los Alamos National Laboratory document LA-UR-10-4505, Los Alamos, New Mexico. (LANL 2010, 110478)
- LANL (Los Alamos National Laboratory), August 2010. "Groundwater Background Investigation Report, Revision 4," Los Alamos National Laboratory document LA-UR-10-4827, Los Alamos, New Mexico. (LANL 2010, 110535)
- LANL (Los Alamos National Laboratory), August 2010. "Completion Report for Regional Aquifer Well R-30," Los Alamos National Laboratory document LA-UR-10-4929, Los Alamos, New Mexico. (LANL 2010, 110518)
- LANL (Los Alamos National Laboratory), October 2010. "Corrective Measures Evaluation Report for Material Disposal Area L, Solid Waste Management Unit 54-006, at Technical Area 54, Revision 1," Los Alamos National Laboratory document LA-UR-10-6506, Los Alamos, New Mexico. (LANL 2010, 110852)
- LANL (Los Alamos National Laboratory), November 2010. "Corrective Measures Evaluation Report for Material Disposal Area G, Consolidated Unit 54-013(b)-99, at Technical Area 54, Revision 2," Los Alamos National Laboratory document LA-UR-10-7868, Los Alamos, New Mexico. (LANL 2010, 111362)
- LANL (Los Alamos National Laboratory), December 2010. "Corrective Measures Evaluation Report for Material Disposal Area H, Solid Waste Management Unit 54-004, at Technical Area 54," Los Alamos National Laboratory document LA-UR-10-8097, Los Alamos, New Mexico. (LANL 2010, 111506)
- LANL (Los Alamos National Laboratory), January 2011. "Work Plan to Plug and Abandon Test Well 3," Los Alamos National Laboratory document LA-UR-11-0185, Los Alamos, New Mexico. (LANL 2011, 111605)
- LANL (Los Alamos National Laboratory), January 2011. "Completion Report for Regional Aquifer Well R-55," Los Alamos National Laboratory document LA-UR-11-0188, Los Alamos, New Mexico. (LANL 2011, 111611)
- 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), 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), June 2011. "Hydrologic Testing Report for Consolidated Unit 16-021(c)-99," Los Alamos National Laboratory document LA-UR-11-3072, Los Alamos, New Mexico. (LANL 2011, 203711)
- Longmire, P., May 2005. "Characterization Well R-25 Geochemistry Report," Los Alamos National Laboratory report LA-14198-MS, Los Alamos, New Mexico. (Longmire 2005, 088510)

9.2 Map Data Sources

Water sampling locations: ER Project Locations; Los Alamos National Laboratory, ESH&Q Waste and Environmental Services Division, 2010-2E; 1:2,500 Scale Data; 04 October 2010.

Primary drainage: Watercourse; Los Alamos National Laboratory, ENV Water Quality & Hydrology Group; 05 April 2005.

Paved road: Road Centerlines for the County of Los Alamos; County of Los Alamos, Information Services; as published 04 March 2009.

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

LANL boundary: LANL Areas Used and Occupied ; Los Alamos National Laboratory, Site Planning & Project Initiation Group, Infrastructure Planning Office; 19 September 2007; as published 13 August 2010.

Land ownership: LANL Areas Used and Occupied; Los Alamos National Laboratory, Site Planning & Project Initiation Group, Infrastructure Planning Office; 19 September 2007; as published 13 August 2010.

TA boundary: Technical Area Boundaries; Los Alamos National Laboratory, Site Planning & Project Initiation Group, Infrastructure Planning Office; September 2007; as published 13 August 2010.

LANL structure: Structures; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 29 November 2010.

Watershed: Watersheds; Los Alamos National Laboratory, ENV Environmental Remediation and Surveillance Program; EP2006-0942; 1:2,500 Scale Data; 27 October 2006.

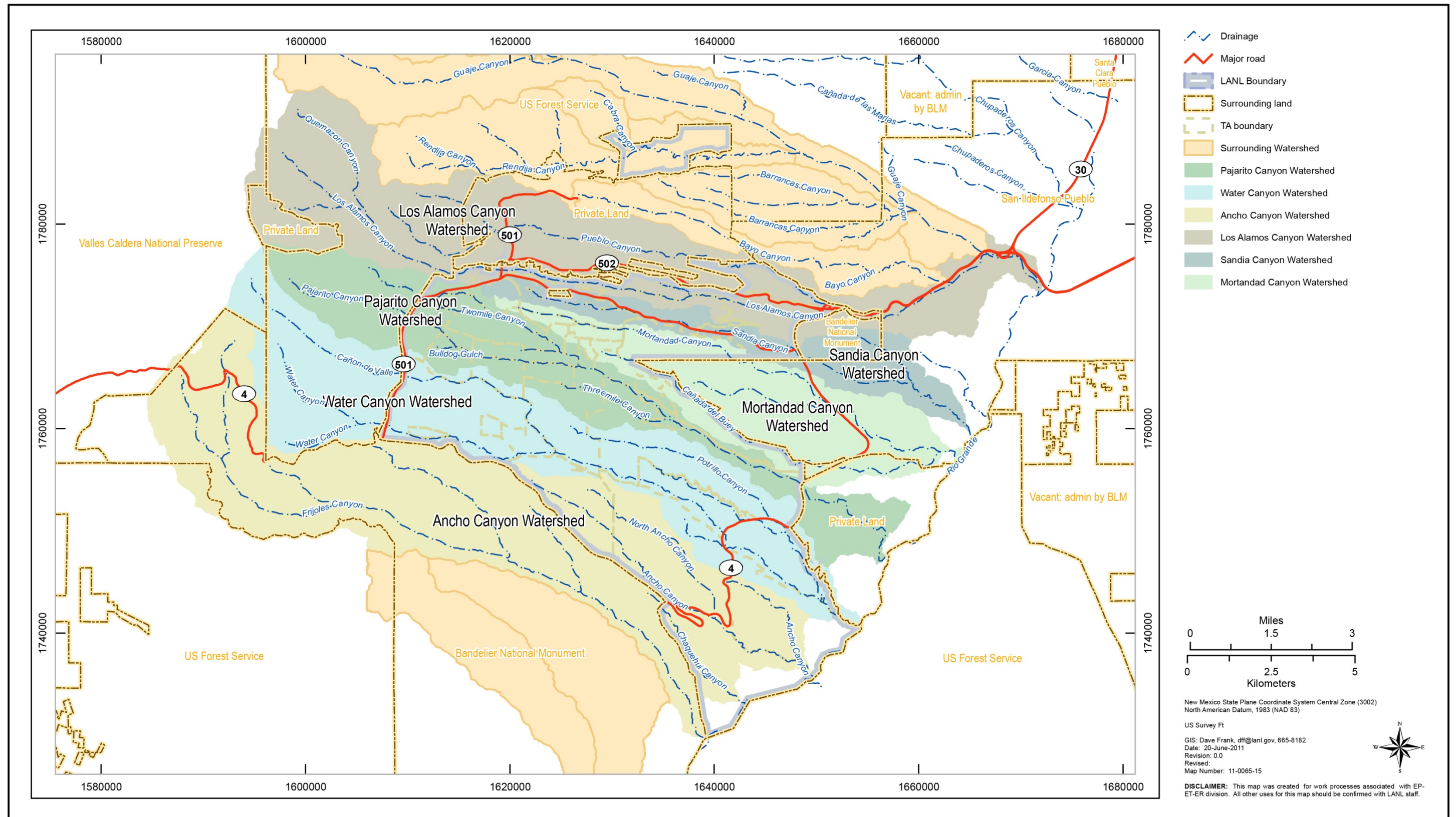


Figure 1.2-1 Watersheds at Los Alamos National Laboratory

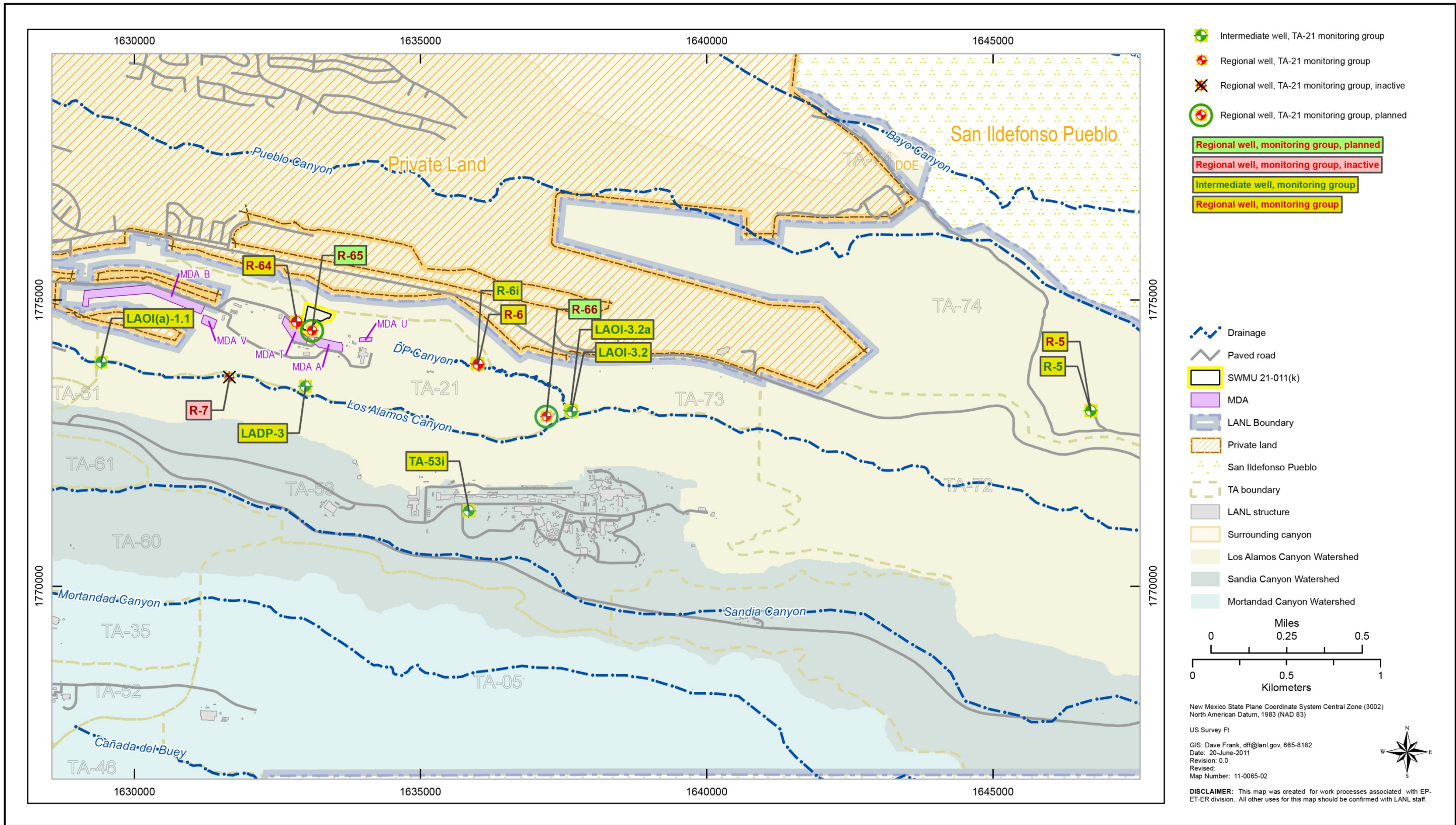


Figure 2.1-1 TA-21 monitoring group

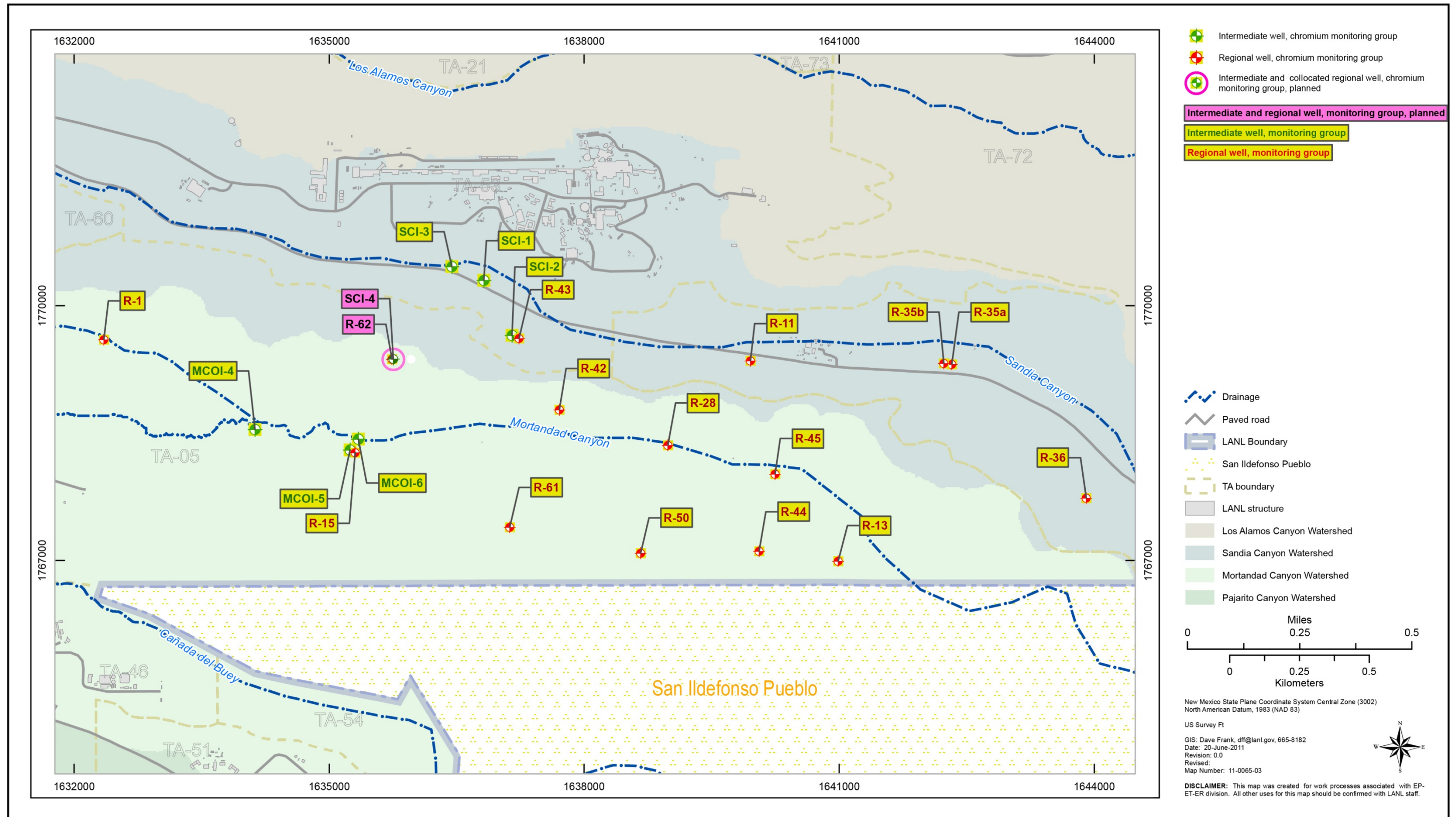


Figure 3.1-1 Chromium investigation monitoring group

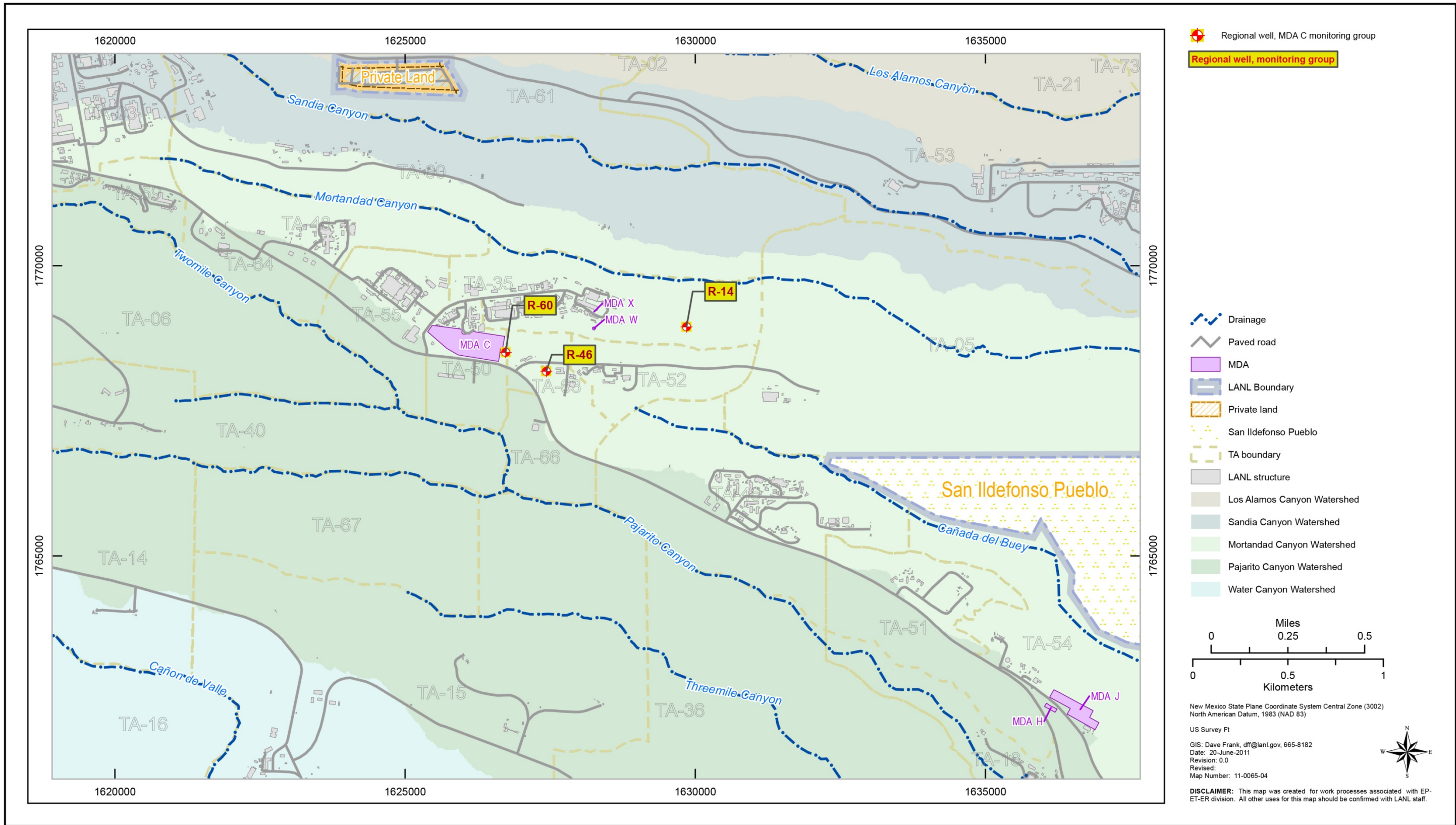


Figure 4.1-1 MDA C monitoring group

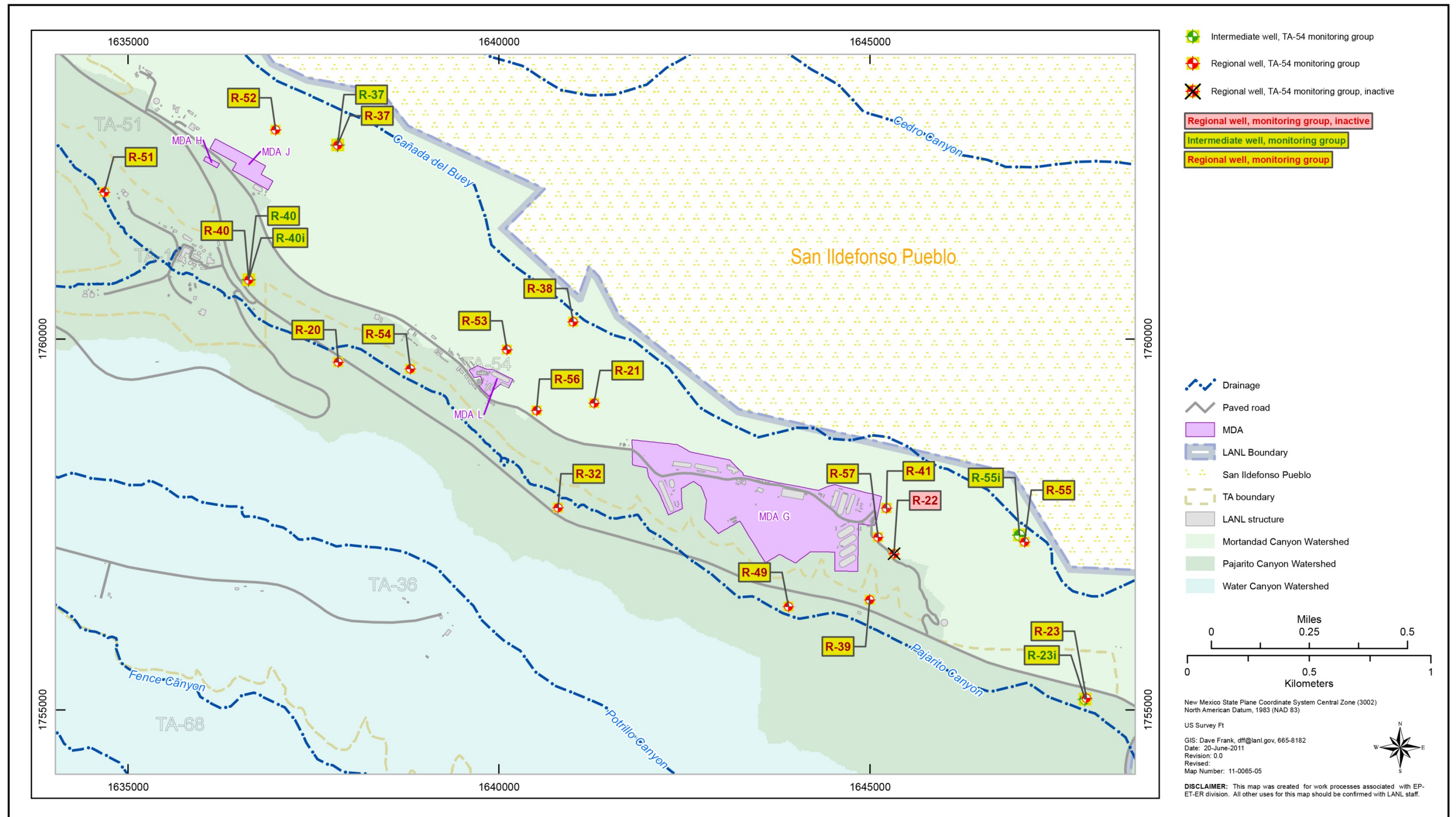


Figure 5.1-1 Monitoring well network for TA-54 MDAs H, L, and G

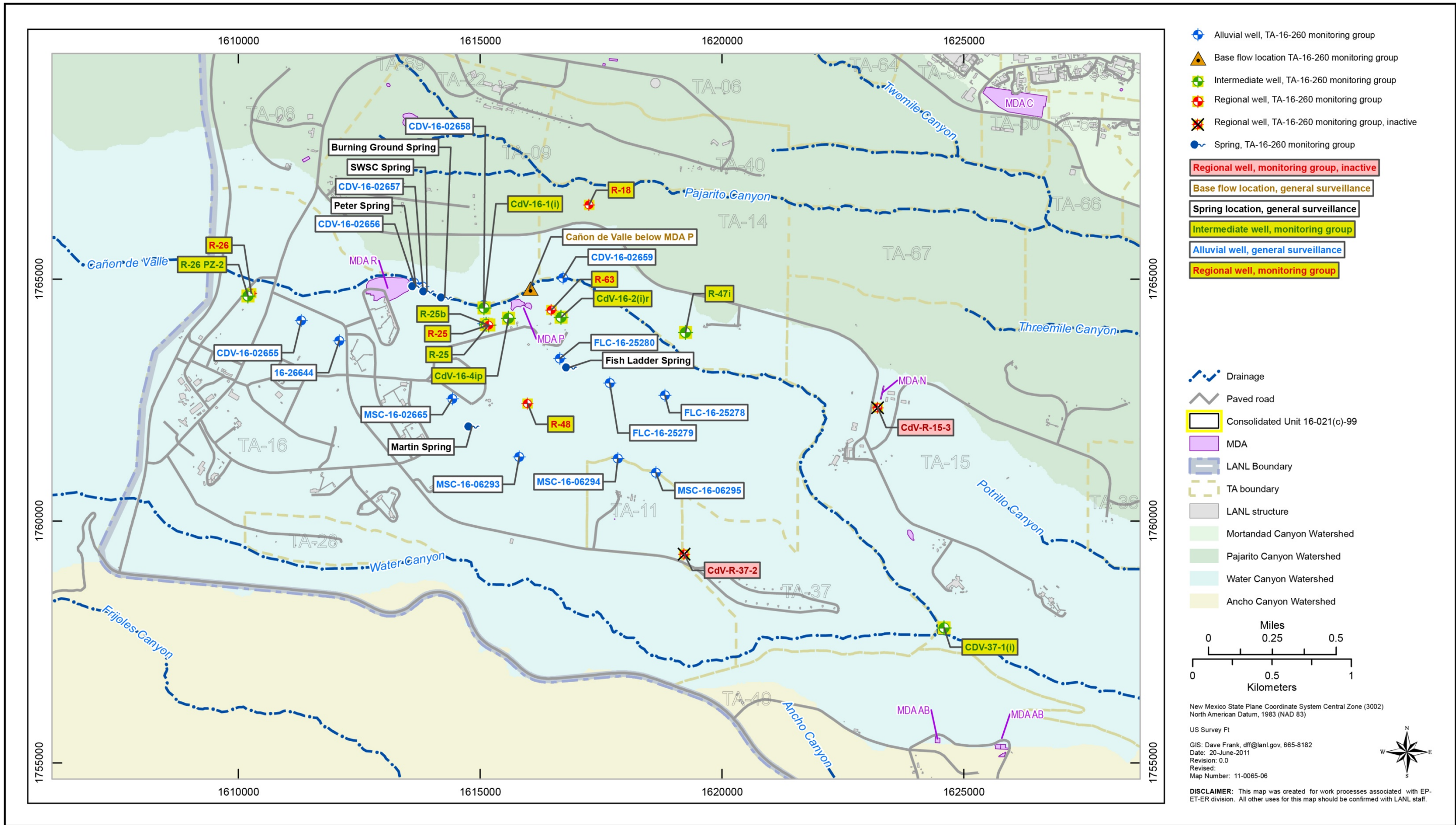


Figure 6.1-1 TA-16 260 Outfall monitoring group

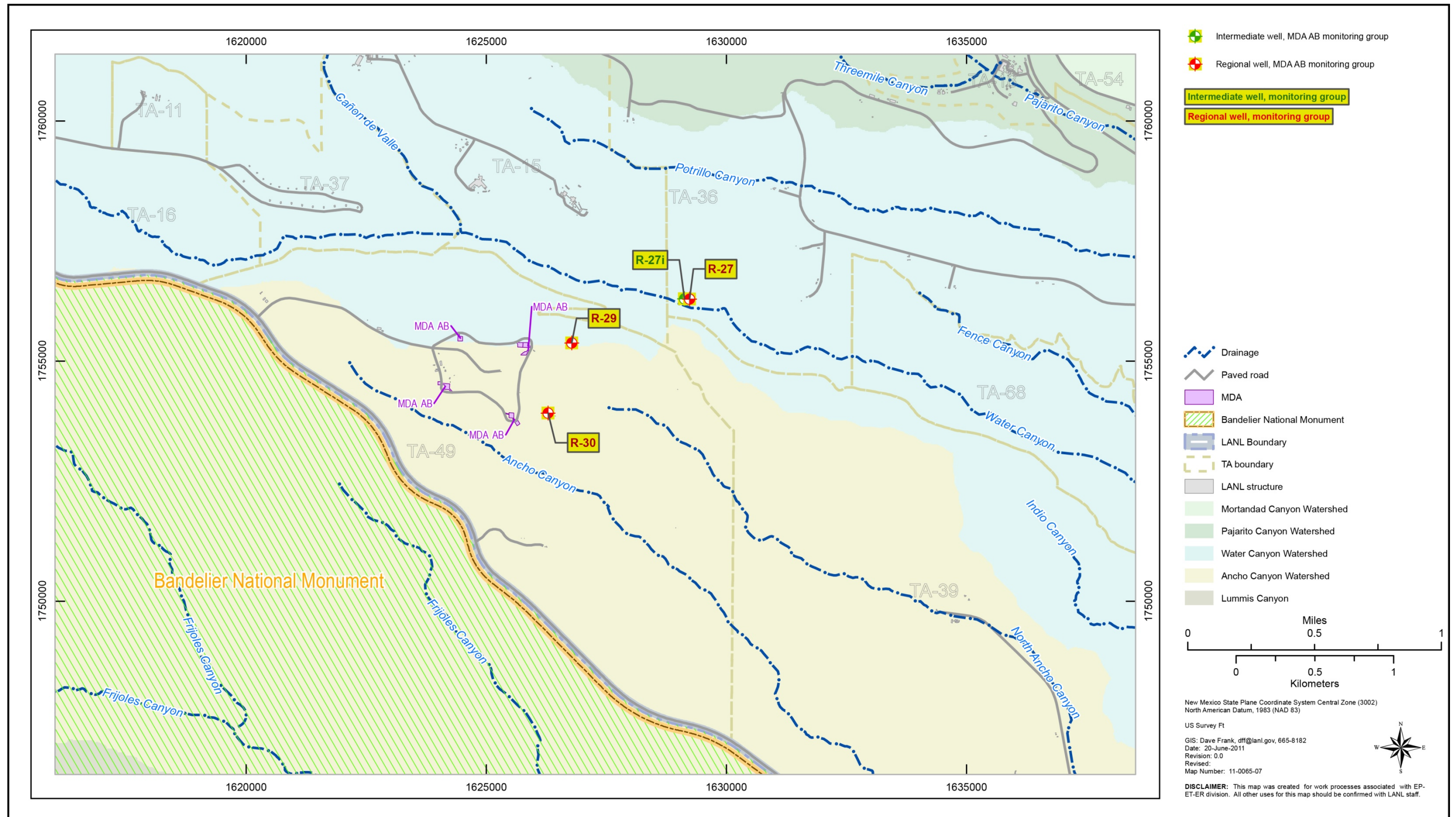


Figure 7.1-1 MDA AB monitoring group

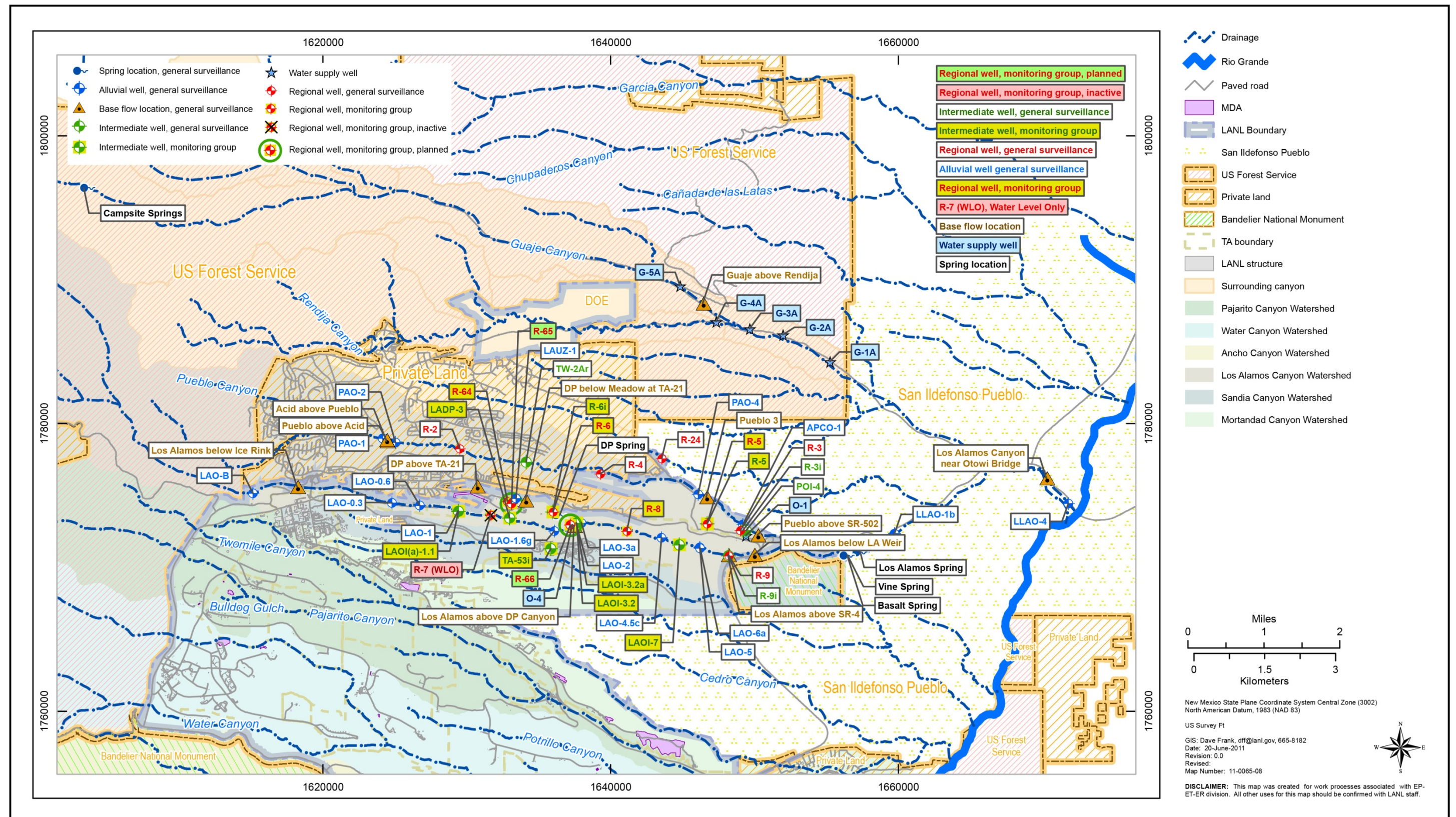


Figure 8.1-1 General surveillance north, Los Alamos Canyon/Pueblo Canyon

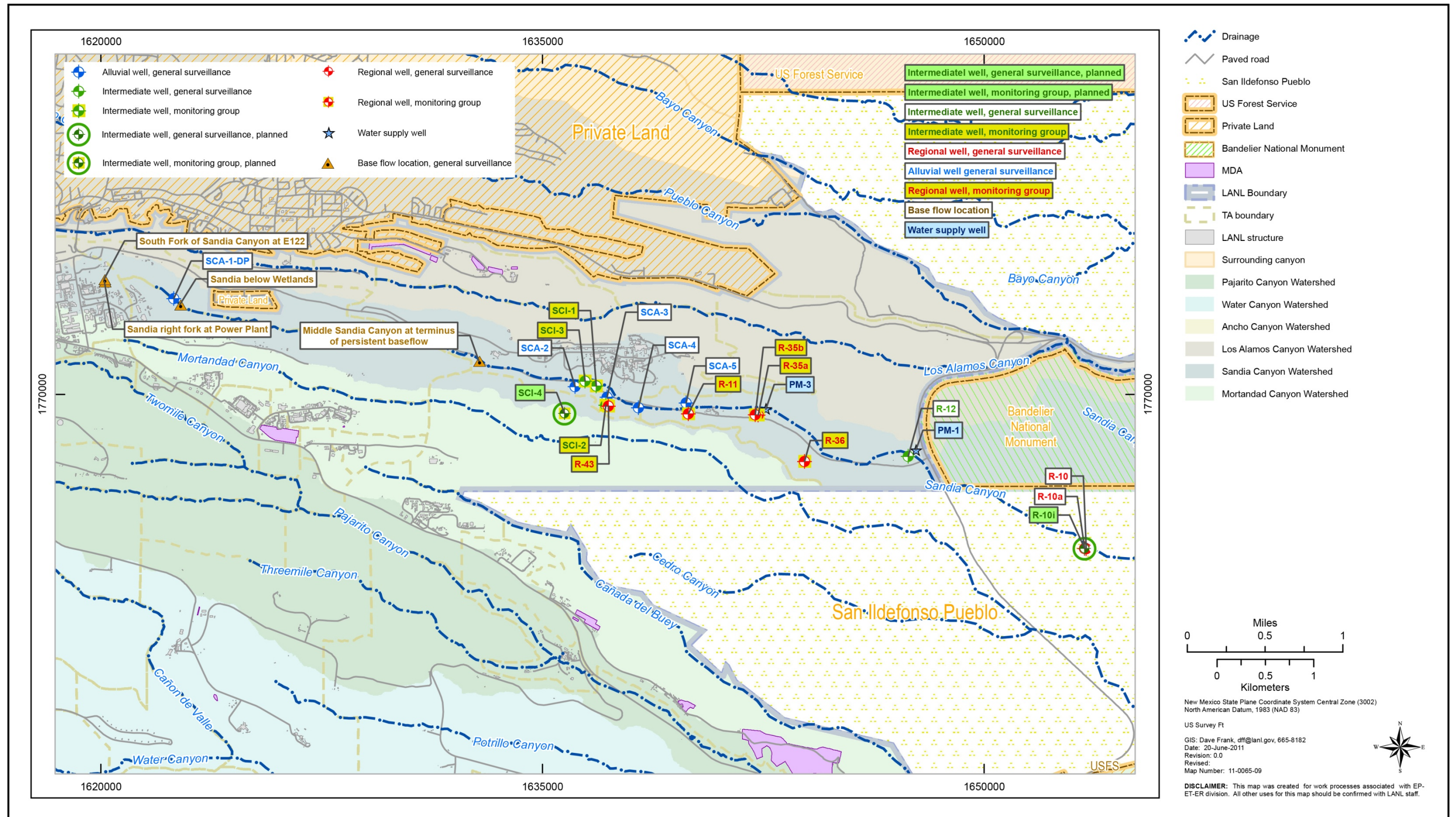


Figure 8.1-2 General surveillance north, Sandia Canyon

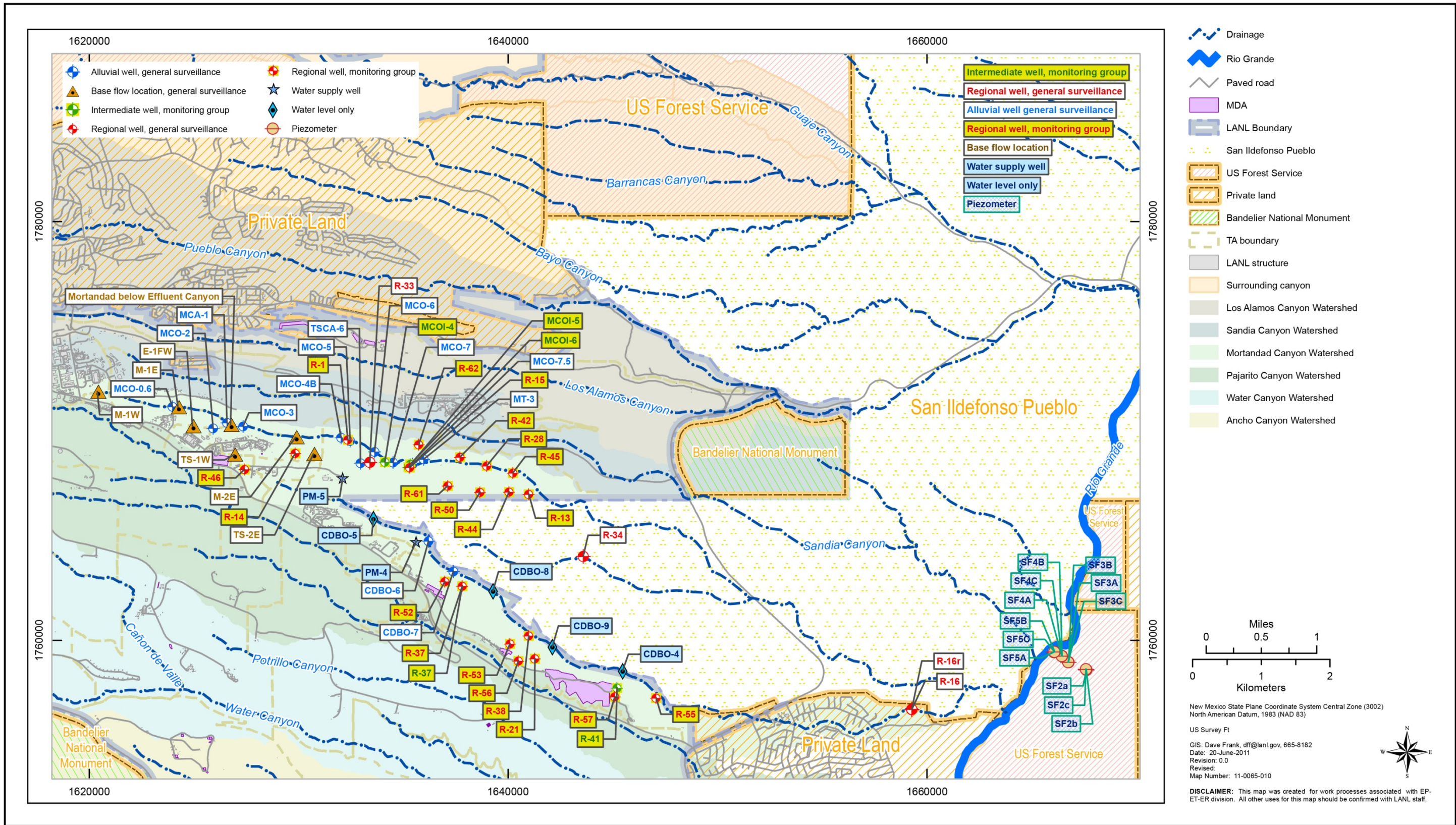


Figure 8.1-3 General surveillance south, Mortandad Canyon



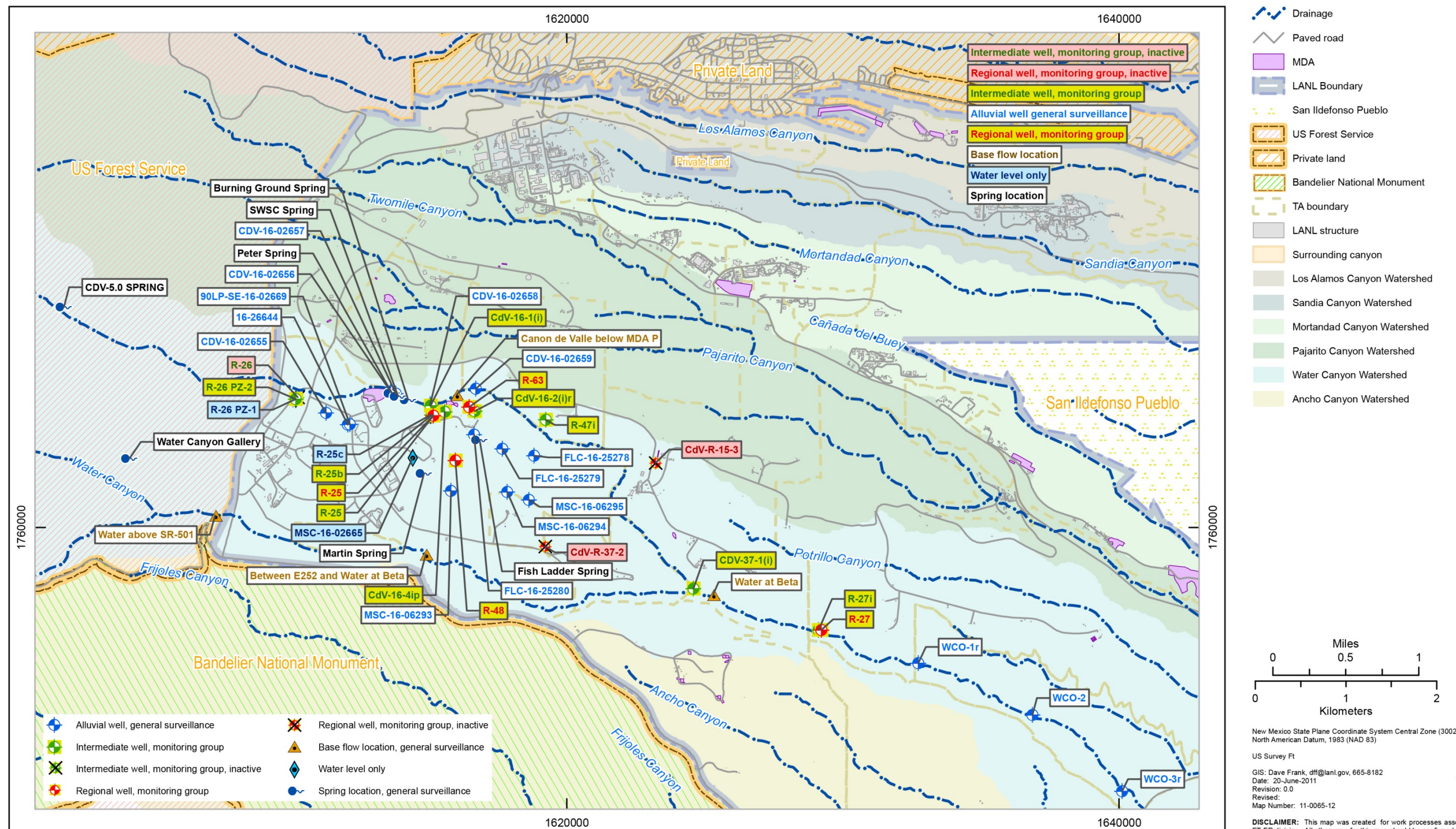


Figure 8.1-5 General surveillance south, Water Canyon/Cañon de Valle

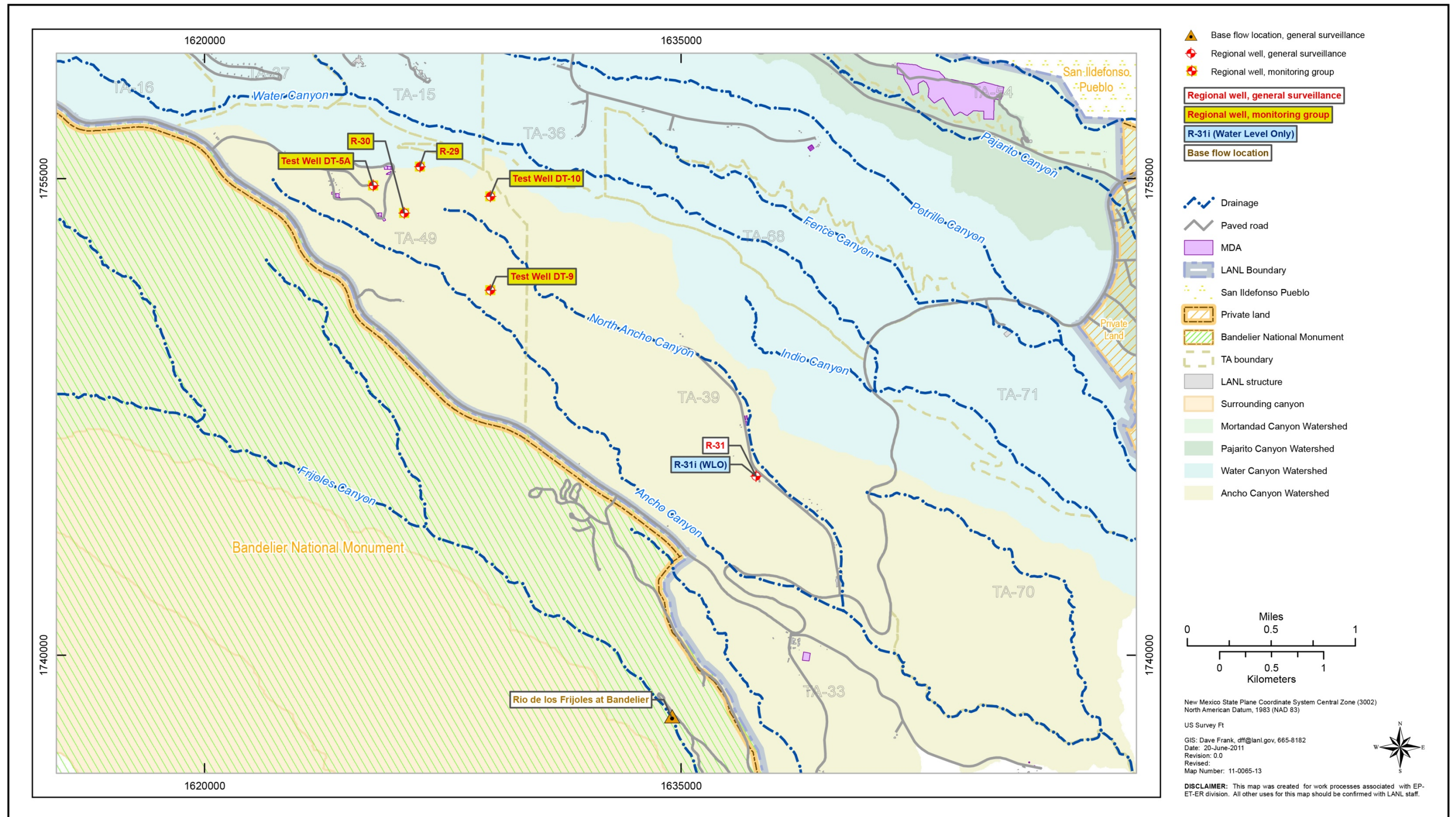


Figure 8.1-6 General surveillance south, Frijoles, Ancho, and Chaquehui Canyons

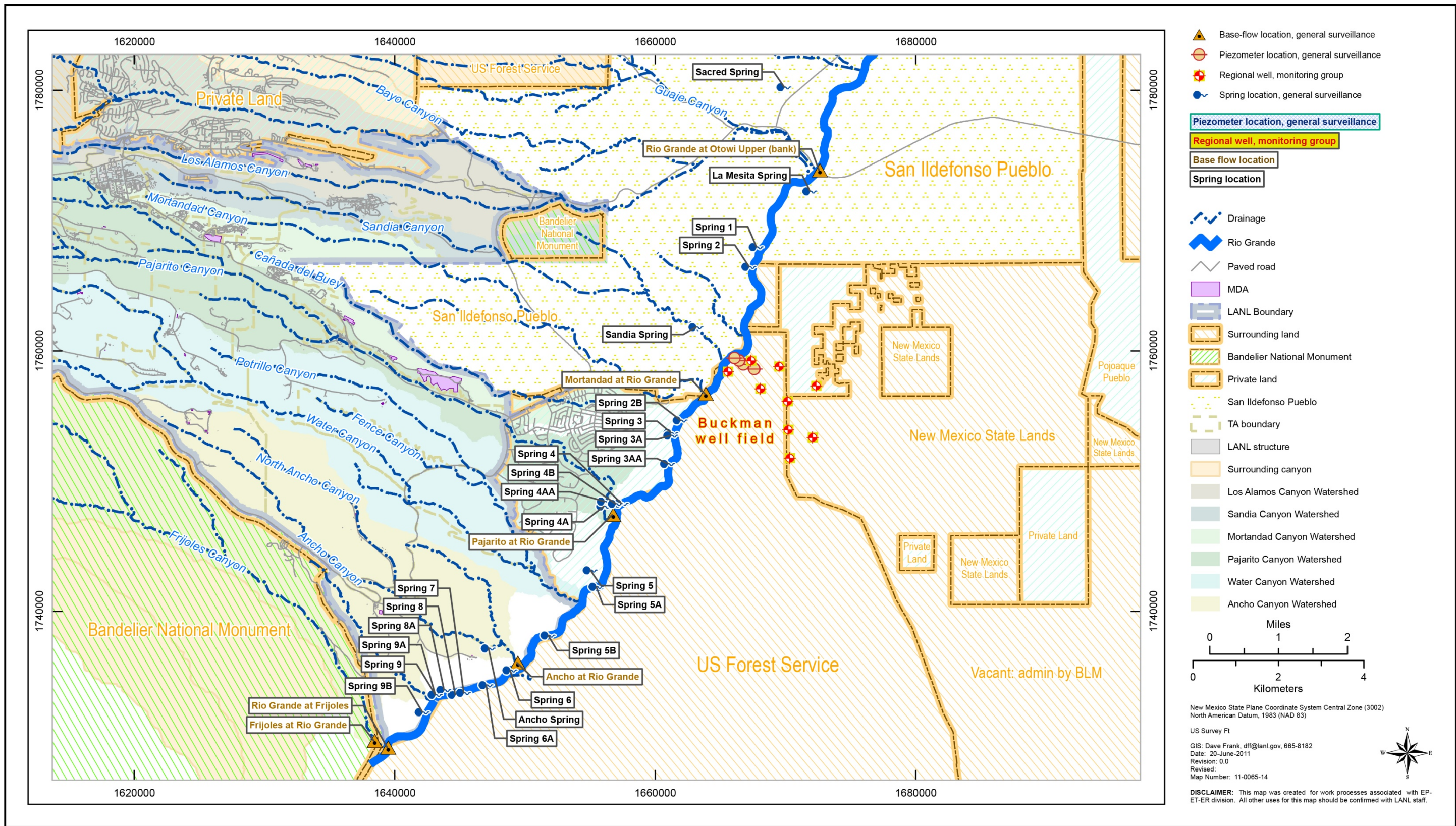


Figure 8.1-7 General surveillance, White Rock Canyon

Table 1.6-1
Potentially Applicable Standards Used to Select Base-Flow and Groundwater Screening Levels

Type	Source	Description	Abbreviation ^a	Potential Applicability ^b					
				Perennial Surface Water		Ephemeral Surface Water		Groundwater (Includes Springs)	
				F	UF	F	UF	F	UF
State of New Mexico Water Quality Control Commission (NMWQCC)									
Standard	NMAC ^c 20.6.4	Livestock Watering	NM LVSTK WTR STD	X	X	X	X		
Standard	NMAC 20.6.4	Wildlife Habitat	NM WQCC WLDLF HAB		X		X		
Standard	NMAC 20.6.4	Aquatic Life Acute	NM Aqu Acute x mg ^d			X	X		
Standard	NMAC 20.6.4	Aquatic Life Chronic	NM Aqu Chronic x mg ^d	X	X				
Standard	NMAC 20.6.4	Human Health Standard	NM HH OO	X	X	X	X		
Standard	NMAC 20.6.2	Groundwater Human Health Standards, Other Standards for Domestic Water Supply and Standards for Irrigation Use	NM GW STD					X	X
Consent Order									
Screening level	Consent Order	Screening Level for Perchlorate in Groundwater	NM GW CONS					X	X
EPA									
Standard	40 CFR ^e 141	EPA maximum contaminant levels	EPA MCL					X	X
Risk—human	EPA Regional Screening Levels ^f	EPA Regional Screening Levels for Tap Water	EPA TAP SCRNLVL					X	X
DOE									
Risk—ecological	DOE Order 5400.5	DOE Biota Concentration Guides	DOE BCG WATER	X	X	X	X		
Risk—human	DOE Order 5400.5	DOE 4-mrem Drinking Water Derived Concentration Guidelines	DOE DW DCG					X	X

^a Abbreviations used in the screening tables in Attachment B-1 of Appendix B.

^b The protocol for selecting the lowest applicable screening levels for groundwater and surface water is described in Appendix B. The description includes assumptions and rationale for hardness-dependent metals. Blank cells indicate the screening level is not applicable to the water type.

^c NMAC = New Mexico Administrative Code.

^d x indicates the hardness concentration (as mg/L) used to calculate screening levels for hardness-dependent trace metals.

^e CFR = Code of Federal Regulations.

^f EPA regional screening levels (EPA 2011, 204336).

Table 1.6-2
Analytical Suites and Frequencies for Locations Assigned to Area-Specific Monitoring Groups

Surface-Water Body or Source Aquifer	Metals ^a	Organics						Radionuclides			General Inorganics				Field Data ⁱ
	TAL Metals	VOCs ^b	SVOCs ^b	Pesticides	PCB ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	General Inorganics ^g	Perchlorate	Stable Isotopes ^h	Suspended Sediment Concentration	
TA-21 Monitoring Group (Upper Los Alamos and Sandia Canyons)															
Intermediate	A	A	A	T	T	T	T	A	A	A	A	A	—	—	A
Regional	A	A	A	T	T	T	T	A	—	A	A	A	—	—	A
Characterization of new deep groundwater wells ^k	Q	Q	Q	S	S	S	S	Q	—	Q	Q	Q	S	—	Q
Chromium Investigation Monitoring Group (Sandia and Mortandad Canyons)															
Intermediate (Sandia)	Q	A	A	T	T	T	T	A	—	A	Q	S	—	—	Q
Intermediate (Mortandad)	Q	A	S	T	T	T	T	A	S	—	Q	S	—	—	Q
Regional	Q	A	A	T	T	T	T	B	—	A	Q	A	—	—	Q
Characterization of new deep groundwater wells	Q	Q	Q	S	S	S	S	Q	—	Q	Q	Q	Q	—	Q
MDA C Monitoring Group (Mortandad and Pajarito Canyons)															
Regional	A	S	A	T	T	T	T	A	—	S	A	A	S	—	S
Characterization for new deep groundwater wells	Q	Q	Q	S	S	S	S	Q	—	Q	Q	Q	S	—	Q
TA-54 Monitoring Group (Mortandad Canyon/Cañada del Buey and Pajarito Canyons)															
Intermediate	Q	Q	Q	T	T	T	T	A	—	S	Q	A	S	—	Q
Regional	Q	Q	Q	T	T	T	T	A	—	S	Q	A	S	—	Q
Characterization of new deep groundwater wells	Q	Q	Q	Q	Q	Q	Q	Q	—	Q	Q	Q	S	—	Q

Table 1.6-2 (continued)

Surface-Water Body or Source Aquifer	Metals ^a	Organics						Radionuclides			General Inorganics				Field Data ⁱ
	TAL Metals	VOCs ^b	SVOCs ^b	Pesticides	PCB ^c	HEXP ^d	Dioxins/ Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	General Inorganics ^g	Perchlorate	Stable Isotopes ^h	Suspended Sediment Concentration	
TA-16 260 Monitoring Group (Water Canyon/Cañon de Valle and Pajarito Canyon)															
Base flow	S	S	A	T	T	S ^{RDX-DP}	T	B	—	—	S	A	—	—	S
Springs	S	S	A	T	T	S ^{RDX-DP}	T	B	—	A	S	A	A	—	S
Alluvial	S	S	A	T	T	S ^{RDX-DP}	T	B	—	—	S	A	—	—	S
Intermediate	S	S	A	T	T	S ^{RDX-DP}	T	B	—	A	S	A	A	—	S
Regional	S	S	A	T	T	S ^{RDX-DP}	T	B	—	A	S	A	A	—	S
Characterization of new deep groundwater wells	Q	Q	Q	S	S	Q ^{RDX-DP}	S	Q	—	Q	Q	Q	S	—	Q

Table 1.6-2 (continued)

Surface-Water Body or Source Aquifer	Metals ^a	Organics						Radionuclides			General Inorganics				Field Data ⁱ
	TAL Metals	VOCs ^b	SVOCs ^b	Pesticides	PCB ^c	HEXP ^d	Dioxins/ Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	General Inorganics ^g	Perchlorate	Stable Isotopes ^h	Suspended Sediment Concentration	
MDA AB Monitoring Group (Ancho and Water Canyons)															
Intermediate	A	A	T	T	T	A ^{RDX-DP}	T	A	—	A	A	A	—	—	A
Regional	S	A	T	T	T	A ^{RDX-DP}	T	S	—	A	S	A	—	—	S

Notes: Sampling suites and frequencies: Q = quarterly (4 times/yr); S = semiannual (2 times/yr); A = annual (1 time/yr); B = biennial (1 time every 2 yr); T = triennial (1 time every 3 yr) in accordance with the preliminary sampling schedule shown in Table 1.8-1. Some locations assigned to an area-specific monitoring group may be assigned analytical suites or frequencies that differ from those shown in this table for site-specific reasons documented in Appendix D.

^a Metals analysis includes the 23 TAL metals (Ag, Al, As, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, Hg, K, Mg, Mn, Na, Ni, Pb, Sb, Se, Tl, V, Zn), plus boron, molybdenum, silicon dioxide, strontium, tin, and uranium.

^b VOC = Volatile organic compounds; SVOC = semivolatile organic compounds.

^c PCB = Polychlorinated biphenyl (compounds).

^d The analytical suite of explosive compounds (HEXP) includes the Consent Order list of the normal SW-846:8330 analytes plus pentaerythritol tetranitrate (PETN); triaminotrinitrobenzene (TATB); 3,5-dinitroaniline, tri(o-cresyl)phosphate (TOCP); 2,4-diamino-6-nitrotoluene; and 2,6-diamino-4-nitrotoluene. The superscript RDX-DP indicates the analysis of RDX-degradation products: hexahydro-1-nitroso-3,5-dinitro-1,3,5-triazine (MNX); hexahydro-1,3-nitro-1,3,5-triazine (DNX); and hexahydro-1,3,5-trinitroso-1,3,5-triazine (TNX).

^e The radionuclide suite includes gross alpha, gross beta, strontium-90, and radionuclides analyzed by alpha and gamma spectroscopy.

^f Tritium samples may be submitted for analysis by liquid scintillation if the average activities are anticipated to exceed 200 pCi/L. Low-level tritium is analyzed using electrolytic enrichment or direct counting.

^g General inorganic analysis includes major anions (bromide, chloride, fluoride, sulfate); major cations (calcium, magnesium, sodium, potassium); nitrate plus nitrite (as N); total Kjeldahl nitrogen (TKN); ammonia; total phosphorus; total organic carbon (TOC); total dissolved solids (TDS); alkalinity; specific conductivity; pH; and hardness. TKN, TOC and total cyanide are analyzed only in unfiltered samples.

^h Analysis for stable nitrogen, deuterium, and oxygen isotopes. The collection of samples for stable isotopic analysis is considered a special sampling campaign that is outside the scope of the regulatory process. In general, samples for isotopic analysis are collected semiannually from "new" wells (those which completed construction, rehabilitation, or conversion on or after October 1, 2010) until at least four sets of data have been collected. Any subsequent sampling for stable isotope analysis will be decided on the basis of site-specific conditions.

ⁱ Field parameters include pH, turbidity, specific conductance, dissolved oxygen, and temperature at all locations. Oxidation-reduction potential (ORP) will be measured if a flow-through cell is used and will not be measured in surface water, spring water, or water collected from Westbay sampling systems unless specified. Alkalinity (ALK) will be measured for all samples either in the field or at the on-site EES-14 laboratory.

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

^k Characterization suites and frequencies apply to new intermediate perched or regional groundwater wells assigned to this monitoring group. "New" wells are defined as those completed, rehabilitated, or converted on or after October 1, 2010. Any planned exceptions to this general protocol are documented in Appendix D.

^l Quarterly samples will also be collected for stable chromium isotopes analysis from new deep wells in the chromium investigation monitoring group.

Table 1.6-3
Analytical Suites and Frequencies for General Surveillance Monitoring (Grouped by Watershed)

Surface-Water Body or Source Aquifer	Metals ^a	Organics						Radionuclides			General Inorganics				Field Data ⁱ
	TAL Metals	VOCs ^b	SVOCs ^b	Pesticides	PCB ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	General Inorganics ^g	Perchlorate	Stable Isotopes ^h	Suspended Sediment Concentration	
Characterization of New Deep Groundwater Wells															
Characterization	Q	Q	Q	S	S	S	S	Q	— ^k	Q	Q	Q	S	—	Q
Los Alamos/Pueblo Canyon (Table 8.2-1)															
Upper Los Alamos Canyon															
Base flow	A	A	A	T	A ^{CNGR}	T	T	A	—	—	A	A	—	A	A
Springs	A	A	A	T	A	T	T	A	—	A	A	A	—	A	A
Alluvial	A	A	A	T	T	T	T	A	—	—	A	A	—	—	A
Intermediate	A	A	A	T	T	T	T	A	—	A	A	A	—	—	A
Regional	A	A	A	T	T	T	T	A	—	A	A	A	—	—	A
Pueblo Canyon															
Base flow	A	A	A	T	A ^{CNGR}	T	T	A	—	—	A	A	—	A	A
Alluvial	A	A	A	T	T	T	T	A	—	—	A	A	—	—	A
Intermediate	A	A	A	T	T	T	T	A	—	A	A	A	—	—	A
Regional	A	A	A	T	T	T	T	A	—	A	A	A	—	—	A
Lower Los Alamos Canyon															
Base flow	A	A	A	T	T	T	T	A	—	A	A	A	—	A	A
Springs	A	A	T	T	T	T	T	A	—	A	A	A	—	A	A
Alluvial	A	A	T	T	T	T	T	A	—	—	A	A	—	—	A
Sandia Canyon (Table 8.3-1)															
Base flow	A	A	A	T	A ^{CNGR}	T	T	B	—	—	A	A	—	A	A
Alluvial	A	A	A	T	T	T	T	B	—	—	A	A	—	—	A
Intermediate	A	A	A	T	T	T	T	A	—	A	A	A	—	—	A
Regional	A	A	A	T	T	T	T	A	—	A	A	A	—	—	A

Table 1.6-3 (continued)

Surface-Water Body or Source Aquifer	Metals ^a	Organics						Radionuclides			General Inorganics				Field Data
	TAL Metals	VOCs ^b	SVOCs ^b	Pesticides	PCB ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	General Inorganics ^g	Perchlorate	Stable Isotopes ^h	Suspended Sediment Concentration	
Mortandad Canyon (Table 8.4-1)															
Base flow	A	A	A	T	T	T	T	A	—	—	A	A	—	A	A
Alluvial (excluding Cañada del Buey)	A	A	A	T	T	T	T	A	A	—	A	A	—	—	A
Alluvial (Cañada del Buey)	A	A	A	T	T	T	T	A	—	A	A	A	—	—	A
Regional	A	A	A	T	T	T	T	A	—	A	A	A	—	—	A
Pajarito Canyon (Table 8.5-1)															
Base flow	A	A	A	T	T	A	T	A	—	—	A	A	—	A	A
Springs	A	A	A	T	T	A	T	A	—	A	A	A	—	A	A
Alluvial	A	A	A	T	T	A	T	A	—	—	A	A	—	—	A
Intermediate	A	A	A	T	T	A	T	A	—	A	A	A	—	—	A
Regional	A	A	A	T	T	A	T	A	—	A	A	A	—	—	A
Water Canyon/Cañon de Valle (Table 8.6-1)															
Base flow	A	A	A	T	T	A ^{RDX-DP}	T	A	—	—	A	A	—	A	A
Springs	A	A	A	T	T	A ^{RDX-DP}	T	A	—	A	A	A	—	A	A
Alluvial	A	A	A	T	T	A ^{RDX-DP}	T	A	—	—	A	A	—	—	A
Ancho/Frijoles Canyon (Table 8.7-1)															
Base flow (Frijoles)	A	T	T	T	T	T	T	A	—	—	A	A	—	A	A
Spring (Frijoles)	A	T	T	T	T	T	T	A	—	A	A	A	—	A	A
Regional (Ancho)	A	A	T	T	T	A	T	A	—	A	A	A	—	—	A
White Rock Canyon/Rio Grande (Table 8.8-1)															
Base flow	A	A	T	T	T	T	T	A	—	—	A	A	—	A	A
Spring Subgroup A (upgradient of Area G, TA-54)	A	A	T	T	T	T	T	A	—	A	A	A	—	A	A
Spring Subgroup B (downgradient of Area G, TA-54)	A	A	A	T	T	A	T	A	—	A	A	A	—	A	A

Table 1.6-3 (continued)

Surface-Water Body or Source Aquifer	Metals ^a	Organics						Radionuclides			General Inorganics				Field Data ⁱ
	TAL Metals	VOCs ^b	SVOCs ^b	Pesticides	PCB ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	General Inorganics ^g	Perchlorate	Stable Isotopes ^h	Suspended Sediment Concentration	
Spring Subgroup C (downgradient of Pajarito Canyon)	A	A	A	T	T	A	T	A	—	A	A	A	—	A	A

Notes: Sampling suites and frequencies: Q = quarterly (4 times/yr); S = semiannual (2 times/yr); A = annual (1 time/yr); T = triennial (1 time every 3 yr), in accordance with the preliminary sampling schedule shown in Table 1.8-1. — = this analytical suite is not scheduled to be collected for this type of water at locations assigned to general surveillance monitoring. Some locations assigned to general surveillance may be assigned analytical suites or frequencies that differ from those shown in this table for site-specific reasons documented in Appendix D.

^a Metals analysis includes the 23 TAL metals (Ag, Al, As, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, Hg, K, Mg, Mn, Na, Ni, Pb, Sb, Se, Tl, V, Zn), plus boron, molybdenum, silica, strontium, tin, and uranium.

^b VOC = Volatile organic compounds; SVOC = semivolatile organic compounds.

^c PCB = Polychlorinated biphenyl [compound]. The superscript CNGR indicates the analysis of PCB congeners using EPA Method 1668A.

^d The analytical suite of explosive compounds (HEXP) includes the Consent Order list of the normal SW-846:8330 analytes plus pentaerythritol tetranitrate (PETN); triaminotrinitrobenzene (TATB); 3,5-dinitroaniline; tri(o-cresyl)phosphate (TOCP); 2,4-diamino-6-nitrotoluene; and 2,6-diamino-4-nitrotoluene. The superscript RDX-DP indicates the analysis of RDX-degradation products: hexahydro-1-nitroso-3,5-dinitro-1,3,5-triazine (MNX); hexahydro-1,3-nitro-1,3,5-triazine (DNX); and hexahydro-1,3,5-trinitroso-1,3,5-triazine (TNX).

^e The radionuclide suite includes gross alpha, gross beta, strontium-90, and radionuclides analyzed by alpha and gamma spectroscopy.

^f Tritium samples may be submitted for analysis by liquid scintillation if average activities are anticipated to exceed 200 pCi/L. Low-level tritium is analyzed using electrolytic enrichment or direct counting.

^g General inorganic analysis includes major anions (bromide, chloride, fluoride, sulfate); major cations (calcium, magnesium, sodium, potassium); nitrate plus nitrite (as N); total Kjeldahl nitrogen (TKN); ammonia; phosphate; total organic carbon (TOC); total dissolved solids (TDS); alkalinity; specific conductivity; pH; and hardness. TKN, TOC and total cyanide are analyzed only in unfiltered samples.

^h Analysis for stable nitrogen, deuterium, and oxygen isotopes. The collection of samples for stable isotopic analysis is considered a special sampling campaign that is outside the scope of the regulatory process. In general, samples for isotopic analysis are collected semiannually from “new” wells (those which completed construction, rehabilitation, or conversion on or after October 1, 2010) until at least four sets of data have been collected. Any subsequent sampling for stable isotope analysis will be decided on the basis of site-specific conditions.

ⁱ Field parameters include pH, turbidity, specific conductance, dissolved oxygen, and temperature at all locations. Oxidation-reduction potential (ORP) will be measured if a flow-through cell is used and will not be measured in surface water, spring water, or water collected from Westbay sampling systems unless specified. Alkalinity (ALK) will be measured for all samples either in the field or at the on-site EES-14 laboratory.

^j Applies to new intermediate perched or regional groundwater wells not assigned to an area-specific monitoring group (Table 1.6-2). “New” wells are defined as those completed, rehabilitated, or converted on or after October 1, 2010. Any planned exceptions to this general protocol are documented in Appendix D.

^k — = This analytical suite is not scheduled to be collected for this type of water for general surveillance monitoring in this watershed.

Table 1.8-1
Sampling Schedule for Monitoring Year October 1, 2011—September 30, 2012 (MY2011)

Monitoring Group or Watershed	Location Type	First Quarter	Second Quarter	Third Quarter	Fourth Quarter	Comments
		Oct–Dec 2011	Jan–Mar 2012	Apr–Jun 2012	Jul–Sep 2012	
Monitoring Groups						
TA-54	Routine	Q	Q	Q	Q	Collect triennial samples in MY2011
Chromium Investigation/MDA C	Routine	Q	Q	Q	Q	Collect biennial and triennial samples in MY2012
TA-21/MDA AB		A	—	—	—	Collect triennial samples in MY2012
TA-16 260	Routine	—	S	—	S	Collect biennial and triennial samples in MY2011
General Surveillance						
General Surveillance—North ^a	Routine	—	—	—	A	Collect biennial samples in MY2012 Collect triennial samples in MY2013
General Surveillance—South ^b	Routine	—	—	A	—	Collect triennial samples in MY2013
General Surveillance—White Rock Canyon	Routine	A	—	—	—	Collect triennial samples in MY2013
Characterization						
All watersheds	Characterization ^c	Q	Q	Q	Q	Collect quarterly characterization samples to meet sampling requirements for newly constructed wells

Notes: Sampling frequencies: Q = quarterly (4 times/yr); S = semiannual (2 times/yr); A = annual (1 time/yr); B = biennial (1 time every 2 yr); T = triennial (1 time every 3 yr);
 — = no samples are scheduled to be collected from this monitoring group during this period.

^a General Surveillance North group includes all general surveillance locations within Los Alamos, Pueblo, Sandia, and Guaje Canyons.

^b General Surveillance South group includes all general surveillance locations within Mortandad, Pajarito, Water/Cañon de Valle, Ancho and Frijoles Canyons.

Table 1.10-1
Frequencies for Locations Assigned to Water-Level Monitoring Only

Assigned Monitoring Group	Location	Rationale for Selection of Location	Source Aquifer	Water Level*
Los Alamos/Pueblo Canyons Watershed				
TA-21 Monitoring Group	R-5 screen 1	Well located downgradient of upper Pueblo and Acid Canyons. Screen has been dry since well installation (2001) although water was observed in the sump below the screen (Koch and Schmeer 2011, 201566). Water level checked annually during sampling of R-5 until this well is reconfigured or replaced.	Intermediate	A ^{HD}
	R-7 screen 1	Well located in middle Los Alamos Canyon. Screen 1 went dry during sampling in December 2003 (Koch and Schmeer 2011, 201566). The zone produced water during drilling, and the screen produced small amounts of water for a short period following installation. Water was detected in the sump below the screen since 2005. Automated monitoring of water levels maintained to see if either zone recovers until this well is reconfigured or replaced.	Intermediate	C ^{HD}
	R-7 screen 2	Well located in middle Los Alamos Canyon. Screen 2 has been dry since well installation in 2001 although water has been observed in the sump since mid-2008 (Koch and Schmeer 2011, 201566). Automated monitoring of water levels maintained to see if either zone recovers until this well is reconfigured or replaced.	Intermediate	C ^{HD}
	R-7 screen 3	Well located in middle Los Alamos Canyon. The collection of water-quality samples from this screen is suspended because it remains impacted by drilling products. Automated monitoring of water levels maintained to monitor the top of the regional aquifer at this location until this well is reconfigured or replaced.	Regional	C
Sandia Canyon Watershed				
General Surveillance	SCA-1	Well located in wetland in upper Sandia Canyon. Sampling events were moved to nearby drive point well SCA-1-DP because of silting in of the screen in SCA-1. Continuous water levels are monitored in SCA-1, and manual measurements are taken at SCA-1-DP during sampling events (Koch and Schmeer 2011, 201566).	Alluvial	C
Mortandad Canyon Watershed				
General Surveillance	CDBO-4 CDBO-5 CDBO-8 CDBO-9	Wells located in Cañada del Buey. CDBO-8 is approximately 0.4 mi southeast of CDBO-7, and CDBO-9 is approximately 0.4 mi downgradient of CDBO-7. Wells have historically been dry (Koch and Schmeer 2011, 201566). Transducers were installed in January 2009 as part of an agreement with NMED to characterize potential transients in recharge in this portion of Cañada del Buey. If any well wets up, a plan to collect samples during a wetted phase will be implemented.	Alluvial	C ^{HD}
TA-54 Monitoring Group	R-41 screen 1	Well located east of MDA G at TA-54. Screen 1 has been dry since well installation (March 2009) (Koch and Schmeer 2011, 201566). Water level checked quarterly during sampling of R-41.	Intermediate	Q ^{HD}

Table 1.10-1 (continued)

Assigned Watershed or Monitoring Group	Location	Rationale for Selection of Location	Source Aquifer	Water Level ^a
Pajarito Canyon Watershed				
General Surveillance	PCO-3	Well located in lower Pajarito Canyon, approximately 730 ft southeast of PCAO-9 and 0.5 mi upstream of the eastern Laboratory boundary, in wetlands on south side of Pajarito Road. In recent years the well has been dry except in response to large runoff events in lower Pajarito Canyon when the well has water for up to several months (Koch and Schmeer 2011, 201566).	Alluvial	C
	R-19 screen 1	Well located on a mesa south of Threemile Canyon and downgradient of TA-16. Screen 1 has been dry since installation of the Westbay sampling system in September 2000 (Koch and Schmeer 2011, 201566). Water-level data will continue to be collected from this screen during sampling events until well R-19 is reconfigured or replaced.	Intermediate	Q ^{HD}
	R-19 screen 5 R-19 screen 6 R-19 screen 7	Well located on a mesa south of Threemile Canyon and downgradient of TA-16. The collection of water-quality samples from these screens is suspended because they remain impacted by drilling products. Water-level data will continue to be collected from these screens until well R-19 is reconfigured or replaced.	Regional	C
TA-54	R-40 screen 1	Monitors TA-54 and potential sources in Pajarito watershed. Water level quickly drops below pump inlet during purge because screen is located in a tight formation with a low recharge rate.	Intermediate	C
Water Canyon/Cañon de Valle Watershed				
TA-16 260 Monitoring Group	90LP-SE-16-02669	Located at TA-16 southeast and downgradient of the 90LP Pond. The borehole contained water at the completion of drilling but since completion of the well, water has not been present in the well (Koch and Schmeer 2011, 201566). An annual manual measurement is taken during each spring to enhance conceptual model of potential changes associated with snowmelt runoff.	Intermediate	A ^{HD}
	R-25 screen 3	Located at TA-16 within the Cañon de Valle watershed. Screen 3 has always been dry but the screen was damaged during installation and is not reliable for water-level monitoring (Koch and Schmeer 2011, 201566). Pump water at screen 3 responded to drilling and installation of adjacent well R-25c (replacement for R-25 screen 3) in August 2008.	Intermediate	C
	R-25c	Located at TA-16 about 50 ft west of well R-25b and about 100 ft west of well R-25. Well completed in September 2008 as a replacement for screen 3 in R-25. The borehole contained water during drilling but the well was dry at completion and did not retain water during attempted slug testing (Koch and Schmeer 2011, 201566). A seismometer was installed at the bottom of the well in September 2010. Water-level data will continue to be collected from the sump water present below this screen to determine if transient water moving through the vadose zone could enter the well.	Intermediate	C ^{HD}

Table 1.10-1 (continued)

Assigned Watershed or Monitoring Group	Location	Rationale for Selection of Location	Source Aquifer	Water Level ^a
	R-26 PZ-1	Deeper piezometer in a dual-completion piezometer installed near well R-26 (Koch and Schmeer 2011, 201566). This piezometer has always been dry when checked. Water-level data will continue to be collected from this piezometer during sampling events at R-26 PZ-2 to evaluate whether this zone wets from infiltration associated with snowmelt runoff.	Intermediate	S ^{HD}
Ancho Canyon Watershed				
General Surveillance	R-31 Screen 1	Located in the north Ancho Canyon tributary. Zone initially showed water during drilling but has been dry since installation of the Westbay system in April 2000 (Koch and Schmeer 2011, 201566). Water-level data will continue to be checked at this screen during annual sampling event until well R-31 is reconfigured or replaced.	Intermediate	A ^{HD}
	R-31 Screen 2 R-31 Screen 3	The collection of water-quality samples from these screens is suspended because they remain impacted by drilling products. Water-level data will continue to be collected from these screens until well R-31 is reconfigured or replaced.	Regional	C
Water-Level Data from Water-Supply Wells (Koch and Schmeer 2011, 201566)				
Cooperative agreement	G-1A, G-2A, G-3A, G-5A	Water-supply wells located in Guaje Canyon	Regional	C
	G-4A	Water-supply well located in lower Rendija Canyon near its confluence with Guaje Canyon	Regional	C
	G-3	Former water-supply well located in Guaje Canyon; converted to monitoring well in 1998	Regional	C
	O-1	Water-supply well located in lower Pueblo Canyon	Regional	C
	O-4	Water-supply well located in Los Alamos Canyon above confluence with DP Canyon	Regional	C
	PM-1 and PM-3	Water-supply wells located in Sandia Canyon	Regional	C
	PM-2	Water-supply well located in Pajarito Canyon	Regional	C
	PM-4	Water-supply well located on Mesita del Buey south of Mortandad Canyon	Regional	C
	PM-5	Water-supply well located on a mesa south of Ten Site and Mortandad Canyons	Regional	C

* Sampling frequency: C = continuous; Q = quarterly (4 times/yr at set time periods); S = semiannual (2 times/yr); A = annual (1 time/yr). The superscript HD indicates this sampling location is historically dry. Continuous monitoring for groundwater refers to the measurement of groundwater-level measurements by a transducer placed in a well and programmed to collect groundwater-level measurements at highly frequent intervals (e.g., every 60 min daily throughout the year).

Table 2.4-1
Interim Monitoring Plan for TA-21 Monitoring Group

Location	Rationale for Selection of Location	Surface Water Body or Source Aquifer	Water Level or Flow ^a	Analytical Suites														
				Metals	Organics						Radionuclides			Inorganics				Field ⁱ
				Metals ^b	VOCs ^c	SVOCs ^c	Pesticides	PCB ^d	HEXP ^e	Dioxins/Furans	Radionuclide ^f	Tritium ^g	Low-Level Tritium ^g	Gen Inorganics ^h	Perchlorate ⁱ	Stable Isotopes ^j	Suspended Sed ^k	DO, ORP, pH, SC, T, Turb, ALK
LADP-3	Monitors downgradient location for potential contaminants from upper Los Alamos Canyon, DP Canyon and TA-21.	Intermediate	C	A	A	A	T	T	T	T	A	— [≡]	A	A	A	A	—	A
LAOI(a)-1.1	Monitors for potential contaminants from upper Los Alamos Canyon, DP Canyon, and TA-21. Background location in Groundwater Background Investigation Report, Revision 3 (GBIR R3) (LANL 2007, 095817) and Groundwater Background Investigation Report, Revision 4 (GBIR R4) (LANL 2010, 110535).	Intermediate	C	A	A	A	T	T	T	T	A	—	A	A	A	—	—	A
LAOI-3.2	Monitors for potential contaminants from upper Los Alamos Canyon, DP Canyon and TA-21.	Intermediate	C	A	A	A	T	T	T	T	A	A	—	A	A	—	—	A
LAOI-3.2a	Monitors for potential contaminants from upper Los Alamos Canyon, DP Canyon and TA-21.	Intermediate	C	A	A	A	T	T	T	T	A	A	—	A	A	—	—	A
R-5 screen 2	Monitors for potential contaminants from upper Pueblo and Acid Canyons. Well is equipped with a Westbay sampling system and is scheduled for redevelopment and conversion in fiscal year (FY) 2012.	Intermediate	C	A	A	—	—	—	—	—	A	—	A	A	A	A	—	A

Table 2.4-1 (continued)

Location	Rationale for Selection of Location	Surface Water Body or Source Aquifer	Water Level or Flow ^a	Analytical Suites														
				Metals	Organics						Radionuclides			Inorganics				Field ^l
				Metals ^b	VOCs ^c	SVOCs ^c	Pesticides	PCB ^d	HEXP ^e	Dioxins/Furans	Radionuclide ^f	Tritium ^g	Low-Level Tritium ^g	Gen Inorganics ^h	Perchlorate ⁱ	Stable Isotopes ^j	Suspended Sed ^k	DO, ORP, pH, SC, T, Turb, ALK
R-6i	Monitors for potential contaminants from upper Los Alamos Canyon, DP Canyon, and TA-21.	Intermediate	C	A	A	A	T	T	T	T	A	A	—	A	A	—	—	A
TA-53i	Monitors for potential southward migration of contaminants from sources in Los Alamos Canyon. Located within TA-53 on the mesa separating Los Alamos and Sandia Canyons.	Intermediate	C	A	A	A	T	T	T	T	A	A	—	A	A	A	—	A
R-5 screen 3	Monitors for potential contaminants from upper Pueblo and Acid Canyons. Well is equipped with a Westbay sampling system and is scheduled for redevelopment and conversion in FY2012.	Regional	C	A	A	—	—	—	—	—	A	—	A	A	A	A	—	A
R-5 screen 4	Monitors for potential contaminants from upper Pueblo and Acid Canyons. Well is equipped with a Westbay sampling system and is scheduled for redevelopment and conversion in FY2012.	Regional	C	A	A	—	—	—	—	—	A	—	A	A	A	A	—	A
R-6	Monitors for potential contaminants from upper Los Alamos Canyon, DP Canyon, and TA-21. Background location in GBIR R4.	Regional	C	A	A	A	T	T	T	T	A	A	—	A	A	—	—	A

Table 2.4-1 (continued)

Location	Rationale for Selection of Location	Surface Water Body or Source Aquifer	Water Level or Flow ^a	Analytical Suites														
				Metals	Organics						Radionuclides			Inorganics				Field ^l
				Metals ^b	VOCs ^c	SVOCs ^c	Pesticides	PCB ^d	HEXP ^e	Dioxins/Furans	Radionuclide ^f	Tritium ^g	Low-Level Tritium ^g	Gen Inorganics ^h	Perchlorate ⁱ	Stable Isotopes ^j	Suspended Sed ^k	DO, ORP, pH, SC, T, Turb, ALK
R-7 screen 3	Placeholder. Monitors for key potential mobile contaminants from upgradient sources in upper Los Alamos Canyon, DP Canyon, and TA-21. Well is equipped with a Westbay sampling system and is scheduled for redevelopment and conversion or replacement in FY2012.	Regional	C	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
R-64	New single-screen regional well. Monitors downgradient location for potential contaminants from upper Los Alamos and DP Canyons and TA-21 MDA T. Completed July 15,2011. ⁿ	Regional	C	Q	Q	Q	S	S	S	S	Q	—	Q	Q	Q	S	—	Q
R-65	New single-screen regional well. Monitors downgradient location for potential contaminants from upper Los Alamos and DP Canyons and TA-21 MDA T. Scheduled for completion October 30, 2011. ⁿ	Regional	C	Q	Q	Q	S	S	S	S	Q	—	Q	Q	Q	S	—	Q
R-66	Placeholder for planned new regional well to replace TW-3, located near Otowi-4. Monitors downgradient location for potential contaminants from upper Los Alamos and DP Canyons and TA-21. Scheduled for completion December 20, 2011. ⁿ	Regional	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Table 2.4-1 (continued)

Notes: Sampling suites and frequencies: C = continuous; Q = quarterly (4 times/yr); S = semiannual (2 times/yr); A = annual (1 time/yr); T= triennial (1 time every 3 yr). Some locations may be assigned analytical suites or frequencies that differ from those indicated for this monitoring group in Table 1.6-2 for site-specific reasons summarized in Table D-2.0-3. Nonfiltered and filtered samples will be collected for general inorganics (excluding anions) and metals. Anions and perchlorate samples will be filtered. Samples collected for radionuclide analysis will be nonfiltered only for all water media. Organic and HEXP constituents are nonfiltered for all water media. Stable isotope samples for nitrogen isotopes are filtered; stable isotope samples for deuterium and oxygen isotopes are not filtered.

- ^a Continuous monitoring for groundwater refers to the measurement of groundwater levels by a transducer placed in a well and programmed to collect groundwater-level measurements at highly frequent intervals (e.g., every 60 min daily throughout the year). Continuous stream-flow monitoring refers to the measurement of stream flow by a base-flow stream gage that is programmed to collect stream-flow measurements at highly frequent intervals. The superscript MP indicates water levels will be monitored at highly frequent intervals using a multiparameter probe that measures specific conductance, water level, and temperature. The superscript HD indicates that this sampling location is historically dry.
- ^b Metals analysis includes the 23 TAL metals (Ag, Al, As, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, Hg, K, Mg, Mn, Na, Ni, Pb, Sb, Se, Ti, V, Zn), plus boron, molybdenum, silicon dioxide, strontium, tin, and uranium.
- ^c VOC = Volatile organic compounds; SVOC = semivolatile organic compounds.
- ^d PCB = Polychlorinated biphenyl (compound).
- ^e HEXP = High explosive (compounds). The HEXP analytical suite includes the Consent Order list of the normal SW-846:8330 analytes plus pentaerythritol tetranitrate (PETN); triaminotrinitrobenzene (TATB); 3,5-dinitroaniline, tri(o-cresyl)phosphate (TOCP); 2,4-diamino-6-nitrotoluene; and 2,6-diamino-4-nitrotoluene. These additional analytes are analyzed by SW-846:8321A.
- ^f The radionuclide suite includes gross alpha, gross beta, alpha spectroscopy, gamma spectroscopy, and strontium-90.
- ^g Tritium samples may be submitted for analysis by liquid scintillation if average activities are anticipated to exceed 200 pCi/L. Low-level tritium is analyzed using electrolytic enrichment or direct counting.
- ^h General inorganic analysis includes major anions (bromide, chloride, fluoride, sulfate); major cations (calcium, magnesium, sodium, potassium); nitrate plus nitrite (as N); total Kjeldahl nitrogen (TKN); ammonia; total phosphorus, total organic carbon (TOC); total dissolved solids (TDS); alkalinity; specific conductivity; pH; and hardness.
- ⁱ Analysis for perchlorate using high-performance liquid chromatography coupled with electrospray ionization mass spectrometry or tandem mass spectrometry (EPA Method 6850).
- ^j Analysis for stable nitrogen, deuterium, and oxygen isotopes. The collection of samples for stable isotopic analysis is considered a special sampling campaign that is outside the scope of the regulatory process. In general, samples for isotopic analysis are collected semiannually from "new" wells (those which completed construction, rehabilitation, or conversion on or after October 1, 2010) until at least four sets of data have been collected. Any subsequent sampling for stable isotope analysis will be decided on the basis of site-specific conditions.
- ^k Suspended sed = Suspended sediment concentration.
- ^l Field parameters include pH, turbidity, specific conductance, dissolved oxygen, and temperature at all locations. Oxidation-reduction potential (ORP) will be measured if a flow-through cell is used and will not be measured in surface water, spring water, or water collected from Westbay sampling systems unless specified otherwise. Alkalinity (ALK) will be measured for all samples either in the field or at the on-site Earth Systems Observations 14 (EES-14) laboratory.
- ^m — = This analytical suite is not scheduled to be collected for this type of water at locations assigned to this monitoring group.
- ⁿ Characterization suites and frequencies apply to new perched-intermediate or regional groundwater wells. "New" wells are defined as those which are completed, rehabilitated, or converted on or after October 1, 2010. Any planned exceptions to this general protocol are documented in Appendix D.

Table 3.4-1
Interim Monitoring Plan for Chromium Investigation Monitoring Group

Location	Rationale for Selection of Location	Surface Water Body or Source Aquifer	Water Level or Flow ^a	Analytical Suites															
				Metals	Organics						Radionuclides			Inorganics					Field ^l
				Metals ^b	VOCs ^c	SVOCs ^c	Pesticides	PCB ^d	HEXP ^e	Dioxins/Furans	Radionuclide ^f	Tritium ^g	Low-Level Tritium ^g	Gen Inorganics ^h	Perchlorate ⁱ	Stable Isotopes ^j	Cr Isotopes ^j	Suspended Sed ^k	DO, ORP, pH, SC, T, Turb, ALK
Sandia Canyon																			
SCI-1	Monitors the first perched-intermediate groundwater encountered along the key infiltration pathway in Sandia Canyon.	Intermediate	C	Q	A	A	T	T	T	T	A	— ^m	A	Q	A	A	—	—	Q
SCI-2	Monitors key infiltration pathway in Sandia Canyon.	Intermediate	C	Q	A	A	T	T	T	T	A	A	—	Q	A	A	—	—	Q
SCI-3	New well. Monitors key infiltration pathway in Sandia Canyon. Scheduled for completion September 30, 2011. ⁿ	Intermediate	C	Q	Q	Q	S	S	S	S	Q	—	Q	Q	Q	S	—	Q	Q
SCI-4	Placeholder for possible new well. Monitors key infiltration pathway in Sandia Canyon. ⁿ	Intermediate	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
R-11	Monitors for potential contaminants from Sandia Canyon and possibly Los Alamos Canyon.	Regional	C	Q	A	A	T	T	T	T	B	—	A	Q	A	—	A	—	Q
R-35a	Sentinel monitoring location for chromium contamination in regional groundwater. Located within the same stratigraphic zone as the upper louvered section of water-supply well PM-3.	Regional	C	Q	A	A	T	T	T	T	B	—	A	Q	A	—	A	—	Q

Table 3.4-1 (continued)

Location	Rationale for Selection of Location	Surface Water Body or Source Aquifer	Water Level or Flow ^a	Analytical Suites															
				Metals	Organics						Radionuclides			Inorganics					Field ^l
				Metals ^b	VOCs ^c	SVOCs ^c	Pesticides	PCB ^d	HEXP ^e	Dioxins/Furans	Radionuclide ^f	Tritium ^g	Low-Level Tritium ^g	Gen Inorganics ^h	Perchlorate ⁱ	Stable Isotopes ^j	Cr Isotopes ^j	Suspended Sed ^k	DO, ORP, pH, SC, T, Turb, ALK
R-35b	Sentinel monitoring location for chromium contamination in the regional groundwater. Located near the water table above the louvered section of water-supply well PM-3.	Regional	C	Q	A	A	T	T	T	T	B	—	A	Q	A	—	A	—	Q
R-36	Key well for nature and extent of contamination from the Sandia Canyon source and other potential sources from canyons to the north. Also serves as a sentinel well for water-supply well PM-1.	Regional	C	Q	A	A	T	T	T	T	B	—	A	Q	A	—	—	—	Q
R-43 screen 1	Monitors downgradient extent of contamination originating in Sandia Canyon and possibly canyons to the north.	Regional	C	Q	A	A	T	T	T	T	B	—	A	Q	A	A	S	—	Q
R-43 screen 2	Monitors downgradient extent of contamination originating in Sandia Canyon and possibly canyons to the north.	Regional	C	Q	A	A	T	T	T	T	B	—	A	Q	A	A	S	—	Q
Mortandad Canyon																			
MCOI-4	Monitors for potential contaminants from upper Mortandad and Ten Site Canyons or possibly Sandia Canyon. Water levels are typically only 1 to 2 ft above the bottom of the well screen. Samples will be collected if sufficient water is available.	Intermediate	C	Q	A	S	T	T	T	T	A	S	—	Q	S	—	—	—	Q

Table 3.4-1 (continued)

Location	Rationale for Selection of Location	Surface Water Body or Source Aquifer	Water Level or Flow ^a	Analytical Suites																
				Metals	Organics							Radionuclides			Inorganics					Field ^l
				Metals ^b	VOCs ^c	SVOCs ^c	Pesticides	PCB ^d	HEXP ^e	Dioxins/Furans	Radionuclide ^f	Tritium ^g	Low-Level Tritium ^g	Gen Inorganics ^h	Perchlorate ⁱ	Stable Isotopes ^j	Cr Isotopes ^j	Suspended Sed ^k	DO, ORP, pH, SC, T, Turb, ALK	
MCOI-5	Monitors for potential contaminants from upper Mortandad and Ten Site Canyons or possibly Sandia Canyon.	Intermediate	C	Q	A	S	T	T	T	T	A	S	—	Q	S	—	—	—	Q	
MCOI-6	Monitors for potential contaminants from upper Mortandad and Ten Site Canyons or possibly Sandia Canyon.	Intermediate	C	Q	A	S	T	T	T	T	A	S	—	Q	S	—	—	—	Q	
R-1	Monitors for potential contaminants from upper Mortandad Canyon or possibly Sandia Canyon. Background location in GBIR R3.	Regional	C	Q	A	A	T	T	T	T	T	—	A	Q	A	—	—	—	Q	
R-13	Monitors for nature and extent of contaminants originating in Mortandad and Sandia Canyons. Key lower boundary well. Background location in GBIR R3.	Regional	C	Q	A	A	T	T	T	T	T	—	A	Q	A	—	—	—	Q	
R-15	Monitors for potential contaminants from upper Ten Site or Mortandad Canyons.	Regional	C	Q	S	S	T	T	T	T	A	—	A	Q	S	—	A	—	Q	
R-28	Monitors for potential contaminants from upper Sandia, Mortandad, or Ten Site Canyons or possibly sources in canyons to the north.	Regional	C	Q	A	A	T	T	T	T	B	A	—	Q	A	—	—	—	Q	
R-42	Key characterization and monitoring point located upgradient of R-28.	Regional	C	Q	S	S	T	T	T	T	B	A	—	Q	A	A	—	—	Q	

Table 3.4-1 (continued)

Location	Rationale for Selection of Location	Surface Water Body or Source Aquifer	Water Level or Flow ^a	Analytical Suites															
				Metals	Organics						Radionuclides			Inorganics					Field ^l
				Metals ^b	VOCs ^c	SVOCs ^c	Pesticides	PCB ^d	HEXP ^e	Dioxins/Furans	Radionuclide ^f	Tritium ^g	Low-Level Tritium ^g	Gen Inorganics ^h	Perchlorate ⁱ	Stable Isotopes ^j	Cr Isotopes ^j	Suspended Sed ^k	DO, ORP, pH, SC, T, Turb, ALK
R-44 screen 1	Monitors near the water table for nature and extent of contaminants from sources in Sandia Canyon and possibly sources in canyons to the north.	Regional	C	Q	A	A	T	T	T	T	B	—	A	Q	A	A	S	—	Q
R-44 screen 2	Monitors for nature and extent of contaminants from sources in Sandia Canyon and possibly sources in canyons to the north.	Regional	C	Q	A	A	T	T	T	T	B	—	A	Q	A	A	S	—	Q
R-45 screen 1	Monitors near the water table for nature and extent of contaminants from sources in Sandia Canyon and possibly sources in canyons to the north.	Regional	C	Q	A	A	T	T	T	T	T	—	A	Q	A	A	S	—	Q
R-45 screen 2	Monitors for nature and extent of contaminants from sources in Sandia Canyon and possibly sources in canyons to the north.	Regional	C	Q	A	A	T	T	T	T	T	—	A	Q	A	A	S	—	Q
R-50 screen 1	Monitoring well located on the mesa south of Mortandad Canyon to define the southern extent of chromium contamination in the regional aquifer.	Regional	C	Q	A	A	T	T	T	T	T	—	A	Q	A	S	Q	—	Q
R-50 screen 2	Monitoring well located on the mesa south of Mortandad Canyon to define the southern extent of chromium contamination in the regional aquifer.	Regional	C	Q	A	A	T	T	T	T	T	—	A	Q	A	S	Q	—	Q

Table 3.4-1 (continued)

Location	Rationale for Selection of Location	Surface Water Body or Source Aquifer	Water Level or Flow ^a	Analytical Suites															
				Metals	Organics						Radionuclides			Inorganics					Field ^l
				Metals ^b	VOCs ^c	SVOCs ^c	Pesticides	PCB ^d	HEXP ^e	Dioxins/Furans	Radionuclide ^f	Tritium ^g	Low-Level Tritium ^g	Gen Inorganics ^h	Perchlorate ⁱ	Stable Isotopes ^j	Cr Isotopes ^j	Suspended Sed ^k	DO, ORP, pH, SC, T, Turb, ALK
R-61 screen 1	New dual-screen well. Completed May 3, 2011. ⁿ	Regional	C	Q	Q	S	S	S	S	S	Q	—	Q	Q	Q	S	Q	Q	Q
R-61 screen 2	New dual-screen well. Completed May 3, 2011. ⁿ	Regional	C	Q	Q	S	S	S	S	S	Q	—	Q	Q	Q	S	Q	Q	Q
R-62 screen 1	New dual-screen well. Scheduled for completion September 16, 2011. ⁿ	Regional	C	Q	Q	S	S	S	S	S	Q	—	Q	Q	Q	S	Q	Q	Q
R-62 screen 2	New dual-screen well. Scheduled for completion September 16, 2011. ⁿ	Regional	C	Q	Q	S	S	S	S	S	Q	—	Q	Q	Q	S	Q	Q	Q

Table 3.4-1 (continued)

Notes: Sampling suites and frequencies: C = continuous; Q = quarterly (4 times/yr); S = semiannual (2 times/yr); A = annual (1 time/yr); B = biennial (1 time every 2 yr); T = triennial (1 time every 3 yr). Some locations may be assigned analytical suites or frequencies that differ from those indicated for this monitoring group in Table 1.6-2 for site-specific reasons summarized in Table D-3.0-3.

Nonfiltered and filtered samples will be collected for general inorganics (excluding anions) and metals. Anions and perchlorate samples will be filtered. Samples collected for radionuclide analysis will be nonfiltered only for all water media. Organic and HEXP constituents are nonfiltered for all water media. Stable isotope samples for nitrogen isotopes are filtered; stable isotope samples for deuterium and oxygen isotopes are not filtered.

- ^a Continuous monitoring for groundwater refers to the measurement of groundwater levels by a transducer placed in a well and programmed to collect groundwater-level measurements at highly frequent intervals (e.g., every 60 min daily throughout the year). Continuous stream-flow monitoring refers to the measurement of stream flow by a base-flow stream gage that is programmed to collect stream-flow measurements at highly frequent intervals. The superscript MP indicates water levels will be monitored at highly frequent intervals using a multiparameter probe that measures specific conductance, water level, and temperature. The superscript HD indicates that this sampling location is historically dry.
- ^b Metals analysis includes the 23 TAL metals, plus boron, molybdenum, silicon dioxide, strontium, tin, and uranium.
- ^c VOC = Volatile organic compounds; SVOC = semivolatile organic compounds.
- ^d PCB = Polychlorinated biphenyl (compound).
- ^e HEXP = High explosive (compounds). The HEXP analytical suite includes the Consent Order list of the normal SW-846:8330 analytes plus pentaerythritol tetranitrate (PETN); triaminotrinitrobenzene (TATB); 3,5-dinitroaniline, tri(o-cresyl)phosphate (TOCP); 2,4-diamino-6-nitrotoluene; and 2,6-diamino-4-nitrotoluene. These additional analytes are analyzed by SW-846:8321A.
- ^f The radionuclide suite includes gross alpha, gross beta, alpha spectroscopy, gamma spectroscopy, and strontium-90.
- ^g Tritium samples may be submitted for analysis by liquid scintillation if average activities are anticipated to exceed 200 pCi/L. Low-level tritium is analyzed using electrolytic enrichment or direct counting.
- ^h General inorganic analysis includes major anions (bromide, chloride, fluoride, sulfate); major cations (calcium, magnesium, sodium, potassium); nitrate plus nitrite (as N); total Kjeldahl nitrogen (TKN); ammonia; total phosphorus, total organic carbon (TOC); total dissolved solids (TDS); alkalinity; specific conductivity; pH; and hardness.
- ⁱ Analysis for perchlorate using high-performance liquid chromatography coupled with electrospray ionization mass spectrometry or tandem mass spectrometry (EPA Method 6850).
- ^j Analysis for stable nitrogen, deuterium, and oxygen isotopes. The collection of samples for stable isotopic analysis is considered a special sampling campaign that is outside the scope of the regulatory process. In general, samples for isotopic analysis are collected semiannually from "new" wells (those which completed construction, rehabilitation, or conversion on or after October 1, 2010) until at least four sets of data have been collected. Any subsequent sampling for stable isotope analysis will be decided on the basis of site-specific conditions.
- ^k Suspended sed = Suspended sediment concentration.
- ^l Field parameters include pH, turbidity, specific conductance, dissolved oxygen, and temperature at all locations. Oxidation-reduction potential (ORP) will be measured if a flow-through cell is used and will not be measured in surface water, spring water, or water collected from Westbay sampling systems unless specified otherwise. Alkalinity (ALK) will be measured for all samples either in the field or at the on-site EES-14 laboratory.
- ^m — = This analytical suite is not scheduled to be collected for this type of water at locations assigned to this monitoring group.
- ⁿ Characterization suites and frequencies apply to new perched-intermediate or regional groundwater wells. "New" wells are defined as those which are completed, rehabilitated, or converted on or after October 1, 2010. Any planned exceptions to this general protocol are documented in Appendix D.

Table 4.4-1
Interim Monitoring Plan for MDA C Monitoring Group

Location	Rationale for Selection of Location	Surface Water Body or Source Aquifer	Water Level or Flow ^a	Analytical Suites														
				Metals	Organics						Radionuclides			Inorganics				Field ^l
				Metals ^b	VOCs ^c	SVOCs ^c	Pesticides	PCB ^d	HEXP ^e	Dioxins/Furans	Radionuclide ^f	Tritium ^g	Low-Level Tritium ^g	Gen Inorganics ^h	Perchlorate ⁱ	Stable Isotopes ^j	Suspended Sed ^k	DO, ORP, pH, SC, T, Turb, ALK
Mortandad Canyon																		
R-14	Monitors for potential contaminants from Ten Site Canyon or upper Mortandad Canyon, including MDA C. Background location in GBIR R4.	Regional	C	A	S	A	T	T	T	T	A	— ^m	S	A	A	S	—	S
R-46	Monitors groundwater quality downgradient of MDA C.	Regional	C	A	S	A	T	T	T	T	A	—	S	A	A	S	—	S
R-60	New monitoring well installed east of MDA C. Monitors for potential contaminant releases from MDA C. Completed October 18, 2010. ⁿ	Regional	C	Q	Q	Q	S	S	S	S	Q	—	Q	Q	Q	S	—	Q

Table 4.4-1 (continued)

Notes: Sampling suites and frequencies: C = continuous; Q = quarterly (4 times/yr); S = semiannual (2 times/yr); A = annual (1 time/yr); T = triennial (1 time every 3 yr). Some locations may be assigned analytical suites or frequencies that differ from those indicated for this monitoring group in Table 1.6-2 for site-specific reasons summarized in Table D-4.0-3.

Nonfiltered and filtered samples will be collected for general inorganics (excluding anions) and metals. Anions and perchlorate samples will be filtered. Samples collected for radionuclide analysis will be nonfiltered only for all water media. Organic and HEXP constituents are nonfiltered for all water media. Stable isotope samples for nitrogen isotopes are filtered; stable isotope samples for deuterium and oxygen isotopes are not filtered.

- ^a Continuous monitoring for groundwater refers to the measurement of groundwater levels by a transducer placed in a well and programmed to collect groundwater-level measurements at highly frequent intervals (e.g., every 60 min daily throughout the year). Continuous stream-flow monitoring refers to the measurement of stream flow by a base-flow stream gage that is programmed to collect stream-flow measurements at highly frequent intervals. The superscript MP indicates water levels will be monitored at highly frequent intervals using a multiparameter probe that measures specific conductance, water level, and temperature. The superscript HD indicates that this sampling location is historically dry.
- ^b Metals analysis includes the 23 TAL metals, plus boron, molybdenum, silicon dioxide, strontium, tin, and uranium.
- ^c VOC = Volatile organic compounds; SVOC = semivolatile organic compounds.
- ^d PCB = Polychlorinated biphenyl (compound).
- ^e HEXP = High explosive (compounds). The HEXP analytical suite includes the Consent Order list of the normal SW-846:8330 analytes plus pentaerythritol tetranitrate (PETN); triaminotrinitrobenzene (TATB); 3,5-dinitroaniline, tri(o-cresyl)phosphate (TOCP); 2,4-diamino-6-nitrotoluene; and 2,6-diamino-4-nitrotoluene. These additional analytes are analyzed by SW-846:8321A.
- ^f The radionuclide suite includes gross alpha, gross beta, alpha spectroscopy, gamma spectroscopy, and strontium-90.
- ^g Tritium samples may be submitted for analysis by liquid scintillation if average activities are anticipated to exceed 200 pCi/L. Low-level tritium is analyzed using electrolytic enrichment or direct counting.
- ^h General inorganic analysis includes major anions (bromide, chloride, fluoride, sulfate); major cations (calcium, magnesium, sodium, potassium); nitrate plus nitrite (as N); total Kjeldahl nitrogen (TKN); ammonia; total phosphorus, total organic carbon (TOC); total dissolved solids (TDS); alkalinity; specific conductivity; pH; and hardness.
- ⁱ Analysis for perchlorate using high-performance liquid chromatography coupled with electrospray ionization mass spectrometry or tandem mass spectrometry (EPA Method 6850).
- ^j Analysis for stable nitrogen, deuterium, and oxygen isotopes. The collection of samples for stable isotopic analysis is considered a special sampling campaign that is outside the scope of the regulatory process. In general, samples for isotopic analysis are collected semiannually from "new" wells (those which completed construction, rehabilitation, or conversion on or after October 1, 2010) until at least four sets of data have been collected. Any subsequent sampling for stable isotope analysis will be decided on the basis of site-specific conditions.
- ^k Suspended sed = Suspended sediment concentration.
- ^l Field parameters include pH, turbidity, specific conductance, dissolved oxygen, and temperature at all locations. Oxidation-reduction potential (ORP) will be measured if a flow-through cell is used and will not be measured in surface water, spring water, or water collected from Westbay sampling systems unless specified otherwise. Alkalinity (ALK) will be measured for all samples either in the field or at the on-site EES-14 laboratory.
- ^m — = This analytical suite is not scheduled to be collected for this type of water at locations assigned to this monitoring group.
- ⁿ Characterization suites and frequencies apply to new perched-intermediate or regional groundwater wells. "New" wells are defined as those which are completed, rehabilitated, or converted on or after October 1, 2010. Any planned exceptions to this general protocol are documented in Appendix D.

Table 5.4-1
Interim Monitoring Plan for TA-54 Monitoring Group

Location	Rationale for Selection of Location	Surface Water Body or Source Aquifer	Water Level or Flow ^a	Analytical Suites														
				Metals	Organics						Radionuclides			Inorganics			Field ^l	
				Metals ^b	VOCs ^c	SVOCs ^c	Pesticides	PCB ^d	HEXP ^e	Dioxins/Furans	Radionuclide ^f	Tritium ^g	Low-Level Tritium ^g	Gen Inorganics ^h	Perchlorate ⁱ	Stable Isotopes ^j	Suspended Sed ^k	DO, ORP, pH, SC, T, Turb, ALK
Sandia Canyon																		
R-23i piezometer (port 1)	Downgradient monitoring location for TA-54. Monitors potential sources in Pajarito watershed and potential sources in canyons to the north.	Intermediate	Q	Q	Q	Q	T	T	T	T	A	S	— ^m	Q	A	S	—	Q
R-23i screen 1 (port 2)	Downgradient monitoring location for TA-54. Also monitors potential sources in Pajarito watershed and potential sources in canyons to the north.	Intermediate	C	Q	Q	Q	T	T	T	T	A	—	S	Q	A	S	—	Q
R-23i screen 2 (port 3)	Downgradient monitoring location for TA-54. Monitors potential sources in Pajarito watershed and potential sources in canyons to the north.	Intermediate	C	Q	Q	Q	T	T	T	T	A	—	S	Q	A	S	—	Q
R-40i	Monitors TA-54 and potential sources in Pajarito watershed. Screen impacted by drilling fluids.	Intermediate	C	Q	Q	Q	T	T	T	T	A	—	S	Q	A	S	—	Q
R-20 screen 1	Monitors TA-54 and potential sources in Pajarito watershed.	Regional	C	Q	Q	Q	T	T	T	T	A	—	S	Q	A	S	—	Q
R-20 screen 2	Monitors TA-54 and potential sources in Pajarito watershed.	Regional	C	Q	Q	Q	T	T	T	T	A	—	S	Q	A	S	—	Q

Table 5.4-1 (continued)

Location	Rationale for Selection of Location	Surface Water Body or Source Aquifer	Water Level or Flow ^a	Analytical Suites														
				Metals	Organics						Radionuclides			Inorganics			Field	
				Metals ^b	VOCs ^c	SVOCs ^c	Pesticides	PCB ^d	HEXP ^e	Dioxins/Furans	Radionuclide ^f	Tritium ^g	Low-Level Tritium ^g	Gen Inorganics ^h	Perchlorate ⁱ	Stable Isotopes ^j	Suspended Sed ^k	DO, ORP, pH, SC, T, Turb, ALK
R-22 screens 1 through 5	Placeholder. Monitors TA-54 and potential sources in Pajarito watershed. Rehabilitated well previously equipped with a Westbay sampling system; final configuration to be determined. ⁿ	Regional	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
R-23	Downgradient monitoring location for TA-54. Also monitors potential sources in Pajarito watershed and possible sources from canyons to the north.	Regional	C	Q	Q	Q	T	T	T	T	A	—	S	Q	A	A	—	Q
R-32	Monitors TA-54 and potential sources in Pajarito watershed.	Regional	C	Q	Q	Q	T	T	T	T	A	—	S	Q	A	S	—	Q
R-39	Monitors TA-54 and potential sources in Pajarito watershed.	Regional	C	Q	Q	Q	T	T	T	T	A	—	S	Q	A	S	—	Q
R-40 screen 2	Monitors TA-54 and potential sources in Pajarito watershed.	Regional	C	Q	Q	Q	T	T	T	T	A	—	S	Q	A	S	—	Q
R-49 screen 1	Monitors groundwater south of Area G in Pajarito Canyon.	Regional	C	Q	Q	Q	T	T	T	T	A	—	S	Q	A	S	—	Q
R-49 screen 2	Monitors groundwater south of Area G in Pajarito Canyon. Background location in GBIR R4.	Regional	C	Q	Q	Q	T	T	T	T	A	—	S	Q	A	S	—	Q
R-51 screen 1	Monitoring well installed west of MDAs H and J, and northwest of TA-18. Monitors TA-54 and other potential contaminant sources in Pajarito Canyon. Completed February 8, 2010.	Regional	C	Q	Q	Q	T	T	T	T	A	—	S	Q	A	S	—	Q

Table 5.4-1 (continued)

Location	Rationale for Selection of Location	Surface Water Body or Source Aquifer	Water Level or Flow ^a	Analytical Suites														
				Metals	Organics						Radionuclides			Inorganics				Field
				Metals ^b	VOCs ^c	SVOCs ^c	Pesticides	PCB ^d	HEXP ^e	Dioxins/Furans	Radionuclide ^f	Tritium ^g	Low-Level Tritium ^g	Gen Inorganics ^h	Perchlorate ⁱ	Stable Isotopes ^j	Suspended Sed ^k	DO, ORP, pH, SC, T Turb, ALK
R-51 screen 2	Monitoring well installed west of MDAs H and J, and northwest of TA-18. Monitors TA-54 and other potential contaminant sources in Pajarito Canyon. Completed February 8, 2010.	Regional	C	Q	Q	Q	T	T	T	T	A	—	S	Q	A	S	—	Q
R-54 screen 1	Monitoring well installed immediately west of MDA L in Pajarito Canyon; monitors for potential releases from MDA L. Completed January 29, 2010.	Regional	C	Q	Q	Q	T	T	T	T	A	—	S	Q	A	S	—	Q
R-54 screen 2	Monitoring well installed immediately west of MDA L in Pajarito Canyon; monitors for potential releases from MDA L. Completed January 29, 2010.	Regional	C	Q	Q	Q	T	T	T	T	A	—	S	Q	A	S	—	Q
Mortandad Canyon (Cañada del Buey)																		
R-37 screen 1	Monitors perched-intermediate groundwater downgradient of MDA H.	Intermediate	C	Q	Q	Q	T	T	T	T	A	—	S	Q	A	S	—	Q
R-55i	New intermediate well located downgradient of MDA G. Monitors for potential contaminant releases from MDA G and other sources in Pajarito Canyon. Completed January 18, 2011. ⁿ	Intermediate	C	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	S	Q	Q

Table 5.4-1 (continued)

Location	Rationale for Selection of Location	Surface Water Body or Source Aquifer	Water Level or Flow ^a	Analytical Suites														
				Metals	Organics						Radionuclides			Inorganics				Field ⁱ
				Metals ^b	VOCs ^c	SVOCs ^c	Pesticides	PCB ^d	HEXP ^e	Dioxins/Furans	Radionuclide ^f	Tritium ^g	Low-Level Tritium ^g	Gen Inorganics ^h	Perchlorate ⁱ	Stable Isotopes ^j	Suspended Sed ^k	DO, ORP, pH, SC, T, Turb, ALK
R-21	Monitors regional groundwater in Mortandad Canyon. Background location in GBIR R3 and GBIR R4.	Regional	C	Q	Q	Q	T	T	T	T	A	—	S	Q	A	S	—	Q
R-37 screen 2	Monitors regional groundwater downgradient of MDA H.	Regional	C	Q	Q	Q	T	T	T	T	A	—	S	Q	A	S	—	Q
R-38	Monitors groundwater downgradient of MDA L in the north fork of Cañada del Buey, in the Mortandad watershed.	Regional	C	Q	Q	Q	T	T	T	T	A	—	S	Q	A	S	—	Q
R-41 screen 2	Monitors groundwater near northeast corner of MDA G.	Regional	C	Q	Q	Q	T	T	T	T	A	—	S	Q	A	S	—	Q
R-52 screen 1	Monitoring well installed north-northeast of MDAs H and J, on mesa south of Cañada del Buey. Monitors for potential releases of contaminants from MDA H. Completed March 31, 2010.	Regional	C	Q	Q	Q	T	T	T	T	A	—	S	Q	A	S	—	Q
R-52 screen 2	Monitoring well installed north-northeast of MDAs H and J, on mesa south of Cañada del Buey. Monitors for potential releases of contaminants from MDA H. Completed March 31, 2010.	Regional	C	Q	Q	Q	T	T	T	T	A	—	S	Q	A	S	—	Q
R-53 screen 1	Monitoring well installed north of MDA L in Cañada del Buey; monitors for potential releases from MDA L. Completed March 29, 2010.	Regional	C	Q	Q	Q	T	T	T	T	A	—	S	Q	A	S	—	Q

Table 5.4-1 (continued)

Location	Rationale for Selection of Location	Surface Water Body or Source Aquifer	Water Level or Flow ^a	Analytical Suites														
				Metals	Organics						Radionuclides			Inorganics			Field	
				Metals ^b	VOCs ^c	SVOCs ^c	Pesticides	PCB ^d	HEXP ^e	Dioxins/Furans	Radionuclide ^f	Tritium ^g	Low-Level Tritium ^g	Gen Inorganics ^h	Perchlorate ⁱ	Stable Isotopes ^j	Suspended Sed ^k	DO, ORP, pH, SC, T, Turb, ALK
R-53 screen 2	Monitoring well installed north of MDA L in Cañada del Buey; monitors for potential releases from MDA L. Completed March 29, 2010.	Regional	C	Q	Q	Q	T	T	T	T	A	—	S	Q	A	S	—	Q
R-55 screen 1	Monitoring well installed downgradient of MDA G. Monitors for potential contaminant releases from MDA G and other sources in Pajarito Canyon. Completed August 25, 2010.	Regional	C	Q	Q	Q	T	T	T	T	A	—	S	Q	A	S	—	Q
R-55 screen 2	Monitoring well installed downgradient of MDA G. Monitors for potential contaminant releases from MDA G and other sources in Pajarito Canyon. Completed August 25, 2010.	Regional	C	Q	Q	Q	T	T	T	T	A	—	S	Q	A	S	—	Q
R-56 screen 1	Monitoring well installed on Mesita del Buey between MDA G and MDA L. Monitors for potential contaminant releases from MDAs G and L, and other sources in Pajarito Canyon. Completed July 19, 2010.	Regional	C	Q	Q	Q	T	T	T	T	A	—	S	Q	A	S	—	Q
R-56 screen 2	Monitoring well installed on Mesita del Buey between MDA G and MDA L. Monitors for potential contaminant releases from MDAs G and L, and other sources in Pajarito Canyon. Completed July 19, 2010.	Regional	C	Q	Q	Q	T	T	T	T	A	—	S	Q	A	S	—	Q

Table 5.4-1 (continued)

Location	Rationale for Selection of Location	Surface Water Body or Source Aquifer	Water Level or Flow ^a	Analytical Suites														
				Metals	Organics						Radionuclides			Inorganics				Field ^l
				Metals ^b	VOCs ^c	SVOCs ^c	Pesticides	PCB ^d	HEXP ^e	Dioxins/Furans	Radionuclide ^f	Tritium ^g	Low-Level Tritium ^g	Gen Inorganics ^h	Perchlorate ⁱ	Stable Isotopes ^j	Suspended Sed ^k	DO, ORP, pH, SC, T, Turb, ALK
R-57 screen 1	Monitoring well installed downgradient of MDA G at the eastern end of TA-54; monitors for potential releases from MDA G. Completed June 8, 2010.	Regional	C	Q	Q	Q	T	T	T	T	A	—	S	Q	A	S	—	Q
R-57 screen 2	Monitoring well installed downgradient of MDA G at the eastern end of TA-54; monitors for potential releases from MDA G. Completed June 8, 2010.	Regional	C	Q	Q	Q	T	T	T	T	A	—	S	Q	A	S	—	Q

Table 5.4-1 (continued)

Notes: Sampling suites and frequencies: C = continuous; Q = quarterly (4 times/yr); S = semiannual (2 times/yr); A = annual (1 time/yr); T = triennial (1 time every 3 yr). Some locations may be assigned analytical suites or frequencies that differ from those indicated for this monitoring group in Table 1.6-2 for site-specific reasons summarized in Table D-5.0-3. Nonfiltered and filtered samples will be collected for general inorganics (excluding anions) and metals. Anions and perchlorate samples will be filtered. Samples collected for radionuclide analysis will be nonfiltered only for all water media. Organic and HEXP constituents are nonfiltered for all water media. Stable isotope samples for nitrogen isotopes are filtered; stable isotope samples for deuterium and oxygen isotopes are not filtered.

- ^a Continuous monitoring for groundwater refers to the measurement of groundwater levels by a transducer placed in a well and programmed to collect groundwater-level measurements at highly frequent intervals (e.g., every 60 min daily throughout the year). Continuous stream-flow monitoring refers to the measurement of stream flow by a base-flow stream gage that is programmed to collect stream-flow measurements at highly frequent intervals. The superscript MP indicates water levels will be monitored at highly frequent intervals using a multiparameter probe that measures specific conductance, water level, and temperature. The superscript HD indicates that this sampling location is historically dry.
- ^b Metals analysis includes the 23 TAL metals, plus boron, molybdenum, silicon dioxide, strontium, tin, and uranium.
- ^c VOC = Volatile organic compounds; SVOC = semivolatile organic compounds.
- ^d PCB = Polychlorinated biphenyl (compound).
- ^e HEXP = High explosive (compounds). The HEXP analytical suite includes the Consent Order list of the normal SW-846:8330 analytes plus pentaerythritol tetranitrate (PETN); triaminotrinitrobenzene (TATB); 3,5-dinitroaniline, tri(o-cresyl)phosphate (TOCP); 2,4-diamino-6-nitrotoluene; and 2,6-diamino-4-nitrotoluene. These additional analytes are analyzed by SW-846:8321A.
- ^f The radionuclide suite includes gross alpha, gross beta, alpha spectroscopy, gamma spectroscopy, and strontium-90.
- ^g Tritium samples may be submitted for analysis by liquid scintillation if average activities are anticipated to exceed 200 pCi/L. Low-level tritium is analyzed using electrolytic enrichment or direct counting.
- ^h General inorganic analysis includes major anions (bromide, chloride, fluoride, sulfate); major cations (calcium, magnesium, sodium, potassium); nitrate plus nitrite (as N); total Kjeldahl nitrogen (TKN); ammonia; total phosphorus, total organic carbon (TOC); total dissolved solids (TDS); alkalinity; specific conductivity; pH; and hardness.
- ⁱ Analysis for perchlorate using high-performance liquid chromatography coupled with electrospray ionization mass spectrometry or tandem mass spectrometry (EPA Method 6850).
- ^j Analysis for stable nitrogen, deuterium, and oxygen isotopes. The collection of samples for stable isotopic analysis is considered a special sampling campaign that is outside the scope of the regulatory process. In general, samples for isotopic analysis are collected semiannually from "new" wells (those which completed construction, rehabilitation, or conversion on or after October 1, 2010) until at least four sets of data have been collected. Any subsequent sampling for stable isotope analysis will be decided on the basis of site-specific conditions.
- ^k Suspended sed = Suspended sediment concentration.
- ^l Field parameters include pH, turbidity, specific conductance, dissolved oxygen, and temperature at all locations. Oxidation-reduction potential (ORP) will be measured if a flow-through cell is used and will not be measured in surface water, spring water, or water collected from Westbay sampling systems unless specified otherwise. Alkalinity (ALK) will be measured for all samples either in the field or at the on-site EES-14 laboratory.
- ^m — = This analytical suite is not scheduled to be collected for this type of water at locations assigned to this monitoring group.
- ⁿ Characterization suites and frequencies apply to new perched-intermediate or regional groundwater wells. "New" wells are defined as those which are completed, rehabilitated, or converted on or after October 1, 2010. Any planned exceptions to this general protocol are documented in Appendix D.
- ^o Quarterly SWS discharge permit sampling required for perchlorate by liquid chromatography-mass spectrometry/mass spectrometry, nitrate plus nitrite as N, TKN, ammonia (as N), TDS, and chloride. Quarterly samples must be collected before the end of the second month in each quarter.
- ^p Annual SWS Discharge Permit sampling required for full suite-water analysis, which includes the following: (1) filtered metals: As, Ba, Cd, Cr, CN, Pb, Se, Ag, U, Cu, Fe, Mn, Zn, Al, B, Co, Mo, Ni; (2) unfiltered metals: Hg; (3) general inorganics: SO₄, F; (4) organics: VOC, SVOC; and (5) radionuclides: gross alpha, radium-226, and radium-228.

Table 6.4-1
Interim Monitoring Plan for TA-16 260 Monitoring Group

Location	Rationale for Selection of Location	Surface Water Body or Source Aquifer	Water Level or Flow ^a	Analytical Suites														
				Metals	Organics						Radionuclides			Inorganics			Field	
				Metals ^b	VOCs ^c	SVOCs ^c	Pesticides	PCB ^d	HEXP ^e	Dioxins/Furans	Radionuclide ^f	Tritium ^g	Low-Level Tritium ^g	Gen Inorganics ^h	Perchlorate ⁱ	Stable Isotopes ^l	Suspended Sed ^k	DO, ORP, pH, SC, T, Turb, ALK
Water Canyon/Cañon de Valle																		
Cañon de Valle below MDA P (E256)	Downgradient surface water location for 260 Outfall. Monitors HE and other contaminants in support of surface CME.	Base flow	C	S	S	A	T	T	S ^{RDX-DP}	T	B	— ^m	—	S	A	—	S	S
Burning Ground Spring	Spring downgradient of TA-16 260 Outfall. Monitors HE and other contaminants in support of surface CME.	Spring	C	S	S	A	T	T	S ^{RDX-DP}	T	B	—	A	S	A	—	S	S
Fish Ladder Spring	Spring/seep located in Fishladder Canyon downgradient of the Fishladder and Burning Ground. Shows HE when wet.	Spring	C	S	S	A	T	T	S ^{RDX-DP}	T	B	—	A	S	A	—	S	S
Martin Spring	Spring located in upper Martin/S-Site Canyon. Shows HE with dynamics. Sources may include both the 260 Outfall and other TA-16 sources. Traditionally sampled as part of 260 Outfall CME efforts.	Spring	C	S	S	A	T	T	S ^{RDX-DP}	T	B	—	A	S	A	—	S	S

Table 6.4-1 (continued)

Location	Rationale for Selection of Location	Surface Water Body or Source Aquifer	Water Level or Flow ^a	Analytical Suites														
				Metals	Organics						Radionuclides			Inorganics			Field ⁱ	
				Metals ^b	VOCs ^c	SVOCs ^c	Pesticides	PCB ^d	HEXP ^e	Dioxins/Furans	Radionuclide ^f	Tritium ^g	Low-Level Tritium ^g	Gen Inorganics ^h	Perchlorate ⁱ	Stable Isotopes ^j	Suspended Sed ^k	DO, ORP, pH, SC, T, Turb, ALK
Peter Spring	Canyon discharge near TA-16 260 Outfall confluence with canyon. Monitors HE and other contaminants in support of surface CME.	Spring	C	S	S	A	T	T	S ^{RDX-DP}	T	B	—	A	S	A	—	S	S
SWSC Spring	Spring downgradient of TA-16 260 outfall. HE contaminated w/dynamics. Supports surface CME.	Spring	C	S	S	A	T	T	S ^{RDX-DP}	T	B	—	A	S	A	—	S	S
CdV-16-02655	Upgradient alluvial well location for TA-16 260 CME. Occasionally shows contamination.	Alluvial	C	S	S	A	T	T	S ^{RDX-DP}	T	B	—	—	S	A	—	—	S
CdV-16-02656	Alluvial well location nearest to 260 Outfall drainage/Cañon de Valle confluence. Downgradient of MDA R. Monitors HE and other contaminants in support of surface CME.	Alluvial	C	S	S	A	T	T	S ^{RDX-DP}	T	B	—	—	S	A	—	—	S
CdV-16-02657	Alluvial well location nearest to 260 Outfall drainage/Cañon de Valle confluence. Shows HE with dynamics. Supports CME.	Alluvial	C	S	S	A	T	T	S ^{RDX-DP}	T	B	—	—	S	A	—	—	S

Table 6.4-1 (continued)

Location	Rationale for Selection of Location	Surface Water Body or Source Aquifer	Water Level or Flow ^a	Analytical Suites														
				Metals	Organics						Radionuclides			Inorganics			Field ⁱ	
				Metals ^b	VOCs ^c	SVOCs ^c	Pesticides	PCB ^d	HEXP ^e	Dioxins/Furans	Radionuclide ^f	Tritium ^g	Low-Level Tritium ^g	Gen Inorganics ^h	Perchlorate ⁱ	Stable Isotopes ^j	Suspended Sed ^k	DO, ORP, pH, SC, T, Turb, ALK
CdV-16-02658	Downgradient alluvial well from 260 Outfall drainage confluence. Monitors HE and other contaminants in support of surface CME.	Alluvial	C	S	S	A	T	T	S ^{RDX-DP}	T	B	—	—	S	A	—	—	S
CdV-16-02659	Downgradient alluvial well from 260 Outfall drainage confluence. Monitors HE and other contaminants in support of surface CME.	Alluvial	C	S	S	A	T	T	S ^{RDX-DP}	T	B	—	—	S	A	—	—	S
FLC-16-25278	Alluvial well downgradient of Fishladder and Burning Ground. Shows HE and is an excellent downgradient monitoring point for Fishladder and Burning Ground.	Alluvial	C	S	S	A	T	T	S ^{RDX-DP}	T	B	—	—	S	A	—	—	S
FLC-16-25279	Alluvial well downgradient of Fishladder and Burning Ground. Shows HE and is an excellent downgradient monitoring point for Fishladder and Burning Ground.	Alluvial	C	S	S	A	T	T	S ^{RDX-DP}	T	B	—	—	S	A	—	—	S

Table 6.4-1 (continued)

Location	Rationale for Selection of Location	Surface Water Body or Source Aquifer	Water Level or Flow ^a	Analytical Suites														
				Metals	Organics					Radionuclides				Inorganics				Field ⁱ
				Metals ^b	VOCs ^c	SVOCs ^c	Pesticides	PCB ^d	HEXP ^e	Dioxins/Furans	Radionuclide ^f	Tritium ^g	Low-Level Tritium ^g	Gen Inorganics ^h	Perchlorate ⁱ	Stable Isotopes ^j	Suspended Sed ^k	DO, ORP, pH, SC, T, Turb, ALK
FLC-16-25280	Alluvial well downgradient of Fishladder and Burning Ground. Shows HE and is an excellent downgradient monitoring point for Fishladder and Burning Ground.	Alluvial	C	S	S	A	T	T	S ^{RDX-DP}	T	B	—	—	S	A	—	—	S
MSC-16-06293	Alluvial well in S-Site/Martin Canyon downgradient of Martin Spring and several TA-16 SWMU sites. Shows HE when wet. Traditionally included in 260 Outfall CME because of possible connections of Martin Spring with 260 Outfall discharges.	Alluvial	C	S	S	A	T	T	S ^{RDX-DP}	T	B	—	—	S	A	—	—	S
MSC-16-06294	Alluvial well in S-Site/Martin Canyon downgradient of Martin Spring and several TA-16 SWMU sites. Shows HE when wet. Traditionally included in 260 Outfall CME because of possible connections of Martin Spring with 260 Outfall discharges.	Alluvial	C	S	S	A	T	T	S ^{RDX-DP}	T	B	—	—	S	A	—	—	S

Table 6.4-1 (continued)

Location	Rationale for Selection of Location	Surface Water Body or Source Aquifer	Water Level or Flow ^a	Analytical Suites														
				Metals	Organics						Radionuclides			Inorganics			Field ⁱ	
				Metals ^b	VOCs ^c	SVOCs ^c	Pesticides	PCB ^d	HEXP ^e	Dioxins/Furans	Radionuclide ^f	Tritium ^g	Low-Level Tritium ^g	Gen Inorganics ^h	Perchlorate ⁱ	Stable Isotopes ^j	Suspended Sed ^k	DO, ORP, pH, SC, T, Turb, ALK
MSC-16-06295	Alluvial well in S-Site/Martin Canyon downgradient of Martin Spring and several TA-16 SWMU sites. Shows HE when wet. Traditionally included in 260 Outfall CME because of possible connections of Martin Spring with 260 Outfall discharges.	Alluvial	C	S	S	A	T	T	S ^{RDX-DP}	T	B	—	—	S	A	—	—	S
16-26644	Intermediate well located at TA-16 SE and downgradient of the 90 Line Pond; previously included in Interim Plan for water-level only. Sampled for TA-16 260 alluvial corrective measures implementation.	Intermediate	C	S	S	A	T	T	S ^{RDX-DP}	T	B	—	—	S	A	—	—	S
CdV-16-1(i)	Well is located at TA-16, downgradient of the 260 Outfall [Consolidated Unit 16-021(c)-99].	Intermediate	C	S	S	A	T	T	S ^{RDX-DP}	T	B	—	—	S	A	—	—	S
CdV-16-2(i)r	Well is located at TA-16, downgradient of the 260 Outfall.	Intermediate	C	S	S	A	T	T	S ^{RDX-DP}	T	B	—	—	S	A	A	—	S

Table 6.4-1 (continued)

Location	Rationale for Selection of Location	Surface Water Body or Source Aquifer	Water Level or Flow ^a	Analytical Suites														
				Metals	Organics					Radionuclides			Inorganics			Field ⁱ		
				Metals ^b	VOCs ^c	SVOCs ^c	Pesticides	PCB ^d	HEXP ^e	Dioxins/Furans	Radionuclide ^f	Tritium ^g	Low-Level Tritium ^g	Gen Inorganics ^h	Perchlorate ⁱ	Stable Isotopes ^j	Suspended Sed ^k	DO, ORP, pH, SC, T, Turb, ALK
CdV-16-4ip screen 1	Hydrologic test well installed downgradient of the 260 Outfall to evaluate the hydrologic properties of the deep perched intermediate aquifer in TA-16. Completed August 23, 2010.	Intermediate	C	Q	Q	Q	S	S	Q ^{RDX-DP}	S	Q	—	Q	Q	Q	Q	Q	Q
Cdv-37-1(i)	Located near the confluence of Water Canyon and Cañon de Valle Canyon. Monitors groundwater contamination in the perched-intermediate zone downgradient of TA-16.	Intermediate	C	S	S	A	T	T	S ^{RDX-DP}	T	B	—	—	S	A	A	—	S
MSC-16-02665	Single-screen intermediate well near the confluence of Water Canyon and Cañon de Valle. Monitors groundwater contamination in the perched-intermediate zone downgradient of TA-16.	Intermediate	C	S	S	A	T	T	S ^{RDX-DP}	T	B	—	—	S	A	A	—	S
R-25 screen 1	Downgradient monitoring location for the 260 Outfall. Well is equipped with a Westbay sampling system.	Intermediate	C	A	S	—	—	—	S ^{RDX-DP}	—	B	—	A	A	A	—	—	S

Table 6.4-1 (continued)

Location	Rationale for Selection of Location	Surface Water Body or Source Aquifer	Water Level or Flow ^a	Analytical Suites														
				Metals	Organics					Radionuclides			Inorganics				Field ⁱ	
				Metals ^b	VOCs ^c	SVOCs ^c	Pesticides	PCB ^d	HEXP ^e	Dioxins/Furans	Radionuclide ^f	Tritium ^g	Low-Level Tritium ^g	Gen Inorganics ^h	Perchlorate ⁱ	Stable Isotopes ^j	Suspended Sed ^k	DO, ORP, pH, SC, T, Turb, ALK
R-25 screen 2	Downgradient monitoring location for the 260 Outfall. Well is equipped with a Westbay sampling system.	Intermediate	C	A	S	—	—	—	S ^{RDX-DP}	—	B	—	A	A	A	—	—	S
R-25 screen 4	Downgradient monitoring location for the 260 Outfall. Well is equipped with a Westbay sampling system.	Intermediate	C	A	S	—	—	—	S ^{RDX-DP}	—	B	—	A	A	A	—	—	S
R-25b	Located immediately west of R-25 on the mesa top in TA-16. Monitors perched-intermediate groundwater for potential contamination associated with effluent from the 260 Outfall. Replaces screen 1 in R-25.	Intermediate	C	S	S	A	T	T	S ^{RDX-DP}	T	B	—	—	A	A	A	—	S
R-26 PZ-2	Piezometer installed near R-26. Provides data for perched-intermediate groundwater upgradient of TA-16.	Intermediate	C	S	S	A	T	T	S ^{RDX-DP}	T	B	—	—	A	A	A	—	S
R-26 screen 1	Provides site-specific background data for perched-intermediate groundwater upgradient of TA-16. Background location in GBIR R3. Converted to single-screen well. ⁿ	Intermediate	C	Q	Q	Q	S	S	Q ^{RDX-DP}	S	Q	—	Q	Q	Q	S	Q	Q

Table 6.4-1 (continued)

Location	Rationale for Selection of Location	Surface Water Body or Source Aquifer	Water Level or Flow ^a	Analytical Suites														
				Metals	Organics						Radionuclides			Inorganics				Field ⁱ
				Metals ^b	VOCs ^c	SVOCs ^c	Pesticides	PCB ^d	HEXP ^e	Dioxins/Furans	Radionuclide ^f	Tritium ^g	Low-Level Tritium ^g	Gen Inorganics ^h	Perchlorate ⁱ	Stable Isotopes ^j	Suspended Sed ^k	DO, ORP, pH, SC, T, Turb, ALK
R-47i	Located northeast of the 260 Outfall. Provides data in support of the 260 Outfall CME.	Intermediate	C	S	S	A	T	T	S ^{RDX-DP}	T	B	—	—	S	A	A	—	S
CdV-R-15-3	Placeholder. The final conversion of this well will be based on the results of the ongoing reliability assessment. ⁿ	Regional	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CdV-R-37-2	Placeholder. The final conversion of this well will be based on the results of the ongoing reliability assessment. ⁿ	Regional	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
R-25 screen 5	Downgradient monitoring location for the 260 Outfall. Well is equipped with a Westbay sampling system.	Regional	C	A	S	—	—	—	S ^{RDX-DP}	—	B	—	A	A	A	—	—	S
R-25 screen 6	Downgradient monitoring location for the 260 Outfall. Well is equipped with a Westbay sampling system.	Regional	C	A	S	—	—	—	S ^{RDX-DP}	—	B	—	A	A	A	—	—	S
R-25 screen 7	Downgradient monitoring location for the 260 Outfall. Well is equipped with a Westbay sampling system.	Regional	C	A	S	—	—	—	S ^{RDX-DP}	—	B	—	A	A	A	—	—	S

Table 6.4-1 (continued)

Location	Rationale for Selection of Location	Surface Water Body or Source Aquifer	Water Level or Flow ^a	Analytical Suites														
				Metals	Organics					Radionuclides			Inorganics			Field ⁱ		
				Metals ^b	VOCs ^c	SVOCs ^c	Pesticides	PCB ^d	HEXP ^e	Dioxins/Furans	Radionuclide ^f	Tritium ^g	Low-Level Tritium ^g	Gen Inorganics ^h	Perchlorate ⁱ	Stable Isotopes ^j	Suspended Sed ^k	DO, ORP, pH, SC, T, Turb, ALK
R-25 screen 8	Downgradient monitoring location for the 260 Outfall. Well is equipped with a Westbay sampling system.	Regional	C	A	S	—	—	—	S ^{RDX-DP}	—	B	—	A	A	A	—	—	S
R-48	Completed by deepening open borehole CdV-16-3(i). Monitors historical TA-16 sources.	Regional	C	S	S	A	T	T	S ^{RDX-DP}	T	B	—	—	S	A	A	—	S
R-63	New single-screen regional well. Replacement well for R-25 screen 5. Completed February 9, 2011. ⁿ	Regional	Q	Q	S	S	S	S	Q ^{RDX-DP}	S	Q	—	Q	Q	Q	S	Q	Q
Pajarito Canyon																		
R-18	Monitors for potential contaminants from sources in TA-16.	Regional	C	S	S	A	T	T	S ^{RDX-DP}	T	B	—	A	S	A	A	—	S

Table 6.4-1 (continued)

Notes: Sampling suites and frequencies: C = continuous; Q = quarterly (4 times/yr); S = semiannual (2 times/yr); A = annual (1 time/yr); B = biennial (1 time every 2 yr); T = triennial (1 time every 3 yr). Some locations may be assigned analytical suites or frequencies that differ from those indicated for this monitoring group in Table 1.6-2 for site-specific reasons summarized in Table D-6.0-3.

Nonfiltered and filtered samples will be collected for general inorganics (excluding anions) and metals. Anions and perchlorate samples will be filtered. Samples collected for radionuclide analysis will be nonfiltered only for all water media. Organic and HEXP constituents are nonfiltered for all water media. Stable isotope samples for nitrogen isotopes are filtered; stable isotope samples for deuterium and oxygen isotopes are not filtered.

- ^a Continuous monitoring for groundwater refers to the measurement of groundwater levels by a transducer placed in a well and programmed to collect groundwater-level measurements at highly frequent intervals (e.g., every 60 min daily throughout the year). Continuous stream-flow monitoring refers to the measurement of stream flow by a base-flow stream gage that is programmed to collect stream-flow measurements at highly frequent intervals. The superscript MP indicates water levels will be monitored at highly frequent intervals using a multiparameter probe that measures specific conductance, water level, and temperature. The superscript HD indicates that this sampling location is historically dry.
- ^b Metals analysis includes the 23 TAL metals, plus boron, molybdenum, silicon dioxide, strontium, tin, and uranium.
- ^c VOC = Volatile organic compounds; SVOC = semivolatile organic compounds.
- ^d PCB = Polychlorinated biphenyl (compound).
- ^e HEXP = High explosive (compounds). The HEXP analytical suite includes the Consent Order list of the normal SW-846:8330 analytes plus pentaerythritol tetranitrate (PETN); triaminotrinitrobenzene (TATB); 3,5-dinitroaniline, tri(o-cresyl)phosphate (TOCP); 2,4-diamino-6-nitrotoluene; and 2,6-diamino-4-nitrotoluene. These additional analytes are analyzed by SW-846:8321A. The superscript RDX-DP designates samples to be submitted for analysis of RDX degradation products: hexahydro-1-nitroso-3,5-dinitro-1,3,5-triazine (MNX); hexahydro-1,3-nitro-1,3,5-triazine (DNX); and hexahydro-1,3,5-trinitroso-1,3,5-triazine (TNX). The RDX-degradation products are analyzed by SW-846:8330.
- ^f The radionuclide suite includes gross alpha, gross beta, alpha spectroscopy, gamma spectroscopy, and strontium-90.
- ^g Tritium samples may be submitted for analysis by liquid scintillation if average activities are anticipated to exceed 200 pCi/L. Low-level tritium is analyzed using electrolytic enrichment or direct counting.
- ^h General inorganic analysis includes major anions (bromide, chloride, fluoride, sulfate); major cations (calcium, magnesium, sodium, potassium); nitrate plus nitrite (as N); total Kjeldahl nitrogen (TKN); ammonia; total phosphorus, total organic carbon (TOC); total dissolved solids (TDS); alkalinity; specific conductivity; pH; and hardness.
- ⁱ Analysis for perchlorate using high-performance liquid chromatography coupled with electrospray ionization mass spectrometry or tandem mass spectrometry (EPA Method 6850).
- ^j Analysis for stable nitrogen, deuterium, and oxygen isotopes. The collection of samples for stable isotopic analysis is considered a special sampling campaign that is outside the scope of the regulatory process. In general, samples for isotopic analysis are collected semiannually from "new" wells (those which completed construction, rehabilitation, or conversion on or after October 1, 2010) until at least four sets of data have been collected. Any subsequent sampling for stable isotope analysis will be decided on the basis of site-specific conditions.
- ^k Suspended sed = Suspended sediment concentration.
- ^l Field parameters include pH, turbidity, specific conductance, dissolved oxygen, and temperature at all locations. Oxidation-reduction potential (ORP) will be measured if a flow-through cell is used and will not be measured in surface water, spring water, or water collected from Westbay sampling systems unless specified otherwise. Alkalinity (ALK) will be measured for all samples either in the field or at the on-site EES-14 laboratory.
- ^m — = This analytical suite is not scheduled to be collected for this type of water at locations assigned to this monitoring group.
- ⁿ Characterization suites and frequencies apply to new perched-intermediate or regional groundwater wells. "New" wells are defined as those which are completed, rehabilitated, or converted on or after October 1, 2010. Any planned exceptions to this general protocol are documented in Appendix D.

Table 7.4-1
Interim Monitoring Plan for MDA AB Monitoring Group

Location	Rationale for Selection of Location	Surface Water Body or Source Aquifer	Water Level or Flow ^a	Analytical Suites														
				Metals	Organics						Radionuclides			Inorganics				Field ^l
				Metals ^b	VOCs ^c	SVOCs ^c	Pesticides	PCB ^d	HEXP ^e	Dioxins/Furans	Radionuclide ^f	Tritium ^g	Low-Level Tritium ^g	Gen Inorganics ^h	Perchlorate ⁱ	Stable Isotopes ^j	Suspended Sed ^k	DO, ORP, pH, SC, T, Turb, ALK
Ancho Canyon																		
R-29	Monitoring well installed to provide a regional aquifer monitoring well downgradient of TA-49 MDA AB to determine whether zones of perched-intermediate groundwater occur under MDA AB and reduce geologic uncertainty. Completed March 12, 2010.	Regional	C	S	A	T	T	T	A ^{RDX-DP}	T	S	≡	A	S	A	—	—	S
R-30	Monitoring well installed to provide a regional aquifer monitoring well at the eastern edge of TA-49 and downgradient of MDA AB to determine whether zones of perched-intermediate groundwater occur under MDA AB, and to reduce geologic uncertainty. Completed April 3, 2010.	Regional	C	S	A	T	T	T	A ^{RDX-DP}	T	S	—	A	S	A	—	—	S
Water Canyon																		
R-27i	Monitors potential contamination associated with the perched-intermediate zone downgradient of historical TA-16 sources.	Intermediate	C	A	A	T	T	T	A ^{RDX-DP}	T	A	—	A	A	A	—	—	A
R-27	Monitors TA-16 in support of the TA-16 260 Outfall CME. Background location in GBIR R4.	Regional	C	A	A	T	T	T	A ^{RDX-DP}	T	A	—	A	A	A	—	—	A

Table 7.4-1 (continued)

Notes: Sampling suites and frequencies: C = continuous; Q = quarterly (4 times/yr); S = semiannual (2 times/yr); A = annual (1 time/yr); T = triennial (1 time every 3 yr). Some locations may be assigned analytical suites or frequencies that differ from those indicated for this monitoring group in Table 1.6-2 for site-specific reasons summarized in Table D-7.0-3.

Nonfiltered and filtered samples will be collected for general inorganics (excluding anions) and metals. Anions and perchlorate samples will be filtered. Samples collected for radionuclide analysis will be nonfiltered only for all water media. Organic and HEXP constituents are nonfiltered for all water media. Stable isotope samples for nitrogen isotopes are filtered; stable isotope samples for deuterium and oxygen isotopes are not filtered.

- ^a Continuous monitoring for groundwater refers to the measurement of groundwater levels by a transducer placed in a well and programmed to collect groundwater-level measurements at highly frequent intervals (e.g., every 60 min daily throughout the year). Continuous stream-flow monitoring refers to the measurement of stream flow by a base-flow stream gage that is programmed to collect stream-flow measurements at highly frequent intervals. The superscript MP indicates water levels will be monitored at highly frequent intervals using a multiparameter probe that measures specific conductance, water level, and temperature. The superscript HD indicates that this sampling location is historically dry.
- ^b Metals analysis includes the 23 TAL metals, plus boron, molybdenum, silicon dioxide, strontium, tin, and uranium.
- ^c VOC = Volatile organic compounds; SVOC = semivolatile organic compounds.
- ^d PCB = Polychlorinated biphenyl (compound).
- ^e HEXP = High explosive (compounds). The HEXP analytical suite includes the Consent Order list of the normal SW-846:8330 analytes plus pentaerythritol tetranitrate (PETN); triaminotrinitrobenzene (TATB); 3,5-dinitroaniline, tri(o-cresyl)phosphate (TOCP); 2,4-diamino-6-nitrotoluene; and 2,6-diamino-4-nitrotoluene. These additional analytes are analyzed by SW-846:8321A. The superscript RDX-DP designates samples to be submitted for analysis of RDX degradation products: hexahydro-1-nitroso-3,5-dinitro-1,3,5-triazine (MNX); hexahydro-1,3-nitro-1,3,5-triazine (DNX); and hexahydro-1,3,5-trinitroso-1,3,5-triazine (TNX). The RDX-degradation products are analyzed by SW-846:8330.
- ^f The radionuclide suite includes gross alpha, gross beta, alpha spectroscopy, gamma spectroscopy, and strontium-90.
- ^g Tritium samples may be submitted for analysis by liquid scintillation if average activities are anticipated to exceed 200 pCi/L. Low-level tritium is analyzed using electrolytic enrichment or direct counting.
- ^h General inorganic analysis includes major anions (bromide, chloride, fluoride, sulfate); major cations (calcium, magnesium, sodium, potassium); nitrate plus nitrite (as N); total Kjeldahl nitrogen (TKN); ammonia; total phosphorus, total organic carbon (TOC); total dissolved solids (TDS); alkalinity; specific conductivity; pH; and hardness.
- ⁱ Analysis for perchlorate using high-performance liquid chromatography coupled with electrospray ionization mass spectrometry or tandem mass spectrometry (EPA Method 6850).
- ^j Analysis for stable nitrogen, deuterium, and oxygen isotopes. The collection of samples for stable isotopic analysis is considered a special sampling campaign that is outside the scope of the regulatory process. In general, samples for isotopic analysis are collected semiannually from "new" wells (those which completed construction, rehabilitation, or conversion on or after October 1, 2010) until at least four sets of data have been collected. Any subsequent sampling for stable isotope analysis will be decided on the basis of site-specific conditions.
- ^k Suspended sed = Suspended sediment concentration.
- ^l Field parameters include pH, turbidity, specific conductance, dissolved oxygen, and temperature at all locations. Oxidation-reduction potential (ORP) will be measured if a flow-through cell is used and will not be measured in surface water, spring water, or water collected from Westbay sampling systems unless specified otherwise. Alkalinity (ALK) will be measured for all samples either in the field or at the on-site EES-14 laboratory.
- ^m — = This analytical suite is not scheduled to be collected for this type of water at locations assigned to this monitoring group.

Table 8.3-1

Interim Monitoring Plan for General Surveillance Monitoring in Los Alamos/Pueblo Watershed

Location	Rationale for Selection of Location	Surface Water Body or Source Aquifer	Water Level or Flow ^a	Analytical Suites														
				Metals	Organics						Radionuclides			Inorganics			Field ^l	
				Metals ^b	VOCs ^c	SVOCs ^c	Pesticides	PCB ^d	HEXP ^e	Dioxins/Furans	Radionuclide ^f	Tritium ^g	Low-Level Tritium ^g	Gen Inorganics ^h	Perchlorate ⁱ	Stable Isotopes ^j	Suspended Sed ^k	DO, ORP, pH, SC, T, Turb, ALK
Upper Los Alamos Canyon (including DP Canyon)																		
DP below Meadow at TA-21 (E039)	Monitors water quality associated with contaminants in reach DP-2 associated with SWMU 21-011(k).	Base flow	C	A	A	A	T	A ^{CN GR}	T	T	A	— _m	—	A	A	—	A	A
DP Canyon above TA-21 (E038)	Monitors baseline water quality in DP Canyon associated with Los Alamos townsite runoff. Monitors water quality upgradient of potential effects from SWMU 21-011(k) in reach DP-2.	Base flow	C	A	A	A	T	A ^{CN GR}	T	T	A	—	—	A	A	—	A	A
Los Alamos above DP Canyon (E030)	Monitors water quality from runoff from SWMUs and AOCs in TA-01, TA-02, and TA-41. Typically persistent flow.	Base flow	C	A	A	A	T	A ^{CN GR}	T	T	A	—	—	A	A	—	A	A
Los Alamos above SR-4 (E042)	Monitors flow from DP and upper Los Alamos Canyons and water quality above the low-head weir. Flows primarily during spring runoff in March and April. Data used as baseline for water-quality evaluation of the weir.	Base flow	C	A	A	A	T	A ^{CN GR}	T	T	A	—	—	A	A	—	A	A
Los Alamos below LA Weir (E050)	Monitors water quality at Laboratory boundary and influence of low-head weir on surface-water quality. Flows primarily during spring runoff in March and April.	Base flow	C	A	A	A	T	A ^{CN GR}	T	T	A	—	—	A	A	—	A	A

Table 8.3-1 (continued)

Location	Rationale for Selection of Location	Surface Water Body or Source Aquifer	Water Level or Flow ^a	Analytical Suites														
				Metals	Organics						Radionuclides			Inorganics			Field ^l	
				Metals ^b	VOCs ^c	SVOCs ^c	Pesticides	PCB ^d	HEXP ^e	Dioxins/Furans	Radionuclide ^f	Tritium ^g	Low-Level Tritium ^g	Gen Inorganics ^h	Perchlorate ⁱ	Stable Isotopes ^j	Suspended Sed ^k	DO, ORP, pH, SC, T, Turb, ALK
Los Alamos below the Ice Rink (E026)	Monitors background water quality. Typically persistent flow.	Base flow	C	A	A	A	T	A ^{CNGR}	T	T	A	—	—	A	A	—	A	A
DP Spring	Monitors water quality from secondary contaminant sources in DP Canyon sediments.	Spring	A	A	A	A	T	A	T	T	A	A	—	A	A	—	A	A
LAO-0.3	Monitors baseline runoff water quality downcanyon of the townsite. Provides baseline for assessing potential effects of runoff from SWMUs and AOCs in TA-01, TA-02, and TA-41.	Alluvial	C	A	A	A	T	T	T	T	A	A	—	A	A	—	—	A
LAO-0.6	Monitors for potential effects from SWMUs and AOCs in TA-41 and TA-02.	Alluvial	C	A	A	A	T	T	T	T	A	—	—	A	A	—	—	A
LAO-1	Monitors potential impact of SWMUs and AOCs in TA-01, TA-02, and TA-04 and sediment contamination in upcanyon reaches.	Alluvial	C	A	A	A	T	T	T	T	A	—	—	A	A	—	—	A
LAO-1.6g	Monitors molybdenum contamination historically associated with TA-53 outfall into Los Alamos Canyon.	Alluvial	C	A	A	A	T	T	T	T	A	—	—	A	A	—	—	A

Table 8.3-1 (continued)

Location	Rationale for Selection of Location	Surface Water Body or Source Aquifer	Water Level or Flow ^a	Analytical Suites														
				Metals	Organics						Radionuclides			Inorganics			Field ^l	
				Metals ^b	VOCs ^c	SVOCs ^c	Pesticides	PCB ^d	HEXP ^e	Dioxins/Furans	Radionuclide ^f	Tritium ^g	Low-Level Tritium ^g	Gen Inorganics ^h	Perchlorate ⁱ	Stable Isotopes ^j	Suspended Sed ^k	DO, ORP, pH, SC, T, Turb, ALK
LAO-2	Monitors cumulative effects of contaminants in DP Canyon. Most downcanyon alluvial groundwater monitoring point in DP Canyon. Shows some mixing of alluvial groundwater from upper portions of Los Alamos Canyon.	Alluvial	C	A	A	A	T	T	T	T	A	—	—	A	A	—	—	A
LAO-3a	Monitors net effect of mixing of alluvial groundwater from Los Alamos and DP Canyons. Located just downcanyon of the confluence of Los Alamos and DP Canyons.	Alluvial	C	A	A	A	T	T	T	T	A	—	—	A	A	—	—	A
LAO-4.5c	Monitors for indications of downcanyon migration of contamination below Los Alamos/DP Canyon confluence.	Alluvial	C	A	A	A	T	T	T	T	A	A	—	A	A	—	—	A
LAO-6a/LAO-5	Monitors potential contaminant migration from upper canyon and serves as facility boundary monitoring location. Typically dry but sometimes wet up during spring. Well with sufficient saturation will be sampled.	Alluvial	C	A	A	A	T	T	T	T	A	A	—	A	A	—	—	A
LAO-B	Monitors background alluvial groundwater quality. Background location in GBIR R3.	Alluvial	C	A	A	A	T	T	T	T	A	—	—	A	A	—	—	A
LAUZ-1	Monitors groundwater contamination associated with contaminated sediments in Reach DP 2.	Alluvial	C ^{MP}	A	A	A	T	T	T	T	A	—	—	A	A	—	—	A

Table 8.3-1 (continued)

Location	Rationale for Selection of Location	Surface Water Body or Source Aquifer	Water Level or Flow ^a	Analytical Suites														
				Metals	Organics						Radionuclides			Inorganics			Field ⁱ	
				Metals ^b	VOCs ^c	SVOCs ^c	Pesticides	PCB ^d	HEXP ^e	Dioxins/Furans	Radionuclide ^f	Tritium ^g	Low-Level Tritium ^g	Gen Inorganics ^h	Perchlorate ⁱ	Stable Isotopes ^j	Suspended Sed ^k	DO, ORP, pH, SC, T, Turb, ALK
LAOI-7	Monitors downgradient location for potential contaminants from upper Los Alamos and DP Canyons and TA-21.	Intermediate	C	A	A	A	T	T	T	T	A	A	—	A	A	—	—	A
R-9i screen 1	Monitors downgradient location for potential contaminants from upper Los Alamos and DP Canyons and TA-21 and possible southward perched-zone migration from Pueblo Canyon. Well is equipped with a Westbay sampling system and is scheduled for redevelopment and conversion in FY2012. ⁿ	Intermediate	C	A	A	—	—	—	T	—	A	—	A	A	A	—	—	A
R-9i screen 2	Monitors downgradient location for potential contaminants from upper Los Alamos and DP Canyons and TA-21 and possible southward perched-zone migration from Pueblo Canyon. Well is equipped with a Westbay sampling system and is scheduled for redevelopment and conversion in FY2012. ⁿ	Intermediate	C	A	A	—	—	—	T	—	A	—	A	A	A	—	—	A
R-8 screen 1	Monitors downgradient location for potential contaminants from upper Los Alamos and DP Canyons and TA-21. Well is equipped with a Westbay sampling system and is scheduled for redevelopment and conversion in FY2012. ⁿ	Regional	C	A	A	—	—	—	T	—	A	—	A	A	A	—	—	A

Table 8.3-1 (continued)

Location	Rationale for Selection of Location	Surface Water Body or Source Aquifer	Water Level or Flow ^a	Analytical Suites														
				Metals	Organics						Radionuclides			Inorganics			Field ^l	
				Metals ^b	VOCs ^c	SVOCs ^c	Pesticides	PCB ^d	HEXP ^e	Dioxins/Furans	Radionuclide ^f	Tritium ^g	Low-Level Tritium ^g	Gen Inorganics ^h	Perchlorate ⁱ	Stable Isotopes ^j	Suspended Sed ^k	DO, ORP, pH, SC, T, Turb, ALK
R-8 screen 2	Monitors downgradient location for potential contaminants from upper Los Alamos and DP Canyons and TA-21. Well is equipped with a Westbay sampling system and is scheduled for redevelopment and conversion in FY2012. ⁿ	Regional	C	A	A	—	—	—	T	—	A	—	A	A	A	—	—	A
R-9	Monitors downgradient location for potential contaminants from upper Los Alamos and DP Canyons and TA-21 and or possible southward perched-zone migration from Pueblo Canyon.	Regional	C	A	A	A	T	T	T	T	A	—	A	A	A	—	—	A
Pueblo Canyon																		
Acid Above Pueblo (E056)	Monitors water quality in lower Acid Canyon to assess cumulative effects of residual contaminants in the Acid Canyon watershed.	Base flow	C	A	A	A	T	A ^{CNGR}	T	T	A	—	—	A	A	—	A	A
Guaje above Rendija Canyon (E089)	Monitors lower extent of flow in Guaje Canyon. Background base-flow location. Responds to snowmelt in high snowpack years, typically in March and April as well as from summer thunderstorms.	Base flow	C	A	A	A	T	A ^{CNGR}	T	T	A	—	—	A	A	—	A	A
Pueblo 3	Provides baseline data for water quality below the Los Alamos County WWTP in Pueblo Canyon and above the wetland. Effluent-supported flow.	Base flow	A	A	A	A	T	A ^{CNGR}	T	A	A	—	—	A	A	—	A	A

Table 8.3-1 (continued)

Location	Rationale for Selection of Location	Surface Water Body or Source Aquifer	Water Level or Flow ^a	Analytical Suites														
				Metals	Organics						Radionuclides			Inorganics			Field ^l	
				Metals ^b	VOCs ^c	SVOCs ^c	Pesticides	PCB ^d	HEXP ^e	Dioxins/Furans	Radionuclide ^f	Tritium ^g	Low-Level Tritium ^g	Gen Inorganics ^h	Perchlorate ⁱ	Stable Isotopes ^j	Suspended Sed ^k	DO, ORP, pH, SC, T, Turb, ALK
Pueblo above Acid (E055)	Monitors water quality associated with townsite runoff and provides a baseline relative to Acid Canyon influence. Flows primarily during spring runoff in March and April but can occur much earlier.	Base flow	C	A	A	A	T	A ^{CNGR}	T	T	A	—	—	A	A	—	A	A
Pueblo above SR 502 (E060)	Monitors lower boundary location to evaluate potential water-quality changes through the Pueblo Canyon wetland. Effluent-supported flow.	Base flow	C	A	A	A	T	A ^{CNGR}	T	A	A	—	—	A	A	—	A	A
APCO-1	Monitors within the wetland below the Pueblo WWTP. Most downcanyon monitoring point in Pueblo Canyon.	Alluvial	C	A	A	A	T	A	T	A	A	—	A	A	A	—	—	A
PAO-1	Monitors groundwater quality in Pueblo Canyon immediately above confluence with Acid Canyon.	Alluvial	C	A	A	A	T	A	T	T	A	—	A	A	A	—	—	A
PAO-2	Monitors groundwater quality in Pueblo Canyon immediately below confluence with Acid Canyon.	Alluvial	C ^{MP}	A	A	A	T	A	T	T	A	—	A	A	A	—	—	A
PAO-4	Monitors below the Los Alamos County WWTP in Pueblo Canyon.	Alluvial	C	A	A	A	T	A	T	T	A	—	A	A	A	—	—	A
POI-4	Monitors for potential contaminants from upper Pueblo and Acid Canyons sources.	Intermediate	C	A	A	A	T	T	T	T	A	—	A	A	A	—	—	A
R-3i	Monitors along the potential infiltration pathway originating in lower Pueblo Canyon.	Intermediate	C	A	A	A	T	T	T	T	A	—	A	A	A	—	—	A

Table 8.3-1 (continued)

Location	Rationale for Selection of Location	Surface Water Body or Source Aquifer	Water Level or Flow ^a	Analytical Suites														
				Metals	Organics						Radionuclides			Inorganics			Field ^l	
				Metals ^b	VOCs ^c	SVOCs ^c	Pesticides	PCB ^d	HEXP ^e	Dioxins/Furans	Radionuclide ^f	Tritium ^g	Low-Level Tritium ^g	Gen Inorganics ^h	Perchlorate ⁱ	Stable Isotopes ^j	Suspended Sed ^k	DO, ORP, pH, SC, T, Turb, ALK
TW-2Ar	Replacement monitoring well for TW-2A. Monitors perched-intermediate groundwater in lower Pueblo Canyon. Completed March 4, 2010.	Intermediate	C	A	A	A	T	T	T	T	A	A	—	A	A	—	—	A
R-2	Monitors for potential contaminants from upper Pueblo and Acid Canyons. Background location in GBIR R4.	Regional	C	A	A	A	T	T	T	T	A	—	A	A	A	—	—	A
R-3	Monitoring well installed in Pueblo Canyon, near the eastern boundary of TA-74. Objective of the well was to provide a regional aquifer monitoring well within potential contamination flow paths in the regional aquifer near municipal production well Otowi 1. Completed June 21, 2010.	Regional	C	A	A	A	T	T	T	T	A	—	A	A	A	—	—	A
R-4	Monitors for potential contaminants from upper Pueblo and Acid Canyons.	Regional	C	A	A	A	T	T	T	T	A	—	A	A	A	—	—	A
R-24	Monitors for potential contaminants from upper Pueblo and Acid Canyons and Guaje Canyon. Background location in GBIR R4.	Regional	C	A	A	A	T	T	T	T	A	—	A	A	A	—	—	A

Table 8.3-1 (continued)

Location	Rationale for Selection of Location	Surface Water Body or Source Aquifer	Water Level or Flow ^a	Analytical Suites														
				Metals	Organics						Radionuclides			Inorganics			Field ⁱ	
				Metals ^b	VOCs ^c	SVOCs ^c	Pesticides	PCB ^d	HEXP ^e	Dioxins/Furans	Radionuclide ^f	Tritium ^g	Low-Level Tritium ^g	Gen Inorganics ^h	Perchlorate ⁱ	Stable Isotopes ^j	Suspended Sed ^k	DO, ORP, pH, SC, T, Turb, ALK
Lower Los Alamos Canyon																		
Los Alamos Canyon near Otowi Bridge (E110)	Measures quality of persistent surface water in Los Alamos Canyon above the confluence of Los Alamos Canyon and Rio Grande. Located on San Ildefonso land and sampled under the MOU.	Base flow	A	A	A	A	T	T	T	T	A	—	A	A	A	—	A	A
Basalt Spring/Vine Tree Spring	Basalt Spring water quality indicates a relation to perched-intermediate groundwater in lower Pueblo Canyon. Located on San Ildefonso land immediately downgradient of the Laboratory boundary and sampled under the MOU. Sample Basalt Spring; if not possible, sample Vine Tree Spring.	Spring	S	S	S	T	T	T	T	T	S	—	S	S	S	—	S	S
Los Alamos Spring	Los Alamos Spring water quality indicates a relation to perched-intermediate groundwater, possibly originating beneath Los Alamos Canyon. Located on San Ildefonso land and sampled under the MOU.	Spring	A	A	A	T	T	T	T	T	A	—	A	A	A	—	A	A
LLAO-1b	Monitors upper portion of San Ildefonso Pueblo reach in lower Los Alamos Canyon. Water quality is consistent with recharge of water that emerges at Basalt Spring. Located on San Ildefonso land and sampled under the MOU.	Alluvial	C	A	A	T	T	T	T	T	A	—	A	A	A	—	—	A

Table 8.3-1 (continued)

Location	Rationale for Selection of Location	Surface Water Body or Source Aquifer	Water Level or Flow ^a	Analytical Suites														
				Metals	Organics						Radionuclides			Inorganics			Field ^l	
				Metals ^b	VOCs ^c	SVOCs ^c	Pesticides	PCB ^d	HEXP ^e	Dioxins/Furans	Radionuclide ^f	Tritium ^g	Low-Level Tritium ^g	Gen Inorganics ^h	Perchlorate ⁱ	Stable Isotopes ^j	Suspended Sed ^k	DO, ORP, pH, SC, T, Turb, ALK
LLAO-4	Monitors lower San Ildefonso Pueblo reach in lower Los Alamos Canyon near the confluence with Rio Grande. Water quality appears to reflect mixing with regional groundwater near the Rio Grande. Located on San Ildefonso land and sampled under the MOU.	Alluvial	C	A	A	T	T	T	T	T	A	—	A	A	A	—	—	A
Upper Guaje Canyon																		
Campsite Spring	Off-site background location in Guaje Canyon. Sample annually in fall. Background location in GBIR R3 and GBIR R4.	Spring	A	A	T	T	T	T	T	T	A	—	A	A	A	—	A	A

Table 8.3-1 (continued)

Notes: Sampling suites and frequencies: C = continuous; Q = quarterly (4 times/yr); S = semiannual (2 times/yr); A = annual (1 time/yr); T = triennial (1 time every 3 yr). Some locations may be assigned analytical suites or frequencies that differ from those indicated for the general surveillance monitoring group in Table 1.6-3 for site-specific reasons summarized in Table D-8.2-3.

Nonfiltered and filtered samples will be collected for general inorganics (excluding anions) and metals. Anions and perchlorate samples will be filtered. Samples collected for radionuclide analysis will be nonfiltered only for all water media. Organic and HEXP constituents are nonfiltered for all water media. Stable isotope samples for nitrogen isotopes are filtered; stable isotope samples for deuterium and oxygen isotopes are not filtered.

- ^a Continuous monitoring for groundwater refers to the measurement of groundwater levels by a transducer placed in a well and programmed to collect groundwater-level measurements at highly frequent intervals (e.g., every 60 min daily throughout the year). Continuous stream-flow monitoring refers to the measurement of stream flow by a base-flow stream gage that is programmed to collect stream-flow measurements at highly frequent intervals. The superscript MP indicates water levels will be monitored at highly frequent intervals using a multiparameter probe that measures specific conductance, water level, and temperature. The superscript HD indicates that this sampling location is historically dry.
- ^b Metals analysis includes the 23 TAL metals, plus boron, molybdenum, silicon dioxide, strontium, tin, and uranium.
- ^c VOC = Volatile organic compounds; SVOC = semivolatile organic compounds.
- ^d PCB = Polychlorinated biphenyl (compound). The superscript CNGR indicates the analysis of PCB congeners using U.S. Environmental Protection Agency (EPA) Method 1668A.
- ^e HEXP = High explosive (compounds). The HEXP analytical suite includes the Consent Order list of the normal SW-846:8330 analytes plus pentaerythritol tetranitrate (PETN); triaminotrinitrobenzene (TATB); 3,5-dinitroaniline, tri(o-cresyl)phosphate (TOCP); 2,4-diamino-6-nitrotoluene; and 2,6-diamino-4-nitrotoluene. These additional analytes are analyzed by SW-846:8321A.
- ^f The radionuclide suite includes gross alpha, gross beta, alpha spectroscopy, gamma spectroscopy, and strontium-90.
- ^g Tritium samples may be submitted for analysis by liquid scintillation if average activities are anticipated to exceed 200 pCi/L. Low-level tritium is analyzed using electrolytic enrichment or direct counting.
- ^h General inorganic analysis includes major anions (bromide, chloride, fluoride, sulfate); major cations (calcium, magnesium, sodium, potassium); nitrate plus nitrite (as N); total Kjeldahl nitrogen (TKN); ammonia; total phosphorus, total organic carbon (TOC); total dissolved solids (TDS); alkalinity; specific conductivity; pH; and hardness.
- ⁱ Analysis for perchlorate using high-performance liquid chromatography coupled with electrospray ionization mass spectrometry or tandem mass spectrometry (EPA Method 6850).
- ^j Analysis for stable nitrogen, deuterium, and oxygen isotopes. The collection of samples for stable isotopic analysis is considered a special sampling campaign that is outside the scope of the regulatory process. In general, samples for isotopic analysis are collected semiannually from "new" wells (those which completed construction, rehabilitation, or conversion on or after October 1, 2010) until at least four sets of data have been collected. Any subsequent sampling for stable isotope analysis will be decided on the basis of site-specific conditions.
- ^k Suspended sed = Suspended sediment concentration.
- ^l Field parameters include pH, turbidity, specific conductance, dissolved oxygen, and temperature at all locations. Oxidation-reduction potential (ORP) will be measured if a flow-through cell is used and will not be measured in surface water, spring water, or water collected from Westbay sampling systems unless specified otherwise. Alkalinity (ALK) will be measured for all samples either in the field or at the on-site EES-14 laboratory.
- ^m — = This analytical suite is not scheduled to be collected for this type of water at locations assigned to this monitoring group.
- ⁿ Characterization suites and frequencies apply to new perched-intermediate or regional groundwater wells. "New" wells are defined as those which are completed, rehabilitated, or converted on or after October 1, 2010. Any planned exceptions to this general protocol are documented in Appendix D.

Table 8.3-2
Interim Monitoring Plan for General Surveillance Monitoring in Sandia Watershed

Location	Rationale for Selection of Location	Surface Water Body or Source Aquifer	Water Level or Flow ^a	Analytical Suites														
				Metals	Organics						Radionuclides			Inorganics				Field
				Metals ^b	VOCs ^c	SVOCs ^c	Pesticides	PCB ^d	HEXP ^e	Dioxins/Furans	Radionuclide ^f	Tritium ^g	Low-Level Tritium ^g	Gen Inorganics ^h	Perchlorate ⁱ	Stable Isotopes ^j	Suspended Sed ^k	DO, ORP, pH, SC, T, Turb. ALK
Middle Sandia Canyon at terminus of persistent base flow	Most downcanyon location of effluent-supported flow from upcanyon. The surface water expression typically infiltrates alluvium upstream of E124.	Base flow	A	A	A	A	T	A ^{CN GR}	T	T	B	— ^m	—	A	A	—	A	A
Sandia below Wetlands (E123)	Monitors water quality of flow from wetland. Persistent effluent-support flow from NPDES Outfall 01A-001.	Base flow	A	A	A	A	T	A ^{CN GR}	T	T	B	—	—	A	A	—	A	A
Sandia right fork at Power Plant (E121)	Persistent effluent-supported flow predominantly from NPDES Outfall 01A-001. Serves as baseline for comparison to downcanyon changes in water quality, especially related to the downcanyon wetland.	Base flow	A	A	A	A	T	A ^{CN GR}	T	T	B	—	—	A	A	—	A	A

Table 8.3-2 (continued)

Location	Rationale for Selection of Location	Surface Water Body or Source Aquifer	Water Level or Flow ^a	Analytical Suites														
				Metals	Organics						Radionuclides			Inorganics				Field ^l
				Metals ^b	VOCs ^c	SVOCs ^c	Pesticides	PCB ^d	HEXP ^e	Dioxins/Furans	Radionuclide ^f	Tritium ^g	Low-Level Tritium ^g	Gen Inorganics ^h	Perchlorate ⁱ	Stable Isotopes ^j	Suspended Sed ^k	DO, ORP, pH, SC, T, Turb, ALK
South fork at Sandia Canyon at E122	Monitors TA-03 runoff. Serves as baseline for comparison to downcanyon changes in water quality, especially related to the downcanyon wetland.	Base flow	A	A	A	A	T	A ^{CNGR}	T	T	B	—	—	A	A	—	A	A
SCA-1-DP	Drivepoint installed near SCA-1 to characterize wetland as a replacement for SCA-1.	Alluvial	A	A	A	A	T	T	T	T	B	—	—	A	A	—	—	A
SCA-2	Located at the upper portion of the lower canyon where the valley floor first opens up and the first significant alluvial storage is present along the canyon.	Alluvial	C ^{MP}	A	A	A	T	T	T	T	B	—	—	A	A	—	—	A
SCA-3	Monitors water quality associated with ongoing effluent releases and secondary source term in canyon sediments. Located in the canyon within a thick (~20–30 ft) alluvial deposit in the lower canyon.	Alluvial	C	A	A	A	T	T	T	T	B	—	—	A	A	—	—	A

Table 8.3-2 (continued)

Location	Rationale for Selection of Location	Surface Water Body or Source Aquifer	Water Level or Flow ^a	Analytical Suites														
				Metals	Organics						Radionuclides			Inorganics				Field ^l
				Metals ^b	VOCs ^c	SVOCs ^c	Pesticides	PCB ^d	HEXP ^e	Dioxins/Furans	Radionuclide ^f	Tritium ^g	Low-Level Tritium ^g	Gen Inorganics ^h	Perchlorate ⁱ	Stable Isotopes ^j	Suspended Sed ^k	DO, ORP, pH, SC, T, Turb, ALK
SCA-4	Monitors water quality associated with ongoing effluent releases and secondary source term in canyon sediments. Located approximately mid-way between SCA-3 and the easternmost drainage from the TA-53 complex.	Alluvial	C	A	A	A	T	T	T	T	B	—	—	A	A	—	—	A
SCA-5	Monitors water quality associated with ongoing effluent releases and secondary source term in canyon sediments. Located just downcanyon of the easternmost drainage from the TA-53 complex. Well is typically dry but responds to runoff periods.	Alluvial	C	A	A	A	T	T	T	T	B	—	—	A	A	—	—	A
R-12 screen 1	Monitors for potential contaminants from Sandia Canyon or possibly Los Alamos or Pueblo Canyons.	Intermediate	C	A	A	A	T	T	T	T	A	—	A	A	A	—	—	A

Table 8.3-2 (continued)

Location	Rationale for Selection of Location	Surface Water Body or Source Aquifer	Water Level or Flow ^a	Analytical Suites														
				Metals	Organics						Radionuclides			Inorganics				Field ^l
				Metals ^b	VOCs ^c	SVOCs ^c	Pesticides	PCB ^d	HEXP ^e	Dioxins/Furans	Radionuclide ^f	Tritium ^g	Low-Level Tritium ^g	Gen Inorganics ^h	Perchlorate ⁱ	Stable Isotopes ^j	Suspended Sed ^k	DO, ORP, pH, SC, T, Turb, ALK
R-12 screen 2	Monitors for potential contaminants from Sandia Canyon or possibly Los Alamos or Pueblo Canyons.	Intermediate	C	A	A	A	T	T	T	T	A	—	A	A	A	—	—	A
R-10 screen 1	Monitors for potential contaminants from Sandia Canyon and possibly Los Alamos or Pueblo Canyons. Located on San Ildefonso land and sampled under the MOU. Background location in GBIR R4.	Regional	C	A	A	A	T	T	T	T	A	—	A	A	A	—	—	A
R-10 screen 2	Monitors for potential contaminants from Sandia Canyon and possibly Los Alamos or Pueblo Canyons. Located on San Ildefonso land and sampled under the MOU. Background location in GBIR R4.	Regional	C	A	A	A	T	T	T	T	A	—	A	A	A	—	—	A

Table 8.3-2 (continued)

Location	Rationale for Selection of Location	Surface Water Body or Source Aquifer	Water Level or Flow ^a	Analytical Suites														
				Metals	Organics						Radionuclides			Inorganics			Field ^l	
				Metals ^b	VOCs ^c	SVOCs ^c	Pesticides	PCB ^d	HEXP ^e	Dioxins/Furans	Radionuclide ^f	Tritium ^g	Low-Level Tritium ^g	Gen Inorganics ^h	Perchlorate ⁱ	Stable Isotopes ^j	Suspended Sed ^k	DO, ORP, pH, SC, T, Turb, ALK
R-10a	Monitors for potential contaminants from Sandia Canyon and possibly Los Alamos or Pueblo Canyons. Located on San Ildefonso land and sampled under the MOU.	Regional	C	A	A	A	T	T	T	T	A	—	A	A	A	—	—	A

Table 8.3-2 (continued)

Notes: Sampling suites and frequencies: C = continuous; Q = quarterly (4 times/yr); S = semiannual (2 times/yr); A = annual (1 time/yr); B = biennial (1 time every 2 yr); T = triennial (1 time every 3 yr). Some locations may be assigned analytical suites or frequencies that differ from those indicated for the general surveillance monitoring group in Table 1.6-3 for site-specific reasons summarized in Table D-8.3-3.

Nonfiltered and filtered samples will be collected for general inorganics (excluding anions) and metals. Anions and perchlorate samples will be filtered. Samples collected for radionuclide analysis will be nonfiltered only for all water media. Organic and HEXP constituents are nonfiltered for all water media. Stable isotope samples for nitrogen isotopes are filtered; stable isotope samples for deuterium and oxygen isotopes are not filtered.

- ^a Continuous monitoring for groundwater refers to the measurement of groundwater levels by a transducer placed in a well and programmed to collect groundwater-level measurements at highly frequent intervals (e.g., every 60 min daily throughout the year). Continuous stream-flow monitoring refers to the measurement of stream flow by a base-flow stream gage that is programmed to collect stream-flow measurements at highly frequent intervals. The superscript MP indicates water levels will be monitored at highly frequent intervals using a multiparameter probe that measures specific conductance, water level, and temperature. The superscript HD indicates that this sampling location is historically dry.
- ^b Metals analysis includes the 23 TAL metals, plus boron, molybdenum, silicon dioxide, strontium, tin, and uranium.
- ^c VOC = Volatile organic compounds; SVOC = semivolatile organic compounds.
- ^d PCB = Polychlorinated biphenyl (compound). The superscript CNGR indicates the analysis of PCB congeners using EPA Method 1668A.
- ^e HEXP = High explosive (compounds). The HEXP analytical suite includes the Consent Order list of the normal SW-846:8330 analytes plus pentaerythritol tetranitrate (PETN); triaminotrinitrobenzene (TATB); 3,5-dinitroaniline, tri(o-cresyl)phosphate (TOCP); 2,4-diamino-6-nitrotoluene; and 2,6-diamino-4-nitrotoluene. These additional analytes are analyzed by SW-846:8321A.
- ^f The radionuclide suite includes gross alpha, gross beta, alpha spectroscopy, gamma spectroscopy, and strontium-90.
- ^g Tritium samples may be submitted for analysis by liquid scintillation if average activities are anticipated to exceed 200 pCi/L. Low-level tritium is analyzed using electrolytic enrichment or direct counting.
- ^h General inorganic analysis includes major anions (bromide, chloride, fluoride, sulfate); major cations (calcium, magnesium, sodium, potassium); nitrate plus nitrite (as N); total Kjeldahl nitrogen (TKN); ammonia; total phosphorus, total organic carbon (TOC); total dissolved solids (TDS); alkalinity; specific conductivity; pH; and hardness.
- ⁱ Analysis for perchlorate using high-performance liquid chromatography coupled with electrospray ionization mass spectrometry or tandem mass spectrometry (EPA Method 6850).
- ^j Analysis for stable nitrogen, deuterium, and oxygen isotopes. The collection of samples for stable isotopic analysis is considered a special sampling campaign that is outside the scope of the regulatory process. In general, samples for isotopic analysis are collected semiannually from "new" wells (those which completed construction, rehabilitation, or conversion on or after October 1, 2010) until at least four sets of data have been collected. Any subsequent sampling for stable isotope analysis will be decided on the basis of site-specific conditions.
- ^k Suspended sed = Suspended sediment concentration.
- ^l Field parameters include pH, turbidity, specific conductance, dissolved oxygen, and temperature at all locations. Oxidation-reduction potential (ORP) will be measured if a flow-through cell is used and will not be measured in surface water, spring water, or water collected from Westbay sampling systems unless specified otherwise. Alkalinity (ALK) will be measured for all samples either in the field or at the on-site EES-14 laboratory.
- ^m — = This analytical suite is not scheduled to be collected for this type of water at locations assigned to this monitoring group.
- ⁿ Characterization suites and frequencies apply to new perched-intermediate or regional groundwater wells. "New" wells are defined as those which are completed, rehabilitated, or converted October 1, 2010. Any planned exceptions to this general protocol are documented in Appendix D.

Table 8.3-3
Interim Monitoring Plan for General Surveillance Monitoring in Mortandad Watershed

Location	Rationale for Selection of Location	Surface Water Body or Source Aquifer	Water Level or Flow ^a	Analytical Suites														
				Metals	Organics						Radionuclides			Inorganics				Field ^l
				Metals ^b	VOCs ^c	SVOCs ^c	Pesticides	PCB ^d	HEXP ^e	Dioxins/Furans	Radionuclide ^f	Tritium ^g	Low-Level Tritium ^g	Gen Inorganics ^h	Perchlorate ⁱ	Stable Isotopes ^j	Suspended Sed ^k	DO, ORP, pH, SC, T, Turb, ALK
E-1FW	Effluent-supported reach in upper Effluent Canyon, primarily from TA-50 RLWTF.	Base flow	A	A	A	A	T	T	T	T	A	— ^m	—	A	A	—	A	A
M-1E	Measures cumulative upper Mortandad potential impacts just above confluence of Effluent Canyon.	Base flow	A	A	A	A	T	T	T	T	A	—	—	A	A	—	A	A
M-1W	Upper Mortandad Canyon. Surface water baseline for Mortandad Canyon.	Base flow	A	A	A	A	T	T	T	T	A	—	—	A	A	—	A	A
M-2E	Addresses distal end of persistent surface water in watershed.	Base flow	A	A	A	A	T	T	T	T	A	—	—	A	A	—	A	A
Mortandad below Effluent Canyon (E200)	First surface water monitoring location in Mortandad below Effluent Canyon confluence.	Base flow	A	A	A	A	T	T	T	T	A	A	—	A	A	—	A	A
TS-1W	Monitors head of Ten Site drainage and potential impacts from MDA C.	Base flow	A	A	A	A	T	T	T	T	A	—	—	A	A	—	A	A
TS-2E	Monitors cumulative impacts from TA-35, including contamination in Pratt Canyon.	Base flow	A	A	A	A	T	T	T	T	A	—	—	A	A	—	A	A
CDBO-6	Monitoring required for SWS Discharge Permit DP-857. ^o	Alluvial	C	A	A	A	T	T	T	T	A	—	—	Q	Q	—	—	Q
CDBO-7	Saturation usually not sufficient to sample but will be sampled if water is present.	Alluvial	C	A	A	A	T	T	T	T	A	—	—	A	A	—	—	A

Table 8.3-3 (continued)

Location	Rationale for Selection of Location	Surface Water Body or Source Aquifer	Water Level or Flow ^a	Analytical Suites														
				Metals	Organics						Radionuclides			Inorganics				Field ^l
				Metals ^b	VOCs ^c	SVOCs ^c	Pesticides	PCB ^d	HEXP ^e	Dioxins/Furans	Radionuclide ^f	Tritium ^g	Low-Level Tritium ^g	Gen Inorganics ^h	Perchlorate ⁱ	Stable Isotopes ^j	Suspended Sed ^k	DO, ORP, pH, SC, T, Turb, ALK
MCA-1	Most downcanyon monitoring point in Mortandad Canyon before confluence of Effluent Canyon.	Alluvial	C	A	A	A	T	T	T	T	A	A	—	A	A	—	—	A
MCO-0.6	Provides alluvial groundwater quality baseline for upper Mortandad Canyon.	Alluvial	C ^{MP}	A	A	A	T	T	T	T	A	A	—	A	A	—	—	A
MCO-2	Monitors potential contaminants in Effluent Canyon above the TA-50 outfall.	Alluvial	C ^{MP}	A	A	A	T	T	T	T	A	A	—	A	A	—	—	A
MCO-3	Monitors trends in alluvial groundwater quality following upgrades to the RLWTF. Monitoring required for RLWTF Discharge Permit DP-1132. ^p	Alluvial	C	A	A	A	T	T	T	T	A	A	—	Q	Q	—	—	Q
MCO-4B	Monitors trends in alluvial groundwater quality following upgrades to the RLWTF. Monitoring required for RLWTF Discharge Permit DP-1132.	Alluvial	C	A	A	A	T	T	T	T	A	A	—	Q	Q	—	—	Q
MCO-5	Monitors trends in alluvial groundwater quality following upgrades to the RLWTF.	Alluvial	C	A	A	A	T	T	T	T	A	A	—	A	A	—	—	A
MCO-6	Monitoring required for RLWTF Discharge Permit DP-1132.	Alluvial	C	A	A	A	T	T	T	T	A	A	—	Q	Q	—	—	Q

Table 8.3-3 (continued)

Location	Rationale for Selection of Location	Surface Water Body or Source Aquifer	Water Level or Flow ^a	Analytical Suites														
				Metals	Organics						Radionuclides			Inorganics			Field ^l	
				Metals ^b	VOCs ^c	SVOCs ^c	Pesticides	PCB ^d	HEXP ^e	Dioxins/Furans	Radionuclide ^f	Tritium ^g	Low-Level Tritium ^g	Gen Inorganics ^h	Perchlorate ⁱ	Stable Isotopes ^j	Suspended Sed ^k	DO, ORP, pH, SC, T, Turb, ALK
MCO-7	Near recent downcanyon extent of alluvial saturation. Monitors trends in alluvial groundwater quality following upgrades to the RLWTF. Monitoring required for RLWTF Discharge Permit DP-1132.	Alluvial	C	A	A	A	T	T	T	T	A	A	—	Q	Q	—	—	Q
MCO-7.5	Monitors distal portion of alluvial groundwater saturation. Monitors trends in alluvial groundwater quality following upgrades to the RLWTF.	Alluvial	C	A	A	A	T	T	T	T	A	A	—	A	A	—	—	A
MT-3	Monitors distal portion of alluvial groundwater saturation.	Alluvial	C	A	A	A	T	T	T	T	A	A	—	A	A	—	—	A
R-16 screen 2	Downgradient monitoring location for TA-54 or other possible sources in Pajarito Canyon or canyons to the north.	Regional	C	A	A	A	T	T	T	T	A	—	A	A	A	—	—	A
R-16 screen 4	Downgradient monitoring location for TA-54 or other possible sources in Pajarito Canyon or canyons to the north.	Regional	C	A	A	A	T	T	T	T	A	—	A	A	A	—	—	A
R-16r	Downgradient monitoring location for TA-54 or other possible sources in Pajarito Canyon or canyons to the north. Replaces screen 1 in R-16. Background location in GBIR R4.	Regional	C	A	A	A	T	T	T	T	A	—	A	A	A	—	—	A

Table 8.3-3 (continued)

Location	Rationale for Selection of Location	Surface Water Body or Source Aquifer	Water Level or Flow ^a	Analytical Suites														
				Metals	Organics						Radionuclides			Inorganics			Field ^l	
				Metals ^b	VOCs ^c	SVOCs ^c	Pesticides	PCB ^d	HEXP ^e	Dioxins/Furans	Radionuclide ^f	Tritium ^g	Low-Level Tritium ^g	Gen Inorganics ^h	Perchlorate ⁱ	Stable Isotopes ^j	Suspended Sed ^k	DO, ORP, pH, SC, T, Turb, ALK
R-33 screen 1	Monitors for potential contaminants from upper Ten Site or Mortandad Canyons. Background location in GBIR R4.	Regional	C	A	A	A	T	T	T	T	A	—	A	A	A	—	—	A
R-33 screen 2	Monitors for potential contaminants from upper Ten Site or Mortandad Canyons. Background location in GBIR R4.	Regional	C	A	A	A	T	T	T	T	A	—	A	A	A	—	—	A
R-34	Monitors regional groundwater for potential contaminants originating beneath Los Alamos, Sandia, or Mortandad Canyons. Key monitoring location for San Ildefonso and Buckman Well Field. Located on San Ildefonso land and sampled under the MOU. Background location in GBIR R4.	Regional	C	Q	A	A	T	T	T	T	A	—	A	Q	A	—	—	Q

Table 8.3-3 (continued)

Notes: Sampling suites and frequencies: C = continuous; Q = quarterly (4 times/yr); S = semiannual (2 times/yr); A = annual (1 time/yr); T = triennial (1 time every 3 yr). Some locations may be assigned analytical suites or frequencies that differ from those indicated for the general surveillance monitoring group in Table 1.6-3 for site-specific reasons summarized in Table D-8.4-3.

Nonfiltered and filtered samples will be collected for general inorganics (excluding anions) and metals. Anions and perchlorate samples will be filtered. Samples collected for radionuclide analysis will be nonfiltered only for all water media. Organic and HEXP constituents are nonfiltered for all water media. Stable isotope samples for nitrogen isotopes are filtered; stable isotope samples for deuterium and oxygen isotopes are not filtered.

- ^a Continuous monitoring for groundwater refers to the measurement of groundwater levels by a transducer placed in a well and programmed to collect groundwater-level measurements at highly frequent intervals (e.g., every 60 min daily throughout the year). Continuous stream-flow monitoring refers to the measurement of stream flow by a base-flow stream gage that is programmed to collect stream-flow measurements at highly frequent intervals. The superscript MP indicates water levels will be monitored at highly frequent intervals using a multiparameter probe that measures specific conductance, water level, and temperature. The superscript HD indicates this sampling location is historically dry.
- ^b Metals analysis includes the 23 TAL metals, plus boron, molybdenum, silicon dioxide, strontium, tin, and uranium.
- ^c VOC = Volatile organic compounds; SVOC = semivolatile organic compounds.
- ^d PCB = Polychlorinated biphenyl (compound).
- ^e HEXP = High explosive (compounds). The HEXP analytical suite includes the Consent Order list of the normal SW-846:8330 analytes plus pentaerythritol tetranitrate (PETN); triaminotrinrobenzene (TATB); 3,5-dinitroaniline, tri(o-cresyl)phosphate (TOCP); 2,4-diamino-6-nitrotoluene; and 2,6-diamino-4-nitrotoluene. These additional analytes are analyzed by SW-846:8321A.
- ^f The radionuclide suite includes gross alpha, gross beta, alpha spectroscopy, gamma spectroscopy, and strontium-90.
- ^g Tritium samples may be submitted for analysis by liquid scintillation if average activities are anticipated to exceed 200 pCi/L. Low-level tritium is analyzed using electrolytic enrichment or direct counting.
- ^h General inorganic analysis includes major anions (bromide, chloride, fluoride, sulfate); major cations (calcium, magnesium, sodium, potassium); nitrate plus nitrite (as N); total Kjeldahl nitrogen (TKN); ammonia; total phosphorus, total organic carbon (TOC); total dissolved solids (TDS); alkalinity; specific conductivity; pH; and hardness.
- ⁱ Analysis for perchlorate using high-performance liquid chromatography coupled with electrospray ionization mass spectrometry or tandem mass spectrometry (EPA Method 6850).
- ^j Analysis for stable nitrogen, deuterium, and oxygen isotopes. The collection of samples for stable isotopic analysis is considered a special sampling campaign that is outside the scope of the regulatory process. In general, samples for isotopic analysis are collected semiannually from "new" wells (those which completed construction, rehabilitation, or conversion on or after October 1, 2010) until at least four sets of data have been collected. Any subsequent sampling for stable isotope analysis will be decided on the basis of site-specific conditions.
- ^k Suspended sed = Suspended sediment concentration.
- ^l Field parameters include pH, turbidity, specific conductance, dissolved oxygen, and temperature at all locations. Oxidation-reduction potential (ORP) will be measured if a flow-through cell is used and will not be measured in surface water, spring water, or water collected from Westbay sampling systems unless specified otherwise. Alkalinity (ALK) will be measured for all samples either in the field or at the on-site EES-14 laboratory.
- ^m — = This analytical suite is not scheduled to be collected for this type of water at locations assigned to this monitoring group.
- ⁿ Characterization suites and frequencies apply to new perched-intermediate or regional groundwater wells. "New" wells are defined as those which are completed, rehabilitated, or converted on or after October 1, 2010. Any planned exceptions to this general protocol are documented in Appendix D.
- ^o The SWS Discharge Permit DP-857 requires quarterly sampling for NO₃+NO₂-N, TKN, NH₃-N, TDS, and Cl, and annual sampling for full-suite water analysis which includes (1) filtered metals: As, Ba, Cd, Cr, CN, Pb, Se, Ag, U, Cu, Fe, Mn, Zn, Al, B, Co, Mo, and Ni; (2) unfiltered metals: Hg; (3) general inorganics: SO₄ and F; (4) organics: VOC and SVOC; and radiologicals: gross alpha, Ra-226 and Ra-228.
- ^p The RLWTF Discharge Permit DP-1132 requires quarterly sampling for perchlorate (by liquid chromatography—mass spectroscopy/mass spectroscopy), NO₃+NO₂-N, TKN, NH₃-N, TDS, and F.

Table 8.3-4
Interim Monitoring Plan for General Surveillance Monitoring in Pajarito Watershed
(Includes Twomile and Threemile Canyons)

Location	Rationale for Selection of Location	Surface Water Body or Source Aquifer	Water Level or Flow ^a	Analytical Suites														
				Metals	Organics						Radionuclides			Inorganics				Field ^l
				Metals ^b	VOCs ^c	SVOCs ^c	Pesticides	PCB ^d	HEXP ^e	Dioxins/Furans	Radionuclide ^f	Tritium ^g	Low-Level Tritium ^g	Gen Inorganics ^h	Perchlorate ⁱ	Stable Isotopes ^j	Suspended Sed ^k	DO, ORP, pH, SC, T, Turb, ALK
Pajarito 0.5 mi above SR-501 (PBF-B)	Background location located 0.5 mi above NM 502. Provides basis for comparison with data from downstream locations.	Base flow	A	A	A	A	T	T	A	T	A	— ^m	—	A	A	—	A	A
Pajarito above Two Mile (E243)	Monitors potential cumulative impacts from upper Twomile basin. Collected at gage station E243.	Base flow	A	A	A	A	T	T	A	T	A	—	—	A	A	—	A	A
Pajarito below confluence of South and North Anchor East Basin (PBF-1)	Located below the confluences of South and North Anchor East Basin (below E242.5). Monitors potential cumulative impacts of SWMUs and AOCs in Anchor East basin.	Base flow	A	A	A	A	T	T	A	T	A	—	—	A	A	—	A	A
Pajarito Below TA-18 (PBF-5)	Monitors base flow below TA-18 at TA boundary. Location moved from road to TA-18 boundary near PCAO-7c.	Base flow	A	A	A	A	T	T	A	T	A	—	—	A	A	—	A	A
Two Mile above Pajarito (E244)	Monitors potential cumulative impacts from upper Pajarito basin. Collected at gage station E244. Flows primarily from July to October.	Base flow	A	A	A	A	T	T	A	T	A	—	—	A	A	—	A	A

Table 8.3-4 (continued)

Location	Rationale for Selection of Location	Surface Water Body or Source Aquifer	Water Level or Flow ^a	Analytical Suites														
				Metals	Organics						Radionuclides			Inorganics				Field ^l
				Metals ^b	VOCs ^c	SVOCs ^c	Pesticides	PCB ^d	HEXP ^e	Dioxins/Furans	Radionuclide ^f	Tritium ^g	Low-Level Tritium ^g	Gen Inorganics ^h	Perchlorate ⁱ	Stable Isotopes ^j	Suspended Sed ^k	DO, ORP, pH, SC, T, Turb, ALK
Two Mile Canyon below TA-59 (PBF-2)	Located in Twomile Canyon below TA-59. Monitors potential cumulative impacts of SWMUs and AOCs in upper Twomile basin.	Base flow	A	A	A	A	T	T	A	T	A	—	—	A	A	—	A	A
Anderson Spring	Monitors Twomile Canyon downgradient of TA-58, above potential sources of contamination in TA-03.	Spring	A	A	A	A	T	T	A	T	A	—	A	A	A	—	A	A
Bulldog Spring	Monitors HE contamination downgradient of TA-09.	Spring	A	A	A	A	T	T	A	T	A	—	A	A	A	—	A	A
Charlie's Spring	Monitors potential contamination from TA-08 area and MDA M.	Spring	A	A	A	A	T	T	A	T	A	—	A	A	A	—	A	A
Homestead Spring	Downgradient of TA-09 (MDA M).	Spring	A	A	A	A	T	T	A	T	A	—	A	A	A	—	A	A
Kieling Spring	Spring with history of HE contamination. Downgradient of TA-09.	Spring	A	A	A	A	T	T	A	T	A	—	A	A	A	—	A	A
PC Spring	Provides background water quality from the regional aquifer.	Spring	A	A	A	A	T	T	A	T	A	—	A	A	A	—	A	A
Starmer Spring	Spring believed to originate from perched-intermediate groundwater in Bandelier Tuff. Provides baseline water quality at a location that is not downgradient of discharges from HE facilities.	Spring	A	A	A	A	T	T	A	T	A	—	A	A	A	—	A	A

Table 8.3-4 (continued)

Location	Rationale for Selection of Location	Surface Water Body or Source Aquifer	Water Level or Flow ^a	Analytical Suites														
				Metals	Organics						Radionuclides			Inorganics				Field ^l
				Metals ^b	VOCs ^c	SVOCs ^c	Pesticides	PCB ^d	HEXP ^e	Dioxins/Furans	Radionuclide ^f	Tritium ^g	Low-Level Tritium ^g	Gen Inorganics ^h	Perchlorate ⁱ	Stable Isotopes ^j	Suspended Sed ^k	DO, ORP, pH, SC, T, Turb, ALK
TA-18 Spring	In Threemile Canyon, upgradient of TA-18 and downgradient of TA-16 firing site facilities.	Spring	A	A	A	A	T	T	A	T	A	—	A	A	A	—	A	A
Threemile Spring	In Threemile Canyon, upgradient of TA-18 and downgradient of TA-15 firing site facilities.	Spring	A	A	A	A	T	T	A	T	A	—	A	A	A	—	A	A
TW-1.72 Spring	Located In Twomile Canyon, downgradient of TA-03 facilities.	Spring	A	A	A	A	T	T	A	T	A	—	A	A	A	—	A	A
18-BG-1	Monitors baseline water quality relative to the TA-18 complex.	Alluvial	C	A	A	A	T	T	A	T	A	—	—	A	A	—	—	A
18-MW-11	Part of a group of alluvial wells within the former TA-18 complex. Well 18-MW-11 included to monitor for potential contaminants associated with buildings 18-147, 18-001, and 18-256.	Alluvial	C	A	A	A	T	T	A	T	A	—	—	A	A	—	—	A
18-MW-18	Part of a group of alluvial wells within the former TA-18 complex. Monitoring point for potential releases associated with historical sewage lagoons on lower Pajarito Canyon.	Alluvial	C ^{MP}	A	A	A	T	T	A	T	A	—	—	A	A	—	—	A
18-MW-8	Part of a group of alluvial wells within the former TA-18 complex. Located in Threemile Canyon downgradient of former Critical Assembly Building at TA-18.	Alluvial	C	A	A	A	T	T	A	T	A	—	—	A	A	—	—	A

Table 8.3-4 (continued)

Location	Rationale for Selection of Location	Surface Water Body or Source Aquifer	Water Level or Flow ^a	Analytical Suites														
				Metals	Organics						Radionuclides			Inorganics				Field ^l
				Metals ^b	VOCs ^c	SVOCs ^c	Pesticides	PCB ^d	HEXP ^e	Dioxins/Furans	Radionuclide ^f	Tritium ^g	Low-Level Tritium ^g	Gen Inorganics ^h	Perchlorate ⁱ	Stable Isotopes ^j	Suspended Sed ^k	DO, ORP, pH, SC, T, Turb, ALK
18-MW-9	Part of a group of alluvial wells within the former TA-18 complex. Well 18-MW-9 included to monitor for potential contaminants associated with buildings 18 31, 18-189, 18 29, and 18-37.	Alluvial	C	A	A	A	T	T	A	T	A	—	—	A	A	—	—	A
3MAO-2	Replacement well for 18-BG-4; located immediately east of confluence with South Fork Threemile Canyon. Characterizes potential impacts of TA-18 SWMUs within Threemile Canyon.	Alluvial	C	A	A	A	T	T	A	T	A	—	—	A	A	—	—	A
PCAO-5	Located above the flood retention structure in Pajarito Canyon, immediately downcanyon of the confluence of Twomile Canyon.	Alluvial	C	A	A	A	T	T	A	T	A	—	—	A	A	—	—	A
PCAO-6	Located just downcanyon of the flood retention structure in Pajarito Canyon. Well has been dry since installation.	Alluvial	C ^{HD}	A	A	A	T	T	A	T	A	—	—	A	A	—	—	A
PCAO-7a	Part of a transect of wells in Pajarito Canyon installed to characterize potential impacts from TA-18.	Alluvial	C	A	A	A	T	T	A	T	A	—	—	A	A	—	—	A

Table 8.3-4 (continued)

Location	Rationale for Selection of Location	Surface Water Body or Source Aquifer	Water Level or Flow ^a	Analytical Suites														
				Metals	Organics						Radionuclides			Inorganics				Field ^l
				Metals ^b	VOCs ^c	SVOCs ^c	Pesticides	PCB ^d	HEXP ^e	Dioxins/Furans	Radionuclide ^f	Tritium ^g	Low-Level Tritium ^g	Gen Inorganics ^h	Perchlorate ⁱ	Stable Isotopes ^j	Suspended Sed ^k	DO, ORP, pH, SC, T, Turb, ALK
PCAO-7b2	Part of a transect of wells in Pajarito Canyon installed to characterize potential impacts from TA-18.	Alluvial	C ^{MP}	A	A	A	T	T	A	T	A	—	—	A	A	—	—	A
PCAO-7c	Part of a transect of wells in Pajarito Canyon installed to characterize potential impacts from TA-18.	Alluvial	C	A	A	A	T	T	A	T	A	—	—	A	A	—	—	A
PCAO-8	Characterizes potential impacts from runoff associated with TA-54 near PCTH-5 (between PCO 2 and PCO-3).	Alluvial	C	A	A	A	T	T	A	T	A	—	—	A	A	—	—	A
PCAO-9	Historical monitoring location at distal extent of alluvial groundwater saturation in lower Pajarito watershed.	Alluvial	C	A	A	A	T	T	A	T	A	—	—	A	A	—	—	A
PCO-2	Historical monitoring location at distal extent of alluvial groundwater saturation in lower Pajarito watershed.	Alluvial	C	A	A	A	T	T	A	T	A	—	—	A	A	—	—	A
TMO-1	Monitors alluvial groundwater at the mouth of Twomile Canyon. Characterizes cumulative potential impacts of SWMUs and AOCs throughout Twomile basin.	Alluvial	C	A	A	A	T	T	A	T	A	—	—	A	A	—	—	A
03-B-13	Near TA-03, building SM-30. Monitored in support of project at SWMU 03-010(a).	Intermediate	C	S	S	S	T	T	A	T	A	A	—	S	A	—	—	S

Table 8.3-4 (continued)

Location	Rationale for Selection of Location	Surface Water Body or Source Aquifer	Water Level or Flow ^a	Analytical Suites														
				Metals	Organics						Radionuclides			Inorganics			Field ^l	
				Metals ^b	VOCs ^c	SVOCs ^c	Pesticides	PCB ^d	HEXP ^e	Dioxins/Furans	Radionuclide ^f	Tritium ^g	Low-Level Tritium ^g	Gen Inorganics ^h	Perchlorate ⁱ	Stable Isotopes ^j	Suspended Sed ^k	DO, ORP, pH, SC, T, Turb, ALK
R-19 screen 2	Monitors for potential contaminants from TA-16. Also provides baseline characterization data for downgradient areas including TA-54.	Intermediate	C	A	A	—	—	—	A	—	A	—	A	A	A	—	—	A
PCI-2	Monitors perched-intermediate groundwater at the confluence of Twomile and Pajarito Canyons. Provides baseline characterization data for areas upgradient of TA-54. Background location in GBIR R4.	Intermediate	C	A	A	A	T	T	A	T	A	—	A	A	A	—	—	A
R-17 screen 1	Monitors MDA C, TA-16, and potential sources in upper Pajarito watershed. Background location in GBIR R4.	Regional	C	A	A	A	T	T	A	T	A	—	A	A	A	—	—	A
R-17 screen 2	Monitors MDA C, TA-16, and potential sources in upper Pajarito watershed. Background location in GBIR R4.	Regional	C	A	A	A	T	T	A	T	A	—	A	A	A	—	—	A
R-19 screen 3	Monitors for potential contaminants from TA-16. Also provides baseline characterization data for downgradient areas including TA-54.	Regional	C	A	A	—	—	—	A	—	A	—	A	A	A	—	—	A

Table 8.3-4 (continued)

Location	Rationale for Selection of Location	Surface Water Body or Source Aquifer	Water Level or Flow ^a	Analytical Suites														
				Metals	Organics						Radionuclides			Inorganics			Field ^l	
				Metals ^b	VOCs ^c	SVOCs ^c	Pesticides	PCB ^d	HEXP ^e	Dioxins/Furans	Radionuclide ^f	Tritium ^g	Low-Level Tritium ^g	Gen Inorganics ^h	Perchlorate ⁱ	Stable Isotopes ^j	Suspended Sed ^k	DO, ORP, pH, SC, T, Turb, ALK
R-19 screen 4	Monitors for potential contaminants from TA-16. Also provides baseline characterization data for downgradient areas including TA-54.	Regional	C	A	A	—	—	—	A	—	A	—	A	A	A	—	—	A

Table 8.3-4 (continued)

Notes: Sampling suites and frequencies: C = continuous; Q = quarterly (4 times/yr); S = semiannual (2 times/yr); A = annual (1 time/yr); T = triennial (1 time every 3 yr). Some locations may be assigned analytical suites or frequencies that differ from those indicated for the general surveillance monitoring group in Table 1.6-3 for site-specific reasons summarized in Table D-8.5-3.

Nonfiltered and filtered samples will be collected for general inorganics (excluding anions) and metals. Anions and perchlorate samples will be filtered. Samples collected for radionuclide analysis will be nonfiltered only for all water media. Organic and HEXP constituents are nonfiltered for all water media. Stable isotope samples for nitrogen isotopes are filtered; stable isotope samples for deuterium and oxygen isotopes are not filtered.

- ^a Continuous monitoring for groundwater refers to the measurement of groundwater levels by a transducer placed in a well and programmed to collect groundwater-level measurements at highly frequent intervals (e.g., every 60 min daily throughout the year). Continuous stream-flow monitoring refers to the measurement of stream flow by a base-flow stream gage that is programmed to collect stream-flow measurements at highly frequent intervals. The superscript MP indicates water levels will be monitored at highly frequent intervals using a multiparameter probe that measures specific conductance, water level, and temperature. The superscript HD indicates that this sampling location is historically dry.
- ^b Metals analysis includes the 23 TAL metals, plus boron, molybdenum, silicon dioxide, strontium, tin, and uranium.
- ^c VOC = Volatile organic compounds; SVOC = semivolatile organic compounds.
- ^d PCB = Polychlorinated biphenyl (compound).
- ^e HEXP = High explosive (compounds). The HEXP analytical suite includes the Consent Order list of the normal SW-846:8330 analytes plus pentaerythritol tetranitrate (PETN); triaminotrinitrobenzene (TATB); 3,5-dinitroaniline, tri(o-cresyl)phosphate (TOCP); 2,4-diamino-6-nitrotoluene; and 2,6-diamino-4-nitrotoluene. These additional analytes are analyzed by SW-846:8321A.
- ^f The radionuclide suite includes gross alpha, gross beta, alpha spectroscopy, gamma spectroscopy, and strontium-90.
- ^g Tritium samples may be submitted for analysis by liquid scintillation if average activities are anticipated to exceed 200 pCi/L. Low-level tritium is analyzed using electrolytic enrichment or direct counting.
- ^h General inorganic analysis includes major anions (bromide, chloride, fluoride, sulfate); major cations (calcium, magnesium, sodium, potassium); nitrate plus nitrite (as N); total Kjeldahl nitrogen (TKN); ammonia; total phosphorus, total organic carbon (TOC); total dissolved solids (TDS); alkalinity; specific conductivity; pH; and hardness.
- ⁱ Analysis for perchlorate using high-performance liquid chromatography coupled with electrospray ionization mass spectrometry or tandem mass spectrometry (EPA Method 6850).
- ^j Analysis for stable nitrogen, deuterium, and oxygen isotopes. The collection of samples for stable isotopic analysis is considered a special sampling campaign that is outside the scope of the regulatory process. In general, samples for isotopic analysis are collected semiannually from "new" wells (those which completed construction, rehabilitation, or conversion on or after October 1, 2010) until at least four sets of data have been collected. Any subsequent sampling for stable isotope analysis will be decided on the basis of site-specific conditions.
- ^k Suspended sed = Suspended sediment concentration.
- ^l Field parameters include pH, turbidity, specific conductance, dissolved oxygen, and temperature at all locations. Oxidation-reduction potential (ORP) will be measured if a flow-through cell is used and will not be measured in surface water, spring water, or water collected from Westbay sampling systems unless specified otherwise. Alkalinity (ALK) will be measured for all samples either in the field or at the on-site EES-14 laboratory.
- ^m — = This analytical suite is not scheduled to be collected for this type of water at locations assigned to this monitoring group.
- ⁿ Characterization suites and frequencies apply to new perched-intermediate or regional groundwater wells. "New" wells are defined as those which are completed, rehabilitated, or converted on or after October 1, 2010. Any planned exceptions to this general protocol are documented in Appendix D.

Table 8.3-5
Interim Monitoring Plan for General Surveillance Monitoring in Water Watershed
(Includes Cañon de Valle, Potrillo Canyon, and Fence Canyon)

Location	Rationale for Selection of Location	Surface Water Body or Source Aquifer	Water Level or Flow ^a	Analytical Suites														
				Metals	Organics					Radionuclides			Inorganics			Field		
				Metals ^b	VOCs ^c	SVOCs ^c	Pesticides	PCB ^d	HEXP ^e	Dioxins/Furans	Radionuclide ^f	Tritium ^g	Low-Level Tritium ^g	Gen Inorganics ^h	Perchlorate ⁱ	Stable Isotopes ^j	Suspended Sed ^k	DO, ORP, pH, SC, T, Turb, ALK
Base flow station between E252 and Water at Beta	Downgradient surface water location for 260 Outfall. Monitors HE and other contaminants in support of surface CME.	Base flow	C	A	A	A	T	T	A ^{RDX-DP}	T	A	— ^m	—	A	A	—	A	A
Water Above SR-501 (E252)	Upgradient location for 260 Outfall CME.	Base flow	C	A	A	A	T	T	A ^{RDX-DP}	T	A	—	—	A	A	—	A	A
Water at Beta	Downgradient surface water location for 260 Outfall.	Base flow	C	A	A	A	T	T	A ^{RDX-DP}	T	A	—	—	A	A	—	A	A
CdV-5.0 Spring	Upgradient location for 260 Outfall CME. Background location in GBIR R3 and GBIR R4.	Spring	C	A	A	A	T	T	A ^{RDX-DP}	T	A	—	A	A	A	—	A	A
Water Canyon Gallery	Upgradient location for TA-16 260 CME. Background location in GBIR R3 and GBIR R4.	Spring	C	A	A	A	T	T	A ^{RDX-DP}	T	A	—	A	A	A	—	A	A
WCO-1r	Replacement well for MCO-1. Well was initially dry.	Alluvial	C	A	A	A	T	T	A ^{RDX-DP}	T	A	—	—	A	A	—	—	A
WCO-2	Well occasionally shows water level responses during spring runoff in March/April. Sample annually in spring.	Alluvial	C	A	A	A	T	T	A ^{RDX-DP}	T	A	—	—	A	A	—	—	A
WCO-3r	Replacement well for WCO-3. Well was initially dry.	Alluvial	C	A	A	A	T	T	A ^{RDX-DP}	T	A	—	—	A	A	—	—	A

Table 8.3-5 (continued)

Notes: Sampling suites and frequencies: C = continuous; Q = quarterly (4 times/yr); S = semiannual (2 times/yr); A = annual (1 time/yr); T = triennial (1 time every 3 yr). Some locations may be assigned analytical suites or frequencies that differ from those indicated for the general surveillance monitoring group in Table 1.6-3 for site-specific reasons summarized in Table D-8.6-3.

Nonfiltered and filtered samples will be collected for general inorganics (excluding anions) and metals. Anions and perchlorate samples will be filtered. Samples collected for radionuclide analysis will be nonfiltered only for all water media. Organic and HEXP constituents are nonfiltered for all water media. Stable isotope samples for nitrogen isotopes are filtered; stable isotope samples for deuterium and oxygen isotopes are not filtered.

- ^a Continuous monitoring for groundwater refers to the measurement of groundwater levels by a transducer placed in a well and programmed to collect groundwater-level measurements at highly frequent intervals (e.g., every 60 min daily throughout the year). Continuous stream-flow monitoring refers to the measurement of stream flow by a base-flow stream gage that is programmed to collect stream-flow measurements at highly frequent intervals. The superscript MP indicates water levels will be monitored at highly frequent intervals using a multiparameter probe that measures specific conductance, water level, and temperature. The superscript HD indicates that this sampling location is historically dry.
- ^b Metals analysis includes the 23 TAL metals, plus boron, molybdenum, silicon dioxide, strontium, tin, and uranium.
- ^c VOC = Volatile organic compounds; SVOC = semivolatile organic compounds.
- ^d PCB = Polychlorinated biphenyl (compound).
- ^e HEXP = High explosive (compounds). The HEXP analytical suite includes the Consent Order list of the normal SW-846:8330 analytes plus pentaerythritol tetranitrate (PETN); triaminotrinitrobenzene (TATB); 3,5-dinitroaniline, tri(o-cresyl)phosphate (TOCP); 2,4-diamino-6-nitrotoluene; and 2,6-diamino-4-nitrotoluene. These additional analytes are analyzed by SW-846:8321A. The superscript RDX-DP designates samples to be submitted for analysis of RDX degradation products: hexahydro-1-nitroso-3,5-dinitro-1,3,5-triazine (MNX); hexahydro-1,3-nitro-1,3,5-triazine (DNX); and hexahydro-1,3,5-trinitroso-1,3,5-triazine (TNX). The RDX-degradation products are analyzed by SW-846:8330.
- ^f The radionuclide suite includes gross alpha, gross beta, alpha spectroscopy, gamma spectroscopy, and strontium-90.
- ^g Tritium samples may be submitted for analysis by liquid scintillation if average activities are anticipated to exceed 200 pCi/L. Low-level tritium is analyzed using electrolytic enrichment or direct counting.
- ^h General inorganic analysis includes major anions (bromide, chloride, fluoride, sulfate); major cations (calcium, magnesium, sodium, potassium); nitrate plus nitrite (as N); total Kjeldahl nitrogen (TKN); ammonia; total phosphorus, total organic carbon (TOC); total dissolved solids (TDS); alkalinity; specific conductivity; pH; and hardness.
- ⁱ Analysis for perchlorate using high-performance liquid chromatography coupled with electrospray ionization mass spectrometry or tandem mass spectrometry (EPA Method 6850).
- ^j Analysis for stable nitrogen, deuterium, and oxygen isotopes. The collection of samples for stable isotopic analysis is considered a special sampling campaign that is outside the scope of the regulatory process. In general, samples for isotopic analysis are collected semiannually from "new" wells (those which completed construction, rehabilitation, or conversion on or after October 1, 2010) until at least four sets of data have been collected. Any subsequent sampling for stable isotope analysis will be decided on the basis of site-specific conditions.
- ^k Suspended sed = Suspended sediment concentration.
- ^l Field parameters include pH, turbidity, specific conductance, dissolved oxygen, and temperature at all locations. Oxidation-reduction potential (ORP) will be measured if a flow-through cell is used and will not be measured in surface water, spring water, or water collected from Westbay sampling systems unless specified otherwise. Alkalinity (ALK) will be measured for all samples either in the field or at the on-site EES-14 laboratory.
- ^m — = This analytical suite is not scheduled to be collected for this type of water at locations assigned to this monitoring group.
- ⁿ Characterization suites and frequencies apply to new perched-intermediate or regional groundwater wells. "New" wells are defined as those which are completed, rehabilitated, or converted on or after October 1, 2010. Any planned exceptions to this general protocol are documented in Appendix D.

Table 8.3-6

Interim Monitoring Plan for General Surveillance Monitoring in Frijoles, Ancho, and Chaquehui Watersheds

Location	Rationale for Selection of Location	Surface Water Body or Source Aquifer	Water Level or Flow ^a	Analytical Suites														
				Metals	Organics						Radionuclides			Inorganics			Field	
				Metals ^b	VOCs ^c	SVOCs ^c	Pesticides	PCB ^d	HEXP ^e	Dioxins/Furans	Radionuclide ^f	Tritium ^g	Low-Level Tritium ^g	Gen Inorganics ^h	Perchlorate ⁱ	Stable Isotopes ^j	Suspended Sed ^k	DO, ORP, pH, SC, T, Turb, ALK
Rio de los Frijoles at Bandelier (E350)	Historical sampling location near Bandelier National Monument headquarters.	Base flow	A	A	T	T	T	T	T	T	A	— ^m	—	A	A	—	A	A
R-31 screen 4	Part of interim monitoring network pending well network assessment for MDA AB.	Regional	C	A	A	—	—	—	A	—	A	—	A	A	A	—	—	A
R-31 screen 5	Part of interim monitoring network pending well network assessment for MDA AB.	Regional	C	A	A	—	—	—	A	—	A	—	A	A	A	—	—	A
Barbara Spring	Off-site background location in upper Frijoles Canyon. Background location in GBIR R3 and GBIR R4.	Spring	A	A	T	T	T	T	T	T	A	—	A	A	A	—	A	A
Ancho Spring	Sampled during the White Rock Canyon/Rio Grande watershed sampling event (see Table 8.8-1).	Spring	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Ancho at Rio Grande	Sampled during the White Rock Canyon/Rio Grande watershed sampling event (see Table 8.8-1).	Base flow	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Frijoles at Rio Grande	Sampled during the White Rock Canyon/Rio Grande watershed sampling event (see Table 8.8-1).	Base flow	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Table 8.3-6 (continued)

Notes: Sampling suites and frequencies: C = continuous; Q = quarterly (4 times/yr); S = semiannual (2 times/yr); A = annual (1 time/yr); T= triennial (1 time every 3 yr). Some locations may be assigned analytical suites or frequencies that differ from those indicated for the general surveillance monitoring group in Table 1.6-3 for site-specific reasons summarized in Table D-8.7-3.

Nonfiltered and filtered samples will be collected for general inorganics (excluding anions) and metals. Anions and perchlorate samples will be filtered. Samples collected for radionuclide analysis will be nonfiltered only for all water media. Organic and HEXP constituents are nonfiltered for all water media. Stable isotope samples for nitrogen isotopes are filtered; stable isotope samples for deuterium and oxygen isotopes are not filtered.

- ^a Continuous monitoring for groundwater refers to the measurement of groundwater levels by a transducer placed in a well and programmed to collect groundwater-level measurements at highly frequent intervals (e.g., every 60 min daily throughout the year). Continuous stream-flow monitoring refers to the measurement of stream flow by a base-flow stream gage that is programmed to collect stream-flow measurements at highly frequent intervals. The superscript MP indicates water levels will be monitored at highly frequent intervals using a multiparameter probe that measures specific conductance, water level, and temperature. The superscript HD indicates that this sampling location is historically dry.
- ^b Metals analysis includes the 23 TAL metals, plus boron, molybdenum, silicon dioxide, strontium, tin, and uranium.
- ^c VOC = Volatile organic compounds; SVOC = semivolatile organic compounds.
- ^d PCB = Polychlorinated biphenyl (compound).
- ^e HEXP = High explosive (compounds). The HEXP analytical suite includes the Consent Order list of the normal SW-846:8330 analytes plus pentaerythritol tetranitrate (PETN); triaminotrinitrobenzene (TATB); 3,5-dinitroaniline, tri(o-cresyl)phosphate (TOCP); 2,4-diamino-6-nitrotoluene; and 2,6-diamino-4-nitrotoluene. These additional analytes are analyzed by SW-846:8321A.
- ^f The radionuclide suite includes gross alpha, gross beta, alpha spectroscopy, gamma spectroscopy, and strontium-90.
- ^g Tritium samples may be submitted for analysis by liquid scintillation if average activities are anticipated to exceed 200 pCi/L. Low-level tritium is analyzed using electrolytic enrichment or direct counting.
- ^h General inorganic analysis includes major anions (bromide, chloride, fluoride, sulfate); major cations (calcium, magnesium, sodium, potassium); nitrate plus nitrite (as N); total Kjeldahl nitrogen (TKN); ammonia; total phosphorus, total organic carbon (TOC); total dissolved solids (TDS); alkalinity; specific conductivity; pH; and hardness.
- ⁱ Analysis for perchlorate using high-performance liquid chromatography coupled with electrospray ionization mass spectrometry or tandem mass spectrometry (EPA Method 6850).
- ^j Analysis for stable nitrogen, deuterium, and oxygen isotopes. The collection of samples for stable isotopic analysis is considered a special sampling campaign that is outside the scope of the regulatory process. In general, samples for isotopic analysis are collected semiannually from "new" wells (those which completed construction, rehabilitation, or conversion on or after October 1, 2010) until at least four sets of data have been collected. Any subsequent sampling for stable isotope analysis will be decided on the basis of site-specific conditions.
- ^k Suspended sed = Suspended sediment concentration.
- ^l Field parameters include pH, turbidity, specific conductance, dissolved oxygen, and temperature at all locations. Oxidation-reduction potential (ORP) will be measured if a flow-through cell is used and will not be measured in surface water, spring water, or water collected from Westbay sampling systems unless specified otherwise. Alkalinity (ALK) will be measured for all samples either in the field or at the on-site EES-14 laboratory.
- ^m — = This analytical suite is not scheduled to be collected for this type of water at locations assigned to this monitoring group.

Table 8.3-7
Interim Monitoring Plan for White Rock Canyon and Rio Grande Watershed Interim Monitoring Plan

Location	Rationale for Selection of Location	Surface Water Body or Source Aquifer	Water Level or Flow ^a	Analytical Suites														
				Metals	Organics						Radionuclides			Inorganics				Field
				Metals ^b	VOCs ^c	SVOCs ^c	Pesticides	PCB ^d	HEXP ^e	Dioxins/Furans	Radionuclide ^f	Tritium ^g	Low-Level Tritium ^g	Gen Inorganics ^h	Perchlorate ⁱ	Stable Isotopes ^j	Suspended Sed ^k	DO, ORP, pH, SC, T, Turb. ALK
Ancho at Rio Grande	Historical annual sampling site. Monitors base flow from Ancho at Rio Grande. If base flow is not reaching the Rio Grande, a surface water sample will be collected at the first upstream location with sufficient flow that is no farther than 1000 ft from the confluence with the Rio Grande.	Base flow	A	A	A	T	T	T	T	T	A	— ^m	—	A	A	—	A	A
Frijoles at Rio Grande	Perimeter station for the Laboratory. Sampled in fall, during White Rock and Rio Grande watershed sampling event. If base flow is not reaching the Rio Grande, a surface water sample will be collected at the first upstream location with sufficient flow that is no farther than 1000 ft from the confluence with the Rio Grande.	Base flow	A	A	A	T	T	T	T	T	A	—	—	A	A	—	A	A
Mortandad at Rio Grande	Located on San Ildefonso land and sampled under the MOU. If base flow is not reaching the Rio Grande, a surface water sample will be collected at the first upstream location with sufficient flow that is no farther than 1000 ft from the confluence with the Rio Grande.	Base flow	A	A	A	A	T	A	A	T	A	—	A	A	A	—	A	A

Table 8.3-7 (continued)

Location	Rationale for Selection of Location	Surface Water Body or Source Aquifer	Water Level or Flow ^a	Analytical Suites														
				Metals	Organics						Radionuclides			Inorganics			Field ^l	
				Metals ^b	VOCs ^c	SVOCs ^c	Pesticides	PCB ^d	HEXP ^e	Dioxins/Furans	Radionuclide ^f	Tritium ^g	Low-Level Tritium ^g	Gen Inorganics ^h	Perchlorate ⁱ	Stable Isotopes ^j	Suspended Sed ^k	DO, ORP, pH, SC, T, Turb, ALK
Pajarito at Rio Grande	Monitors base flow from Pajarito at the Rio Grande. If base flow is not reaching the Rio Grande, a surface water sample will be collected at the first upstream location with sufficient flow that is no farther than 1000 ft from the confluence with the Rio Grande.	Base flow	A	A	A	T	T	T	T	T	A	—	—	A	A	—	A	A
Rio Grande at Frijoles	Monitors base flow in the Rio Grande at Frijoles Canyon.	Base flow	A	A	A	T	T	T	T	T	A	—	—	A	A	—	A	A
Rio Grande at Otowi Upper	Monitors base flow in the Rio Grande at Otowi Bridge. Located on San Ildefonso land and sampled under the MOU.	Base flow	A	A	A	A	T	A	A	T	A	—	A	A	A	—	A	A
La Mesita Spring	Monitors regional aquifer downgradient of the Laboratory. Located on San Ildefonso land and sampled under the MOU.	Spring	A	A	A	T	T	T	T	T	A	—	A	A	A	—	A	A
Sacred Spring	Off-site spring that monitors regional aquifer downgradient of the Laboratory. Background location. Located on San Ildefonso land and sampled under the MOU. Background location in GBIR R3 and GBIR R4.	Spring	A	A	A	T	T	T	T	T	A	—	A	A	A	—	A	A
Sandia Spring	Monitors regional aquifer downgradient of the Laboratory. Located on San Ildefonso land and sampled under the MOU. Background location in GBIR R4.	Spring	A	A	A	T	T	T	T	T	A	—	A	A	A	—	A	A

Table 8.3-7 (continued)

Location	Rationale for Selection of Location	Surface Water Body or Source Aquifer	Water Level or Flow ^a	Analytical Suites														
				Metals	Organics						Radionuclides			Inorganics			Field ^l	
				Metals ^b	VOCs ^c	SVOCs ^c	Pesticides	PCB ^d	HEXP ^e	Dioxins/Furans	Radionuclide ^f	Tritium ^g	Low-Level Tritium ^g	Gen Inorganics ^h	Perchlorate ⁱ	Stable Isotopes ^j	Suspended Sed ^k	DO, ORP, pH, SC, T, Turb, ALK
Spring 1	Monitors regional aquifer downgradient of the Laboratory. Background location. Located on San Ildefonso land and sampled under the MOU. Background location in GBIR R3 and GBIR R4.	Spring	A	A	A	T	T	T	T	T	A	—	A	A	A	—	A	A
Spring 2	Monitors regional aquifer downgradient of the Laboratory. Located on San Ildefonso land and sampled under the MOU.	Spring	A	A	A	T	T	T	T	T	A	—	A	A	A	—	A	A
Spring 2B	Monitors regional aquifer downgradient of the Laboratory.	Spring	A	A	A	A	T	T	A	T	A	—	A	A	A	—	A	A
Spring 3	Monitors regional aquifer downgradient of the Laboratory.	Spring	A	A	A	A	T	T	A	T	A	—	A	A	A	—	A	A
Spring 3A	Monitors regional aquifer downgradient of the Laboratory.	Spring	A	A	A	A	T	T	A	T	A	—	A	A	A	—	A	A
Spring 3AA	Monitors regional aquifer downgradient of the Laboratory.	Spring	A	A	A	A	T	T	A	T	A	—	A	A	A	—	A	A
Spring 4	Monitors regional aquifer downgradient of the Laboratory.	Spring	A	A	A	A	T	T	A	T	A	—	A	A	A	—	A	A
Spring 4A	Monitors regional aquifer downgradient of the Laboratory.	Spring	A	A	A	A	T	T	A	T	A	—	A	A	A	—	A	A
Spring 4AA	Monitors regional aquifer downgradient of the Laboratory.	Spring	A	A	A	A	T	T	A	T	A	—	A	A	A	—	A	A
Spring 4B	Monitors regional aquifer downgradient of the Laboratory.	Spring	A	A	A	A	T	T	A	T	A	—	A	A	A	—	A	A

Table 8.3-7 (continued)

Location	Rationale for Selection of Location	Surface Water Body or Source Aquifer	Water Level or Flow ^a	Analytical Suites														
				Metals	Organics						Radionuclides			Inorganics			Field	
				Metals ^b	VOCs ^c	SVOCs ^c	Pesticides	PCB ^d	HEXP ^e	Dioxins/Furans	Radionuclide ^f	Tritium ^g	Low-Level Tritium ^g	Gen Inorganics ^h	Perchlorate ⁱ	Stable Isotopes ^j	Suspended Sed ^k	DO, ORP, pH, SC, T, Turb, ALK
Ancho Spring	Monitors regional aquifer downgradient of the Laboratory. Background location in GBIR R3 and GBIR R4.	Spring	A	A	A	A	T	T	A	T	A	—	A	A	A	—	A	A
Spring 5	Monitors regional aquifer downgradient of the Laboratory.	Spring	A	A	A	A	T	T	A	T	A	—	A	A	A	—	A	A
Spring 5A	Monitors regional aquifer downgradient of the Laboratory.	Spring	A	A	A	A	T	T	A	T	A	—	A	A	A	—	A	A
Spring 5B	Monitors regional aquifer downgradient of the Laboratory. Background location in GBIR R3.	Spring	A	A	A	A	T	T	A	T	A	—	A	A	A	—	A	A
Spring 6	Monitors regional aquifer downgradient of the Laboratory. Background location in GBIR R3 and GBIR R4.	Spring	A	A	A	A	T	T	A	T	A	—	A	A	A	—	A	A
Spring 6A	Monitors regional aquifer downgradient of the Laboratory. Background location in GBIR R3 and GBIR R4.	Spring	A	A	A	A	T	T	A	T	A	—	A	A	A	—	A	A
Spring 8A	Monitors regional aquifer downgradient of the Laboratory. Background location in GBIR R3.	Spring	A	A	A	A	T	T	A	T	A	—	A	A	A	—	A	A
Spring 9	Monitors regional aquifer downgradient of the Laboratory. Background location in GBIR R3 and GBIR R4.	Spring	A	A	A	A	T	T	A	T	A	—	A	A	A	—	A	A

Table 8.3-7 (continued)

Location	Rationale for Selection of Location	Surface Water Body or Source Aquifer	Water Level or Flow ^a	Analytical Suites														
				Metals	Organics						Radionuclides			Inorganics				Field ^l
				Metals ^b	VOCs ^c	SVOCs ^c	Pesticides	PCB ^d	HEXP ^e	Dioxins/Furans	Radionuclide ^f	Tritium ^g	Low-Level Tritium ^g	Gen Inorganics ^h	Perchlorate ⁱ	Stable Isotopes ^j	Suspended Sed ^k	DO, ORP, pH, SC, T, Turb, ALK
Spring 9A	Monitors regional aquifer downgradient of the Laboratory. Background location in GBIR R3 and GBIR R4.	Spring	A	A	A	A	T	T	A	T	A	—	A	A	A	—	A	
Spring 9B	Monitors regional aquifer downgradient of the Laboratory. Background location in GBIR R3 and GBIR R4.	Spring	A	A	A	A	T	T	A	T	A	—	A	A	A	—	A	A

Table 8.3-7 (continued)

Notes: Sampling suites and frequencies: C = continuous; Q = quarterly (4 times/yr); S = semiannual (2 times/yr); A = annual (1 time/yr); T= triennial (1 time every 3 yr). Some locations may be assigned analytical suites or frequencies that differ from those indicated for the general surveillance monitoring group in Table 1.6-3 for site-specific reasons summarized in Table D-8.8-3.

Nonfiltered and filtered samples will be collected for general inorganics (excluding anions) and metals. Anions and perchlorate samples will be filtered. Samples collected for radionuclide analysis will be nonfiltered only for all water media. Organic and HEXP constituents are nonfiltered for all water media. Stable isotope samples for nitrogen isotopes are filtered; stable isotope samples for deuterium and oxygen isotopes are not filtered.

- ^a Continuous monitoring for groundwater refers to the measurement of groundwater levels by a transducer placed in a well and programmed to collect groundwater-level measurements at highly frequent intervals (e.g., every 60 min daily throughout the year). Continuous stream-flow monitoring refers to the measurement of stream flow by a base-flow stream gage that is programmed to collect stream-flow measurements at highly frequent intervals. The superscript MP indicates water levels will be monitored at highly frequent intervals using a multiparameter probe that measures specific conductance, water level, and temperature. The superscript HD indicates that this sampling location is historically dry.
- ^b Metals analysis includes the 23 TAL metals, plus boron, molybdenum, silicon dioxide, strontium, tin, and uranium.
- ^c VOC = Volatile organic compounds; SVOC = semivolatile organic compounds.
- ^d PCB = Polychlorinated biphenyl (compound).
- ^e HEXP = High explosive (compounds). The HEXP analytical suite includes the Consent Order list of the normal SW-846:8330 analytes plus pentaerythritol tetranitrate (PETN); triaminotrinitrobenzene (TATB); 3,5-dinitroaniline, tri(o-cresyl)phosphate (TOCP); 2,4-diamino-6-nitrotoluene; and 2,6-diamino-4-nitrotoluene. These additional analytes are analyzed by SW-846:8321A.
- ^f The radionuclide suite includes gross alpha, gross beta, alpha spectroscopy, gamma spectroscopy, and strontium-90.
- ^g Tritium samples may be submitted for analysis by liquid scintillation if average activities are anticipated to exceed 200 pCi/L. Low-level tritium is analyzed using electrolytic enrichment or direct counting.
- ^h General inorganic analysis includes major anions (bromide, chloride, fluoride, sulfate); major cations (calcium, magnesium, sodium, potassium); nitrate plus nitrite (as N); total Kjeldahl nitrogen (TKN); ammonia; total phosphorus, total organic carbon (TOC); total dissolved solids (TDS); alkalinity; specific conductivity; pH; and hardness.
- ⁱ Analysis for perchlorate using high-performance liquid chromatography coupled with electrospray ionization mass spectrometry or tandem mass spectrometry (EPA Method 6850).
- ^j Analysis for stable nitrogen, deuterium, and oxygen isotopes. The collection of samples for stable isotopic analysis is considered a special sampling campaign that is outside the scope of the regulatory process. In general, samples for isotopic analysis are collected semiannually from "new" wells (those which completed construction, rehabilitation, or conversion on or after October 1, 2010) until at least four sets of data have been collected. Any subsequent sampling for stable isotope analysis will be decided on the basis of site-specific conditions.
- ^k Suspended sed = Suspended sediment concentration.
- ^l Field parameters include pH, turbidity, specific conductance, dissolved oxygen, and temperature at all locations. Oxidation-reduction potential (ORP) will be measured if a flow-through cell is used and will not be measured in surface water, spring water, or water collected from Westbay sampling systems unless specified otherwise. Alkalinity (ALK) will be measured for all samples either in the field or at the on-site EES-14 laboratory.
- ^m — = This analytical suite is not scheduled to be collected for this type of water at locations assigned to this monitoring group.

Appendix A

*Acronyms and Abbreviations,
Metric Conversion Table, and Data Qualifier Definitions*

A-1.0 ACRONYMS AND ABBREVIATIONS

ALK	alkalinity
AK	acceptable knowledge
AOC	area of concern
BCG	Biota Concentration Guides (DOE)
bgs	below ground surface
cfs	cubic feet per second
CFR	Code of Federal Regulations
CME	corrective measures evaluation
CMI	corrective measures implementation
CMS	corrective measures study
Consent Order	Compliance Order on Consent
COPC	chemical of potential concern
CV	casing volume
DCG	Derived Concentration Guidelines (DOE)
DDD	dichlorodiphenyldichloroethane[4,4'-]
DDE	dichlorodiphenyldichloroethylene[4,4'-]
DDT	dichlorodiphenyltrichloroethane[4,4'-]
DO	dissolved oxygen
DOE	Department of Energy (U.S.)
DNX	hexahydro-1,3-dinitroso-1,3,5-triazine
EES-14	Earth Systems Observations (Laboratory group)
EP	Environmental Programs (Directorate)
EPA	Environmental Protection Agency (U.S.)
F	filtered
FY	fiscal year
GBIR	Groundwater Background Investigation Report
GFM	geologic framework model
GGRL	Geochemistry and Geomaterials Research Laboratories (EES-14 analytical laboratory)
GW	groundwater
HE	high explosives (also HEXP)
HMX	octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine
ICP-AES	inductively coupled atomic emission spectrometry
ICP-MS	inductively coupled mass spectrometry

IDW	investigation-derived waste
Interim Plan	Interim Facility-Wide Groundwater Monitoring Plan
IR	investigation report
LANL	Los Alamos National Laboratory
MCIR	Mortandad Canyon investigation report
MCL	maximum contaminant level
MDA	material disposal area
MDL	method detection limit
MNA	monitored natural attenuation
MNX	hexahydro-1-nitroso-3,5-dinitro-1,3,5-triazine
MOU	memorandum of understanding
MP	Multiport System (Westbay)
MY	monitoring year
NIST	National Institute of Standards and Technology
NMAC	New Mexico Administrative Code
NMED	New Mexico Environment Department
NMWQCC	New Mexico Water Quality Control Commission
NOI	notice of intent
NPDES	National Pollutant Discharge Elimination System
NTU	nephelometric turbidity unit
OCDD	octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]
ORP	oxygen-reduction potential
P&A	plugged and abandoned (also plugging and abandonment)
PCB	polychlorinated biphenyl
PEB	performance evaluation blank
PETN	pentaerythritol tetranitrate
PMR	periodic monitoring report
PQL	practical quantitation limit
PVC	polyvinyl chloride
QA	quality assurance
QC	quality control
RACER	Risk Analysis, Communication, Evaluation, and Reduction (database)
RCRA	Resource Conservation and Recovery Act
RDX	hexahydro-1,3,5-trinitro-1,3,5-triazine
redox	oxidation reduction

RFI	RCRA facility investigation
RLWTF	Radioactive Liquid Waste Treatment Facility
RPF	Records Processing Facility
RSL	Regional Screening Level (EPA)
SC	specific conductance
SMO	Sample Management Office
SOP	standard operating procedure
SVOC	semivolatile organic compound
SWMU	solid waste management unit
SWWS	Sanitary Wastewater Systems
SWSC	Sanitary Wastewater Systems Consolidation
TA	technical area
TAL	target analyte list (EPA)
TATB	triaminotrinitrobenzene
TBD	to be determined
TCDD	tetrachlorodibenzodioxin[2,3,7,8-]
TCE	trichloroethene
TDS	total dissolved solids
TKN	total Kjeldahl nitrogen
TNT	trinitrotoluene(2,4,6)
TNX	hexahydro-1,3,5-trinitroso-1,3,5-triazine
TOC	total organic carbon
TOCP	tri(o-cresyl)phosphate
TW	Test Well
UF	unfiltered
USGS	U.S. Geological Survey
USFS	U.S. Forest Service
VOC	volatile organic compound
WCSF	waste characterization strategy form
WWTP	waste water treatment 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 ($\mu\text{g/g}$)	1	parts per million (ppm)
liters (L)	0.26	gallons (gal.)
milligrams per liter (mg/L)	1	parts per million (ppm)
degrees Celsius ($^{\circ}\text{C}$)	$9/5 + 32$	degrees Fahrenheit ($^{\circ}\text{F}$)

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.
UJ	The analyte was not positively identified in the sample, and the associated value is an estimate of the sample-specific detection or quantitation limit.
R	The data are rejected as a result of major problems with quality assurance/quality control (QA/QC) parameters.

Appendix B

Screening Information

B-1.0 OVERVIEW

Attachment B-1 to this appendix presents screening tables for groundwater and base-flow water-quality data used to optimize monitoring strategies for watersheds and area-specific monitoring groups in the Interim Facility-Wide Groundwater Monitoring Plan (the Interim Plan, prepared by Los Alamos National Laboratory (the Laboratory)). Selection of the screening values for groundwater data follows the approach prescribed for the development of groundwater cleanup levels in Section VIII of the Compliance Order on Consent (the Consent Order). An analogous protocol is used to select screening values for base-flow surface-water data. The process used to select the cleanup levels from applicable standards or screening levels (Table B-1.0-1) is described in section B-2.0 for groundwater and section B-3.0 for base flow.

Groundwater and base-flow data from 2006 to 2010 are screened against one-half of the groundwater or base-flow cleanup level. Groundwater data are also screened against the Laboratory's groundwater background values (LANL 2007, 095817), where available.

The screening implemented in the tables (Attachment B-1 on CD) serves as a high-level screening tool consistent with U.S. Environmental Protection Agency (EPA) regulatory guidance (EPA 1996, 065402). The screening does not trigger actions or define unacceptable levels of contaminants in water. In this appendix, "screening" refers to identification of locations in a watershed or area-specific monitoring group where contaminant concentrations fall below screening levels and therefore do not require additional evaluation. On the other hand, where contaminant concentrations exceed a screening level, additional evaluation may be needed to determine actions. The screening levels include assumptions—such as residential land-use scenarios—that are protective for a wide range of site conditions but are generally more stringent than site-specific levels.

Attachment B-1 (on CD) presents screening tables organized by the six area-specific monitoring groups plus the general surveillance monitoring group in seven watersheds. Within each watershed or area-specific monitoring group, these screening tables are organized by analytical suite for each water type sampled. Groundwater types include springs, alluvial groundwater, intermediate-perched groundwater, and regional groundwater; surface water types are ephemeral and perennial base flow. Four screening tables are included in Attachment B-1:

- Table B1-1, Analytical Data Screening for Frequency of Detection in Each Watershed or Area-Specific Monitoring Group: Groundwater (Including Springs)
- Table B1-2, Analytical Data Screening for Frequency of Detection in Each Watershed or Area-Specific Monitoring Group: Base Flow
- Table B1-3, Analytical Data Screening for Frequency of Detection at Locations in Each Watershed or Area-Specific Monitoring Group: Groundwater (Including Springs)
- Table B1-4, Analytical Data Screening for Frequency of Detection at Locations in Each Watershed or Area-Specific Monitoring Group: Base Flow

For each water type in each watershed or area-specific monitoring group, the screening tables report statistics for analytes categorized by analytical suite, with statistics tabulated separately for filtered (F) and unfiltered (UF) samples:

- diesel range organics (DRO)
- dioxin/furans (DIOX/FUR)
- gasoline range organics (GRO)

- general inorganics (GENINORG)
- herbicides (HERB)
- high explosives (HEXP)
- metals (METALS)
- polychlorinated biphenyls (PCB)
- PCB congeners (PCB CONGENER or PCB CONG)
- pesticides (PEST)
- radioactivity (RAD)
- semivolatile organic analytes (SVOA)
- volatile organic analytes (VOA)

The list of analytical suites and water types compiled for individual watersheds or area-specific monitoring group varies according to the availability of sampling locations and analytical data in that watershed for 2006 to 2010, the period of time covered by these tables. Table columns in Tables B1-1 and B1-2 summarize the following types of information:

- Analyte—the name of the analyte screened
- Method—analytical method(s)
- Units—unit of measurement
- Number of analyses—number of analyses available for screening, preceded by the less-than symbol (<) if all of the available analyses are classified as not detected
- Number of Detects—number of values classified as detected
- Number of Nondetects—number of values classified as not detected
- Min, Mean, and Max—minimum, mean, and maximum of detected values (or if in italics, minimum, mean, and maximum of the minimum detection levels)
- BV—applicable numerical background value, if available, used for screening
- Number >BV—number of detections greater than the background value
- Std—numerical value for the groundwater or base-flow cleanup level used for screening, if available
- Number >Std—number of detected values greater than the groundwater or base-flow cleanup level
- 1/2 Std—one-half of the numerical value for the groundwater or base-flow cleanup level
- Number >1/2 Std—number of detected values greater than one-half the groundwater or base-flow cleanup level
- Std Type—a reference for the groundwater or base-flow cleanup level

Abbreviations used for standards and screening levels in the table column “Std Type” are provided in Table B-1.0-1.

B-2.0 PROTOCOL FOR SELECTING SCREENING LEVELS FOR GROUNDWATER DATA

Water quality data for groundwater (including springs) are compared to the groundwater cleanup levels, determined according to the process described in Section VIII of the Consent Order. The cleanup levels are selected from the lowest applicable standard or screening level (Table B-1.0-1):

- New Mexico Water Quality Control Commission (NMWQCC) Standards for Ground Water (20.6.2.3103 New Mexico Administrative Code [NMAC])
- EPA National Primary Drinking Water Regulations: maximum contaminant levels (MCLs) (40 Code of Federal Regulations [CFR] Part 141 through July 1, 2007)
- Consent Order groundwater screening level for perchlorate (Section VIII.A.1)
- U.S. Department of Energy (DOE) Derived Concentration Guidelines (DCGs) for radionuclides (ingested-water DCG based on a target limit of 4 mrem/yr) (DOE 5400.5, Figure III-1)

If no standard exists for a chemical analyte, groundwater data are compared against the EPA's Regional screening levels (RSLs) for tap water (EPA 2011, 204336). For compounds with screening levels based on cancer risk, the EPA's screening values in the RSL tables are based on a cancer risk of 10^{-6} . These risk levels are adjusted to a cancer risk of 10^{-5} , consistent with requirements in the Consent Order, by moving the decimal point one place to the right.

The screening process for groundwater also compares each analyte against background values for naturally occurring metals and general chemical parameters at or near the Laboratory. The background values for each groundwater zone (alluvial, intermediate, or regional) are from the groundwater background investigation report (LANL 2007, 094856; LANL 2010, 110535).

B-3.0 PROTOCOL FOR SCREENING BASE-FLOW SURFACE WATER DATA

The NMWQCC establishes surface water standards in the State of New Mexico Standards for Interstate and Intrastate Surface Waters (20.6.4 NMAC). Certain reaches of watercourses may have specific classification and have segment-specific designated uses. The designated uses for surface water are associated with use-specific water-quality criteria, including numeric criteria. Nonclassified surface waters are described as ephemeral, intermittent, or perennial, each of which also has corresponding designated uses described in 20.6.4 NMAC.

The Laboratory's sitewide monitoring program includes base-flow stations in reaches that are assigned to different watercourse classifications in 20.6.4 NMAC, each of which has its own set of water-quality criteria. In addition, the Laboratory collects samples from surface waters under tribal regulatory jurisdiction. Although these waters are specifically excluded from state regulation (20.6.4.7[DD] NMAC), they are nonetheless included in the screening in this Interim Plan.

The base-flow monitoring locations are assigned to one of two screening categories—perennial or ephemeral (Table B-3.0-1). Along with a hardness value, this category determines the screening levels used for data at each monitoring location. Water-quality data from these locations are compared with the base-flow cleanup level, determined as the lowest numeric standard among the designated uses.

Hardness-dependent screening levels used to screen data at each base-flow monitoring location in the 2011 Interim Plan are the geometric mean of hardness data (mg/L as CaCO_3) collected since 2006 at each location (Table B-3.0-1). Hardness-dependent acute and chronic criteria for dissolved aluminum, cadmium, chromium, copper, lead, manganese, nickel, silver, and zinc were used in accordance with the requirements of 20.6.4 NMAC.

Radionuclide data for ephemeral and perennial surface-water locations are compared with the DOE Biota Concentration Guides (BCGs) (DOE 2002, 085637), as modified by site-specific BCGs for selected radionuclides (McNaughton et al. 2008, 106501).

B-4.0 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. This information is also included in text citations. ER IDs are assigned by the Environmental Programs Directorate's Records Processing Facility (RPF) and are used to locate the document at the RPF and, where applicable, in the master reference set.

Copies of the master reference set are maintained at the New Mexico Environment Department Hazardous Waste Bureau and the Directorate. The set was developed to ensure that the administrative authority has all material needed to review this document, and it is updated with every document submitted to the administrative authority. Documents previously submitted to the administrative authority are not included.

DOE (U.S. Department of Energy), July 2002. "A Graded Approach for Evaluating Radiation Doses to Aquatic and Terrestrial Biota," DOE Standard No. DOE-STD-1153-2002, U.S. Department of Energy, Washington, D.C. (DOE 2002, 085637)

EPA (U.S. Environmental Protection Agency), April 1996. "Soil Screening Guidance: User's Guide," EPA/540/R-96/018, Office of Solid Waste and Emergency Response, Washington, D.C. (EPA 1996, 065402)

EPA (U.S. Environmental Protection Agency), June 2011. "Regional Screening Level (RSL) Composite Table June 2011," Regional Screening Levels for Chemical Contaminants at Superfund Sites screening level/preliminary remediation goal website, tables available online at http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/index.htm, Washington, D.C. (EPA 2011, 204336)

LANL (Los Alamos National Laboratory), May 2007. "Groundwater Background Investigation Report, Revision 3," Los Alamos National Laboratory document LA-UR-07-2853, Los Alamos, New Mexico. (LANL 2007, 095817)

LANL (Los Alamos National Laboratory), February 2007. "Groundwater Background Investigation Report, Revision 2," Los Alamos National Laboratory document LA-UR-07-0755, Los Alamos, New Mexico. (LANL 2007, 094856)

LANL (Los Alamos National Laboratory), August 2010. "Groundwater Background Investigation Report, Revision 4," Los Alamos National Laboratory document LA-UR-10-4827, Los Alamos, New Mexico. (LANL 2010, 110535)

McNaughton, M., P. Fresquez, and W. Eisele, May 2008. "Site-Representative Biota Concentration Guides at Los Alamos," Los Alamos National Laboratory document LA-UR-08-2783, Los Alamos, New Mexico. (McNaughton et al. 2008, 106501)

Table B-1.0-1
Potentially Applicable Standards Used to Select Screening Levels

Type	Source	Description	Abbreviation ^a	Potential Applicability					
				Perennial Surface Water		Ephemeral Surface Water		Groundwater (Includes Springs)	
				F	UF	F	UF	F	UF
NMWQCC									
Standard	NMAC 20.6.4	Livestock Watering	NM LVSTK WTR STD	X	X	X	X		
Standard	NMAC 20.6.4	Wildlife Habitat	NM WQCC WLDF HAB		X		X		
Standard	NMAC 20.6.4	Aquatic Life Acute	NM Aqu Acute ^b			X	X		
Standard	NMAC 20.6.4	Aquatic Life Chronic	NM Aqu Chronic ^b	X	X				
Standard	NMAC 20.6.4	Human Health Standard	NM HH OO	X	X	X	X		
Standard	NMAC 20.6.2	Groundwater Human Health Standards, Other Standards for Domestic Water Supply and Standards for Irrigation Use	NM GW STD					X	X
Consent Order									
Screening Level	Consent Order	Screening Level for Perchlorate in Groundwater	NM GW CONS					X	X
EPA									
Standard	40 CFR 141	EPA maximum contaminant levels	EPA MCL					X	X
Risk—human	EPA RSLs ^c	EPA Regional Screening Levels for Tapwater	EPA TAP SCRNLVL					X	X
DOE									
Risk—ecological	DOE Order 5400.5	DOE Biota Concentration Guides	DOE BCG WATER	X	X	X	X		
Risk—human	DOE Order 5400.5	DOE 4-mrem Drinking Water Derived Concentration Guidelines	DOE DW DCG					X	X

^a Abbreviations used here and in the screening tables in Attachment B-1.

^b Hardness-dependent.

^c EPA RSLs (EPA 2011, 204336).

Table B-3.0-1
Hardness Assignments Used to Select Screening Levels

Watershed	Location	Stream Type	Hardness (mg/L as CaCO₃)
Guaje	Guaje above Rendija	Ephemeral	40
Pueblo	Acid above Pueblo	Ephemeral	50
Pueblo	Pueblo 3	Ephemeral	80
Pueblo	Pueblo above Acid	Ephemeral	80
Pueblo	Pueblo above SR-502	Perennial	70
Los Alamos	DP above TA-21	Ephemeral	100
Los Alamos	DP below Meadow at TA-21	Ephemeral	100
Los Alamos	Los Alamos above DP Canyon	Ephemeral	50
Los Alamos	Los Alamos above SR-4	Ephemeral	60
Los Alamos	Los Alamos below Ice Rink	Perennial	40
Los Alamos	Los Alamos below LA Weir	Ephemeral	60
Los Alamos	Los Alamos Canyon near Otowi Bridge	Ephemeral	100
Sandia	Middle Sandia Canyon at terminus of persistent baseflow	Ephemeral	90
Sandia	Sandia below Wetlands	Perennial	100
Sandia	Sandia left fork at Asphalt Plant	Perennial	100
Sandia	Sandia right fork at Power Plant	Perennial	100
Sandia	South Fork of Sandia Canyon at E122	Ephemeral	100
Mortandad	E-1E	Ephemeral	90
Mortandad	E-1FW	Ephemeral	80
Mortandad	E-1W	Ephemeral	100
Mortandad	M-1E	Ephemeral	60
Mortandad	M-1W	Ephemeral	50
Mortandad	M-2E	Ephemeral	90
Mortandad	Mortandad below Effluent Canyon	Ephemeral	60
Mortandad	TS-1W	Ephemeral	60
Mortandad	TS-2E	Ephemeral	70
Pajarito	Pajarito 0.5 mi above SR-501	Perennial	30
Pajarito	Pajarito above Twomile	Ephemeral	50
Pajarito	Pajarito at Rio Grande	Ephemeral	70
Pajarito	Pajarito below confluences of South and North Anchor East Basin	Perennial	50
Pajarito	Pajarito below TA-18	Ephemeral	70
Pajarito	Two Mile Canyon below TA-59	Ephemeral	50
Pajarito	Twomile above Pajarito	Ephemeral	50
Water	Between E252 and Water at Beta	Perennial	50
Water	Canon de Valle below MDA P	Perennial	70
Water	Water above SR-501	Perennial	40
Water	Water at Beta	Perennial	50

Table B-3.0-1 (continued)

Watershed	Location	Stream Type	Hardness (mg/L as CaCO₃)
Ancho	Ancho at Rio Grande	Ephemeral	50
Frijoles	Frijoles at Rio Grande	Perennial	40
Frijoles	Rio de los Frijoles at Bandelier	Perennial	30
White Rock	Rio Grande at Otowi Bridge	Perennial	100
White Rock	Buckman Diversion SW	Perennial	100
White Rock	Mortandad at Rio Grande	Ephemeral	100
White Rock	Rio Grande at Frijoles	Perennial	100

Attachment B-1

*Tables B1-1 to B1-4
(on CD included with this document)*

Appendix C

*Procedures, Methods, and
Investigation-Derived Waste Management*

C-1.0 PROCEDURES FOR MEASURING GROUNDWATER LEVELS AND COLLECTING WATER SAMPLES

This section summarizes Los Alamos National Laboratory (LANL or the Laboratory) standard operating procedures (SOPs) used to measure groundwater levels and to collect groundwater, base-flow, and spring samples. These procedures are listed in the table below and are summarized in subsequent sections. These (or equivalent) procedures (or equivalent) will be used during sampling activities conducted in accordance with the 2011 Interim Facility-Wide Groundwater Monitoring Plan (the Interim Plan).

Procedure Identifier	Procedure Title	Applicability
Measurement of Groundwater Levels		
SOP-5223	Manual Groundwater Level Measurements	Procedure for measuring depth to groundwater and determining groundwater elevation in a monitoring well or an open borehole
SOP-5227	Pressure Transducer Installation, Removal, and Maintenance	Procedure to install, remove, and maintain pressure transducers to monitor and record water-level data in monitoring wells and piezometers
SOP-5226	Westbay Pressure Transducer Installation, Removal, and Maintenance	Procedure to install, remove, and maintain pressure transducers to monitor and record water-level data in Westbay monitoring wells
SOP-5230	Groundwater Level Data Processing	Procedure to review and validate groundwater level data obtained from pressure transducers
SOP-5260	Pressure Monitoring of Packer Systems in Monitoring Wells	Procedure for monitoring and maintenance of Baski sampling system packers and temporary packers installed in water wells
Collection of Groundwater Samples		
SOP-5232	Groundwater Sampling	Procedure for sampling groundwater using a dedicated submersible pump, Baski sampling system, or a portable pump
SOP-5225	Groundwater Sampling Using Westbay MP System	Procedure for sampling groundwater using the Westbay multiport (MP) system
EP-ERSS-SOP-5061	Field Decontamination of Equipment	Procedure for field decontamination of equipment
SOP-06.03	Sampling for Volatile Organic Compounds in Groundwater	Procedure for collecting groundwater samples for volatile organic compound (VOC) analysis
Collection of Surface Water and Spring Samples		
SOP-5224	Spring and Surface Water Sampling	Procedure for sampling springs and surface water
Measuring Field Parameters		
ENV-DO-203	Field Water Quality Analyses	Procedure for measuring field analytical water-quality parameters
Sample Preparation, Preservation, and Transportation		
EP-ERSS-SOP-5059	Field Quality Control Samples	Procedure for collection of field quality control (QC) samples, including field duplicates, equipment rinsate blanks, and trip blanks
SOP-219	Sample Control and Field Documentation	Procedure for establishing and maintaining sample traceability using sample control and field documentation
EP-ERSS-SOP-5056	Sample Containers and Preservation	Procedure specifying sample containers, collection and preservation techniques, and holding times

Procedure Identifier	Procedure Title	Applicability
SOP-066	Filtering and Chemical Preservation of Water Samples	Procedure describes the process for the chemical preservation of storm water and groundwater samples
EP-ERSS-SOP-5057	Handling, Packaging, and Transporting Field Samples	Procedure for sample packaging and shipping
ENV-WQH-QP-029	Creating and Maintaining Chain of Custody	Procedure for generating an analytical request and maintaining chain of custody in the collection, management, and processing of water-quality samples
SOP-5255	Shipping of Environmental Samples by the WES SMO	Procedure for receiving, packaging, and shipping samples to analytical laboratories.
Field Activities Documentation		
SOP-5181	Notebook and Logbook Documentation for Environmental Directorate Technical and Field Activities	Procedure for documenting technical work and field activities in a notebook or logbook.
Waste Management		
SOP-5238	Characterization and Management of Environmental Program Waste	Procedure for characterizing and managing generated waste

C-2.0 SUMMARY OF FIELD INVESTIGATION METHODS

Method	Summary
General	<p>The objective of this sampling program is to collect samples from wells, springs, or base-flow stations that are representative of physical and geochemical conditions in the targeted hydrogeologic unit. To meet this objective, sampling equipment, sampling methods, monitoring-well operation and maintenance, and sample-handling procedures are implemented such that the chemistry of the sample is not altered.</p> <p>The procedures summarized below have been developed to meet the above objective and to be consistent with the requirements of the Compliance Order on Consent.</p>
Groundwater Level Measurements Referenced Procedures: <ul style="list-style-type: none"> • SOP-5227, Pressure Transducer Installation, Removal, and Maintenance • SOP-5226, Westbay Pressure Transducer Installation, Removal and Maintenance • SOP-5223, Manual Groundwater Level Measurements • SOP-5230, Groundwater Level Data Processing 	<p>This summary applies to the collection of groundwater-level data. Groundwater levels are manually measured at predetermined intervals. Additionally, data is downloaded at wells with pressure transducers installed after each sampling event. Water levels cannot be manually measured in wells equipped with the Westbay sampling system; however, data from these wells are downloaded before and after each sampling event. Westbay transducers must be removed before sampling and reinstalled after each sampling event.</p> <p>Two methods are used to collect water-level data:</p> <ul style="list-style-type: none"> • Pressure transducers are used to measure water levels in individual wells or well screens at specified intervals. Most wells sampled under the Interim Plan are monitored with pressure transducers. • Manual water-level measurements are routinely measured in wells not instrumented with pressure transducers. These measurements are also taken before purging and sampling alluvial wells. Manual water level measurements are also taken periodically to verify transducer readings. <p>Data from pressure transducers are automatically recorded in a data logger for later retrieval and processing to calculate water levels. Information collected during manual water level measurements is documented on the Groundwater Level Measurement Form or Groundwater Level Project Field Form. Pressure transducers are periodically bench-tested to verify calibration.</p>

Method	Summary												
<p>Collection of Groundwater Samples Using Dedicated Submersible or Portable Pumping Systems</p> <p>Referenced Procedures:</p> <ul style="list-style-type: none"> • SOP-5232, Groundwater Sampling • ENV-DO-203, Field Water Quality Analyses • EP-ERSS-SOP-5056, Sample Containers and Preservation • SOP-5238, Characterization and Management of Environmental Program Waste • SOP-5181, Notebook and Logbook Documentation for Environmental Directorate Technical Field Activities 	<p>This summary applies to the use of an electric Gear-driven Submersible Pump system, a bladder-pump system, a Bennett pump system, a Baski pump system, a hand-bailer system, and portable versions of the bladder pump and Bennett pump to sample wells.</p> <ul style="list-style-type: none"> • Wells are purged sufficiently before sample collection to ensure samples will be representative of formation water. • The pumping rate should be adjusted, if possible, during purging so that excessive drawdown does not occur. Field crews may have limited ability to restrict flow, depending on the pumping system. Turning off the pump while purging regional and intermediate wells should be avoided unless absolutely necessary. Instead, the pumping rate should be slowed to prevent drawdown into the screen, whenever possible. • The discharge rate is calculated either by using an in-line flow meter or by filling a bucket or bottle of known volume and dividing by the fill time. Flow rate is monitored at regular intervals during the purge, preferably once per casing volume and while the drop pipe is being cleared. • In general, a well may be sampled once the following criteria have been met (see SOP-5232 for details): <ul style="list-style-type: none"> ❖ A minimum of one casing volume (CV) has been removed for alluvial wells and a minimum of three CVs (plus drop pipe) have been removed for intermediate or regional wells (unless otherwise requested) ❖ The field indicator parameters have stabilized within their allowable ranges (as listed below) for at least three consecutive measurements taken a minimum of 3 or 5 min apart. <table border="1"> <thead> <tr> <th>Field Parameter</th><th>Stabilization Criteria (Yeskis and Zavala 2002, 204429)</th></tr> </thead> <tbody> <tr> <td>Turbidity</td><td>± 10% when turbidity is greater than 10 nephelometric turbidity units (NTUs)</td></tr> <tr> <td>Dissolved Oxygen</td><td>± 0.3 mg/L,</td></tr> <tr> <td>pH</td><td>± 0.1 Standard Unit (SU)</td></tr> <tr> <td>Specific Conductance</td><td>± 3%</td></tr> <tr> <td>Temperature</td><td>± 10% (per the Compliance Order on Consent)</td></tr> </tbody> </table> <ul style="list-style-type: none"> • Purge water is discharged under the notice of intent (NOI) with the New Mexico Environment Department (NMED) or containerized pending waste determination. • Sample labels and documentation are completed for each sample following procedures referenced in this Interim Plan. All activities are documented in the field logbook and appropriate field forms. • Chain-of-custody seals are applied to each sample container before samples are transported from the site. • All samples are submitted to the Sample Management Office (SMO) and then shipped to the designated off-site analytical laboratory in a timely manner to allow the laboratory to conduct analyses within proper holding times. 	Field Parameter	Stabilization Criteria (Yeskis and Zavala 2002, 204429)	Turbidity	± 10% when turbidity is greater than 10 nephelometric turbidity units (NTUs)	Dissolved Oxygen	± 0.3 mg/L,	pH	± 0.1 Standard Unit (SU)	Specific Conductance	± 3%	Temperature	± 10% (per the Compliance Order on Consent)
Field Parameter	Stabilization Criteria (Yeskis and Zavala 2002, 204429)												
Turbidity	± 10% when turbidity is greater than 10 nephelometric turbidity units (NTUs)												
Dissolved Oxygen	± 0.3 mg/L,												
pH	± 0.1 Standard Unit (SU)												
Specific Conductance	± 3%												
Temperature	± 10% (per the Compliance Order on Consent)												

Method	Summary
<p>Collection of Groundwater Samples Using Westbay System</p> <p>Referenced Procedures:</p> <ul style="list-style-type: none"> • SOP-5225, Groundwater Sampling Using Westbay Sampling System • SOP-5226, Westbay Pressure Transducer Installation, Removal and Maintenance • ENV-DO-203, Field Water Quality Analyses • EP-ERSS-SOP-5056, Sample Containers and Preservation 	<p>This summary applies to the sampling of wells equipped with the Westbay MP system, a multilevel groundwater monitoring system. Samples are collected using a dedicated closed-access tube with valved ports that provide access to multiple levels of a borehole through a single well casing. The Westbay system is designed to allow for sampling without purging under normal aquifer conditions and takes samples at an in situ pressure.</p> <ul style="list-style-type: none"> • The Westbay MP system consists of casing components that are permanently installed in the final casing, portable pressure measurement and sampling probes, and specialized tools. • The sampling probes are lowered to a precise port depth from which the sample is collected. This sampling system is a non-purge system so no purge water is generated. • Samples are collected directly into the sampling probe's sample containers and are transferred into the appropriate sample containers as soon as possible. • Data collected during sampling, including port pressures and field parameters, are documented on the appropriate forms in SOP-5225. • The sample probe and sample containers are the only equipment or materials that are reused and are decontaminated between sampling each port, as described in SOP-5225. • Sample labels and documentation are completed for each sample following procedures referenced in this Interim Plan. <p>Samples are delivered to SMO and shipped to the designated off-site analytical laboratory in a timely manner to allow the samples to be analyzed within proper holding times.</p>
<p>Collection of Spring and Surface Water Samples</p> <p>Referenced Procedures:</p> <ul style="list-style-type: none"> • ENV-DO-203, Field Water Quality Analyses • SOP-5224, Spring and Surface Water Sampling • EP-ERSS-SOP-5056, Sample Containers and Preservation • ENV-WQH-SOP-009, Operation and Maintenance of Stream Gauge Stations 	<p>This summary applies to collecting water-quality samples from base-flow sites and springs.</p> <ul style="list-style-type: none"> • Permanent spring and base-flow sampling sites are usually identified by posts or gaging stations. However, this may not be possible at some sites. • Ideally, samples are collected from flowing water. In some cases, the samples may need to be collected from pooled or ponded water. Samples are collected far enough upstream of a confluence so the sample is not influenced by water from another stream. If there is any question about whether a representative sample can be collected, field personnel are instructed to contact the requestor before proceeding. • Samples may be collected using either the direct containment method, or by using a peristaltic pump. Filtered samples must be collected using a peristaltic pump. • Where both field conditions and flow conditions allow, take a discharge measurement using one of the methods outlined in SOP-5224. Discharge may be estimated where quantitative measurements are not possible. • Sample labels and documentation are completed for each sample following procedures referenced in this Interim Plan. All activities are documented in the field logbook and appropriate field forms. • Samples are delivered to SMO and shipped to the designated off-site analytical laboratory in a timely manner to allow the samples to be analyzed within proper holding times.

Method	Summary
<p>Sample Bottles and Preservation of Samples</p> <p>Referenced Procedure:</p> <ul style="list-style-type: none"> • EP-ERSS-SOP-5056, Sample Containers and Preservation • SOP-066, Filtering and Chemical Preservation of Water Samples 	<p>This summary applies to requirements for sampling containers, sample pretreatment, and sample preservation requirements that are applicable to all water-quality samples.</p> <ul style="list-style-type: none"> • All samples are collected in containers specifically prepared for that given parameter. • Sample containers are pre-cleaned to a 300 Series (I-Chem, ESS) and are commercially available through a number of vendors. • For filtered samples for the analysis of dissolved constituents, the following systems will be used: <ul style="list-style-type: none"> ❖ in-line 0.45-µm disposable filter capsules, ❖ in-line filter holders with 0.45-µm filter membranes, or ❖ in-line 0.02-µm disposable filter capsules (for samples requiring microfiltration only). • Samples are preserved in accordance with Attachment 1 to SOP-5056. Samples are preserved and pH tested immediately after collection.
<p>Handling, Packaging, and Shipping of Samples</p> <p>Referenced Procedures:</p> <ul style="list-style-type: none"> • EP-ERSS-SOP-5057, Handling, Packaging, and Transporting Field Samples • SOP-5255, Shipping of Environmental Samples by the WES SMO 	<p>This summary applies to requirements for handling, packaging, and shipping of samples.</p> <ul style="list-style-type: none"> • After all samples are collected and preserved, the sample containers are wiped off and custody tape is applied before packaging. • Samples for off-site analysis are transported to the SMO for shipment to off-site analytical laboratories. • The sampling personnel will coordinate with the SMO regarding shipment of all samples.
<p>Sample Documentation</p> <p>Referenced Procedures:</p> <ul style="list-style-type: none"> • SOP-219, Sample Control and Field Documentation • ENV-WQH-QP-028, Creating and Maintaining Chain-of-Custody • EP-ERSS-SOP-5057, Handling, Packaging, and Transporting Field Samples • SOP-5181, Notebook and Logbook Documentation for Environmental Directorate Technical Field Activities 	<p>This summary applies to requirements for documentation of sample collection.</p> <ul style="list-style-type: none"> • The requested parameters, preservation and bottle type, chain-of-custody, required field parameters, and any other additional information are included on the analytical request generated from the database. • All sampling activities are documented in the field logbooks and appropriate field forms. • Chain of custody is documented on the analytical request form and signed to verify that the samples were not left unattended. • All field information, date and time of sample, purging and final field parameters, field conditions, and sampling personnel are included in the specific sampling method field sheets.

Method	Summary
<p>Field Quality Assurance/Quality Control Samples</p> <p>Referenced Procedure:</p> <ul style="list-style-type: none"> • ENV-WQH-QP-028, Creating and Maintaining Chain-of-Custody 	<p>Field quality assurance (QA)/QC samples are required by the Consent Order, and are discussed in detail in Appendix E. Field QA/QC samples to be collected are summarized below.</p> <ul style="list-style-type: none"> • Field blanks are collected at a frequency of 10% of all samples collected. • Equipment rinsate blanks are collected at a minimum frequency of 1 per day when non-dedicated sampling equipment is used. • Field duplicates are collected at a rate of 10% of all samples by media type, with a minimum of one duplicate collected per sample batch. • Trip blanks are included with any coolers containing samples submitted for VOC analysis. • Performance evaluation blanks will be submitted on an as-needed basis to evaluate the reagent-grade water used for decontamination and preparation of blanks.

C-3.0 METHODS AND INSTRUMENTS USED FOR FIELD MEASUREMENTS

Field Parameter	Method Description	U.S. Environmental Agency--Approved Methods	Primary Field Instrument(s)	Primary Flow-Through Cell Used/Type	Description
pH	Hydrogen ion, pH (pH units): electrometric measurement	EPA: Method 150.1 Standard Methods,* 4500-H ⁺ B Editions 18 th , 19 th , 20 th	YSI 650 Handheld Multiparameter Instrument	YSI 650 cell	Samples will be analyzed for pH and temperature in the field using a flow-through cell during well purging and at the time of sample collection. The listed instrument is commercially available with a temperature sensor for automatic compensation. A calibration check is performed on the meter using the manufacturer's instructions with standard buffers traceable to National Institute of Standards and Technology (NIST) and recorded. Standards are purchased from commercial vendors.
Temperature	Temperature, thermometric (°C)	EPA: Method 170.1 Standard Methods, 2550 B Editions 18 th , 19 th , 20 th	YSI 650 Handheld Multiparameter Instrument	YSI 650 cell	Samples will be analyzed for temperature concurrently with pH measurement in the field using a flow-through cell during well purging and at the time of sample collection. The listed instruments are commercially available with a temperature sensor for automatic compensation.
Specific Conductance	Electrical conductance (micromhos/cm at 25°C): Wheatstone bridge	EPA: Method 120.1 Standard Methods, 2510 B Editions 18 th , 19 th , 20 th	YSI 650 Handheld Multiparameter Instrument	YSI 650 cell	Samples will be analyzed for specific conductance in the field using a flow-through cell during well purging and at the time of sample collection. The listed instruments are commercially available with a temperature sensor for automatic compensation. A calibration check is performed on the meter using the manufacturer's instructions with standard buffers traceable to NIST and is recorded. Standards are purchased from commercial vendors.
Dissolved Oxygen	Oxygen, dissolved (mg/L): electrode	EPA: Method 360.1 Standard Methods, 4500-O G Editions 18 th , 19 th , 20 th	YSI 650 Handheld Multiparameter Instrument	YSI 650 cell	Samples will be analyzed for dissolved oxygen in the field using a flow-through cell during well purging and at the time of sample collection. The listed instruments are commercially available with a temperature sensor for automatic compensation. The meter is calibrated using the manufacturer's instructions and is recorded.

Field Parameter	Method Description	U.S. Environmental Agency--Approved Methods	Primary Field Instrument(s)	Primary Flow-Through Cell Used/Type	Description
Turbidity	NTU	EPA: Method 180.1 Standard Methods, 2130 B Editions 18 th , 19 th , 20 th	Hach 2100P, YSI 650 Handheld Multiparameter Instrument	Single sample aliquot application	Samples will be analyzed for turbidity in the field using a single aliquot during well purging and at the time of sample collection. The listed instruments are commercially available, and a calibration check is performed on the meter using the manufacturer's instructions. The YSI 650 Handheld Multiparameter Instrument serves as a back-up in case the primary instrument fails.
Oxidation Reduction Potential	Reduction-oxidation potential (mV): electrode method	Standard Methods, 2580 A Editions 18 th , 19 th , 20 th	YSI 650 Handheld Multiparameter Instrument	YSI 650 cell	Samples will be analyzed for oxidation-reduction potential in the field using a flow-through cell during well purging and at the time of sample collection. The listed instruments are commercially available with a temperature sensor for automatic compensation. A calibration check is performed on the meter using the manufacturer's instructions and is recorded.

* "Standard Methods" refers to editions of the Standard Methods for the Examination of Water and Wastewater, published by the American Public Health Association (Washington, D.C.).

C-4.0 ANALYTICAL METHODS—GROUNDWATER ANALYTICAL SUITES

C-4.1 Analyses by Accredited Contract Laboratories

Samples for laboratory analysis are submitted to accredited contract laboratories. The contract laboratories are required to establish method detection limits (MDLs) and practical quantitation limits (PQLs) for target analytes.

The MDL is the minimum concentration of an analyte that can be measured and reported with a 99% confidence that the concentration is greater than zero, as determined by the procedure set forth at Appendix B of 40 Code of Federal Regulations Part 136. The MDL is based on prepared spiked samples that go through the entire sample preparation scheme before they are analyzed. Most often, the MDL samples are analyzed by the contract laboratories under ideal conditions when the analytical instrumentation has been recently serviced, cleaned, and calibrated.

The PQL is the lowest concentration that can be reliably measured within specified limits of precision, accuracy, representativeness, completeness, and comparability during *routine* laboratory operating conditions using approved U.S. Environmental Protection Agency (EPA) methods. In most cases the contract laboratories define the low spike on their initial calibration curve as the PQL. Generally, the PQL is 3 to 5 times higher than the MDL and should not be more than 10 times the MDL.

Tables C-4.1-1 and C-4.1-2 provide the mode (that is, most frequent value) for MDL and PQLs reported for 2010 analyses of groundwater and base-flow samples for the Laboratory by contract laboratories, organized by analytical suite and method. The number of sample analyses and detections (that is, results greater than the MDL) for the period from 2006 to 2010 are given. The tables include values for applicable cleanup and/or background levels for each analyte listed. The cleanup levels are derived as described in Appendix B-2.0, Protocol for Selecting Cleanup Levels. The background values are from the most recent NMED-approved report (LANL 2009, 106115, Table 4.2-3; NMED 2010, 109327).

A subset of Tables C-4.1-1 and C-4.1-2 appears in three tables that compare the PQLs with cleanup or background levels.

Table C-4.1-3 shows analytes with a PQL above the applicable groundwater cleanup level.

Table C-4.1-4 shows analytes with a PQL above the background values for alluvial, intermediate, and regional groundwater from Laboratory guidance (LANL 2009, 106115).

Table C-4.1-5 shows analytes with a PQL above the base-flow cleanup level.

Comments in these tables indicate the cases where the MDL is below the cleanup level for the analyte, thus meeting the Consent Order requirement (Section IX).

The background levels for seldom-detected analytes were based on the MDL. In some cases, background values were determined using data from an internal analytical laboratory. As a result of differences in analytical methods and variation of reported MDLs over time, some MDL values are slightly above a groundwater background level.

For comparison, the lowest of background values for intermediate and regional groundwater identified in the Groundwater Background Investigation Report, Revision 4 (LANL 2010, 110535) are also shown in Table C-4.1-4. These background values are substantially higher for several analytes.

For most of the organic compounds where the MDL is higher than the cleanup level, the compound has seldom or never been detected in years of water samples, as indicated in Table C-4.1-3 for groundwater and Table C-4.1-5 for base flow.

The analytical services provided under contract to the Laboratory meet EPA requirements. Based on EPA 530-R-09-007 Unified Guidance (p. 2-7), "Any practical quantification limit (PQL) approved by the Regional Administrator under §264.97(h) [or §258.53(g)] that is used in the statistical method shall be the lowest concentration level that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions available to the facility."

The Laboratory's primary analytical services provider is GEL Laboratories, LLC. GEL's client base includes 15 U.S. Department of Energy sites, 8 districts of the U.S. Army Corps of Engineers, the southern division of the U.S. Navy, several of the largest industrial manufacturers in southeastern U.S., and over 50 nuclear power plants in the U.S.

For the few instances where MDLs for analytes are higher than the cleanup levels for results reported in 2010, the MDLs are based on routine laboratory operating conditions available to the Laboratory. Most of these cases involve volatile or semivolatile organic compounds analyzed by EPA Methods SW-846:8260B and SW-846:8270C. Eighty compounds are analyzed by volatile organic Method SW-846:8260B. Of these 80 compounds, 67 have groundwater cleanup levels, and in 61 of these cases the MDL is below the cleanup level. The Laboratory also receives 80 analytes analyzed by semivolatile organic Method SW-846:8270C. Of these 80 compounds, 69 have groundwater cleanup levels, and in 55 of these cases the MDL is below the cleanup level.

C-4.2 Analyses by On-Site Laboratories

Regulatory analyses that support Laboratory's characterization, cleanup, and monitoring programs are provided by external contract analytical laboratories. However, in some specific situations, samples are most appropriately submitted for on-site analysis by the Geochemistry and Geomaterials Research Laboratories (GGRL) in the Laboratory's Earth Systems Observations Group (EES-14). In-house analyses are often used in the following cases:

- When rapid turnaround data (e.g., less than 24 h) are required to support activities such as drilling, well development, or well rehabilitation. Such rapid turnaround analyses are unavailable (at reasonable cost) from external laboratories.
- When special studies are undertaken to develop and refine conceptual models for contaminant transport in the environment. Examples of such studies are stable isotope analyses and filtration studies.
- When a well screen is impacted by residual effects of drilling and construction and is not producing reliable or representative water-quality data that fully meet monitoring objectives.

Table C-4.2-1 lists the analytical methods, PQLs, and MDLs for analytes reported by GGRL in recent data packages submitted to the Laboratory. The analytical methods used by GGRL are the most recent EPA and industry-accepted extraction and analytical methods for chemical analyses of these analytes.

C-5.0 INVESTIGATION-DERIVED WASTE MANAGEMENT

This section describes how investigation-derived waste (IDW) generated during the groundwater monitoring activities conducted under this Interim Plan will be managed. IDW is waste generated as a

result of field-investigation activities and may include, but is not limited to, purge water, contact waste, decontamination fluids, and all other wastes that has potentially come into contact with contaminants. IDW generated during implementation of the Interim Plan will be managed to protect human health and the environment, comply with applicable regulatory requirements, and adhere to Laboratory waste minimization goals.

All IDW generated during groundwater-monitoring activities will be managed in accordance with applicable Environmental Programs Directorate SOPs, which incorporate the requirements of all applicable EPA and NMED regulations, DOE orders, and Laboratory requirements. The SOP applicable to the characterization and management of IDW is

- SOP-5238, Characterization and Management of Environmental Program Waste, available at <http://www.lanl.gov/environment/all/qa/adeq.shtml>.

The Los Alamos National Security, LLC, Hazardous Waste Minimization Plan (LANL 2009, 109324) will be implemented during groundwater monitoring to minimize waste generation. This document is updated annually as a requirement of Permit Section 2.9 of the Laboratory's Hazardous Waste Facility Permit.

The IDW waste streams associated with groundwater monitoring are identified in the table below and are briefly described below. The estimated volumes of these waste streams that may be generated during the implementation of this Interim Plan are summarized in Table C-5.0-1.

A waste characterization strategy form (WCSF) will be prepared and approved per requirements of SOP-5238. The WCSF will provide detailed information on IDW characterization methods, management, containerization, and potential volumes. IDW characterization is completed through review of sampling data and/or documentation or by direct sampling of the IDW or the media being investigated (e.g., groundwater, surface soil, subsurface soil). Waste characterization may include a review of historical information and process knowledge to identify whether listed hazardous waste may be present (i.e., due diligence reviews). If low levels of hazardous waste from a listed source are identified, a "contained in" determination may be submitted for approval to NMED.

Wastes will be containerized and placed in clearly marked, appropriately constructed waste accumulation areas. Waste accumulation area postings, regulated storage duration, and inspection requirements will be based on the type of IDW and its classification. Container and storage requirements will be detailed in the WCSF and approved before the waste is generated. Transportation and disposal requirements will also be detailed in the WCSF and approved before waste is generated.

Waste Determinations

The number of sampling events needed to make Resource Conservation and Recovery Act (RCRA) waste determinations will be based on acceptable knowledge (AK) of groundwater conditions within a watershed at the well or surface sample location. AK includes a review of historical information and process knowledge to identify whether hazardous waste, from a listed source, may be present (i.e., due diligence reviews).

The number of sampling events needed to make the waste determination for a given location is summarized as follows:

- For locations where existing AK demonstrates no RCRA hazardous waste or hazardous constituents above RCRA regulatory limits, a minimum of one sampling event will be used annually to confirm the nonhazardous waste determination. This waste determination will be reevaluated with data from subsequent sampling campaigns.
- For new wells with no existing AK, two consecutive sampling events will be conducted to ensure reproducibility and to establish reliable AK. Wastes generated during the first sampling event will be characterized by the data collected during the event. These wastes will be managed in accordance with the regulatory classification.
- For locations where RCRA hazardous constituents are suspected to exhibit a characteristic or sporadic, but not confirmed, the waste will initially be managed as hazardous. Once data is received from the first sampling event, waste will be managed and disposed of according to the analytical results. Waste generated from subsequent sampling events will be managed using AK from previous events until analytical data is available.

For new locations at or near a known listed hazardous waste source, that does not have a “contained in” determination, waste will be managed as hazardous until a due diligence can be performed. If a listed hazardous waste source is identified and low levels of listed hazardous waste constituents are detected, a “contained in” determination may be submitted to NMED for approval.

- For locations where IDW has been identified as RCRA hazardous waste, subsequent IDW generated at the location will be managed as hazardous waste until the data from four consecutive sampling events contain no RCRA hazardous waste or hazardous constituents above RCRA regulatory limits. At this point, the waste will be managed as nonhazardous.

Where RCRA constituents are detected, the following steps may be taken to complete the waste determination:

- Where duplicate groundwater samples are collected during the same sampling event and one is a nondetect and the other is detected, the Laboratory assumes the detection is the result of laboratory or field contamination. The detection will not be used for waste determination.
- When an F-, U-, P-, or K-listed contaminant is detected, the sources contributing to the watershed will be evaluated (i.e., due diligence reviews). If there is no documentation that these contaminants are from listed processes, the waste will be managed as nonhazardous.
- Sampling purge water will be managed in accordance with the most current version of ENV-RCRA-SOP-010, Land Application of Groundwater, as amended by the NMED-approved LANL Drilling, Development, Rehabilitation and Sampling Purge Water Decision Tree—Revised 03/12/2010 (NMED 2010, 109025).

Waste Management

Purge water: This waste stream consists of water purged from wells before and during sampling. The management of nonhazardous purge water will comply with ENV-RCRA-SOP-010, Land Application of Groundwater. If the purge water is hazardous, it will be managed in accordance with hazardous waste management requirements.

Purge water will be characterized based on the results of the analysis of water samples from the well from which the purge water originated or by direct sampling and analysis of the purge water. Purge water will be land applied if it meets the criteria in the NMED-approved NOI for land application of groundwater.

Contact waste: The contact waste stream consists of potentially contaminated wastes that “contacted” purge water during sampling. This waste stream consists primarily of, but is not limited to, personal protective equipment such as gloves; decontamination wastes such as paper wipes; and disposable sampling supplies. Characterization of this waste stream will be performed through AK from analytical results for the environmental media (i.e., purge water) with which it came into contact or direct sampling of the containerized waste and a review of any potentially RCRA Hazardous Listed Waste sources. The Laboratory expects most of these contact wastes will be nonhazardous waste that will be disposed of at a New Mexico solid waste landfill or low-level waste that will be disposed of at Area G at Technical Area 54 (TA-54).

Decontamination fluids: The decontamination fluids waste stream will consist of liquid wastes from decontamination activities (i.e., decontamination solutions and rinse waters). Consistent with waste minimization practices, the Laboratory employs dry decontamination methods to the extent possible. If dry decontamination cannot be performed, liquid decontamination wastes will be collected in containers at the point of generation. The decontamination fluids will be characterized through AK of the waste materials, the levels of contamination observed in the environmental media (e.g., purge water) and, if necessary, direct sampling of the containerized waste. The Laboratory expects most of these wastes to be nonhazardous liquid waste or radioactive liquid waste that will be sent to one of its wastewater treatment facilities or a LANL approved offsite treatment facility.

C-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. This information is also included in text citations. ER IDs are assigned by the Environmental Programs Directorate’s Records Processing Facility (RPF) and are used to locate the document at the RPF and, where applicable, in the master reference set.

Copies of the master reference set are maintained at the NMED Hazardous Waste Bureau and the Directorate. The set was developed to ensure that the administrative authority has all material needed to review this document, and it is updated with every document submitted to the administrative authority. Documents previously submitted to the administrative authority are not included.

LANL (Los Alamos National Laboratory), May 2007. “Groundwater Background Investigation Report, Revision 3,” Los Alamos National Laboratory document LA-UR-07-2853, Los Alamos, New Mexico. (LANL 2007, 095817)

LANL (Los Alamos National Laboratory), May 2009. “2009 Interim Facility-Wide Groundwater Monitoring Plan,” Los Alamos National Laboratory document LA-UR-09-1340, Los Alamos, New Mexico. (LANL 2009, 106115)

LANL (Los Alamos National Laboratory), November 2009. “Los Alamos National Security, LLC, Hazardous Waste Minimization Plan,” Los Alamos National Laboratory document LA-UR-09-07682, Los Alamos, New Mexico. (LANL 2009, 109324)

LANL (Los Alamos National Laboratory), August 2010. "Groundwater Background Investigation Report, Revision 4," Los Alamos National Laboratory document LA-UR-10-4827, Los Alamos, New Mexico. (LANL 2010, 110535)

NMED (New Mexico Environment Department), March 12, 2010. "LANL Drilling, Development, Rehabilitation and Sampling Purge Water Decision Tree Revision," New Mexico Environment Department letter to G. Turner (DOE-LASO) and T. George (LANL) from J.P. Bearzi (NMED-HWB) and W.C. Olsen (NMED-GWQB), Santa Fe, New Mexico. (NMED 2010, 109025)

NMED (New Mexico Environment Department), May 4, 2010. "Approval with Direction, 2009 Interim Facility-Wide Groundwater Monitoring Plan," 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, 109327)

Yeskis, D., and B. Zavala, May 2002. "Ground-Water Sampling Guidelines for Superfund and RCRA Project Managers," a *Ground Water Forum Issue Paper*, EPA 542-S-02-001, Office of Solid Waste and Emergency Response, Washington, D.C. (Yeskis and Zavala 2002, 204429)

Table C-4.1-1
Analytes, Analytical Methods, and MDLs and PQLs Obtained for 2010 Analyses of
Groundwater Samples by Contract Laboratories and Number of Sample Analyses and Detections for the Period 2006 to 2010

Suite	Analyte or CAS No.	Analyte Name	Total Samples 2006–2010	Total Detects 2006–2010	Method	MDL ^a	PQL ^a	Cleanup Level ^b	Background ^c	Unit	Cleanup-Level Type
Diox/Fur	35822-46-9	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	525	44	SW-846:8290		0.00005			µg/L	
Diox/Fur	37871-00-4	Heptachlorodibenzodioxins (Total)	525	91	SW-846:8290		0.00005			µg/L	
Diox/Fur	67562-39-4	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	525	28	SW-846:8290		0.00005			µg/L	
Diox/Fur	55673-89-7	Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	525	0	SW-846:8290		0.00005			µg/L	
Diox/Fur	38998-75-3	Heptachlorodibenzofurans (Total)	525	47	SW-846:8290		0.00005			µg/L	
Diox/Fur	39227-28-6	Hexachlorodibenzodioxin[1,2,3,4,7,8-]	525	1	SW-846:8290		0.00005			µg/L	
Diox/Fur	57653-85-7	Hexachlorodibenzodioxin[1,2,3,6,7,8-]	525	2	SW-846:8290		0.00005			µg/L	
Diox/Fur	19408-74-3	Hexachlorodibenzodioxin[1,2,3,7,8,9-]	525	2	SW-846:8290		0.00005			µg/L	
Diox/Fur	34465-46-8	Hexachlorodibenzodioxins (Total)	525	8	SW-846:8290		0.00005			µg/L	
Diox/Fur	70648-26-9	Hexachlorodibenzofuran[1,2,3,4,7,8-]	525	11	SW-846:8290		0.00005			µg/L	
Diox/Fur	57117-44-9	Hexachlorodibenzofuran[1,2,3,6,7,8-]	525	4	SW-846:8290		0.00005			µg/L	
Diox/Fur	72918-21-9	Hexachlorodibenzofuran[1,2,3,7,8,9-]	525	0	SW-846:8290		0.00005			µg/L	
Diox/Fur	60851-34-5	Hexachlorodibenzofuran[2,3,4,6,7,8-]	525	2	SW-846:8290		0.00005			µg/L	
Diox/Fur	55684-94-1	Hexachlorodibenzofurans (Total)	525	32	SW-846:8290		0.00005			µg/L	
Diox/Fur	3268-87-9	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	525	79	SW-846:8290		0.0001			µg/L	
Diox/Fur	39001-02-0	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	525	35	SW-846:8290		0.0001			µg/L	
Diox/Fur	40321-76-4	Pentachlorodibenzodioxin[1,2,3,7,8-]	525	2	SW-846:8290		0.00005			µg/L	
Diox/Fur	36088-22-9	Pentachlorodibenzodioxins (Total)	525	5	SW-846:8290		0.00005			µg/L	
Diox/Fur	57117-41-6	Pentachlorodibenzofuran[1,2,3,7,8-]	525	3	SW-846:8290		0.00005			µg/L	
Diox/Fur	57117-31-4	Pentachlorodibenzofuran[2,3,4,7,8-]	525	5	SW-846:8290		0.00005			µg/L	
Diox/Fur	30402-15-4	Pentachlorodibenzofurans (Totals)	525	26	SW-846:8290		0.00005			µg/L	
Diox/Fur	1746-01-6	Tetrachlorodibenzodioxin[2,3,7,8-]	525	0	SW-846:8290		0.00001	0.00003		µg/L	EPA MCL
Diox/Fur	41903-57-5	Tetrachlorodibenzodioxins (Total)	525	1	SW-846:8290		0.00001			µg/L	
Diox/Fur	51207-31-9	Tetrachlorodibenzofuran[2,3,7,8-]	525	1	SW-846:8290		0.00001			µg/L	
Diox/Fur	55722-27-5	Tetrachlorodibenzofurans (Totals)	525	7	SW-846:8290		0.00001			µg/L	
DRO	TPH-DRO	Total Petroleum Hydrocarbons Diesel Range Organics	64	25	SW-846:8015M	65	200			µg/L	
Geninorg	ALK-CO3	Alkalinity-CO3	2678	351	EPA:310.1	0.73	1			mg/L	
Geninorg	ALK-CO3+HCO3	Alkalinity-CO3+HCO3	2680	2677	EPA:310.1	0.73	1		52	mg/L	
Geninorg	NH3-N	Ammonia as Nitrogen	2706	497	EPA:350.1	0.016	0.05		0.04	mg/L	
Geninorg	Br(-1)	Bromide	2699	669	EPA:300.0	0.066	0.2		0.03	mg/L	
Geninorg	Ca	Calcium	4761	4756	SW-846:6010B	0.05	0.2		17.3	mg/L	
Geninorg	Cl(-1)	Chloride	2733	2727	EPA:300.0	0.066	0.2	250	3.57	mg/L	NM GW STD
Geninorg	CN(TOTAL)	Cyanide (Total)	2169	222	EPA:335.4	0.0017	0.005	0.2		mg/L	EPA MCL
Geninorg	F(-1)	Fluoride	2748	2647	EPA:300.0	0.033	0.1	1.6	0.23	mg/L	NM GW STD
Geninorg	HARDNESS	Hardness	4733	4727	SM:A2340B	0.35	1.24			mg/L	

Table C-4.1-1 (continued)

Suite	Analyte or CAS No.	Analyte Name	Total Samples 2006–2010	Total Detects 2006–2010	Method	MDL ^a	PQL ^a	Cleanup Level ^b	Background ^c	Unit	Cleanup-Level Type
Geninorg	Mg	Magnesium	4761	4748	SW-846:6010B	0.085	0.3		4.15	mg/L	
Geninorg	NO3+NO2-N	Nitrate-Nitrite as Nitrogen	2700	2343	EPA:353.2	0.01	0.05	10	0.57	mg/L	EPA MCL
Geninorg	C2O4	Oxalate	7	0	EPA:300.0	0.33	1			mg/L	
Geninorg	CIO4	Perchlorate	3364	2541	SW-846:6850	0.05	0.2	4	0.05	µg/L	NM GW CONS
Geninorg	pH	pH	2671	2671	EPA:150.1	0.01	0.1			SU	
Geninorg	K	Potassium	4761	4748	SW-846:6010B	0.05	0.15		2.63	mg/L	
Geninorg	Na	Sodium	4761	4756	SW-846:6010B	0.1	0.3		12.2	mg/L	
Geninorg	SO4(-2)	Sulfate	2731	2712	EPA:300.0	0.1	0.4	600	7.2	mg/L	NM GW STD
Geninorg	SSC	Suspended Sediment Concentration	502	245	EPA:160.2	0.76	3.33			mg/L	
Geninorg	TDS	Total Dissolved Solids	2708	2703	EPA:160.1	2.4	10	1000	127	mg/L	NM GW STD
Geninorg	TKN	Total Kjeldahl Nitrogen	3142	1084	EPA:351.2	0.033	0.1		0.04	mg/L	
Geninorg	TOC	Total Organic Carbon	2273	1898	SW-846:9060	0.33	1		0.33	mg/L	
Geninorg	PO4-P	Total Phosphate as Phosphorus	2606	821	EPA:365.4	0.015	0.05		0.05	mg/L	
Geninorg	TSS	Total Suspended Solids	116	65	EPA:160.2	2.3	10			mg/L	
GRO	TPH-GRO	Total Petroleum Hydrocarbons Gasoline Range Org	11	7	SW-846:8015M	11	50			µg/L	
Herb	94-75-7	D[2,4-]	388	0	SW-846:8151A	0.087	0.26	70		µg/L	EPA MCL
Herb	75-99-0	Dalapon	388	0	SW-846:8151A	1.3	5.3	200		µg/L	EPA MCL
Herb	94-82-6	DB[2,4-]	388	2	SW-846:8151A	0.087	0.26	290		µg/L	EPA TAP SCRNLVL
Herb	1918-00-9	Dicamba	388	0	SW-846:8151A	0.087	0.26	1100		µg/L	EPA TAP SCRNLVL
Herb	120-36-5	Dichlorprop	388	0	SW-846:8151A	0.087	0.26			µg/L	
Herb	88-85-7	Dinoseb	388	0	SW-846:8151A	0.087	0.26	7		µg/L	EPA MCL
Herb	94-74-6	MCPA	388	0	SW-846:8151A	12	53	18		µg/L	EPA TAP SCRNLVL
Herb	93-65-2	MCPP	388	0	SW-846:8151A	11	53	37		µg/L	EPA TAP SCRNLVL
Herb	93-76-5	T[2,4,5-]	388	0	SW-846:8151A	0.087	0.26	370		µg/L	EPA TAP SCRNLVL
Herb	93-72-1	TP[2,4,5-]	388	0	SW-846:8151A	0.087	0.26	50		µg/L	EPA MCL
Hexp	6629-29-4	2,4-Diamino-6-nitrotoluene	1739	17	SW-846:8321	0.39	1.3			µg/L	
Hexp	59229-75-3	2,6-Diamino-4-nitrotoluene	1739	9	SW-846:8321	0.39	1.3			µg/L	
Hexp	618-87-1	3,5-Dinitroaniline	1739	25	SW-846:8321	0.39	1.3			µg/L	
Hexp	19406-51-0	Amino-2,6-dinitrotoluene[4-]	1740	121	SW-846:8321	0.1	0.33	73		µg/L	EPA TAP SCRNLVL
Hexp	35572-78-2	Amino-4,6-dinitrotoluene[2-]	1740	97	SW-846:8321	0.1	0.33	73		µg/L	EPA TAP SCRNLVL
Hexp	99-65-0	Dinitrobenzene[1,3-]	1740	1	SW-846:8321	0.1	0.33	3.7		µg/L	EPA TAP SCRNLVL
Hexp	121-14-2	Dinitrotoluene[2,4-]	1740	14	SW-846:8321	0.1	0.33	2.2		µg/L	EPA TAP SCRNLVL
Hexp	606-20-2	Dinitrotoluene[2,6-]	1740	2	SW-846:8321	0.1	0.33	37		µg/L	EPA TAP SCRNLVL
Hexp	DNX	DNX	1234	42	SW-846:8330	0.069	0.5			µg/L	
Hexp	2691-41-0	HMX	1742	231	SW-846:8321	0.1	0.33	1800		µg/L	EPA TAP SCRNLVL
Hexp	MNX	MNX	1234	80	SW-846:8330	0.091	0.5			µg/L	
Hexp	98-95-3	Nitrobenzene	1740	2	SW-846:8321	0.1	0.33	1.2		µg/L	EPA TAP SCRNLVL

Table C-4.1-1 (continued)

Suite	Analyte or CAS No.	Analyte Name	Total Samples 2006–2010	Total Detects 2006–2010	Method	MDL ^a	PQL ^a	Cleanup Level ^b	Background ^c	Unit	Cleanup-Level Type
Hexp	88-72-2	Nitrotoluene[2-]	1740	7	SW-846:8321	0.1	0.33	3.1		µg/L	EPA TAP SCRNLVL
Hexp	99-08-1	Nitrotoluene[3-]	1740	1	SW-846:8321	0.1	0.33	3.7		µg/L	EPA TAP SCRNLVL
Hexp	99-99-0	Nitrotoluene[4-]	1740	0	SW-846:8321	0.1	0.65	42		µg/L	EPA TAP SCRNLVL
Hexp	78-11-5	PETN	1740	0	SW-846:8321	0.13	1.3			µg/L	
Hexp	121-82-4	RDX	1742	260	SW-846:8321	0.1	0.33	6.1		µg/L	EPA TAP SCRNLVL
Hexp	3058-38-6	TATB	1739	3	SW-846:8321	0.39	1.3			µg/L	
Hexp	479-45-8	Tetryl	1740	0	SW-846:8321	0.13	0.65	150		µg/L	EPA TAP SCRNLVL
Hexp	TNX	TNX	1234	43	SW-846:8330	0.082	0.5			µg/L	
Hexp	99-35-4	Trinitrobenzene[1,3,5-]	1740	54	SW-846:8321	0.1	0.33	1100		µg/L	EPA TAP SCRNLVL
Hexp	118-96-7	Trinitrotoluene[2,4,6-]	1740	42	SW-846:8321	0.1	0.33	22		µg/L	EPA TAP SCRNLVL
Hexp	78-30-8	Tris (o-cresyl) phosphate	1739	0	SW-846:8321	0.39	1.3			µg/L	
Metals	Al	Aluminum	4766	1573	SW-846:6010B	68	200	5000	68	µg/L	NM GW STD
Metals	Sb	Antimony	4757	130	SW-846:6020	0.5	3	6	0.5	µg/L	EPA MCL
Metals	As	Arsenic	4758	1054	SW-846:6020	1.5	5	10	4.32	µg/L	EPA MCL
Metals	Ba	Barium	4761	4747	SW-846:6010B	1	5	1000	56.8	µg/L	NM GW STD
Metals	Be	Beryllium	4761	59	SW-846:6010B	1	5	4	1	µg/L	EPA MCL
Metals	B	Boron	4752	3373	SW-846:6010B	15	50	750	15.1	µg/L	NM GW STD
Metals	Cd	Cadmium	4756	183	SW-846:6020	0.11	1	5	1	µg/L	EPA MCL
Metals	Cr	Chromium	5093	3290	SW-846:6020	2.5	10	50	1	µg/L	NM GW STD
Metals	Co	Cobalt	4761	458	SW-846:6010B	1	5	50	0.5	µg/L	NM GW STD
Metals	Cu	Copper	4761	702	SW-846:6010B	3	10	1000	3	µg/L	NM GW STD
Metals	Fe	Iron	4766	2600	SW-846:6010B	30	100	1000	21	µg/L	NM GW STD
Metals	Pb	Lead	4756	857	SW-846:6020	0.5	2	15	0.5	µg/L	EPA MCL
Metals	Mn	Manganese	4766	2632	SW-846:6010B	2	10	200	2	µg/L	NM GW STD
Metals	Hg	Mercury	4732	103	EPA:245.2	0.066	0.2	2	0.06	µg/L	EPA MCL
Metals	Mo	Molybdenum	4730	2929	SW-846:6020	0.1	0.5	1000	2	µg/L	NM GW STD
Metals	Ni	Nickel	4756	3849	SW-846:6020	0.5	2	200	1	µg/L	NM GW STD
Metals	Se	Selenium	4756	269	SW-846:6020	1	5	50	6	µg/L	EPA MCL
Metals	SiO2	Silicon Dioxide	1718	1710	SW-846:6010B	0.053	0.213		50.7	mg/L	
Metals	Ag	Silver	4756	157	SW-846:6020	0.2	1	50	1	µg/L	NM GW STD
Metals	Sr	Strontium	4733	4728	SW-846:6010B	1	5	22000	120	µg/L	EPA TAP SCRNLVL
Metals	Tl	Thallium	4756	372	SW-846:6020	0.3	1	2	1	µg/L	EPA MCL
Metals	Sn	Tin	4733	84	SW-846:6010B	2.5	10	22000	3.26	µg/L	EPA TAP SCRNLVL
Metals	U	Uranium	4732	3954	SW-846:6020	0.05	0.2	30	0.72	µg/L	EPA MCL
Metals	V	Vanadium	4761	3819	SW-846:6010B	1	5	180	1	µg/L	EPA TAP SCRNLVL
Metals	Zn	Zinc	4763	2777	SW-846:6010B	3.3	10	10000	2	µg/L	NM GW STD
PCB	12674-11-2	Aroclor-1016	1170	1	SW-846:8082	0.033	0.1	0.5		µg/L	EPA MCL

Table C-4.1-1 (continued)

Suite	Analyte or CAS No.	Analyte Name	Total Samples 2006–2010	Total Detects 2006–2010	Method	MDL ^a	PQL ^a	Cleanup Level ^b	Background ^c	Unit	Cleanup-Level Type
PCB	11104-28-2	Aroclor-1221	1170	0	SW-846:8082	0.033	0.1	0.5		µg/L	EPA MCL
PCB	11141-16-5	Aroclor-1232	1170	0	SW-846:8082	0.033	0.1	0.5		µg/L	EPA MCL
PCB	53469-21-9	Aroclor-1242	1170	5	SW-846:8082	0.033	0.1	0.5		µg/L	EPA MCL
PCB	12672-29-6	Aroclor-1248	1170	0	SW-846:8082	0.033	0.1	0.5		µg/L	EPA MCL
PCB	11097-69-1	Aroclor-1254	1171	9	SW-846:8082	0.033	0.1	0.5		µg/L	EPA MCL
PCB	11096-82-5	Aroclor-1260	1170	8	SW-846:8082	0.033	0.1	0.5		µg/L	EPA MCL
PCB	37324-23-5	Aroclor-1262	1169	0	SW-846:8082	0.033	0.1	0.5		µg/L	EPA MCL
Pest	309-00-2	Aldrin	1229	4	SW-846:8081A	0.005	0.02	0.04		µg/L	EPA TAP SCRNLVL
Pest	319-84-6	BHC[alpha-]	1229	1	SW-846:8081A	0.005	0.02	0.11		µg/L	EPA TAP SCRNLVL
Pest	319-85-7	BHC[beta-]	1229	1	SW-846:8081A	0.006	0.02	0.37		µg/L	EPA TAP SCRNLVL
Pest	319-86-8	BHC[delta-]	1229	4	SW-846:8081A	0.005	0.02			µg/L	
Pest	58-89-9	BHC[gamma-]	1229	4	SW-846:8081A	0.005	0.02	0.2		µg/L	EPA MCL
Pest	5103-71-9	Chlordane[alpha-]	1229	0	SW-846:8081A	0.005	0.02			µg/L	
Pest	5103-74-2	Chlordane[gamma-]	1229	3	SW-846:8081A	0.005	0.02			µg/L	
Pest	72-54-8	DDD[4,4'-]	1229	14	SW-846:8081A	0.01	0.04	2.8		µg/L	EPA TAP SCRNLVL
Pest	72-55-9	DDE[4,4'-]	1229	15	SW-846:8081A	0.005	0.04	2		µg/L	EPA TAP SCRNLVL
Pest	50-29-3	DDT[4,4'-]	1229	8	SW-846:8081A	0.01	0.04	2		µg/L	EPA TAP SCRNLVL
Pest	60-57-1	Dieldrin	1229	8	SW-846:8081A	0.01	0.04	0.042		µg/L	EPA TAP SCRNLVL
Pest	959-98-8	Endosulfan I	1229	4	SW-846:8081A	0.005	0.02			µg/L	
Pest	33213-65-9	Endosulfan II	1229	5	SW-846:8081A	0.011	0.045			µg/L	
Pest	1031-07-8	Endosulfan Sulfate	1229	6	SW-846:8081A	0.01	0.04			µg/L	
Pest	72-20-8	Endrin	1229	5	SW-846:8081A	0.01	0.04	2		µg/L	EPA MCL
Pest	7421-93-4	Endrin Aldehyde	1229	3	SW-846:8081A	0.005	0.04			µg/L	
Pest	53494-70-5	Endrin Ketone	1229	0	SW-846:8081A	0.01	0.04			µg/L	
Pest	76-44-8	Heptachlor	1229	10	SW-846:8081A	0.005	0.02	0.4		µg/L	EPA MCL
Pest	1024-57-3	Heptachlor Epoxide	1229	3	SW-846:8081A	0.005	0.02	0.2		µg/L	EPA MCL
Pest	72-43-5	Methoxychlor[4,4'-]	1229	0	SW-846:8081A	0.05	0.2	40		µg/L	EPA MCL
Pest	8001-35-2	Toxaphene (Technical Grade)	1229	1	SW-846:8081A	0.15	0.5	3		µg/L	EPA MCL
Rad	Am-241	Americium-241	2578	61	Alpha Spectroscopy	0.05		1.2	0.04	pCi/L	DOE DW DCG
Rad	Cs-137	Cesium-137	2552	3	Gamma Spectroscopy	8		120	5.8	pCi/L	DOE DW DCG
Rad	Co-60	Cobalt-60	2552	0	Gamma Spectroscopy	8		200		pCi/L	DOE DW DCG
Rad	GROSSA	Gross alpha	1821	377	Gas Proportional Counting	3		15	2.98	pCi/L	EPA MCL
Rad	GROSSB	Gross beta	1817	1079	Gas Proportional Counting	3			4	pCi/L	
Rad	GROSSG	Gross gamma	2552	145	Gamma Spectroscopy	120			648	pCi/L	
Rad	Np-237	Neptunium-237	2649	1	Alpha Spectroscopy	0.05		1.2		pCi/L	DOE DW DCG
Rad	Pu-238	Plutonium-238	2551	18	Alpha Spectroscopy	0.05		1.6	0.06	pCi/L	DOE DW DCG
Rad	Pu-239/240	Plutonium-239/240	2551	57	Alpha Spectroscopy	0.05		1.2		pCi/L	DOE DW DCG

Table C-4.1-1 (continued)

Suite	Analyte or CAS No.	Analyte Name	Total Samples 2006–2010	Total Detects 2006–2010	Method	MDL ^a	PQL ^a	Cleanup Level ^b	Background ^c	Unit	Cleanup-Level Type
Rad	K-40	Potassium-40	2552	12	Gamma Spectroscopy	10		280		pCi/L	DOE DW DCG
Rad	Ra-226	Radium-226	612	187	Gas Proportional Counting	1		4		pCi/L	DOE DW DCG
Rad	Ra-226	Radium-226	612	187	Alpha Spectroscopy	1		4		pCi/L	DOE DW DCG
Rad	Ra-228	Radium-228	615	216	Gas Proportional Counting	1		4		pCi/L	DOE DW DCG
Rad	Na-22	Sodium-22	2552	0	Gamma Spectroscopy	10		400		pCi/L	DOE DW DCG
Rad	Sr-90	Strontium-90	2585	184	Gas Proportional Counting	0.5		8	0.29	pCi/L	EPA MCL
Rad	Tc-99	Technetium-99	60	0	Gas Proportional Counting	1		4000		pCi/L	DOE DW DCG
Rad	Th-228	Thorium-228	163	16	Alpha Spectroscopy	0.05				pCi/L	
Rad	Th-230	Thorium-230	163	10	Alpha Spectroscopy	0.05				pCi/L	
Rad	Th-232	Thorium-232	163	21	Alpha Spectroscopy	0.05				pCi/L	
Rad	H-3	Tritium	2454	1197	Liquid Scintillation Counting	250		20000	0.32	pCi/L	EPA MCL
Rad	U-234	Uranium-234	2559	2177	Alpha Spectroscopy	0.05		20	0.18	pCi/L	DOE DW DCG
Rad	U-235/236	Uranium-235/236	2559	360	Alpha Spectroscopy	0.05		24		pCi/L	DOE DW DCG
Rad	U-238	Uranium-238	2559	2144	Alpha Spectroscopy	0.05		24	0.19	pCi/L	DOE DW DCG
SVOA	83-32-9	Acenaphthene	2074	2	SW-846:8270C	0.33	1.1	2200		µg/L	EPA TAP SCRNLVL
SVOA	208-96-8	Acenaphthylene	2074	3	SW-846:8270C	0.21	1.1			µg/L	
SVOA	62-53-3	Aniline	2074	0	SW-846:8270C	2.5	10	120		µg/L	EPA TAP SCRNLVL
SVOA	120-12-7	Anthracene	2074	4	SW-846:8270C	0.21	1.1	11000		µg/L	EPA TAP SCRNLVL
SVOA	1912-24-9	Atrazine	2074	0	SW-846:8270C	3	10	3		µg/L	EPA MCL
SVOA	103-33-3	Azobenzene	2074	0	SW-846:8270C	2	10	1.3		µg/L	EPA TAP SCRNLVL
SVOA	92-87-5	Benzidine	2074	0	SW-846:8270C	3	10	0.00094		µg/L	EPA TAP SCRNLVL
SVOA	56-55-3	Benzo(a)anthracene	2074	6	SW-846:8270C	0.2	1	0.29		µg/L	EPA TAP SCRNLVL
SVOA	50-32-8	Benzo(a)pyrene	2074	9	SW-846:8270C	0.2	1	0.2		µg/L	EPA MCL
SVOA	205-99-2	Benzo(b)fluoranthene	2074	10	SW-846:8270C	0.2	1	0.29		µg/L	EPA TAP SCRNLVL
SVOA	191-24-2	Benzo(g,h,i)perylene	2074	6	SW-846:8270C	0.2	1			µg/L	
SVOA	207-08-9	Benzo(k)fluoranthene	2074	9	SW-846:8270C	0.2	1	2.9		µg/L	EPA TAP SCRNLVL
SVOA	65-85-0	Benzoic Acid	2074	28	SW-846:8270C	6	20	150000		µg/L	EPA TAP SCRNLVL
SVOA	100-51-6	Benzyl Alcohol	2074	0	SW-846:8270C	2	10	3700		µg/L	EPA TAP SCRNLVL
SVOA	111-91-1	Bis(2-chloroethoxy)methane	2074	0	SW-846:8270C	3	10	110		µg/L	EPA TAP SCRNLVL
SVOA	111-44-4	Bis(2-chloroethyl)ether	2074	0	SW-846:8270C	2	10	0.12		µg/L	EPA TAP SCRNLVL
SVOA	117-81-7	Bis(2-ethylhexyl)phthalate	2074	128	SW-846:8270C	2	10	6		µg/L	EPA MCL
SVOA	101-55-3	Bromophenyl-phenylether[4-]	2074	0	SW-846:8270C	2	10			µg/L	
SVOA	85-68-7	Butylbenzylphthalate	2074	0	SW-846:8270C	2	10	350		µg/L	EPA TAP SCRNLVL
SVOA	59-50-7	Chloro-3-methylphenol[4-]	2074	0	SW-846:8270C	2	10	3700		µg/L	EPA TAP SCRNLVL
SVOA	106-47-8	Chloroaniline[4-]	2074	0	SW-846:8270C	2	10	3.4		µg/L	EPA TAP SCRNLVL
SVOA	91-58-7	Chloronaphthalene[2-]	2074	2	SW-846:8270C	0.3	1	2900		µg/L	EPA TAP SCRNLVL
SVOA	95-57-8	Chlorophenol[2-]	2074	0	SW-846:8270C	2	10	180		µg/L	EPA TAP SCRNLVL

Table C-4.1-1 (continued)

Suite	Analyte or CAS No.	Analyte Name	Total Samples 2006–2010	Total Detects 2006–2010	Method	MDL ^a	PQL ^a	Cleanup Level ^b	Background ^c	Unit	Cleanup-Level Type
SVOA	7005-72-3	Chlorophenyl-phenyl[4-] Ether	2074	0	SW-846:8270C	2	10			µg/L	
SVOA	218-01-9	Chrysene	2074	5	SW-846:8270C	0.2	1	29		µg/L	EPA TAP SCRNLVL
SVOA	53-70-3	Dibenz(a,h)anthracene	2074	4	SW-846:8270C	0.2	1	0.029		µg/L	EPA TAP SCRNLVL
SVOA	132-64-9	Dibenzofuran	2074	0	SW-846:8270C	2	10	37		µg/L	EPA TAP SCRNLVL
SVOA	95-50-1	Dichlorobenzene[1,2-]	2074	1	SW-846:8270C	2	10	600		µg/L	EPA MCL
SVOA	541-73-1	Dichlorobenzene[1,3-]	2074	16	SW-846:8270C	2	10			µg/L	
SVOA	106-46-7	Dichlorobenzene[1,4-]	2074	0	SW-846:8270C	2	10	75		µg/L	EPA MCL
SVOA	91-94-1	Dichlorobenzidine[3,3'-]	2074	0	SW-846:8270C	2	10	1.5		µg/L	EPA TAP SCRNLVL
SVOA	120-83-2	Dichlorophenol[2,4-]	2074	0	SW-846:8270C	2	10	110		µg/L	EPA TAP SCRNLVL
SVOA	84-66-2	Diethylphthalate	2074	48	SW-846:8270C	2	10	29000		µg/L	EPA TAP SCRNLVL
SVOA	131-11-3	Dimethyl Phthalate	2074	0	SW-846:8270C	2	10			µg/L	
SVOA	105-67-9	Dimethylphenol[2,4-]	2074	0	SW-846:8270C	2	10	730		µg/L	EPA TAP SCRNLVL
SVOA	84-74-2	Di-n-butylphthalate	2074	0	SW-846:8270C	2	10	3700		µg/L	EPA TAP SCRNLVL
SVOA	534-52-1	Dinitro-2-methylphenol[4,6-]	2074	0	SW-846:8270C	3	10	2.9		µg/L	EPA TAP SCRNLVL
SVOA	51-28-5	Dinitrophenol[2,4-]	2074	0	SW-846:8270C	5	20	73		µg/L	EPA TAP SCRNLVL
SVOA	121-14-2	Dinitrotoluene[2,4-]	2074	14	SW-846:8270C	2	10	2.2		µg/L	EPA TAP SCRNLVL
SVOA	606-20-2	Dinitrotoluene[2,6-]	2073	2	SW-846:8270C	2	10	37		µg/L	EPA TAP SCRNLVL
SVOA	117-84-0	Di-n-octylphthalate	2074	5	SW-846:8270C	3	10			µg/L	
SVOA	88-85-7	Dinoseb	2074	0	SW-846:8270C	2	10	7		µg/L	EPA MCL
SVOA	123-91-1	Dioxane[1,4-]	2010	119	SW-846:8270C	2	10	6.7		µg/L	EPA TAP SCRNLVL
SVOA	122-39-4	Diphenylamine	2069	0	SW-846:8270C	3	10	910		µg/L	EPA TAP SCRNLVL
SVOA	206-44-0	Fluoranthene	2074	4	SW-846:8270C	0.2	1	1500		µg/L	EPA TAP SCRNLVL
SVOA	86-73-7	Fluorene	2074	3	SW-846:8270C	0.2	1	1500		µg/L	EPA TAP SCRNLVL
SVOA	118-74-1	Hexachlorobenzene	2074	0	SW-846:8270C	2	10	1		µg/L	EPA MCL
SVOA	87-68-3	Hexachlorobutadiene	2074	0	SW-846:8270C	2	10	8.6		µg/L	EPA TAP SCRNLVL
SVOA	77-47-4	Hexachlorocyclopentadiene	2074	0	SW-846:8270C	3	10	50		µg/L	EPA MCL
SVOA	67-72-1	Hexachloroethane	2074	0	SW-846:8270C	2	10	48		µg/L	EPA TAP SCRNLVL
SVOA	193-39-5	Indeno(1,2,3-cd)pyrene	2074	5	SW-846:8270C	0.2	1	0.29		µg/L	EPA TAP SCRNLVL
SVOA	78-59-1	Isophorone	2074	0	SW-846:8270C	3	10	710		µg/L	EPA TAP SCRNLVL
SVOA	90-12-0	Methylnaphthalene[1-]	2072	3	SW-846:8270C	0.3	1	23		µg/L	EPA TAP SCRNLVL
SVOA	91-57-6	Methylnaphthalene[2-]	2074	2	SW-846:8270C	0.3	1	150		µg/L	EPA TAP SCRNLVL
SVOA	95-48-7	Methylphenol[2-]	2074	2	SW-846:8270C	2	10	1800		µg/L	EPA TAP SCRNLVL
SVOA	106-44-5	Methylphenol[4-]	1341	2	SW-846:8270C	3	10	180		µg/L	EPA TAP SCRNLVL
SVOA	91-20-3	Naphthalene	2074	3	SW-846:8270C	0.3	1	30		µg/L	NM GW STD
SVOA	88-74-4	Nitroaniline[2-]	2074	0	SW-846:8270C	2	10	370		µg/L	EPA TAP SCRNLVL
SVOA	99-09-2	Nitroaniline[3-]	2074	0	SW-846:8270C	2	10			µg/L	
SVOA	100-01-6	Nitroaniline[4-]	2074	0	SW-846:8270C	3	10	34		µg/L	EPA TAP SCRNLVL

Table C-4.1-1 (continued)

Suite	Analyte or CAS No.	Analyte Name	Total Samples 2006–2010	Total Detects 2006–2010	Method	MDL ^a	PQL ^a	Cleanup Level ^b	Background ^c	Unit	Cleanup-Level Type
SVOA	98-95-3	Nitrobenzene	2074	2	SW-846:8270C	3	10	1.2		µg/L	EPA TAP SCRNLVL
SVOA	88-75-5	Nitrophenol[2-]	2074	0	SW-846:8270C	2	10			µg/L	
SVOA	100-02-7	Nitrophenol[4-]	2074	0	SW-846:8270C	2	10			µg/L	
SVOA	55-18-5	Nitrosodiethylamine[N-]	2074	0	SW-846:8270C	2	10	0.0014		µg/L	EPA TAP SCRNLVL
SVOA	62-75-9	Nitrosodimethylamine[N-]	2074	0	SW-846:8270C	2	10	0.0042		µg/L	EPA TAP SCRNLVL
SVOA	924-16-3	Nitroso-di-n-butylamine[N-]	2074	0	SW-846:8270C	3	10	0.024		µg/L	EPA TAP SCRNLVL
SVOA	621-64-7	Nitroso-di-n-propylamine[N-]	2074	0	SW-846:8270C	2	10	0.096		µg/L	EPA TAP SCRNLVL
SVOA	930-55-2	Nitrosopyrrolidine[N-]	2074	0	SW-846:8270C	2	10	0.32		µg/L	EPA TAP SCRNLVL
SVOA	108-60-1	Oxybis(1-chloropropane)[2,2'-]	2074	0	SW-846:8270C	2	10	3.2		µg/L	EPA TAP SCRNLVL
SVOA	608-93-5	Pentachlorobenzene	2074	0	SW-846:8270C	3	10	29		µg/L	EPA TAP SCRNLVL
SVOA	87-86-5	Pentachlorophenol	2074	1	SW-846:8270C	2	10	1		µg/L	EPA MCL
SVOA	85-01-8	Phenanthrene	2074	5	SW-846:8270C	0.2	1			µg/L	
SVOA	108-95-2	Phenol	2074	5	SW-846:8270C	1	10	5		µg/L	NM GW STD
SVOA	129-00-0	Pyrene	2074	2	SW-846:8270C	0.3	1	1100		µg/L	EPA TAP SCRNLVL
SVOA	110-86-1	Pyridine	1564	0	SW-846:8270C	3	10	37		µg/L	EPA TAP SCRNLVL
SVOA	95-94-3	Tetrachlorobenzene[1,2,4,5]	2074	0	SW-846:8270C	3	10	11		µg/L	EPA TAP SCRNLVL
SVOA	58-90-2	Tetrachlorophenol[2,3,4,6-]	2074	1	SW-846:8270C	2	10	1100		µg/L	EPA TAP SCRNLVL
SVOA	120-82-1	Trichlorobenzene[1,2,4-]	2074	1	SW-846:8270C	2	10	70		µg/L	EPA MCL
SVOA	95-95-4	Trichlorophenol[2,4,5-]	2074	0	SW-846:8270C	2	10	3700		µg/L	EPA TAP SCRNLVL
SVOA	88-06-2	Trichlorophenol[2,4,6-]	2074	0	SW-846:8270C	2	10	61		µg/L	EPA TAP SCRNLVL
VOA	67-64-1	Acetone	2543	253	SW-846:8260B	3.5	10	22000		µg/L	EPA TAP SCRNLVL
VOA	75-05-8	Acetonitrile	2543	5	SW-846:8260B	6.3	25	130		µg/L	EPA TAP SCRNLVL
VOA	107-02-8	Acrolein	2543	2	SW-846:8260B	1.3	5	0.042		µg/L	EPA TAP SCRNLVL
VOA	107-13-1	Acrylonitrile	2543	0	SW-846:8260B	1	5	0.45		µg/L	EPA TAP SCRNLVL
VOA	71-43-2	Benzene	2543	10	SW-846:8260B	0.3	1	5		µg/L	EPA MCL
VOA	108-86-1	Bromobenzene	2543	0	SW-846:8260B	0.25	1	88		µg/L	EPA TAP SCRNLVL
VOA	74-97-5	Bromochloromethane	2543	0	SW-846:8260B	0.3	1			µg/L	
VOA	75-27-4	Bromodichloromethane	2543	0	SW-846:8260B	0.25	1	80		µg/L	EPA MCL
VOA	75-25-2	Bromoform	2543	1	SW-846:8260B	0.25	1	80		µg/L	EPA MCL
VOA	74-83-9	Bromomethane	2543	2	SW-846:8260B	0.3	1	8.7		µg/L	EPA TAP SCRNLVL
VOA	71-36-3	Butanol[1-]	2004	6	SW-846:8260B	15	50	3700		µg/L	EPA TAP SCRNLVL
VOA	78-93-3	Butanone[2-]	2543	75	SW-846:8260B	1.3	5	7100		µg/L	EPA TAP SCRNLVL
VOA	104-51-8	Butylbenzene[n-]	2543	0	SW-846:8260B	0.25	1			µg/L	
VOA	135-98-8	Butylbenzene[sec-]	2543	0	SW-846:8260B	0.25	1			µg/L	
VOA	98-06-6	Butylbenzene[tert-]	2543	0	SW-846:8260B	0.25	1			µg/L	
VOA	75-15-0	Carbon Disulfide	2543	14	SW-846:8260B	1.3	5	1000		µg/L	EPA TAP SCRNLVL
VOA	56-23-5	Carbon Tetrachloride	2543	0	SW-846:8260B	0.3	1	5		µg/L	EPA MCL

Table C-4.1-1 (continued)

Suite	Analyte or CAS No.	Analyte Name	Total Samples 2006–2010	Total Detects 2006–2010	Method	MDL ^a	PQL ^a	Cleanup Level ^b	Background ^c	Unit	Cleanup-Level Type
VOA	126-99-8	Chloro-1,3-butadiene[2-]	2543	0	SW-846:8260B	0.3	1	0.16		µg/L	EPA TAP SCRNLVL
VOA	107-05-1	Chloro-1-propene[3-]	2543	0	SW-846:8260B	1.5	5	6.5		µg/L	EPA TAP SCRNLVL
VOA	108-90-7	Chlorobenzene	2543	0	SW-846:8260B	0.25	1	100		µg/L	EPA MCL
VOA	124-48-1	Chlorodibromomethane	2543	1	SW-846:8260B	0.3	1	80		µg/L	EPA MCL
VOA	75-00-3	Chloroethane	2543	0	SW-846:8260B	0.3	1	21000		µg/L	EPA TAP SCRNLVL
VOA	67-66-3	Chloroform	2543	127	SW-846:8260B	0.25	1	80		µg/L	EPA MCL
VOA	74-87-3	Chloromethane	2543	77	SW-846:8260B	0.3	1	190		µg/L	EPA TAP SCRNLVL
VOA	95-49-8	Chlorotoluene[2-]	2543	0	SW-846:8260B	0.25	1	730		µg/L	EPA TAP SCRNLVL
VOA	106-43-4	Chlorotoluene[4-]	2543	0	SW-846:8260B	0.25	1	2600		µg/L	EPA TAP SCRNLVL
VOA	96-12-8	Dibromo-3-Chloropropane[1,2-]	2543	0	SW-846:8260B	0.3	1	0.2		µg/L	EPA MCL
VOA	106-93-4	Dibromoethane[1,2-]	2543	0	SW-846:8260B	0.25	1	0.05		µg/L	EPA MCL
VOA	74-95-3	Dibromomethane	2543	0	SW-846:8260B	0.3	1	8.2		µg/L	EPA TAP SCRNLVL
VOA	95-50-1	Dichlorobenzene[1,2-]	2543	1	SW-846:8260B	0.25	1	600		µg/L	EPA MCL
VOA	541-73-1	Dichlorobenzene[1,3-]	2543	16	SW-846:8260B	0.25	1			µg/L	
VOA	106-46-7	Dichlorobenzene[1,4-]	2543	0	SW-846:8260B	0.25	1	75		µg/L	EPA MCL
VOA	75-71-8	Dichlorodifluoromethane	2543	0	SW-846:8260B	0.3	1	390		µg/L	EPA TAP SCRNLVL
VOA	75-34-3	Dichloroethane[1,1-]	2543	66	SW-846:8260B	0.3	1	25		µg/L	NM GW STD
VOA	107-06-2	Dichloroethane[1,2-]	2543	6	SW-846:8260B	0.25	1	5		µg/L	EPA MCL
VOA	75-35-4	Dichloroethene[1,1-]	2543	65	SW-846:8260B	0.3	1	5		µg/L	NM GW STD
VOA	156-59-2	Dichloroethene[cis-1,2-]	2543	8	SW-846:8260B	0.3	1	70		µg/L	EPA MCL
VOA	156-60-5	Dichloroethene[trans-1,2-]	2543	0	SW-846:8260B	0.3	1	100		µg/L	EPA MCL
VOA	78-87-5	Dichloropropane[1,2-]	2543	0	SW-846:8260B	0.25	1	5		µg/L	EPA MCL
VOA	142-28-9	Dichloropropane[1,3-]	2543	0	SW-846:8260B	0.3	1	730		µg/L	EPA TAP SCRNLVL
VOA	594-20-7	Dichloropropane[2,2-]	2543	0	SW-846:8260B	0.3	1			µg/L	
VOA	563-58-6	Dichloropropene[1,1-]	2543	0	SW-846:8260B	0.25	1			µg/L	
VOA	10061-01-5	Dichloropropene[cis-1,3-]	2543	0	SW-846:8260B	0.25	1			µg/L	
VOA	10061-02-6	Dichloropropene[trans-1,3-]	2543	0	SW-846:8260B	0.25	1			µg/L	
VOA	60-29-7	Diethyl Ether	2004	5	SW-846:8260B	0.3	1	7300		µg/L	EPA TAP SCRNLVL
VOA	97-63-2	Ethyl Methacrylate	2543	0	SW-846:8260B	1	5	3300		µg/L	EPA TAP SCRNLVL
VOA	100-41-4	Ethylbenzene	2543	4	SW-846:8260B	0.25	1	700		µg/L	EPA MCL
VOA	87-68-3	Hexachlorobutadiene	2543	0	SW-846:8260B	0.3	1	8.6		µg/L	EPA TAP SCRNLVL
VOA	591-78-6	Hexanone[2-]	2543	1	SW-846:8260B	1.3	5	47		µg/L	EPA TAP SCRNLVL
VOA	74-88-4	Iodomethane	2543	1	SW-846:8260B	1.3	5			µg/L	
VOA	78-83-1	Isobutyl alcohol	2543	1	SW-846:8260B	13	50	11000		µg/L	EPA TAP SCRNLVL
VOA	98-82-8	Isopropylbenzene	2543	11	SW-846:8260B	0.25	1	680		µg/L	EPA TAP SCRNLVL
VOA	99-87-6	Isopropyltoluene[4-]	2543	4	SW-846:8260B	0.25	1			µg/L	
VOA	126-98-7	Methacrylonitrile	2542	0	SW-846:8260B	1	5	1		µg/L	EPA TAP SCRNLVL

Table C-4.1-1 (continued)

Suite	Analyte or CAS No.	Analyte Name	Total Samples 2006–2010	Total Detects 2006–2010	Method	MDL ^a	PQL ^a	Cleanup Level ^b	Background ^c	Unit	Cleanup-Level Type
VOA	80-62-6	Methyl Methacrylate	2543	1	SW-846:8260B	1	5	1400		µg/L	EPA TAP SCRNLVL
VOA	1634-04-4	Methyl tert-Butyl Ether	2004	32	SW-846:8260B	0.25	1	120		µg/L	EPA TAP SCRNLVL
VOA	108-10-1	Methyl-2-pentanone[4-]	2543	8	SW-846:8260B	1.3	5	2000		µg/L	EPA TAP SCRNLVL
VOA	75-09-2	Methylene Chloride	2543	15	SW-846:8260B	3	10	5		µg/L	EPA MCL
VOA	91-20-3	Naphthalene	2543	7	SW-846:8260B	0.25	1	30		µg/L	NM GW STD
VOA	107-12-0	Propionitrile	2543	0	SW-846:8260B	1.5	5			µg/L	
VOA	103-65-1	Propylbenzene[1-]	2543	0	SW-846:8260B	0.25	1	1300		µg/L	EPA TAP SCRNLVL
VOA	100-42-5	Styrene	2543	5	SW-846:8260B	0.25	1	100		µg/L	EPA MCL
VOA	630-20-6	Tetrachloroethane[1,1,1,2-]	2543	0	SW-846:8260B	0.3	1	5.2		µg/L	EPA TAP SCRNLVL
VOA	79-34-5	Tetrachloroethane[1,1,2,2-]	2543	0	SW-846:8260B	0.25	1	10		µg/L	NM GW STD
VOA	127-18-4	Tetrachloroethene	2543	86	SW-846:8260B	0.3	1	5		µg/L	EPA MCL
VOA	108-88-3	Toluene	2543	245	SW-846:8260B	0.25	1	750		µg/L	NM GW STD
VOA	76-13-1	Trichloro-1,2,2-trifluoroethane[1,1,2-]	2541	1	SW-846:8260B	1	5	59000		µg/L	EPA TAP SCRNLVL
VOA	87-61-6	Trichlorobenzene[1,2,3-]	2543	2	SW-846:8260B	0.33	1	29		µg/L	EPA TAP SCRNLVL
VOA	120-82-1	Trichlorobenzene[1,2,4-]	2543	1	SW-846:8260B	0.3	1	70		µg/L	EPA MCL
VOA	71-55-6	Trichloroethane[1,1,1-]	2543	54	SW-846:8260B	0.33	1	60		µg/L	NM GW STD
VOA	79-00-5	Trichloroethane[1,1,2-]	2543	9	SW-846:8260B	0.25	1	5		µg/L	EPA MCL
VOA	79-01-6	Trichloroethene	2543	150	SW-846:8260B	0.25	1	5		µg/L	EPA MCL
VOA	75-69-4	Trichlorofluoromethane	2543	0	SW-846:8260B	0.3	1	1300		µg/L	EPA TAP SCRNLVL
VOA	96-18-4	Trichloropropane[1,2,3-]	2543	0	SW-846:8260B	0.3	1	0.0072		µg/L	EPA TAP SCRNLVL
VOA	95-63-6	Trimethylbenzene[1,2,4-]	2543	3	SW-846:8260B	0.25	1	15		µg/L	EPA TAP SCRNLVL
VOA	108-67-8	Trimethylbenzene[1,3,5-]	2543	0	SW-846:8260B	0.25	1	370		µg/L	EPA TAP SCRNLVL
VOA	108-05-4	Vinyl acetate	2543	0	SW-846:8260B	1.5	5	410		µg/L	EPA TAP SCRNLVL
VOA	75-01-4	Vinyl Chloride	2543	0	SW-846:8260B	0.5	1	1		µg/L	NM GW STD
VOA	95-47-6	Xylene[1,2-]	2543	4	SW-846:8260B	0.3	1	1200		µg/L	EPA TAP SCRNLVL
VOA	Xylene[1,3 and 1,4]	Xylene[1,3-]+Xylene[1,4-]	2541	20	SW-846:8260B	0.5	2			µg/L	

Note: Blank cells indicate there are no values.

^a Mode (most frequent) of values reported for 2010 data.

^b This value is derived as result of logic provided in Appendix B-2.0, Protocol for Selecting Cleanup Levels.

^c Lowest of background values for alluvial, intermediate, and regional groundwater as identified in the Laboratory's 2007 groundwater background report (LANL 2007, 095817).

Table C-4.1-2
Analytes, Analytical Methods, and MDLs and PQLs Obtained for 2010 Analyses of
Base-Flow Samples by Contract Laboratories and Number of Sample Analyses and Detections for the Period 2006 to 2010

Suite	Analyte or CAS No.	Analyte Name	Total Samples 2006–2010	Total Detects 2006–2010	Method	MDL ^a	PQL ^a	Cleanup Level ^b	Unit	Cleanup-Level Type
Diox/Fur	35822-46-9	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	75	27	SW-846:8290		0.00005		µg/L	
Diox/Fur	37871-00-4	Heptachlorodibenzodioxins (Total)	75	45	SW-846:8290		0.00005		µg/L	
Diox/Fur	67562-39-4	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	75	16	SW-846:8290		0.00005		µg/L	
Diox/Fur	55673-89-7	Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	75	6	SW-846:8290		0.00005		µg/L	
Diox/Fur	38998-75-3	Heptachlorodibenzofurans (Total)	75	28	SW-846:8290		0.00005		µg/L	
Diox/Fur	39227-28-6	Hexachlorodibenzodioxin[1,2,3,4,7,8-]	75	4	SW-846:8290		0.00005		µg/L	
Diox/Fur	57653-85-7	Hexachlorodibenzodioxin[1,2,3,6,7,8-]	75	5	SW-846:8290		0.00005		µg/L	
Diox/Fur	19408-74-3	Hexachlorodibenzodioxin[1,2,3,7,8,9-]	75	4	SW-846:8290		0.00005		µg/L	
Diox/Fur	34465-46-8	Hexachlorodibenzodioxins (Total)	75	14	SW-846:8290		0.00005		µg/L	
Diox/Fur	70648-26-9	Hexachlorodibenzofuran[1,2,3,4,7,8-]	75	5	SW-846:8290		0.00005		µg/L	
Diox/Fur	57117-44-9	Hexachlorodibenzofuran[1,2,3,6,7,8-]	75	4	SW-846:8290		0.00005		µg/L	
Diox/Fur	72918-21-9	Hexachlorodibenzofuran[1,2,3,7,8,9-]	75	1	SW-846:8290		0.00005		µg/L	
Diox/Fur	60851-34-5	Hexachlorodibenzofuran[2,3,4,6,7,8-]	75	6	SW-846:8290		0.00005		µg/L	
Diox/Fur	55684-94-1	Hexachlorodibenzofurans (Total)	75	22	SW-846:8290		0.00005		µg/L	
Diox/Fur	3268-87-9	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	75	37	SW-846:8290		0.0001		µg/L	
Diox/Fur	39001-02-0	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	75	21	SW-846:8290		0.0001		µg/L	
Diox/Fur	40321-76-4	Pentachlorodibenzodioxin[1,2,3,7,8-]	75	2	SW-846:8290		0.00005		µg/L	
Diox/Fur	36088-22-9	Pentachlorodibenzodioxins (Total)	75	10	SW-846:8290		0.00005		µg/L	
Diox/Fur	57117-41-6	Pentachlorodibenzofuran[1,2,3,7,8-]	75	6	SW-846:8290		0.00005		µg/L	
Diox/Fur	57117-31-4	Pentachlorodibenzofuran[2,3,4,7,8-]	75	4	SW-846:8290		0.00005		µg/L	
Diox/Fur	30402-15-4	Pentachlorodibenzofurans (Totals)	75	17	SW-846:8290		0.00005		µg/L	
Diox/Fur	1746-01-6	Tetrachlorodibenzodioxin[2,3,7,8-]	75	3	SW-846:8290		0.00001	5.1E-08	µg/L	NM HH OO
Diox/Fur	41903-57-5	Tetrachlorodibenzodioxins (Total)	75	10	SW-846:8290		0.00001		µg/L	
Diox/Fur	51207-31-9	Tetrachlorodibenzofuran[2,3,7,8-]	75	6	SW-846:8290		0.00001		µg/L	
Diox/Fur	55722-27-5	Tetrachlorodibenzofurans (Totals)	75	11	SW-846:8290		0.00001		µg/L	
DRO	TPH-DRO	Total Petroleum Hydrocarbons Diesel Range Organics	1	1	SW-846:8015M	65	200		µg/L	
Geninorg	ALK-CO3	Alkalinity-CO3	399	81	EPA:310.1	0.73	1		mg/L	
Geninorg	ALK-CO3+HCO3	Alkalinity-CO3+HCO3	399	396	EPA:310.1	0.73	1		mg/L	
Geninorg	NH3-N	Ammonia as Nitrogen	404	197	EPA:350.1	0.016	0.05		mg/L	
Geninorg	Br(-1)	Bromide	399	135	EPA:300.0	0.066	0.2		mg/L	
Geninorg	Ca	Calcium	724	724	SW-846:6010B	0.05	0.2		mg/L	
Geninorg	Cl(-1)	Chloride	395	395	EPA:300.0	0.066	0.2		mg/L	
Geninorg	CN(TOTAL)	Cyanide (Total)	338	71	EPA:335.4	0.0017	0.005		mg/L	
Geninorg	F(-1)	Fluoride	402	380	EPA:300.0	0.033	0.1		mg/L	
Geninorg	HARDNESS	Hardness	721	721	SM:A2340B	0.35	1.24		mg/L	

Table C-4.1-2 (continued)

Suite	Analyte or CAS No.	Analyte Name	Total Samples 2006–2010	Total Detects 2006–2010	Method	MDL ^a	PQL ^a	Cleanup Level ^b	Unit	Cleanup-Level Type
Geninorg	Mg	Magnesium	724	724	SW-846:6010B	0.085	0.3		mg/L	
Geninorg	NO3+NO2-N	Nitrate-Nitrite as Nitrogen	404	247	EPA:353.2	0.01	0.05	132	mg/L	NM LVSTK WTR STD
Geninorg	ClO4	Perchlorate	460	305	SW-846:6850	0.05	0.2		µg/L	
Geninorg	pH	pH	395	395	EPA:150.1	0.01	0.1		SU	
Geninorg	K	Potassium	724	724	SW-846:6010B	0.05	0.15		mg/L	
Geninorg	Na	Sodium	724	724	SW-846:6010B	0.1	0.3		mg/L	
Geninorg	SO4(-2)	Sulfate	402	400	EPA:300.0	0.1	0.4		mg/L	
Geninorg	SSC	Suspended Sediment Concentration	339	262	EPA:160.2	0.76	3.33		mg/L	
Geninorg	TDS	Total Dissolved Solids	392	390	EPA:160.1	2.4	10		mg/L	
Geninorg	TKN	Total Kjeldahl Nitrogen	487	380	EPA:351.2	0.033	0.1		mg/L	
Geninorg	TOC	Total Organic Carbon	353	352	SW-846:9060	0.33	1		mg/L	
Geninorg	PO4-P	Total Phosphate as Phosphorus	398	233	EPA:365.4	0.015	0.05		mg/L	
Geninorg	TSS	Total Suspended Solids	19	15	EPA:160.2	2.3	10		mg/L	
Herb	94-75-7	D[2,4-]	42	0	SW-846:8151A	0.087	0.26		µg/L	
Herb	75-99-0	Dalapon	42	0	SW-846:8151A	1.3	5.3		µg/L	
Herb	94-82-6	DB[2,4-]	42	0	SW-846:8151A	0.087	0.26		µg/L	
Herb	1918-00-9	Dicamba	42	0	SW-846:8151A	0.087	0.26		µg/L	
Herb	120-36-5	Dichlorprop	42	0	SW-846:8151A	0.087	0.26		µg/L	
Herb	88-85-7	Dinoseb	42	0	SW-846:8151A	0.087	0.26		µg/L	
Herb	94-74-6	MCPA	42	0	SW-846:8151A	12	53		µg/L	
Herb	93-65-2	MCPP	42	0	SW-846:8151A	11	53		µg/L	
Herb	93-76-5	T[2,4,5-]	42	0	SW-846:8151A	0.087	0.26		µg/L	
Herb	93-72-1	TP[2,4,5-]	42	0	SW-846:8151A	0.087	0.26		µg/L	
Hexp	6629-29-4	2,4-Diamino-6-nitrotoluene	175	4	SW-846:8321	0.39	1.3		µg/L	
Hexp	59229-75-3	2,6-Diamino-4-nitrotoluene	175	2	SW-846:8321	0.39	1.3		µg/L	
Hexp	618-87-1	3,5-Dinitroaniline	175	1	SW-846:8321	0.39	1.3		µg/L	
Hexp	19406-51-0	Amino-2,6-dinitrotoluene[4-]	175	12	SW-846:8321	0.1	0.33		µg/L	
Hexp	35572-78-2	Amino-4,6-dinitrotoluene[2-]	175	14	SW-846:8321	0.1	0.33		µg/L	
Hexp	99-65-0	Dinitrobenzene[1,3-]	175	0	SW-846:8321	0.1	0.33		µg/L	
Hexp	121-14-2	Dinitrotoluene[2,4-]	175	0	SW-846:8321	0.1	0.33		µg/L	
Hexp	606-20-2	Dinitrotoluene[2,6-]	175	0	SW-846:8321	0.1	0.33		µg/L	
Hexp	DNX	DNX	131	8	SW-846:8330	0.069	0.5		µg/L	
Hexp	2691-41-0	HMX	175	46	SW-846:8321	0.1	0.33		µg/L	
Hexp	MNX	MNX	131	9	SW-846:8330	0.091	0.5		µg/L	
Hexp	98-95-3	Nitrobenzene	175	0	SW-846:8321	0.1	0.33	690	µg/L	NM HH OO
Hexp	88-72-2	Nitrotoluene[2-]	175	0	SW-846:8321	0.1	0.33		µg/L	
Hexp	99-08-1	Nitrotoluene[3-]	175	0	SW-846:8321	0.1	0.33		µg/L	

Table C-4.1-2 (continued)

Suite	Analyte or CAS No.	Analyte Name	Total Samples 2006–2010	Total Detects 2006–2010	Method	MDL ^a	PQL ^a	Cleanup Level ^b	Unit	Cleanup-Level Type
Hexp	99-99-0	Nitrotoluene[4-]	175	0	SW-846:8321	0.1	0.65		µg/L	
Hexp	78-11-5	PETN	175	0	SW-846:8321	0.13	1.3		µg/L	
Hexp	121-82-4	RDX	175	30	SW-846:8321	0.1	0.33		µg/L	
Hexp	3058-38-6	TATB	175	0	SW-846:8321	0.39	1.3		µg/L	
Hexp	479-45-8	Tetryl	175	0	SW-846:8321	0.13	0.65		µg/L	
Hexp	TNX	TNX	131	7	SW-846:8330	0.082	0.5		µg/L	
Hexp	99-35-4	Trinitrobenzene[1,3,5-]	175	0	SW-846:8321	0.1	0.33		µg/L	
Hexp	118-96-7	Trinitrotoluene[2,4,6-]	175	0	SW-846:8321	0.1	0.33		µg/L	
Hexp	78-30-8	Tris (o-cresyl) phosphate	175	0	SW-846:8321	0.39	1.3		µg/L	
Metals	Al	Aluminum	724	519	SW-846:6010B	68	200	391	µg/L	NM Aqu Chronic 30 mg/L hardness
Metals	Sb	Antimony	724	36	SW-846:6020	0.5	3	640	µg/L	NM HH OO
Metals	As	Arsenic	730	205	SW-846:6020	1.5	5	9	µg/L	NM HH OO
Metals	Ba	Barium	724	724	SW-846:6010B	1	5		µg/L	
Metals	Be	Beryllium	724	20	SW-846:6010B	1	5		µg/L	
Metals	B	Boron	716	540	SW-846:6010B	15	50	5000	µg/L	NM LVSTK WTR STD
Metals	Cd	Cadmium	724	70	SW-846:6020	0.11	1	0.23	µg/L	NM Aqu Chronic 30 mg/L hardness
Metals	Cr	Chromium	728	419	SW-846:6020	2.5	10	35	µg/L	NM Aqu Chronic 30 mg/L hardness
Metals	Co	Cobalt	724	117	SW-846:6010B	1	5	1000	µg/L	NM LVSTK WTR STD
Metals	Cu	Copper	724	264	SW-846:6010B	3	10	4	µg/L	NM Aqu Chronic 30 mg/L hardness
Metals	Fe	Iron	724	627	SW-846:6010B	30	100		µg/L	
Metals	Pb	Lead	724	286	SW-846:6020	0.5	2	1	µg/L	NM Aqu Chronic 30 mg/L hardness
Metals	Mn	Manganese	724	660	SW-846:6010B	2	10	1216	µg/L	NM Aqu Chronic 30 mg/L hardness
Metals	Hg	Mercury	719	17	EPA:245.2	0.066	0.2	0.77	µg/L	NM WQCC WLDLF HAB
Metals	Mo	Molybdenum	724	495	SW-846:6020	0.1	0.5		µg/L	
Metals	Ni	Nickel	724	643	SW-846:6020	0.5	2	24	µg/L	NM Aqu Chronic 30 mg/L hardness
Metals	Se	Selenium	724	45	SW-846:6020	1	5	5	µg/L	NM WQCC WLDLF HAB
Metals	SiO2	Silicon Dioxide	225	225	SW-846:6010B	0.053	0.213		mg/L	
Metals	Ag	Silver	724	78	SW-846:6020	0.2	1	0.7	µg/L	NM Aqu Chronic 30 mg/L hardness
Metals	Sr	Strontium	716	716	SW-846:6010B	1	5		µg/L	
Metals	Tl	Thallium	724	69	SW-846:6020	0.3	1	0.47	µg/L	NM HH OO
Metals	Sn	Tin	716	10	SW-846:6010B	2.5	10		µg/L	
Metals	U	Uranium	716	524	SW-846:6020	0.05	0.2		µg/L	
Metals	V	Vanadium	724	603	SW-846:6010B	1	5	100	µg/L	NM LVSTK WTR STD
Metals	Zn	Zinc	724	490	SW-846:6010B	3.3	10	53	µg/L	NM Aqu Chronic 30 mg/L hardness
PCB	12674-11-2	Aroclor-1016	216	0	SW-846:8082	0.033	0.1	0.00064	µg/L	NM HH OO
PCB	11104-28-2	Aroclor-1221	216	0	SW-846:8082	0.033	0.1	0.00064	µg/L	NM HH OO
PCB	11141-16-5	Aroclor-1232	216	0	SW-846:8082	0.033	0.1	0.00064	µg/L	NM HH OO

Table C-4.1-2 (continued)

Suite	Analyte or CAS No.	Analyte Name	Total Samples 2006–2010	Total Detects 2006–2010	Method	MDL ^a	PQL ^a	Cleanup Level ^b	Unit	Cleanup-Level Type
PCB	53469-21-9	Aroclor-1242	216	0	SW-846:8082	0.033	0.1	0.00064	µg/L	NM HH OO
PCB	12672-29-6	Aroclor-1248	216	0	SW-846:8082	0.033	0.1	0.00064	µg/L	NM HH OO
PCB	11097-69-1	Aroclor-1254	216	6	SW-846:8082	0.033	0.1	0.00064	µg/L	NM HH OO
PCB	11096-82-5	Aroclor-1260	216	7	SW-846:8082	0.033	0.1	0.00064	µg/L	NM HH OO
PCB	37324-23-5	Aroclor-1262	216	0	SW-846:8082	0.033	0.1	0.00064	µg/L	NM HH OO
PCB Cong	2051-60-7	PCB-1	53	0	EPA:1668A		0.000028		µg/L	
PCB Cong	33146-45-1	PCB-10	10	0	EPA:1668A		0.000035		µg/L	
PCB Cong	39485-83-1	PCB-100	43	0	EPA:1668A		0.000028		µg/L	
PCB Cong	60145-21-3	PCB-103	53	1	EPA:1668A		0.000028		µg/L	
PCB Cong	56558-16-8	PCB-104	53	0	EPA:1668A		0.000028		µg/L	
PCB Cong	32598-14-4	PCB-105	53	7	EPA:1668A		0.000035		µg/L	
PCB Cong	70424-69-0	PCB-106	35	3	EPA:1668A		0.000007		µg/L	
PCB Cong	PCB-106/118	PCB-106/PCB-118	18	3	EPA:1668A		0.0000097		µg/L	
PCB Cong	70424-68-9	PCB-107	35	3	EPA:1668A		0.000007		µg/L	
PCB Cong	PCB-107/109	PCB-107/PCB-109	18	0	EPA:1668A		0.000028		µg/L	
PCB Cong	PCB-108/112	PCB-108/PCB-112	18	0	EPA:1668A		0.000028		µg/L	
PCB Cong	PCB-108/124	PCB-108/PCB-124	10	1	EPA:1668A		0.0000139		µg/L	
PCB Cong	2050-67-1	PCB-11	53	4	EPA:1668A		0.000056		µg/L	
PCB Cong	38380-03-9	PCB-110	43	5	EPA:1668A		0.000028		µg/L	
PCB Cong	39635-32-0	PCB-111	35	0	EPA:1668A		0.000007		µg/L	
PCB Cong	PCB-111/115	PCB-111/PCB-115	18	0	EPA:1668A		0.000028		µg/L	
PCB Cong	74472-36-9	PCB-112	10	0	EPA:1668A		0.000007		µg/L	
PCB Cong	68194-10-5	PCB-113	43	0	EPA:1668A		0.000028		µg/L	
PCB Cong	74472-37-0	PCB-114	53	1	EPA:1668A		0.000007		µg/L	
PCB Cong	56558-17-9	PCB-119	43	0	EPA:1668A		0.000028		µg/L	
PCB Cong	PCB-12/13	PCB-12/PCB-13	53	0	EPA:1668A		0.000056		µg/L	
PCB Cong	68194-12-7	PCB-120	53	1	EPA:1668A		0.000028		µg/L	
PCB Cong	56558-18-0	PCB-121	53	0	EPA:1668A		0.000028		µg/L	
PCB Cong	76842-07-4	PCB-122	53	1	EPA:1668A		0.000028		µg/L	
PCB Cong	65510-44-3	PCB-123	53	1	EPA:1668A		0.000035		µg/L	
PCB Cong	70424-70-3	PCB-124	43	1	EPA:1668A		0.000028		µg/L	
PCB Cong	57465-28-8	PCB-126	53	1	EPA:1668A		0.000007		µg/L	
PCB Cong	39635-33-1	PCB-127	53	0	EPA:1668A		0.000028		µg/L	
PCB Cong	PCB-128/162	PCB-128/PCB-162	18	0	EPA:1668A		0.000028		µg/L	
PCB Cong	55215-18-4	PCB-129	43	1	EPA:1668A		0.000028		µg/L	
PCB Cong	52663-66-8	PCB-130	53	5	EPA:1668A		0.000028		µg/L	
PCB Cong	61798-70-7	PCB-131	53	1	EPA:1668A		0.000028		µg/L	

Table C-4.1-2 (continued)

Suite	Analyte or CAS No.	Analyte Name	Total Samples 2006–2010	Total Detects 2006–2010	Method	MDL ^a	PQL ^a	Cleanup Level ^b	Unit	Cleanup-Level Type
PCB Cong	PCB-132/161	PCB-132/PCB-161	18	0	EPA:1668A		0.000028		µg/L	
PCB Cong	35694-04-3	PCB-133	35	2	EPA:1668A		0.000007		µg/L	
PCB Cong	PCB-133/142	PCB-133/PCB-142	18	0	EPA:1668A		0.000028		µg/L	
PCB Cong	52704-70-8	PCB-134	35	2	EPA:1668A		0.000035		µg/L	
PCB Cong	PCB-134/143	PCB-134/PCB-143	18	0	EPA:1668A		0.000028		µg/L	
PCB Cong	52744-13-5	PCB-135	43	1	EPA:1668A		0.000028		µg/L	
PCB Cong	38411-22-2	PCB-136	53	6	EPA:1668A		0.000028		µg/L	
PCB Cong	35694-06-5	PCB-137	53	3	EPA:1668A		0.000028		µg/L	
PCB Cong	PCB-139/140	PCB-139/PCB-140	10	1	EPA:1668A		0.0000139		µg/L	
PCB Cong	PCB-139/149	PCB-139/PCB-149	18	1	EPA:1668A		0.000028		µg/L	
PCB Cong	34883-41-5	PCB-14	53	0	EPA:1668A		0.000056		µg/L	
PCB Cong	59291-64-4	PCB-140	43	0	EPA:1668A		0.000028		µg/L	
PCB Cong	52712-04-6	PCB-141	53	8	EPA:1668A		0.000028		µg/L	
PCB Cong	41411-61-4	PCB-142	10	0	EPA:1668A		0.000007		µg/L	
PCB Cong	68194-15-0	PCB-143	10	0	EPA:1668A		0.000007		µg/L	
PCB Cong	68194-14-9	PCB-144	53	5	EPA:1668A		0.000028		µg/L	
PCB Cong	74472-40-5	PCB-145	53	0	EPA:1668A		0.000028		µg/L	
PCB Cong	PCB-146/165	PCB-146/PCB-165	18	0	EPA:1668A		0.000028		µg/L	
PCB Cong	68194-13-8	PCB-147	43	1	EPA:1668A		0.000028		µg/L	
PCB Cong	74472-41-6	PCB-148	53	0	EPA:1668A		0.000028		µg/L	
PCB Cong	2050-68-2	PCB-15	53	3	EPA:1668A		0.000056		µg/L	
PCB Cong	68194-08-1	PCB-150	53	0	EPA:1668A		0.000028		µg/L	
PCB Cong	52663-63-5	PCB-151	43	2	EPA:1668A		0.000028		µg/L	
PCB Cong	68194-09-2	PCB-152	53	0	EPA:1668A		0.000028		µg/L	
PCB Cong	60145-22-4	PCB-154	53	1	EPA:1668A		0.000028		µg/L	
PCB Cong	33979-03-2	PCB-155	53	0	EPA:1668A		0.000028		µg/L	
PCB Cong	38380-08-4	PCB-156	43	5	EPA:1668A		0.000004		µg/L	
PCB Cong	PCB-156/157	PCB-156/PCB-157	10	4	EPA:1668A		0.0000138		µg/L	
PCB Cong	69782-90-7	PCB-157	43	1	EPA:1668A		0.000005		µg/L	
PCB Cong	PCB-158/160	PCB-158/PCB-160	18	0	EPA:1668A		0.000028		µg/L	
PCB Cong	39635-35-3	PCB-159	53	1	EPA:1668A		0.000028		µg/L	
PCB Cong	38444-78-9	PCB-16	10	0	EPA:1668A		0.000035		µg/L	
PCB Cong	PCB-16/32	PCB-16/PCB-32	43	2	EPA:1668A		0.000028		µg/L	
PCB Cong	41411-62-5	PCB-160	10	0	EPA:1668A		0.000007		µg/L	
PCB Cong	74472-43-8	PCB-161	10	0	EPA:1668A		0.000007		µg/L	
PCB Cong	39635-34-2	PCB-162	10	0	EPA:1668A		0.000007		µg/L	
PCB Cong	74472-46-1	PCB-165	10	0	EPA:1668A		0.000007		µg/L	

Table C-4.1-2 (continued)

Suite	Analyte or CAS No.	Analyte Name	Total Samples 2006–2010	Total Detects 2006–2010	Method	MDL ^a	PQL ^a	Cleanup Level ^b	Unit	Cleanup-Level Type
PCB Cong	41411-63-6	PCB-166	43	0	EPA:1668A		0.000028		µg/L	
PCB Cong	52663-72-6	PCB-167	53	6	EPA:1668A		0.000007		µg/L	
PCB Cong	59291-65-5	PCB-168	43	0	EPA:1668A		0.000028		µg/L	
PCB Cong	32774-16-6	PCB-169	53	0	EPA:1668A		0.000007		µg/L	
PCB Cong	37680-66-3	PCB-17	53	2	EPA:1668A		0.000028		µg/L	
PCB Cong	35065-30-6	PCB-170	53	7	EPA:1668A		0.000028		µg/L	
PCB Cong	52663-71-5	PCB-171	43	1	EPA:1668A		0.000028		µg/L	
PCB Cong	PCB-171/173	PCB-171/PCB-173	10	4	EPA:1668A		0.0000138		µg/L	
PCB Cong	52663-74-8	PCB-172	53	5	EPA:1668A		0.000028		µg/L	
PCB Cong	68194-16-1	PCB-173	43	0	EPA:1668A		0.000028		µg/L	
PCB Cong	38411-25-5	PCB-174	53	8	EPA:1668A		0.000028		µg/L	
PCB Cong	40186-70-7	PCB-175	53	2	EPA:1668A		0.000028		µg/L	
PCB Cong	52663-65-7	PCB-176	53	5	EPA:1668A		0.000028		µg/L	
PCB Cong	52663-70-4	PCB-177	53	6	EPA:1668A		0.000028		µg/L	
PCB Cong	52663-67-9	PCB-178	53	3	EPA:1668A		0.000028		µg/L	
PCB Cong	52663-64-6	PCB-179	53	7	EPA:1668A		0.000028		µg/L	
PCB Cong	37680-65-2	PCB-18	43	2	EPA:1668A		0.000028		µg/L	
PCB Cong	PCB-18/30	PCB-18/PCB-30	10	3	EPA:1668A		0.0000138		µg/L	
PCB Cong	PCB-180/193	PCB-180/PCB-193	10	1	EPA:1668A		0.0000139		µg/L	
PCB Cong	74472-47-2	PCB-181	53	0	EPA:1668A		0.000028		µg/L	
PCB Cong	60145-23-5	PCB-182	35	3	EPA:1668A		0.000007		µg/L	
PCB Cong	PCB-182/187	PCB-182/PCB-187	18	0	EPA:1668A		0.000028		µg/L	
PCB Cong	52663-69-1	PCB-183	43	2	EPA:1668A		0.000028		µg/L	
PCB Cong	PCB-183/185	PCB-183/PCB-185	10	3	EPA:1668A		0.0000139		µg/L	
PCB Cong	74472-48-3	PCB-184	53	0	EPA:1668A		0.000028		µg/L	
PCB Cong	52712-05-7	PCB-185	43	1	EPA:1668A		0.000028		µg/L	
PCB Cong	74472-49-4	PCB-186	53	0	EPA:1668A		0.000028		µg/L	
PCB Cong	74487-85-7	PCB-188	53	0	EPA:1668A		0.000028		µg/L	
PCB Cong	39635-31-9	PCB-189	53	3	EPA:1668A		0.000007		µg/L	
PCB Cong	38444-73-4	PCB-19	53	0	EPA:1668A		0.000028		µg/L	
PCB Cong	41411-64-7	PCB-190	53	5	EPA:1668A		0.000028		µg/L	
PCB Cong	74472-50-7	PCB-191	53	3	EPA:1668A		0.000028		µg/L	
PCB Cong	74472-51-8	PCB-192	53	0	EPA:1668A		0.000028		µg/L	
PCB Cong	69782-91-8	PCB-193	43	1	EPA:1668A		0.000028		µg/L	
PCB Cong	35694-08-7	PCB-194	53	7	EPA:1668A		0.000028		µg/L	
PCB Cong	52663-78-2	PCB-195	53	5	EPA:1668A		0.000028		µg/L	
PCB Cong	PCB-196/203	PCB-196/PCB-203	18	0	EPA:1668A		0.000028		µg/L	

Table C-4.1-2 (continued)

Suite	Analyte or CAS No.	Analyte Name	Total Samples 2006–2010	Total Detects 2006–2010	Method	MDL ^a	PQL ^a	Cleanup Level ^b	Unit	Cleanup-Level Type
PCB Cong	33091-17-7	PCB-197	43	0	EPA:1668A		0.000028		µg/L	
PCB Cong	PCB-197/200	PCB-197/PCB-200	10	0	EPA:1668A		0.0000139		µg/L	
PCB Cong	68194-17-2	PCB-198	43	0	EPA:1668A		0.000028		µg/L	
PCB Cong	52663-75-9	PCB-199	43	2	EPA:1668A		0.000028		µg/L	
PCB Cong	2051-61-8	PCB-2	53	0	EPA:1668A		0.000028		µg/L	
PCB Cong	PCB-20/21/33	PCB-20/PCB-21/PCB-33	18	0	EPA:1668A		0.000028		µg/L	
PCB Cong	52663-73-7	PCB-200	43	0	EPA:1668A		0.000028		µg/L	
PCB Cong	40186-71-8	PCB-201	53	3	EPA:1668A		0.000028		µg/L	
PCB Cong	2136-99-4	PCB-202	53	4	EPA:1668A		0.000028		µg/L	
PCB Cong	74472-52-9	PCB-204	53	0	EPA:1668A		0.000028		µg/L	
PCB Cong	74472-53-0	PCB-205	53	1	EPA:1668A		0.000028		µg/L	
PCB Cong	40186-72-9	PCB-206	53	6	EPA:1668A		0.000028		µg/L	
PCB Cong	52663-79-3	PCB-207	53	0	EPA:1668A		0.000028		µg/L	
PCB Cong	52663-77-1	PCB-208	53	1	EPA:1668A		0.000028		µg/L	
PCB Cong	2051-24-3	PCB-209	53	1	EPA:1668A		0.000028		µg/L	
PCB Cong	PCB-21/33	PCB-21/PCB-33	10	1	EPA:1668A		0.0000139		µg/L	
PCB Cong	38444-85-8	PCB-22	53	4	EPA:1668A		0.000028		µg/L	
PCB Cong	55720-44-0	PCB-23	53	0	EPA:1668A		0.000028		µg/L	
PCB Cong	55702-45-9	PCB-24	35	0	EPA:1668A		0.000007		µg/L	
PCB Cong	PCB-24/27	PCB-24/PCB-27	18	0	EPA:1668A		0.000028		µg/L	
PCB Cong	55712-37-3	PCB-25	53	0	EPA:1668A		0.000028		µg/L	
PCB Cong	38444-81-4	PCB-26	43	0	EPA:1668A		0.000028		µg/L	
PCB Cong	PCB-26/29	PCB-26/PCB-29	10	0	EPA:1668A		0.0000139		µg/L	
PCB Cong	38444-76-7	PCB-27	10	0	EPA:1668A		0.000007		µg/L	
PCB Cong	7012-37-5	PCB-28	43	2	EPA:1668A		0.000028		µg/L	
PCB Cong	15862-07-4	PCB-29	43	0	EPA:1668A		0.000028		µg/L	
PCB Cong	2051-62-9	PCB-3	53	0	EPA:1668A		0.000028		µg/L	
PCB Cong	35693-92-6	PCB-30	43	0	EPA:1668A		0.000028		µg/L	
PCB Cong	16606-02-3	PCB-31	53	7	EPA:1668A		0.000028		µg/L	
PCB Cong	38444-77-8	PCB-32	10	1	EPA:1668A		0.000007		µg/L	
PCB Cong	37680-68-5	PCB-34	53	0	EPA:1668A		0.000028		µg/L	
PCB Cong	37680-69-6	PCB-35	53	0	EPA:1668A		0.000028		µg/L	
PCB Cong	38444-87-0	PCB-36	53	0	EPA:1668A		0.000028		µg/L	
PCB Cong	38444-90-5	PCB-37	53	4	EPA:1668A		0.000028		µg/L	
PCB Cong	53555-66-1	PCB-38	53	0	EPA:1668A		0.000028		µg/L	
PCB Cong	38444-88-1	PCB-39	53	0	EPA:1668A		0.000028		µg/L	
PCB Cong	13029-08-8	PCB-4	35	0	EPA:1668A		0.000035		µg/L	

Table C-4.1-2 (continued)

Suite	Analyte or CAS No.	Analyte Name	Total Samples 2006–2010	Total Detects 2006–2010	Method	MDL ^a	PQL ^a	Cleanup Level ^b	Unit	Cleanup-Level Type
PCB Cong	PCB-4/10	PCB-4/PCB-10	18	0	EPA:1668A		0.000056		µg/L	
PCB Cong	38444-93-8	PCB-40	43	0	EPA:1668A		0.000028		µg/L	
PCB Cong	PCB-40/71	PCB-40/PCB-71	10	1	EPA:1668A		0.0000139		µg/L	
PCB Cong	52663-59-9	PCB-41	35	1	EPA:1668A		0.000035		µg/L	
PCB Cong	PCB-41/64/71/72	PCB-41/PCB-64/PCB-71/PCB-72	18	0	EPA:1668A		0.000028		µg/L	
PCB Cong	36559-22-5	PCB-42	35	1	EPA:1668A		0.000007		µg/L	
PCB Cong	PCB-42/59	PCB-42/PCB-59	18	0	EPA:1668A		0.000028		µg/L	
PCB Cong	70362-46-8	PCB-43	35	1	EPA:1668A		0.000007		µg/L	
PCB Cong	PCB-43/49	PCB-43/PCB-49	18	0	EPA:1668A		0.000028		µg/L	
PCB Cong	41464-39-5	PCB-44	43	2	EPA:1668A		0.000028		µg/L	
PCB Cong	PCB-44/47/65	PCB-44/PCB-47/PCB-65	10	1	EPA:1668A		0.00002		µg/L	
PCB Cong	70362-45-7	PCB-45	43	0	EPA:1668A		0.000028		µg/L	
PCB Cong	PCB-45/51	PCB-45/PCB-51	10	0	EPA:1668A		0.0000139		µg/L	
PCB Cong	41464-47-5	PCB-46	53	0	EPA:1668A		0.000028		µg/L	
PCB Cong	70362-47-9	PCB-48	35	0	EPA:1668A		0.000007		µg/L	
PCB Cong	PCB-48/75	PCB-48/PCB-75	18	0	EPA:1668A		0.000028		µg/L	
PCB Cong	PCB-49/69	PCB-49/PCB-69	10	4	EPA:1668A		0.0000138		µg/L	
PCB Cong	16605-91-7	PCB-5	53	2	EPA:1668A		0.000056		µg/L	
PCB Cong	62796-65-0	PCB-50	43	0	EPA:1668A		0.000028		µg/L	
PCB Cong	PCB-50/53	PCB-50/PCB-53	10	0	EPA:1668A		0.0000139		µg/L	
PCB Cong	68194-04-7	PCB-51	43	13	EPA:1668A		0.000028		µg/L	
PCB Cong	PCB-52/69	PCB-52/PCB-69	18	0	EPA:1668A		0.000028		µg/L	
PCB Cong	41464-41-9	PCB-53	43	0	EPA:1668A		0.000028		µg/L	
PCB Cong	15968-05-5	PCB-54	53	0	EPA:1668A		0.000028		µg/L	
PCB Cong	74338-24-2	PCB-55	53	0	EPA:1668A		0.000028		µg/L	
PCB Cong	41464-43-1	PCB-56	35	5	EPA:1668A		0.000007		µg/L	
PCB Cong	PCB-56/60	PCB-56/PCB-60	18	0	EPA:1668A		0.000028		µg/L	
PCB Cong	70424-67-8	PCB-57	53	0	EPA:1668A		0.000028		µg/L	
PCB Cong	41464-49-7	PCB-58	53	0	EPA:1668A		0.000028		µg/L	
PCB Cong	PCB-59/62/75	PCB-59/PCB-62/PCB-75	10	0	EPA:1668A		0.00002		µg/L	
PCB Cong	25569-80-6	PCB-6	53	0	EPA:1668A		0.000056		µg/L	
PCB Cong	33025-41-1	PCB-60	10	3	EPA:1668A		0.000007		µg/L	
PCB Cong	PCB-61/70	PCB-61/PCB-70	18	0	EPA:1668A		0.000028		µg/L	
PCB Cong	54230-22-7	PCB-62	43	0	EPA:1668A		0.000028		µg/L	
PCB Cong	74472-34-7	PCB-63	53	0	EPA:1668A		0.000028		µg/L	
PCB Cong	52663-58-8	PCB-64	10	4	EPA:1668A		0.000007		µg/L	
PCB Cong	33284-54-7	PCB-65	43	0	EPA:1668A		0.000028		µg/L	

Table C-4.1-2 (continued)

Suite	Analyte or CAS No.	Analyte Name	Total Samples 2006–2010	Total Detects 2006–2010	Method	MDL ^a	PQL ^a	Cleanup Level ^b	Unit	Cleanup-Level Type
PCB Cong	32598-10-0	PCB-66	10	3	EPA:1668A		0.000035		µg/L	
PCB Cong	PCB-66/PCB-76	PCB-66/PCB-76	18	0	EPA:1668A		0.000028		µg/L	
PCB Cong	73575-53-8	PCB-67	53	0	EPA:1668A		0.000028		µg/L	
PCB Cong	73575-52-7	PCB-68	53	2	EPA:1668A		0.000028		µg/L	
PCB Cong	33284-50-3	PCB-7	35	0	EPA:1668A		0.000007		µg/L	
PCB Cong	PCB-7/9	PCB-7/PCB-9	18	0	EPA:1668A		0.000056		µg/L	
PCB Cong	41464-42-0	PCB-72	10	1	EPA:1668A		0.000007		µg/L	
PCB Cong	74338-23-1	PCB-73	53	0	EPA:1668A		0.000028		µg/L	
PCB Cong	32690-93-0	PCB-74	43	0	EPA:1668A		0.000028		µg/L	
PCB Cong	32598-13-3	PCB-77	53	5	EPA:1668A		0.000007		µg/L	
PCB Cong	70362-49-1	PCB-78	53	0	EPA:1668A		0.000028		µg/L	
PCB Cong	41464-48-6	PCB-79	53	1	EPA:1668A		0.000028		µg/L	
PCB Cong	34883-43-7	PCB-8	10	2	EPA:1668A		0.0000114		µg/L	
PCB Cong	33284-52-5	PCB-80	53	0	EPA:1668A		0.000028		µg/L	
PCB Cong	70362-50-4	PCB-81	53	0	EPA:1668A		0.000007		µg/L	
PCB Cong	52663-62-4	PCB-82	53	5	EPA:1668A		0.000028		µg/L	
PCB Cong	60145-20-2	PCB-83	53	2	EPA:1668A		0.000028		µg/L	
PCB Cong	PCB-84/PCB-92	PCB-84/PCB-92	18	0	EPA:1668A		0.000028		µg/L	
PCB Cong	PCB-85/116	PCB-85/PCB-116	18	0	EPA:1668A		0.000028		µg/L	
PCB Cong	PCB-85/116/117	PCB-85/PCB-116/PCB-117	10	1	EPA:1668A		0.00002		µg/L	
PCB Cong	55312-69-1	PCB-86	43	0	EPA:1668A		0.000028		µg/L	
PCB Cong	PCB-87/117/125	PCB-87/PCB-117/PCB-125	18	0	EPA:1668A		0.000028		µg/L	
PCB Cong	55215-17-3	PCB-88/91	53	3	EPA:1668A		0.000028		µg/L	
PCB Cong	73575-57-2	PCB-89	53	0	EPA:1668A		0.000028		µg/L	
PCB Cong	34883-39-1	PCB-9	10	0	EPA:1668A		0.000007		µg/L	
PCB Cong	PCB-90/101	PCB-90/PCB-101	18	0	EPA:1668A		0.000028		µg/L	
PCB Cong	73575-56-1	PCB-93	43	0	EPA:1668A		0.000028		µg/L	
PCB Cong	PCB-93/100	PCB-93/PCB-100	10	0	EPA:1668A		0.0000139		µg/L	
PCB Cong	73575-55-0	PCB-94	53	0	EPA:1668A		0.000028		µg/L	
PCB Cong	PCB-95/98/102	PCB-95/PCB-98/PCB-102	18	0	EPA:1668A		0.000028		µg/L	
PCB Cong	73575-54-9	PCB-96	53	0	EPA:1668A		0.000028		µg/L	
PCB Cong	41464-51-1	PCB-97	43	1	EPA:1668A		0.000028		µg/L	
PCB Cong	PCB-98/102	PCB-98/PCB-102	10	1	EPA:1668A		0.0000139		µg/L	
PCB Cong	38380-01-7	PCB-99	53	6	EPA:1668A		0.000035		µg/L	
PCB Cong	DECACB(Total)	Total decaCB	53	1	EPA:1668A		0.000028		µg/L	
PCB Cong	25512-42-9	Total diCB	53	8	EPA:1668A		0.000056		µg/L	
PCB Cong	27323-18-8	Total monoCB	53	0	EPA:1668A		0.000028		µg/L	

Table C-4.1-2 (continued)

Suite	Analyte or CAS No.	Analyte Name	Total Samples 2006–2010	Total Detects 2006–2010	Method	MDL ^a	PQL ^a	Cleanup Level ^b	Unit	Cleanup-Level Type
PCB Cong	53742-07-7	Total nonaCB	53	6	EPA:1668A		0.000028		µg/L	
PCB Cong	55722-26-4	Total octaCB	53	7	EPA:1668A		0.000028		µg/L	
PCB Cong	25429-29-2	Total pentaCB	53	13	EPA:1668A		0.00003		µg/L	
PCB Cong	25323-68-6	Total triCB	53	7	EPA:1668A		0.000028		µg/L	
Pest	309-00-2	Aldrin	197	1	SW-846:8081A	0.005	0.02	0.0005	µg/L	NM HH OO
Pest	319-84-6	BHC[alpha-]	197	1	SW-846:8081A	0.005	0.02		µg/L	
Pest	319-85-7	BHC[beta-]	197	1	SW-846:8081A	0.006	0.02		µg/L	
Pest	319-86-8	BHC[delta-]	197	4	SW-846:8081A	0.005	0.02		µg/L	
Pest	58-89-9	BHC[gamma-]	197	1	SW-846:8081A	0.005	0.02	0.95	µg/L	NM Aqu Acute
Pest	5103-71-9	Chlordane[alpha-]	197	1	SW-846:8081A	0.005	0.02	0.0043	µg/L	NM Aqu Chronic
Pest	5103-74-2	Chlordane[gamma-]	197	2	SW-846:8081A	0.005	0.02	0.0043	µg/L	NM Aqu Chronic
Pest	72-54-8	DDD[4,4'-]	197	3	SW-846:8081A	0.01	0.04	0.001	µg/L	NM WQCC WLDLF HAB
Pest	72-55-9	DDE[4,4'-]	197	5	SW-846:8081A	0.005	0.04	0.001	µg/L	NM WQCC WLDLF HAB
Pest	50-29-3	DDT[4,4'-]	197	4	SW-846:8081A	0.01	0.04	0.001	µg/L	NM WQCC WLDLF HAB
Pest	60-57-1	Dieldrin	197	2	SW-846:8081A	0.01	0.04	0.00054	µg/L	NM HH OO
Pest	959-98-8	Endosulfan I	197	2	SW-846:8081A	0.005	0.02	0.056	µg/L	NM Aqu Chronic
Pest	33213-65-9	Endosulfan II	197	2	SW-846:8081A	0.011	0.045	0.056	µg/L	NM Aqu Chronic
Pest	1031-07-8	Endosulfan Sulfate	197	2	SW-846:8081A	0.01	0.04	89	µg/L	NM HH OO
Pest	72-20-8	Endrin	197	2	SW-846:8081A	0.01	0.04	0.036	µg/L	NM Aqu Chronic
Pest	7421-93-4	Endrin Aldehyde	197	3	SW-846:8081A	0.005	0.04	0.3	µg/L	NM HH OO
Pest	53494-70-5	Endrin Ketone	197	1	SW-846:8081A	0.01	0.04		µg/L	
Pest	76-44-8	Heptachlor	197	2	SW-846:8081A	0.005	0.02	0.0038	µg/L	NM Aqu Chronic
Pest	1024-57-3	Heptachlor Epoxide	197	2	SW-846:8081A	0.005	0.02	0.0038	µg/L	NM Aqu Chronic
Pest	72-43-5	Methoxychlor[4,4'-]	197	1	SW-846:8081A	0.05	0.2		µg/L	
Pest	8001-35-2	Toxaphene (Technical Grade)	197	0	SW-846:8081A	0.15	0.5	0.0002	µg/L	NM Aqu Chronic
Rad	Am-241	Americium-241	434	25	Alpha Spectroscopy	0.05		400	pCi/L	DOE BCG WATER
Rad	Cs-137	Cesium-137	427	9	Gamma Spectroscopy	8		40	pCi/L	DOE BCG WATER
Rad	Co-60	Cobalt-60	427	0	Gamma Spectroscopy	8		4000	pCi/L	DOE BCG WATER
Rad	GROSSA	Gross alpha	292	71	Gas Proportional Counting	3		15	pCi/L	NM LVSTK WTR STD
Rad	GROSSB	Gross beta	292	237	Gas Proportional Counting	3			pCi/L	
Rad	GROSSG	Gross gamma	427	1	Gamma Spectroscopy	120			pCi/L	
Rad	Np-237	Neptunium-237	437	0	Alpha Spectroscopy	0.05			pCi/L	
Rad	Pu-238	Plutonium-238	433	30	Alpha Spectroscopy	0.05			pCi/L	
Rad	Pu-239/240	Plutonium-239/240	433	44	Alpha Spectroscopy	0.05		200	pCi/L	DOE BCG WATER
Rad	K-40	Potassium-40	427	5	Gamma Spectroscopy	10			pCi/L	
Rad	Ra-226	Radium-226	73	11	Alpha Spectroscopy	1		30	pCi/L	NM LVSTK WTR STD
Rad	Ra-226	Radium-226	73	11	Gas Proportional Counting	1		30	pCi/L	NM LVSTK WTR STD

Table C-4.1-2 (continued)

Suite	Analyte or CAS No.	Analyte Name	Total Samples 2006–2010	Total Detects 2006–2010	Method	MDL ^a	PQL ^a	Cleanup Level ^b	Unit	Cleanup-Level Type
Rad	Ra-228	Radium-228	69	15	Gas Proportional Counting	1		30	pCi/L	NM LVSTK WTR STD
Rad	Na-22	Sodium-22	427	0	Gamma Spectroscopy	10			pCi/L	
Rad	Sr-90	Strontium-90	427	59	Gas Proportional Counting	0.5		300	pCi/L	DOE BCG WATER
Rad	Th-228	Thorium-228	69	21	Alpha Spectroscopy	0.05			pCi/L	
Rad	Th-230	Thorium-230	69	16	Alpha Spectroscopy	0.05			pCi/L	
Rad	Th-232	Thorium-232	69	23	Alpha Spectroscopy	0.05		300	pCi/L	DOE BCG WATER
Rad	H-3	Tritium	195	190	Liquid Scintillation Counting	250		20000	pCi/L	NM LVSTK WTR STD
Rad	U-234	Uranium-234	431	295	Alpha Spectroscopy	0.05		200	pCi/L	DOE BCG WATER
Rad	U-235/236	Uranium-235/236	431	39	Alpha Spectroscopy	0.05			pCi/L	
Rad	U-238	Uranium-238	431	309	Alpha Spectroscopy	0.05		200	pCi/L	DOE BCG WATER
SVOA	83-32-9	Acenaphthene	281	1	SW-846:8270C	0.33	1.1	990	µg/L	NM HH OO
SVOA	208-96-8	Acenaphthylene	281	1	SW-846:8270C	0.21	1.1		µg/L	
SVOA	62-53-3	Aniline	281	0	SW-846:8270C	2.5	10		µg/L	
SVOA	120-12-7	Anthracene	281	2	SW-846:8270C	0.21	1.1	40000	µg/L	NM HH OO
SVOA	1912-24-9	Atrazine	281	0	SW-846:8270C	3	10		µg/L	
SVOA	103-33-3	Azobenzene	281	0	SW-846:8270C	2	10		µg/L	
SVOA	92-87-5	Benzidine	281	0	SW-846:8270C	3	10		µg/L	
SVOA	56-55-3	Benzo(a)anthracene	281	2	SW-846:8270C	0.2	1		µg/L	
SVOA	50-32-8	Benzo(a)pyrene	281	3	SW-846:8270C	0.2	1	0.18	µg/L	NM HH OO
SVOA	205-99-2	Benzo(b)fluoranthene	281	1	SW-846:8270C	0.2	1		µg/L	
SVOA	191-24-2	Benzo(g,h,i)perylene	281	3	SW-846:8270C	0.2	1		µg/L	
SVOA	207-08-9	Benzo(k)fluoranthene	281	3	SW-846:8270C	0.2	1		µg/L	
SVOA	65-85-0	Benzoic Acid	281	3	SW-846:8270C	6	20		µg/L	
SVOA	100-51-6	Benzyl Alcohol	281	1	SW-846:8270C	2	10		µg/L	
SVOA	111-91-1	Bis(2-chloroethoxy)methane	281	1	SW-846:8270C	3	10		µg/L	
SVOA	111-44-4	Bis(2-chloroethyl)ether	281	1	SW-846:8270C	2	10		µg/L	
SVOA	117-81-7	Bis(2-ethylhexyl)phthalate	281	13	SW-846:8270C	2	10		µg/L	
SVOA	101-55-3	Bromophenyl-phenylether[4-]	281	1	SW-846:8270C	2	10		µg/L	
SVOA	85-68-7	Butylbenzylphthalate	281	0	SW-846:8270C	2	10	1900	µg/L	NM HH OO
SVOA	59-50-7	Chloro-3-methylphenol[4-]	281	0	SW-846:8270C	2	10		µg/L	
SVOA	106-47-8	Chloroaniline[4-]	281	0	SW-846:8270C	2	10		µg/L	
SVOA	91-58-7	Chloronaphthalene[2-]	281	1	SW-846:8270C	0.3	1	1600	µg/L	NM HH OO
SVOA	95-57-8	Chlorophenol[2-]	281	0	SW-846:8270C	2	10	150	µg/L	NM HH OO
SVOA	7005-72-3	Chlorophenyl-phenyl[4-] Ether	281	0	SW-846:8270C	2	10		µg/L	
SVOA	218-01-9	Chrysene	281	2	SW-846:8270C	0.2	1		µg/L	
SVOA	53-70-3	Dibenz(a,h)anthracene	281	3	SW-846:8270C	0.2	1		µg/L	
SVOA	132-64-9	Dibenzofuran	281	0	SW-846:8270C	2	10		µg/L	

Table C-4.1-2 (continued)

Suite	Analyte or CAS No.	Analyte Name	Total Samples 2006–2010	Total Detects 2006–2010	Method	MDL ^a	PQL ^a	Cleanup Level ^b	Unit	Cleanup-Level Type
SVOA	95-50-1	Dichlorobenzene[1,2-]	281	0	SW-846:8270C	2	10	1300	µg/L	NM HH OO
SVOA	541-73-1	Dichlorobenzene[1,3-]	281	0	SW-846:8270C	2	10	960	µg/L	NM HH OO
SVOA	106-46-7	Dichlorobenzene[1,4-]	281	1	SW-846:8270C	2	10	190	µg/L	NM HH OO
SVOA	91-94-1	Dichlorobenzidine[3,3'-]	281	0	SW-846:8270C	2	10		µg/L	
SVOA	120-83-2	Dichlorophenol[2,4-]	281	0	SW-846:8270C	2	10	290	µg/L	NM HH OO
SVOA	84-66-2	Diethylphthalate	281	3	SW-846:8270C	2	10	44000	µg/L	NM HH OO
SVOA	131-11-3	Dimethyl Phthalate	281	0	SW-846:8270C	2	10	1100000	µg/L	NM HH OO
SVOA	105-67-9	Dimethylphenol[2,4-]	281	0	SW-846:8270C	2	10	850	µg/L	NM HH OO
SVOA	84-74-2	Di-n-butylphthalate	281	0	SW-846:8270C	2	10	4500	µg/L	NM HH OO
SVOA	534-52-1	Dinitro-2-methylphenol[4,6-]	281	0	SW-846:8270C	3	10	280	µg/L	NM HH OO
SVOA	51-28-5	Dinitrophenol[2,4-]	281	0	SW-846:8270C	5	20	5300	µg/L	NM HH OO
SVOA	121-14-2	Dinitrotoluene[2,4-]	281	0	SW-846:8270C	2	10		µg/L	
SVOA	606-20-2	Dinitrotoluene[2,6-]	281	0	SW-846:8270C	2	10		µg/L	
SVOA	117-84-0	Di-n-octylphthalate	281	0	SW-846:8270C	3	10		µg/L	
SVOA	88-85-7	Dinoseb	281	0	SW-846:8270C	2	10		µg/L	
SVOA	123-91-1	Dioxane[1,4-]	270	6	SW-846:8270C	2	10		µg/L	
SVOA	122-39-4	Diphenylamine	281	0	SW-846:8270C	3	10		µg/L	
SVOA	206-44-0	Fluoranthene	281	2	SW-846:8270C	0.2	1	140	µg/L	NM HH OO
SVOA	86-73-7	Fluorene	281	2	SW-846:8270C	0.2	1	5300	µg/L	NM HH OO
SVOA	118-74-1	Hexachlorobenzene	281	0	SW-846:8270C	2	10	0.0029	µg/L	NM HH OO
SVOA	87-68-3	Hexachlorobutadiene	281	0	SW-846:8270C	2	10		µg/L	
SVOA	77-47-4	Hexachlorocyclopentadiene	281	0	SW-846:8270C	3	10	1100	µg/L	NM HH OO
SVOA	67-72-1	Hexachloroethane	281	0	SW-846:8270C	2	10		µg/L	
SVOA	193-39-5	Indeno(1,2,3-cd)pyrene	281	4	SW-846:8270C	0.2	1		µg/L	
SVOA	78-59-1	Isophorone	281	0	SW-846:8270C	3	10		µg/L	
SVOA	90-12-0	Methylnaphthalene[1-]	281	1	SW-846:8270C	0.3	1		µg/L	
SVOA	91-57-6	Methylnaphthalene[2-]	281	2	SW-846:8270C	0.3	1		µg/L	
SVOA	95-48-7	Methylphenol[2-]	281	0	SW-846:8270C	2	10		µg/L	
SVOA	106-44-5	Methylphenol[4-]	161	0	SW-846:8270C	3	10		µg/L	
SVOA	91-20-3	Naphthalene	281	1	SW-846:8270C	0.3	1		µg/L	
SVOA	88-74-4	Nitroaniline[2-]	281	0	SW-846:8270C	2	10		µg/L	
SVOA	99-09-2	Nitroaniline[3-]	281	1	SW-846:8270C	2	10		µg/L	
SVOA	100-01-6	Nitroaniline[4-]	281	1	SW-846:8270C	3	10		µg/L	
SVOA	98-95-3	Nitrobenzene	281	0	SW-846:8270C	3	10	690	µg/L	NM HH OO
SVOA	88-75-5	Nitrophenol[2-]	281	0	SW-846:8270C	2	10		µg/L	
SVOA	100-02-7	Nitrophenol[4-]	281	0	SW-846:8270C	2	10		µg/L	
SVOA	55-18-5	Nitrosodiethylamine[N-]	281	1	SW-846:8270C	2	10		µg/L	

Table C-4.1-2 (continued)

Suite	Analyte or CAS No.	Analyte Name	Total Samples 2006–2010	Total Detects 2006–2010	Method	MDL ^a	PQL ^a	Cleanup Level ^b	Unit	Cleanup-Level Type
SVOA	62-75-9	Nitrosodimethylamine[N-]	281	1	SW-846:8270C	2	10		µg/L	
SVOA	924-16-3	Nitroso-di-n-butylamine[N-]	281	1	SW-846:8270C	3	10		µg/L	
SVOA	621-64-7	Nitroso-di-n-propylamine[N-]	281	0	SW-846:8270C	2	10		µg/L	
SVOA	930-55-2	Nitrosopyrrolidine[N-]	281	1	SW-846:8270C	2	10		µg/L	
SVOA	108-60-1	Oxybis(1-chloropropane)[2,2'-]	281	0	SW-846:8270C	2	10	65000	µg/L	NM HH OO
SVOA	608-93-5	Pentachlorobenzene	281	1	SW-846:8270C	3	10		µg/L	
SVOA	87-86-5	Pentachlorophenol	281	0	SW-846:8270C	2	10	15	µg/L	NM Aqu Chronic
SVOA	85-01-8	Phenanthrene	281	3	SW-846:8270C	0.2	1		µg/L	
SVOA	108-95-2	Phenol	281	0	SW-846:8270C	1	10	860000	µg/L	NM HH OO
SVOA	129-00-0	Pyrene	281	1	SW-846:8270C	0.3	1	4000	µg/L	NM HH OO
SVOA	110-86-1	Pyridine	185	0	SW-846:8270C	3	10		µg/L	
SVOA	95-94-3	Tetrachlorobenzene[1,2,4,5]	281	1	SW-846:8270C	3	10		µg/L	
SVOA	58-90-2	Tetrachlorophenol[2,3,4,6-]	281	0	SW-846:8270C	2	10		µg/L	
SVOA	120-82-1	Trichlorobenzene[1,2,4-]	281	0	SW-846:8270C	2	10	70	µg/L	NM HH OO
SVOA	95-95-4	Trichlorophenol[2,4,5-]	281	0	SW-846:8270C	2	10		µg/L	
SVOA	88-06-2	Trichlorophenol[2,4,6-]	281	0	SW-846:8270C	2	10		µg/L	
VOA	67-64-1	Acetone	309	64	SW-846:8260B	3.5	10		µg/L	
VOA	75-05-8	Acetonitrile	309	0	SW-846:8260B	6.3	25		µg/L	
VOA	107-02-8	Acrolein	309	2	SW-846:8260B	1.3	5	9	µg/L	NM HH OO
VOA	107-13-1	Acrylonitrile	309	0	SW-846:8260B	1	5		µg/L	
VOA	71-43-2	Benzene	309	2	SW-846:8260B	0.3	1	510	µg/L	NM HH OO
VOA	108-86-1	Bromobenzene	309	0	SW-846:8260B	0.25	1		µg/L	
VOA	74-97-5	Bromochloromethane	309	0	SW-846:8260B	0.3	1		µg/L	
VOA	75-27-4	Bromodichloromethane	309	9	SW-846:8260B	0.25	1		µg/L	
VOA	75-25-2	Bromoform	309	7	SW-846:8260B	0.25	1		µg/L	
VOA	74-83-9	Bromomethane	309	0	SW-846:8260B	0.3	1	1500	µg/L	NM HH OO
VOA	71-36-3	Butanol[1-]	219	0	SW-846:8260B	15	50		µg/L	
VOA	78-93-3	Butanone[2-]	309	7	SW-846:8260B	1.3	5		µg/L	
VOA	104-51-8	Butylbenzene[n-]	309	0	SW-846:8260B	0.25	1		µg/L	
VOA	135-98-8	Butylbenzene[sec-]	309	0	SW-846:8260B	0.25	1		µg/L	
VOA	98-06-6	Butylbenzene[tert-]	309	0	SW-846:8260B	0.25	1		µg/L	
VOA	75-15-0	Carbon Disulfide	309	0	SW-846:8260B	1.3	5		µg/L	
VOA	56-23-5	Carbon Tetrachloride	309	0	SW-846:8260B	0.3	1		µg/L	
VOA	126-99-8	Chloro-1,3-butadiene[2-]	309	0	SW-846:8260B	0.3	1		µg/L	
VOA	107-05-1	Chloro-1-propene[3-]	294	0	SW-846:8260B	1.5	5		µg/L	
VOA	108-90-7	Chlorobenzene	309	0	SW-846:8260B	0.25	1	1600	µg/L	NM HH OO
VOA	124-48-1	Chlorodibromomethane	309	10	SW-846:8260B	0.3	1		µg/L	

Table C-4.1-2 (continued)

Suite	Analyte or CAS No.	Analyte Name	Total Samples 2006–2010	Total Detects 2006–2010	Method	MDL ^a	PQL ^a	Cleanup Level ^b	Unit	Cleanup-Level Type
VOA	75-00-3	Chloroethane	309	0	SW-846:8260B	0.3	1		µg/L	
VOA	67-66-3	Chloroform	309	14	SW-846:8260B	0.25	1		µg/L	
VOA	74-87-3	Chloromethane	309	2	SW-846:8260B	0.3	1		µg/L	
VOA	95-49-8	Chlorotoluene[2-]	309	0	SW-846:8260B	0.25	1		µg/L	
VOA	106-43-4	Chlorotoluene[4-]	309	0	SW-846:8260B	0.25	1		µg/L	
VOA	96-12-8	Dibromo-3-Chloropropane[1,2-]	309	0	SW-846:8260B	0.3	1		µg/L	
VOA	106-93-4	Dibromoethane[1,2-]	309	0	SW-846:8260B	0.25	1		µg/L	
VOA	74-95-3	Dibromomethane	309	0	SW-846:8260B	0.3	1		µg/L	
VOA	95-50-1	Dichlorobenzene[1,2-]	309	0	SW-846:8260B	0.25	1	1300	µg/L	NM HH OO
VOA	541-73-1	Dichlorobenzene[1,3-]	309	0	SW-846:8260B	0.25	1	960	µg/L	NM HH OO
VOA	106-46-7	Dichlorobenzene[1,4-]	309	1	SW-846:8260B	0.25	1	190	µg/L	NM HH OO
VOA	75-71-8	Dichlorodifluoromethane	309	0	SW-846:8260B	0.3	1		µg/L	
VOA	75-34-3	Dichloroethane[1,1-]	309	0	SW-846:8260B	0.3	1		µg/L	
VOA	107-06-2	Dichloroethane[1,2-]	309	0	SW-846:8260B	0.25	1		µg/L	
VOA	75-35-4	Dichloroethene[1,1-]	309	0	SW-846:8260B	0.3	1		µg/L	
VOA	156-59-2	Dichloroethene[cis-1,2-]	309	0	SW-846:8260B	0.3	1		µg/L	
VOA	156-60-5	Dichloroethene[trans-1,2-]	309	0	SW-846:8260B	0.3	1	10000	µg/L	NM HH OO
VOA	78-87-5	Dichloropropane[1,2-]	309	0	SW-846:8260B	0.25	1		µg/L	
VOA	142-28-9	Dichloropropane[1,3-]	309	0	SW-846:8260B	0.3	1		µg/L	
VOA	594-20-7	Dichloropropane[2,2-]	309	0	SW-846:8260B	0.3	1		µg/L	
VOA	563-58-6	Dichloropropene[1,1-]	309	0	SW-846:8260B	0.25	1		µg/L	
VOA	10061-01-5	Dichloropropene[cis-1,3-]	309	0	SW-846:8260B	0.25	1		µg/L	
VOA	10061-02-6	Dichloropropene[trans-1,3-]	309	0	SW-846:8260B	0.25	1		µg/L	
VOA	60-29-7	Diethyl Ether	219	3	SW-846:8260B	0.3	1		µg/L	
VOA	97-63-2	Ethyl Methacrylate	309	0	SW-846:8260B	1	5		µg/L	
VOA	100-41-4	Ethylbenzene	309	0	SW-846:8260B	0.25	1	2100	µg/L	NM HH OO
VOA	87-68-3	Hexachlorobutadiene	309	0	SW-846:8260B	0.3	1	180	µg/L	NM HH OO
VOA	591-78-6	Hexanone[2-]	309	0	SW-846:8260B	1.3	5		µg/L	
VOA	74-88-4	Iodomethane	309	0	SW-846:8260B	1.3	5		µg/L	
VOA	78-83-1	Isobutyl alcohol	309	0	SW-846:8260B	13	50		µg/L	
VOA	98-82-8	Isopropylbenzene	309	0	SW-846:8260B	0.25	1		µg/L	
VOA	99-87-6	Isopropyltoluene[4-]	309	0	SW-846:8260B	0.25	1		µg/L	
VOA	126-98-7	Methacrylonitrile	309	0	SW-846:8260B	1	5		µg/L	
VOA	80-62-6	Methyl Methacrylate	309	0	SW-846:8260B	1	5		µg/L	
VOA	1634-04-4	Methyl tert-Butyl Ether	219	0	SW-846:8260B	0.25	1		µg/L	
VOA	108-10-1	Methyl-2-pentanone[4-]	309	0	SW-846:8260B	1.3	5		µg/L	
VOA	75-09-2	Methylene Chloride	309	2	SW-846:8260B	3	10		µg/L	

Table C-4.1-2 (continued)

Suite	Analyte or CAS No.	Analyte Name	Total Samples 2006–2010	Total Detects 2006–2010	Method	MDL ^a	PQL ^a	Cleanup Level ^b	Unit	Cleanup-Level Type
VOA	91-20-3	Naphthalene	309	1	SW-846:8260B	0.25	1		µg/L	
VOA	107-12-0	Propionitrile	309	0	SW-846:8260B	1.5	5		µg/L	
VOA	103-65-1	Propylbenzene[1-]	309	0	SW-846:8260B	0.25	1		µg/L	
VOA	100-42-5	Styrene	309	1	SW-846:8260B	0.25	1		µg/L	
VOA	630-20-6	Tetrachloroethane[1,1,1,2-]	309	0	SW-846:8260B	0.3	1		µg/L	
VOA	79-34-5	Tetrachloroethane[1,1,2,2-]	309	0	SW-846:8260B	0.25	1		µg/L	
VOA	127-18-4	Tetrachloroethene	309	0	SW-846:8260B	0.3	1	33	µg/L	NM HH OO
VOA	108-88-3	Toluene	309	5	SW-846:8260B	0.25	1	15000	µg/L	NM HH OO
VOA	76-13-1	Trichloro-1,2,2-trifluoroethane[1,1,2-]	309	0	SW-846:8260B	1	5		µg/L	
VOA	87-61-6	Trichlorobenzene[1,2,3-]	309	0	SW-846:8260B	0.33	1		µg/L	
VOA	120-82-1	Trichlorobenzene[1,2,4-]	309	0	SW-846:8260B	0.3	1	70	µg/L	NM HH OO
VOA	71-55-6	Trichloroethane[1,1,1-]	309	2	SW-846:8260B	0.33	1		µg/L	
VOA	79-00-5	Trichloroethane[1,1,2-]	309	0	SW-846:8260B	0.25	1		µg/L	
VOA	79-01-6	Trichloroethene	309	0	SW-846:8260B	0.25	1		µg/L	
VOA	75-69-4	Trichlorofluoromethane	309	0	SW-846:8260B	0.3	1		µg/L	
VOA	96-18-4	Trichloropropane[1,2,3-]	309	0	SW-846:8260B	0.3	1		µg/L	
VOA	95-63-6	Trimethylbenzene[1,2,4-]	309	0	SW-846:8260B	0.25	1		µg/L	
VOA	108-67-8	Trimethylbenzene[1,3,5-]	309	0	SW-846:8260B	0.25	1		µg/L	
VOA	108-05-4	Vinyl acetate	309	0	SW-846:8260B	1.5	5		µg/L	
VOA	75-01-4	Vinyl Chloride	309	0	SW-846:8260B	0.5	1		µg/L	
VOA	95-47-6	Xylene[1,2-]	309	0	SW-846:8260B	0.3	1		µg/L	
VOA	Xylene[1,3 and 1,4]	Xylene[1,3-]+Xylene[1,4-]	308	0	SW-846:8260B	0.5	2		µg/L	

Note: Blank cells indicate there are no values.

^a Mode (most frequent) of values reported for 2010 data.

^b This value is derived as a result of logic provided in Appendix B-2.0, Protocol for Selecting Cleanup Levels.

Table C-4.1-3
Analytes with PQLs above Groundwater Cleanup Levels

Suite	Analyte or CAS No.	Analyte Name	Total Samples 2006–2010	Total Detects 2006–2010	Method	MDL ^a	PQL ^a	Cleanup Level ^b	Background ^c	Background ^d	Unit	Cleanup-Level Type	Comment
Herb	94-74-6	MCPA	388	0	SW-846:8151A	12	53	18			µg/L	EPA TAP SCRNLVL	Although the PQL is higher, the MDL is less than the EPA tap water screening level. The Laboratory uses a routine analytical method for this compound under its contract analytical program.
Herb	93-65-2	MCPP	388	0	SW-846:8151A	11	53	37			µg/L	EPA TAP SCRNLVL	Although the PQL is higher, the MDL is less than the EPA tap water screening level. The Laboratory uses a routine analytical method for this compound under its contract analytical program.
Metals	Be	Beryllium	4761	59	SW-846:6010B	1	5	4	1	1	µg/L	EPA MCL	Although the PQL is higher, the MDL is less than the EPA maximum contaminant level (MCL). The Laboratory uses a routine analytical method for this compound under its contract analytical program.
SVOA	1912-24-9	Atrazine	2074	0	SW-846:8270C	3	10	3			µg/L	EPA MCL	Although the PQL is higher, the MDL is equal to the EPA MCL. The Laboratory uses a routine analytical method for this compound under its contract analytical program.
SVOA	103-33-3	Azobenzene	2074	0	SW-846:8270C	2	10	1.3			µg/L	EPA TAP SCRNLVL	The MDL exceeds the EPA tap water screening level. The Laboratory uses a routine analytical method for this compound under its contract analytical program.
SVOA	92-87-5	Benzidine	2074	0	SW-846:8270C	3	10	0.00094			µg/L	EPA TAP SCRNLVL	The MDL exceeds the EPA tap water screening level. The Laboratory uses a routine analytical method for this compound under its contract analytical program.
SVOA	56-55-3	Benzo(a)anthracene	2074	6	SW-846:8270C	0.2	1	0.29			µg/L	EPA TAP SCRNLVL	Although the PQL is higher, the MDL is less than the EPA tap water screening level. The Laboratory uses a routine analytical method for this compound under its contract analytical program.
SVOA	50-32-8	Benzo(a)pyrene	2074	9	SW-846:8270C	0.2	1	0.2			µg/L	EPA MCL	Although the PQL is higher, the MDL is equal to the EPA MCL. The Laboratory uses a routine analytical method for this compound under its contract analytical program.
SVOA	205-99-2	Benzo(b)fluoranthene	2074	10	SW-846:8270C	0.2	1	0.29			µg/L	EPA TAP SCRNLVL	Although the PQL is higher, the MDL is less than the EPA tap water screening level. The Laboratory uses a routine analytical method for this compound under its contract analytical program.
SVOA	111-44-4	Bis(2-chloroethyl)ether	2074	0	SW-846:8270C	2	10	0.12			µg/L	EPA TAP SCRNLVL	The MDL exceeds the EPA tap water screening level. The Laboratory uses a routine analytical method for this compound under its contract analytical program.
SVOA	117-81-7	Bis(2-ethylhexyl)phthalate	2074	128	SW-846:8270C	2	10	6			µg/L	EPA MCL	Although the PQL is higher, the MDL is less than the EPA MCL. The Laboratory uses a routine analytical method for this compound under its contract analytical program.
SVOA	106-47-8	Chloroaniline[4-]	2074	0	SW-846:8270C	2	10	3.4			µg/L	EPA TAP SCRNLVL	Although the PQL is higher, the MDL is less than the EPA tap water screening level. The Laboratory uses a routine analytical method for this compound under its contract analytical program.
SVOA	53-70-3	Dibenz(a,h)anthracene	2074	4	SW-846:8270C	0.2	1	0.029			µg/L	EPA TAP SCRNLVL	The MDL exceeds the EPA tap water screening level. The Laboratory uses a routine analytical method for this compound under its contract analytical program.
SVOA	91-94-1	Dichlorobenzidine[3,3'-]	2074	0	SW-846:8270C	2	10	1.5			µg/L	EPA TAP SCRNLVL	The MDL exceeds the EPA tap water screening level. The Laboratory uses a routine analytical method for this compound under its contract analytical program.
SVOA	534-52-1	Dinitro-2-methylphenol[4,6-]	2074	0	SW-846:8270C	3	10	2.9			µg/L	EPA TAP SCRNLVL	The MDL exceeds the EPA tap water screening level. The Laboratory uses a routine analytical method for this compound under its contract analytical program.

Table C-4.1-3 (continued)

Suite	Analyte or CAS No.	Analyte Name	Total Samples 2006–2010	Total Detects 2006–2010	Method	MDL ^a	PQL ^a	Cleanup Level ^b	Background ^c	Background ^d	Unit	Cleanup-Level Type	Comment
SVOA	121-14-2	Dinitrotoluene[2,4-]	2074	14	SW-846:8270C	2	10	2.2			µg/L	EPA TAP SCRNLVL	The Laboratory also analyzes this compound by SW-846:8321; that PQL is below the EPA tap water screening level.
SVOA	88-85-7	Dinoseb	2074	0	SW-846:8270C	2	10	7			µg/L	EPA MCL	The Laboratory also analyzes this compound by SW-846:8151A; that PQL is below the EPA MCL.
SVOA	123-91-1	Dioxane[1,4-]	2010	119	SW-846:8270C	2	10	6.7			µg/L	EPA TAP SCRNLVL	Although the PQL is higher, the MDL is less than the EPA tap water screening level. The Laboratory uses a routine analytical method for this compound under its contract analytical program.
SVOA	118-74-1	Hexachlorobenzene	2074	0	SW-846:8270C	2	10	1			µg/L	EPA MCL	The MDL exceeds the EPA MCL. The Laboratory uses a routine analytical method for this compound under its contract analytical program.
SVOA	87-68-3	Hexachlorobutadiene	2074	0	SW-846:8270C	2	10	8.6			µg/L	EPA TAP SCRNLVL	The Laboratory also analyzes this compound by SW-846:8260B; that PQL is below the EPA tap water screening level
SVOA	193-39-5	Indeno(1,2,3-cd)pyrene	2074	5	SW-846:8270C	0.2	1	0.29			µg/L	EPA TAP SCRNLVL	Although the PQL is higher, the MDL is less than the EPA tap water screening level. The Laboratory uses a routine analytical method for this compound under its contract analytical program.
SVOA	98-95-3	Nitrobenzene	2074	2	SW-846:8270C	3	10	1.2			µg/L	EPA TAP SCRNLVL	The Laboratory also analyzes this compound by SW-846:8321; that PQL is below the EPA tap water screening level
SVOA	55-18-5	Nitrosodiethylamine[N-]	2074	0	SW-846:8270C	2	10	0.0014			µg/L	EPA TAP SCRNLVL	The MDL exceeds the EPA tap water screening level. The Laboratory uses a routine analytical method for this compound under its contract analytical program.
SVOA	62-75-9	Nitrosodimethylamine[N-]	2074	0	SW-846:8270C	2	10	0.0042			µg/L	EPA TAP SCRNLVL	The MDL exceeds the EPA tap water screening level. The Laboratory uses a routine analytical method for this compound under its contract analytical program.
SVOA	924-16-3	Nitroso-di-n-butylamine[N-]	2074	0	SW-846:8270C	3	10	0.024			µg/L	EPA TAP SCRNLVL	The MDL exceeds the EPA tap water screening level. The Laboratory uses a routine analytical method for this compound under its contract analytical program.
SVOA	621-64-7	Nitroso-di-n-propylamine[N-]	2074	0	SW-846:8270C	2	10	0.096			µg/L	EPA TAP SCRNLVL	The MDL exceeds the EPA tap water screening level. The Laboratory uses a routine analytical method for this compound under its contract analytical program.
SVOA	930-55-2	Nitrosopyrrolidine[N-]	2074	0	SW-846:8270C	2	10	0.32			µg/L	EPA TAP SCRNLVL	The MDL exceeds the EPA tap water screening level. The Laboratory uses a routine analytical method for this compound under its contract analytical program.
SVOA	108-60-1	Oxybis(1-chloropropane)[2,2'-]	2074	0	SW-846:8270C	2	10	3.2			µg/L	EPA TAP SCRNLVL	Although the PQL is higher, the MDL is less than the EPA tap water screening level. The Laboratory uses a routine analytical method for this compound under its contract analytical program.
SVOA	87-86-5	Pentachlorophenol	2074	1	SW-846:8270C	2	10	1			µg/L	EPA MCL	The MDL exceeds the EPA MCL. The Laboratory uses a routine analytical method for this compound under its contract analytical program.
SVOA	108-95-2	Phenol	2074	5	SW-846:8270C	1	10	5			µg/L	NM GW STD	Although the PQL is higher, the MDL is less than the NM groundwater standard. The Laboratory uses a routine analytical method for this compound under its contract analytical program.
VOA	107-02-8	Acrolein	2543	2	SW-846:8260B	1.3	5	0.042			µg/L	EPA TAP SCRNLVL	The MDL exceeds the EPA tap water screening level. The Laboratory uses a routine analytical method for this compound under its contract analytical program.

Table C-4.1-3 (continued)

Suite	Analyte or CAS No.	Analyte Name	Total Samples 2006–2010	Total Detects 2006–2010	Method	MDL ^a	PQL ^a	Cleanup Level ^b	Background ^c	Background ^d	Unit	Cleanup-Level Type	Comment
VOA	107-13-1	Acrylonitrile	2543	0	SW-846:8260B	1	5	0.45			µg/L	EPA TAP SCRNLVL	The MDL exceeds the EPA tap water screening level. The Laboratory uses a routine analytical method for this compound under its contract analytical program.
VOA	126-99-8	Chloro-1,3-butadiene[2-]	2543	0	SW-846:8260B	0.3	1	0.16			µg/L	EPA TAP SCRNLVL	The MDL exceeds the EPA tap water screening level. The Laboratory uses a routine analytical method for this compound under its contract analytical program.
VOA	96-12-8	Dibromo-3-Chloropropane[1,2-]	2543	0	SW-846:8260B	0.3	1	0.2			µg/L	EPA MCL	The MDL exceeds the EPA MCL. The Laboratory uses a routine analytical method for this compound under its contract analytical program.
VOA	106-93-4	Dibromoethane[1,2-]	2543	0	SW-846:8260B	0.25	1	0.05			µg/L	EPA MCL	The MDL exceeds the EPA MCL. The Laboratory uses a routine analytical method for this compound under its contract analytical program.
VOA	126-98-7	Methacrylonitrile	2542	0	SW-846:8260B	1	5	1			µg/L	EPA TAP SCRNLVL	Although the PQL is higher, the MDL is equal to the EPA tap water screening level. The Laboratory uses a routine analytical method for this compound under its contract analytical program.
VOA	75-09-2	Methylene Chloride	2543	15	SW-846:8260B	3	10	5			µg/L	EPA MCL	Although the PQL is higher, the MDL is less than the EPA MCL. The Laboratory uses a routine analytical method for this compound under its contract analytical program.
VOA	96-18-4	Trichloropropane[1,2,3-]	2543	0	SW-846:8260B	0.3	1	0.0072			µg/L	EPA TAP SCRNLVL	The MDL exceeds the EPA tap water screening level. The Laboratory uses a routine analytical method for this compound under its contract analytical program.

Note: Blank cells indicate there are no values.

^a Mode (most frequent) of values reported for 2010 data.

^b This value is derived as result of logic provided in Appendix B-2.0, Protocol for Selecting Cleanup Levels.

^c Lowest of background values for alluvial, intermediate, and regional groundwater as identified in the Laboratory's 2007 groundwater background report (LANL 2007, 095817).

^d Lowest of background values for intermediate and regional groundwater as identified in the Laboratory's 2010 groundwater background report (LANL 2010, 110535).

Table C-4.1-4
Analytes with PQLs above Groundwater Background Levels

Suite	Analyte or CAS No.	Analyte Name	Total Samples 2006–2010	Total Detects 2006–2010	Method	MDL ^a	PQL ^a	Cleanup Level ^b	Background ^c	Background ^d	Unit	Cleanup-Level Type	Comment
Geninorg	NH3-N	Ammonia as Nitrogen	2706	497	EPA:350.1	0.016	0.05		0.04	0.07	mg/L		The PQL exceeds the background. The Laboratory uses a routine analytical method for this compound under its contract analytical program.
Geninorg	Br(-1)	Bromide	2699	669	EPA:300.0	0.066	0.2		0.03	0.07	mg/L		The MDL exceeds the background. The Laboratory uses a routine analytical method for this compound under its contract analytical program.
Geninorg	ClO4	Perchlorate	3364	2541	SW-846:6850	0.05	0.2	4	0.05	0.48	µg/L	NM GW CONS	While the PQL is above background, the MDL and the PQL are less than the Consent Order screening value
Geninorg	TKN	Total Kjeldahl Nitrogen	3142	1084	EPA:351.2	0.033	0.1		0.04	0.29	mg/L		The PQL exceeds the background. The Laboratory uses a routine analytical method for this compound under its contract analytical program.
Geninorg	TOC	Total Organic Carbon	2273	1898	SW-846:9060	0.33	1		0.33	0.07	mg/L		The PQL exceeds the background. The Laboratory uses a routine analytical method for this compound under its contract analytical program.
Metals	Al	Aluminum	4766	1573	SW-846:6010B	68	200	5000	68	68	µg/L	NM GW STD	While the PQL is above background, the MDL and the PQL are less than the NM groundwater standard.
Metals	Sb	Antimony	4757	130	SW-846:6020	0.5	3	6	0.5	0.5	µg/L	EPA MCL	While the PQL is above background, the MDL and the PQL are less than the EPA MCL.
Metals	As	Arsenic	4758	1054	SW-846:6020	1.5	5	10	4.32	3.43	µg/L	EPA MCL	While the PQL is above background, the MDL and the PQL are less than the EPA MCL.
Metals	Be	Beryllium	4761	59	SW-846:6010B	1	5	4	1	1	µg/L	EPA MCL	The MDL is less than the EPA MCL. The Laboratory uses a routine analytical method for this compound under its contract analytical program.
Metals	B	Boron	4752	3373	SW-846:6010B	15	50	750	15.1	35.42	µg/L	NM GW STD	While the PQL is above background, the MDL and the PQL are less than the NM groundwater standard.
Metals	Cr	Chromium	5093	3290	SW-846:6020	2.5	10	50	1	4.74	µg/L	NM GW STD	The MDL is less than the New Mexico groundwater standard. The Laboratory uses a routine analytical method for this compound under its contract analytical program.
Metals	Co	Cobalt	4761	458	SW-846:6010B	1	5	50	0.5	1	µg/L	NM GW STD	The MDL is less than the New Mexico groundwater standard. The Laboratory uses a routine analytical method for this compound under its contract analytical program.
Metals	Cu	Copper	4761	702	SW-846:6010B	3	10	1000	3	3	µg/L	NM GW STD	While the PQL is above background, the MDL and the PQL are less than the NM groundwater standard
Metals	Fe	Iron	4766	2600	SW-846:6010B	30	100	1000	21	30	µg/L	NM GW STD	The MDL is less than the New Mexico groundwater standard. The Laboratory uses a routine analytical method for this compound under its contract analytical program.
Metals	Pb	Lead	4756	857	SW-846:6020	0.5	2	15	0.5	0.5	µg/L	EPA MCL	While the PQL is above background, the MDL and the PQL are less than the EPA MCL.
Metals	Mn	Manganese	4766	2632	SW-846:6010B	2	10	200	2	36	µg/L	NM GW STD	While the PQL is above background, the MDL and the PQL are less than the NM groundwater standard.
Metals	Hg	Mercury	4732	103	EPA:245.2	0.066	0.2	2	0.06	0.07	µg/L	EPA MCL	The MDL is less than the EPA MCL. The Laboratory uses a routine analytical method for this compound under its contract analytical program.
Metals	Ni	Nickel	4756	3849	SW-846:6020	0.5	2	200	1	2.98	µg/L	NM GW STD	While the PQL is above background, the MDL and the PQL are less than the NM groundwater standard.
Metals	Sn	Tin	4733	84	SW-846:6010B	2.5	10	22000	3.26	25	µg/L	EPA TAP SCRNLVL	While the PQL is above background, the MDL and the PQL are less than the EPA tap water screening level
Metals	V	Vanadium	4761	3819	SW-846:6010B	1	5	180	1	15.21	µg/L	EPA TAP SCRNLVL	While the PQL is above background, the MDL and the PQL are less than the EPA tap water screening level

Table C-4.1-4 (continued)

Suite	Analyte or CAS No.	Analyte Name	Total Samples 2006–2010	Total Detects 2006–2010	Method	MDL ^a	PQL ^a	Cleanup Level ^b	Background ^c	Background ^d	Unit	Cleanup-Level Type	Comment
Metals	Zn	Zinc	4763	2777	SW-846:6010B	3.3	10	10000	2	3.3	µg/L	NM GW STD	The MDL is less than the New Mexico groundwater standard. The Laboratory uses a routine analytical method for this compound under its contract analytical program.
Rad	Am-241	Americium-241	2578	61	Alpha Spectroscopy	0.05		1.2	0.04	0.05	pCi/L	DOE DW DCG	The MDA is less than the DOE Derived Concentration Guidelines (DCG). The Laboratory uses a routine analytical method for this compound under its contract analytical program.
Rad	Cs-137	Cesium-137	2552	3	Gamma Spectroscopy	8		120	5.8	6.92	pCi/L	DOE DW DCG	The minimum detectable activity is less than the DOE DCG. The Laboratory uses a routine analytical method for this compound under its contract analytical program.
Rad	GROSSA	Gross alpha	1821	377	Gas Proportional Counting	3		15	2.98	2.75	pCi/L	EPA action level	The minimum detectable activity is less than the EPA action level. The Laboratory uses a routine analytical method for this compound under its contract analytical program.
Rad	Sr-90	Strontium-90	2585	184	Gas Proportional Counting	0.5		8	0.29	0.51	pCi/L	EPA action level	The minimum detectable activity is less than the EPA action level. The Laboratory uses a routine analytical method for this compound under its contract analytical program.
Rad	H-3	Tritium	2454	1197	Liquid Scintillation Counting	250		20000	0.32	6.26	pCi/L	EPA action level	The MDL exceeds the background but is below the EPA action level. This background value was determined using data from a laboratory no longer under contract. The Laboratory uses a routine analytical method for this compound under its contract analytical program.

Note: Blank cells indicate there are no values.

^a Mode (most frequent) of values reported for 2010 data.

^b This value is derived as result of logic provided in Appendix B-2.0, Protocol for Selecting Cleanup Levels.

^c Lowest of background values for alluvial, intermediate, and regional groundwater as identified in the Laboratory's 2007 groundwater background report (LANL 2007, 095817).

^d Lowest of background values for intermediate and regional groundwater as identified in the Laboratory's 2010 groundwater background report (LANL 2010, 110535).

Table C-4.1-5
Analytes with a PQL above Base-Flow Cleanup Levels

Suite	Analyte or CAS No.	Analyte Name	Total Samples 2006–2010	Total Detects 2006–2010	Method	MDL ^a	PQL ^a	Screening Level ^b	Unit	Screening-Level Type	Comment
Diox/Fur	1746-01-6	Tetrachlorodibenzodioxin[2,3,7,8-]	75	3	SW-846:8290		0.00001	5.1E-08	µg/L	NM HH OO	The PQL exceeds the New Mexico human health numerical criterion. The Laboratory uses a routine analytical method for this compound under its contract analytical program.
Metals	Cd	Cadmium	724	70	SW-846:6020	0.11	1	0.23	µg/L	NM Aqu Chronic 30 mg/L hardness	Although the PQL is higher, the MDL is less than the New Mexico aquatic chronic numerical criterion. The Laboratory uses a routine analytical method for this compound under its contract analytical program.
Metals	Cu	Copper	724	264	SW-846:6010B	3	10	4	µg/L	NM Aqu Chronic 30 mg/L hardness	Although the PQL is higher, the MDL is less than the New Mexico aquatic chronic numerical criterion. The Laboratory uses a routine analytical method for this compound under its contract analytical program.
Metals	Pb	Lead	724	286	SW-846:6020	0.5	2	1	µg/L	NM Aqu Chronic 30 mg/L hardness	Although the PQL is higher, the MDL is less than the New Mexico aquatic chronic numerical criterion. The Laboratory uses a routine analytical method for this compound under its contract analytical program.
Metals	Ag	Silver	724	78	SW-846:6020	0.2	1	0.7	µg/L	NM Aqu Chronic 30 mg/L hardness	Although the PQL is higher, the MDL is less than the New Mexico aquatic chronic numerical criterion. The Laboratory uses a routine analytical method for this compound under its contract analytical program.
Metals	Tl	Thallium	724	69	SW-846:6020	0.3	1	0.47	µg/L	NM HH OO	Although the PQL is higher, the MDL is less than the New Mexico human health numerical criterion. The Laboratory uses a routine analytical method for this compound under its contract analytical program.
PCB	12674-11-2	Aroclor-1016	216	0	SW-846:8082	0.033	0.1	0.00064	µg/L	NM HH OO	The Laboratory also analyzes PCBs by EPA:1668A; the PQL for that method is less than the New Mexico human health numerical criterion.
PCB	11104-28-2	Aroclor-1221	216	0	SW-846:8082	0.033	0.1	0.00064	µg/L	NM HH OO	The Laboratory also analyzes PCBs by EPA:1668A; the PQL for that method is less than the New Mexico human health numerical criterion.
PCB	11141-16-5	Aroclor-1232	216	0	SW-846:8082	0.033	0.1	0.00064	µg/L	NM HH OO	The Laboratory also analyzes PCBs by EPA:1668A; the PQL for that method is less than the New Mexico human health numerical criterion.
PCB	53469-21-9	Aroclor-1242	216	0	SW-846:8082	0.033	0.1	0.00064	µg/L	NM HH OO	The Laboratory also analyzes PCBs by EPA:1668A; the PQL for that method is less than the New Mexico human health numerical criterion.
PCB	12672-29-6	Aroclor-1248	216	0	SW-846:8082	0.033	0.1	0.00064	µg/L	NM HH OO	The Laboratory also analyzes PCBs by EPA:1668A; the PQL for that method is less than the New Mexico human health numerical criterion.
PCB	11097-69-1	Aroclor-1254	216	6	SW-846:8082	0.033	0.1	0.00064	µg/L	NM HH OO	The Laboratory also analyzes PCBs by EPA:1668A; the PQL for that method is less than the New Mexico human health numerical criterion.
PCB	11096-82-5	Aroclor-1260	216	7	SW-846:8082	0.033	0.1	0.00064	µg/L	NM HH OO	The Laboratory also analyzes PCBs by EPA:1668A; the PQL for that method is less than the New Mexico human health numerical criterion.
PCB	37324-23-5	Aroclor-1262	216	0	SW-846:8082	0.033	0.1	0.00064	µg/L	NM HH OO	The Laboratory also analyzes PCBs by EPA:1668A; the PQL for that method is less than the New Mexico human health numerical criterion.
Pest	309-00-2	Aldrin	197	1	SW-846:8081A	0.005	0.02	0.0005	µg/L	NM HH OO	The MDL exceeds the New Mexico human health numerical criterion. The Laboratory uses a routine analytical method for this compound under its contract analytical program.
Pest	5103-71-9	Chlordane[alpha-]	197	1	SW-846:8081A	0.005	0.02	0.0043	µg/L	NM Aqu Chronic	The MDL exceeds the New Mexico aquatic chronic numerical criterion. The Laboratory uses a routine analytical method for this compound under its contract analytical program.
Pest	5103-74-2	Chlordane[gamma-]	197	2	SW-846:8081A	0.005	0.02	0.0043	µg/L	NM Aqu Chronic	The MDL exceeds the New Mexico aquatic chronic numerical criterion. The Laboratory uses a routine analytical method for this compound under its contract analytical program.
Pest	72-54-8	DDD[4,4'-]	197	3	SW-846:8081A	0.01	0.04	0.001	µg/L	NM WQCC WLDLF HAB	The MDL exceeds the New Mexico wildlife habitat numerical criterion. The Laboratory uses a routine analytical method for this compound under its contract analytical program.
Pest	72-55-9	DDE[4,4'-]	197	5	SW-846:8081A	0.005	0.04	0.001	µg/L	NM WQCC WLDLF HAB	The MDL exceeds the New Mexico wildlife habitat numerical criterion. The Laboratory uses a routine analytical method for this compound under its contract analytical program.

Table C-4.1-5 (continued)

Suite	Analyte or CAS No.	Analyte Name	Total Samples 2006–2010	Total Detects 2006–2010	Method	MDL ^a	PQL ^a	Screening Level ^b	Unit	Screening-Level Type	Comment
Pest	50-29-3	DDT[4,4'-]	197	4	SW-846:8081A	0.01	0.04	0.001	µg/L	NM WQCC WLDLF HAB	The MDL exceeds the New Mexico wildlife habitat numerical criterion. The Laboratory uses a routine analytical method for this compound under its contract analytical program.
Pest	60-57-1	Dieldrin	197	2	SW-846:8081A	0.01	0.04	0.00054	µg/L	NM HH OO	The MDL exceeds the New Mexico human health numerical criterion. The Laboratory uses a routine analytical method for this compound under its contract analytical program.
Pest	72-20-8	Endrin	197	2	SW-846:8081A	0.01	0.04	0.036	µg/L	NM Aqu Chronic	Although the PQL is higher, the MDL is less than the New Mexico aquatic chronic numerical criterion. The Laboratory uses a routine analytical method for this compound under its contract analytical program.
Pest	76-44-8	Heptachlor	197	2	SW-846:8081A	0.005	0.02	0.0038	µg/L	NM Aqu Chronic	The MDL exceeds the New Mexico aquatic chronic numerical criterion. The Laboratory uses a routine analytical method for this compound under its contract analytical program.
Pest	1024-57-3	Heptachlor Epoxide	197	2	SW-846:8081A	0.005	0.02	0.0038	µg/L	NM Aqu Chronic	The MDL exceeds the New Mexico aquatic chronic numerical criterion. The Laboratory uses a routine analytical method for this compound under its contract analytical program.
Pest	8001-35-2	Toxaphene (Technical Grade)	197	0	SW-846:8081A	0.15	0.5	0.0002	µg/L	NM Aqu Chronic	The MDL exceeds the New Mexico aquatic chronic numerical criterion. The Laboratory uses a routine analytical method for this compound under its contract analytical program.
SVOA	50-32-8	Benzo(a)pyrene	281	3	SW-846:8270C	0.2	1	0.18	µg/L	NM HH OO	The MDL exceeds the New Mexico human health numerical criterion. The Laboratory uses a routine analytical method for this compound under its contract analytical program.
SVOA	118-74-1	Hexachlorobenzene	281	0	SW-846:8270C	2	10	0.0029	µg/L	NM HH OO	The MDL exceeds the New Mexico human health numerical criterion. The Laboratory uses a routine analytical method for this compound under its contract analytical program.

Note: Blank cells indicate there are no values.

^a Mode (most frequent) of values reported for 2010 data.

^b This value is derived as result of logic provided in Appendix B-2.0, Protocol for Selecting Screening Levels.

Table C-4.2-1
Analytical Methods, PQLs, and MDLs for Analytes Reported by GGRL

Analyte	Analytical Method	Method Description	MDL	PQL	Unit
General Inorganics					
Alkalinity-CO ₃	EPA:310.1	Titrimetric	0.8	4	mg/L
Alkalinity-CO ₃ +HCO ₃	EPA:310.1	Titrimetric	0.8	4	mg/L
Ammonia as Nitrogen	EPA:350.3	Ion selective electrode	0.1	0.5	mg/L
Bromide	EPA:300.0	Ion chromatography	0.01	0.05	mg/L
Calcium	EPA:200.7	ICP-AES ^a	0.01	0.05	mg/L
Chloride	EPA:300.0	Ion chromatography	0.01	0.05	mg/L
Fluoride	EPA:300.0	Ion chromatography	0.01	0.05	mg/L
Magnesium	EPA:200.7	ICP-AES	0.01	0.05	mg/L
Nitrite as Nitrogen	EPA:300.0	Ion chromatography	0.003	0.015	mg/L
Nitrate as Nitrogen	EPA:300.0	Ion chromatography	0.002	0.01	mg/L
Oxalate	EPA:300.0	Ion chromatography	0.01	0.05	mg/L
Perchlorate	EPA:314.0	Ion chromatography	2	10	µg/L
pH	EPA:150.1	pH meter	— ^b	—	SU
Phosphorus, Orthophosphate (Expressed as PO ₄)	EPA:300.0	Ion chromatography	0.01	—	mg/L
Potassium	EPA:200.7	ICP-AES	0.01	—	mg/L
Sodium	EPA:200.7	ICP-AES	0.01	0.05	mg/L
Sulfate	EPA:300.0	Ion chromatography	0.01	0.05	mg/L
Total Organic Carbon	SW-846:9060	Carbonaceous analyzer	0.2	1	mg/L
Sulfide, Total	EPA:376.2	Colorimetric	0.01	0.05	mg/L
Metals					
Aluminum	EPA:200.7	ICP-AES	1	5	µg/L
Antimony	EPA:200.8	ICP-MS ^c	1	5	µg/L
Arsenic	EPA:200.8	ICP-MS	0.2	1	µg/L
Barium	EPA:200.7	ICP-AES	1	5	µg/L
Beryllium	EPA:200.8	ICP-MS	1	5	µg/L
Boron	EPA:200.7	ICP-AES	2	10	µg/L
Cadmium	EPA:200.8	ICP-MS	1	5	µg/L
Cesium	EPA:200.8	ICP-MS	1	5	µg/L
Chromium	EPA:200.8	ICP-MS	1	5	µg/L
Chromium Hexavalent Ion	SW-846:7196A	Ultraviolet–Visible Spectrophotometry	0.05	0.25	µg/L
Cobalt	EPA:200.8	ICP-MS	1	5	µg/L
Copper	EPA:200.8	ICP-MS	1	5	µg/L
Iron	EPA:200.7	ICP-AES	10	50	µg/L
Lithium	EPA:200.7	ICP-AES	1	5	µg/L
Lead	EPA:200.8	ICP-MS	0.2	1	µg/L
Manganese	EPA:200.7	ICP-AES	1	5	µg/L
Mercury	EPA:200.8	ICP-MS	0.05	0.25	µg/L

Table C-4.2-1 (continued)

Analyte	Analytical Method	Method Description	MDL	PQL	Unit
Molybdenum	EPA:200.8	ICP-MS	1	5	µg/L
Nickel	EPA:200.8	ICP-MS	1	5	µg/L
Selenium	EPA:200.8	ICP-MS	1	5	µg/L
Silicon Dioxide	EPA:200.7	ICP-AES	0.0214	0.107	mg/L
Silver	EPA:200.8	ICP-MS	1	5	µg/L
Strontium	EPA:200.7	ICP-AES	1	5	µg/L
Thallium	EPA:200.8	ICP-MS	1	5	µg/L
Tin	EPA:200.8	ICP-MS	1	5	µg/L
Titanium	EPA:200.7	ICP-AES	2	10	µg/L
Uranium	EPA:200.8	ICP-MS	0.2	1	µg/L
Vanadium	EPA:200.8	ICP-MS	1	5	µg/L
Zinc	EPA:200.7	ICP-AES	1	5	µg/L
Isotope					
Deuterium Ratio	Generic:Deuterium Ratio	Isotope ratio mass spectrometry	—	—	permil
Oxygen-18/Oxygen-16 Ratio	Generic:Oxygen Isotope Ratio	Isotope ratio mass spectrometry	—	—	permil
Nitrogen-15/Nitrogen-14 Ratio	Generic:Nitrogen Isotope Ratio	Isotope ratio mass spectrometry	—	—	permil

^a ICP-AES = inductively coupled plasma atomic emission spectroscopy.

^b — = Not applicable.

^c ICP-MS = inductively coupled mass spectrometry.

Table C-5.0-1
Waste Stream, Estimated Volumes, and Management of IDW

Waste Stream	Estimated Volume	On-Site Management and Final Disposition
Purge water	5 to 3000 gal. per well per sampling event	Land application per ENV-RCRA-SOP-010, Land Application of Groundwater
Contact waste	Less than 110 gal. per watershed monitoring campaign	Accumulation in 55-gal. drums with drum liners. Disposal off-site at a New Mexico solid waste landfill or on-site disposal at TA-54, Area G
Decontamination fluids	Less than 55 gal. per watershed monitoring campaign	Treatment at an on-site or Laboratory-approved off-site wastewater treatment facility for which waste meets waste acceptance criteria

Appendix D

*Supplemental Information for
Assigned Sampling Suites and Frequencies*

D-1.0 INTRODUCTION

D-1.1 Introduction

Appendix D provides supplemental information relevant to this annual update of sampling frequencies and analytical suites assigned to locations in each area-specific monitoring group or watershed. Locations monitored for water-level only are also included in this appendix. Table D-1.1-1 provides an index to the assigned monitoring group for each monitoring location included in the 2010 and/or 2011 Interim Facility-Wide Groundwater Monitoring Plans (hereafter, the Interim Plans). The table lists monitoring locations in alphabetical order for each hydrologic zone: base-flow stations, springs, alluvial groundwater wells, perched-intermediate groundwater wells, and regional groundwater wells. Information provided for each location in Table D-1.1-1 includes the watershed in which it is physically located, the monitoring groups to which this location was assigned in the 2010 and 2011 Interim Plans, its current status as a monitoring location, and the table in this appendix documenting the rationale for its assigned suites and frequencies.

Table D-1.1-2 lists sampling locations that were used for the determination of background water quality for the regional and perched-intermediate aquifers in the Groundwater Background Investigation Report, Revision 3 (LANL 2007, 095817) and Revision 4 (LANL 2010, 110535).

D-1.2 Approach for Reviewing and Updating Assigned Analytical Suites and Frequencies

This section outlines the systematic approach by which water-quality data are reviewed to optimize the facility's interim monitoring plan based on the following primary considerations:

- general types of contaminants released from upgradient sources,
- extent to which contaminant nature and extent have been defined,
- expected transport characteristics of the released contaminants,
- frequency of detection of contaminants in the monitoring group,
- magnitude of concentrations relative to the lowest applicable standard, and
- direction and rate of change of contaminant concentrations.

Table D-1.2-1 provides guidance for determining a lowest-frequency sampling schedule for each analytical suite for a monitoring group based on the range of possible outcomes for the considerations listed above. The data review process is applied to each hydrologic zone in each monitoring group to generate a preliminary sampling schedule for that group. The highest sampling frequencies apply to areas in which a mobile contaminant has been detected above a standard but where its nature and extent may not have been characterized sufficiently to support decisions about actions to be taken. The lowest frequencies apply to analytes that are not chemicals of potential concern (COPC) for an area, are relatively immobile in the subsurface, and have not been detected. Sampling frequencies for a specific monitoring group may be increased above the lowest frequencies given in Table D-1.2-1 when necessary to meet other requirements or to address project needs. This process was used to derive the sampling frequencies presented in Tables 1.6-2 and 1.6-3 in the main body of this plan as described in sections D-2.0 to D-8.0 in this appendix.

The following general rules of thumb were used to define the lowest sampling frequencies for specific analytical suites (excluding those locations undergoing characterization sampling):

Naturally Occurring Constituents. General inorganics, metals, and perchlorate are sampled annually if these suites contain one or more COPC for an area, the nature and extent of those COPCs are well characterized, and additional data are not needed to support regulatory decision-making, such as an investigation report or a corrective measures evaluation (CME). To the extent that additional data are needed to meet project objectives, then the relevant analytical suite is sampled semiannually in base flow and alluvial groundwater, and quarterly in deep groundwater.

Organic Constituents. The main characteristic used to determine the lowest sampling frequency for an organic analytical suite is the mobility of its constituents. Suites containing organic constituents with moderate to high mobility in the environment (volatile organic compounds [VOCs] and, to a lesser extent, semivolatile organic compounds [SVOCs]) are sampled annually in areas for which there is a history of nondetections and where additional data are not needed to support regulatory decision-making, such as an investigation report or a CME. If consistently detected or if additional data are needed to meet project objectives, then the relevant suite is sampled semiannually in base flow and alluvial groundwater, and quarterly in deep groundwater. Analytical suites for organic constituents with low mobility in the environment (dioxins/furans, pesticides, polychlorinated biphenyls [PCBs], and high explosives [HEXP]) are sampled triennially in areas for which they are not COPCs and where there is a history of nondetections.

Radionuclides (other than tritium). If there is a history of nondetections or if detections fall within the range of natural background (for naturally occurring radionuclides), then the lowest sampling frequency applies, which is annual if radionuclides are among the COPCs for an area being monitored, and biennial otherwise. Frequency is increased to semiannual if one or more radionuclides are detected above background, if the nature and extent of radionuclide COPCs is not well characterized, or if additional data are needed to support decision-making.

Tritium. Tritium samples are collected only from springs and deep groundwater. Annual frequencies apply except where additional data are not needed to support regulatory decision-making, such as an investigation report or a CME. Samples for low-level tritium analysis are collected for locations where the average tritium activity is anticipated to be 200 pCi/L or less so as to avoid contaminating the low-level tritium laboratory.

Detection Statistics. Statistical summaries of detections for monitoring locations are provided in Attachment B-1 of Appendix B (on CD):

- Table B1-1, Analytical Data Screening for Frequency of Detection in Each Watershed or Area-Specific Monitoring Group: Groundwater (Including Springs)
- Table B1-2, Analytical Data Screening for Frequency of Detection in Each Watershed or Area-Specific Monitoring Group: Base Flow
- Table B1-3, Analytical Data Screening for Frequency of Detection at Locations in Each Watershed or Area-Specific Monitoring Group: Groundwater (Including Springs)
- Table B1-4, Analytical Data Screening for Frequency of Detection at Locations in Each Watershed or Area-Specific Monitoring Group: Base Flow

Note that analytes with practical quantitation limits above the applicable groundwater or base-flow screening levels are indicated in Tables C-4.1-3 and C-4.1-4 for groundwater and Table C-4.1-5 for base flow. Exceedances above one-half-standard are generally indeterminate for these analytes for those cases in which the analytes are not detected. These cases are not explicitly noted in the tables included in this appendix.

Based on statistical summaries of detections provided in Tables B1-3 and B1-4, Tables D-1.2-2 through D-1.2-5 provide overviews of the spatial distributions of selected analytes as a function of monitoring group, hydrologic zone, and watershed. Analytes detected at least twice above one-half standard in one or more monitoring locations are listed in Table D-1.2-2 for locations assigned to an area-specific monitoring group and in Table D-1.2-4 for locations assigned to general surveillance. Organic analytes detected two or more times at more than one location, regardless of whether or not a standard exists for them, are listed in Table D-1.2-3 for locations assigned to an area-specific monitoring group and in Table D-1.2-5 for locations assigned to general surveillance. These tables provide a basis for a preliminary monitoring plan for each monitoring group, which is then adjusted based on closer examination of the data in the context of data reliability, data adequacy, consistency with the site conceptual model, and other site-specific considerations.

D-1.3 Other Analytical Suites

Stable Isotopes of Hydrogen, Oxygen, and Nitrogen (in nitrate). Baseline stable isotope data are collected at all new wells during full-suite characterization sampling events. Baseline sampling for stable isotopes is conducted annually or semiannually, rather than quarterly, to minimize the potential of obtaining data that may not be representative of the groundwater if it has not yet fully re-equilibrated following drilling and construction activities. Baseline sampling for stable isotopes continues until a minimum of four data sets have been obtained. In the 2011 Interim Plan, sampling for stable isotopes is planned for intermediate and regional wells in monitoring groups for which these data will allow refinement of the conceptual model, specifically, the TA-54, chromium investigation, TA-21, and TA-16-260 monitoring groups. Because of ongoing questions regarding the conceptual model at Technical Area 54 (TA-54), once the initial four rounds of characterization data have been collected, stable-isotope samples will be collected on a semiannual basis for all intermediate and regional monitoring wells to provide temporal consistency within the isotope data base to facilitate comparison of data.

Stable Chromium Isotopes. A new analytical suite is established for stable chromium isotopes in the 2011 Interim Plan, applicable only to the chromium investigation monitoring group. Chromium isotopes provide information on the presence of background and anthropogenic chromate in groundwater and the degree of chromate reduction that has occurred along groundwater flow paths. As such, they are an important component of assessing the potential for natural attenuation in groundwater systems. The following locations have been chosen for continued monitoring of chromium isotopes at the frequency shown:

- R-11, annual
- R-43 screens 1 and 2, semiannual
- R-35a, annual
- R-35b, annual
- R-44 screens 1 and 2, semiannual
- R-45 screens 1 and 2, semiannual
- R-50 screens 1 and 2, quarterly
- R-15, annual
- R-61 screens 1 and 2, quarterly
- R-62 screens 1 and 2, quarterly when drilled

These locations were chosen as they are at or near the perimeter of the regional aquifer chromium plume and will provide information on chromate reduction in the regional aquifer that may be contributing to the relatively steady-state behavior of the plume. The frequency of sampling was determined by the number of existing chromium isotope data points for each well and variability in chromium isotopes previously noted at each location. Newer wells (R-50, R-61, and R-62) are proposed for quarterly sampling, whereas older wells have a lower sampling frequency.

Wells Equipped with Westbay Sampling Systems. Sampling from screens equipped with Westbay sampling systems is limited to the collection of key analytical suites because of concerns about the capability of these nonpurgeable systems to provide representative water-quality data. The current plan is to convert all remaining wells with Westbay sampling systems to dual-screen or single-screen wells with purgeable sampling systems. Converted wells will be assigned to characterization frequencies and suites applicable to their assigned monitoring group.

D-1.4 Organization of Tables for Monitoring Groups and General Surveillance

Individual sections for each monitoring group, including the general surveillance group, each include three tables: one listing analytes detected more than once above one-half standard, one listing default suites and frequencies for the monitoring group, and one listing suites and frequencies assigned to each location within that group. These three types of tables are described below.

Analytes Detected at a Location More Than Once above One-Half Standard

The first table in each section summarizes analytes detected at least twice above one-half standard at locations assigned to the monitoring group, based on statistical summaries of detections provided in Attachment B-1 of Appendix B (on CD).

Default Analytical Suites and Frequencies for Each Monitoring Group

The second table in each section defines default analytical suites and frequencies for the area-specific monitoring group or watershed-specific general surveillance group. Default suites and frequencies are tailored for each type of sampling location (e.g., base flow, alluvial, intermediate, regional, or springs) in the current Interim Plan. Analytical suites assigned to existing (pre-2010) wells within watersheds and investigation areas are based on the results of applicable investigation reports and a review of ongoing monitoring data, as presented in the statistical summaries of detections in Attachment B-1 of Appendix B (on CD). The assignment of specific analytical suites to a well also reflects data needs for pending CMEs.

Also listed in the table of default suites and frequencies are characterization suites and sampling frequencies for newly installed wells (wells installed on or after October 1, 2010). New wells will be sampled for a minimum of four quarters for the characterization suite for new wells.

Finally, the table summarizes the rationale for changes to default suites and frequencies in those cases for which these aspects differ between the current Interim Plan and the previous version.

Analytical Suites and Frequencies for Each Location within the Monitoring Group

The third table in each section lists individual monitoring locations in that monitoring group, along with rationales for those locations for which assigned analytical suites or frequencies differ from default conditions established in the second table described above. Exceptions to the analytical suites and sampling frequencies may be the result of a number of factors such as additional regulatory or permit

requirements and sampling commitments outlined in the memorandum of understanding (MOU) with the Pueblo of San Ildefonso. Exceptions to the assignment of default suites and frequencies may also include new wells, recently rehabilitated wells, and wells affected by residual drilling fluids. To document the evaluation process used to update the current Interim Plan, the detailed sampling tables also list the analytical suites and frequencies assigned to each location in the 2010 Interim Plan (LANL 2010, 109830).

D-2.0 INTERIM MONITORING PLAN FOR TA-21 MONITORING GROUP

The TA-21 monitoring group was established in the 2010 Interim Plan (LANL 2010, 109830) and consists of deep groundwater wells located in the upper Los Alamos watershed. The objectives, scope, and COPCs for this monitoring group are described in section 2.0 in the main body of the Interim Plan.

- Table D-2.0-1 summarizes analytes detected at least twice above one-half standard.
- Table D-2.0-2 defines default suites and frequencies for each hydrologic zone assigned to this monitoring group.
- Table D-2.0-3 lists monitoring locations assigned to this monitoring group and documents the basis for changes in sampling suite and frequency compared with the 2010 Interim Plan (LANL 2010, 109830).

D-3.0 INTERIM MONITORING PLAN FOR THE CHROMIUM INVESTIGATION MONITORING GROUP

This monitoring group was established in the 2010 Interim Plan (LANL 2010, 109830) and consists of deep groundwater wells located in Sandia and Mortandad watersheds. The objectives, scope, and COPCs for this monitoring group are described in section 3.0 in the main body of the Interim Plan.

- Table D-3.0-1 summarizes analytes detected at least twice above one-half standard.
- Table D-3.0-2 defines default suites and frequencies for each hydrologic zone assigned to this monitoring group.
- Table D-3.0-3 lists monitoring locations assigned to this monitoring group and documents the basis for changes in sampling suite and frequency compared with the 2010 Interim Plan (LANL 2010, 109830).

D-4.0 INTERIM MONITORING PLAN FOR THE MDA C MONITORING GROUP

The Material Disposal Area (MDA) C monitoring group was established in the 2010 Interim Plan (LANL 2010, 109830) and consists of deep groundwater wells located in Pajarito and Mortandad watersheds. The objectives, scope, and COPCs for this monitoring group are described in section 4.0 of the Interim Plan.

- Table D-4.0-1 summarizes analytes detected at least twice above one-half standard.
- Table D-4.0-2 defines default suites and frequencies for each hydrologic zone assigned to this monitoring group.
- Table D-4.0-3 lists monitoring locations assigned to this monitoring group and documents the basis for changes in sampling suite and frequency compared with the 2010 Interim Plan (LANL 2010, 109830).

D-5.0 INTERIM MONITORING PLAN FOR THE TA-54 MONITORING GROUP

The TA-54 monitoring group was established in the 2009 Interim Plan and consists of deep groundwater wells located in Cañada del Buey and Pajarito Canyon watershed. The objectives, scope, and COPCs for this monitoring group are described in section 5.0 in the main body of the Interim Plan.

- Table D-5.0-1 summarizes analytes detected at least twice above one-half standard.
- Table D-5.0-2 defines default suites and frequencies for each hydrologic zone assigned to this monitoring group.
- Table D-5.0-3 lists monitoring locations assigned to this monitoring group and documents the basis for changes in sampling suite and frequency compared with the 2010 Interim Plan (LANL 2010, 109830).

D-6.0 INTERIM MONITORING PLAN FOR THE TA-16-260 MONITORING GROUP

The TA-16 260 deep groundwater monitoring group was established in the 2010 Interim Plan (LANL 2010, 109830). Dropping the qualifier “deep groundwater” from the name of this monitoring group reflects the addition of a base-flow location and several alluvial wells. Other locations in this group include wells and springs located in Water Canyon and its main tributary, Cañon de Valle, as well as one regional well in the Pajarito Canyon watershed. The objectives, scope, and COPCs for this monitoring group are described in section 6.0 in the main body of the Interim Plan.

- Table D-6.0-1 summarizes analytes detected at least twice above one-half standard.
- Table D-6.0-2 defines default suites and frequencies for each hydrologic zone assigned to this monitoring group.
- Table D-6.0-3 lists monitoring locations assigned to this monitoring group and documents the basis for changes in sampling suite and frequency compared with the 2010 Interim Plan (LANL 2010, 109830).

D-7.0 INTERIM MONITORING PLAN FOR THE MDA AB MONITORING GROUP

The MDA AB monitoring group was established in the 2010 Interim Plan and consists of deep groundwater wells in Ancho Canyon and Pajarito Canyon watershed. The objectives, scope, and COPCs for this monitoring group are described in section 7.0 in the main body of the Interim Plan.

- Table D-7.0-1 summarizes analytes detected at least twice above one-half standard.
- Table D-7.0-2 defines default suites and frequencies for each hydrologic zone assigned to this monitoring group.
- Table D-7.0-3 lists monitoring locations assigned to this monitoring group and documents the basis for changes in sampling suite and frequency compared with the 2010 Interim Plan (LANL 2010, 109830).

D-8.0 INTERIM MONITORING PLAN FOR THE GENERAL SURVEILLANCE MONITORING GROUP

D-8.1 Overview

Interim monitoring locations not associated with area-specific monitoring groups are included in the general surveillance monitoring group. This group includes all base-flow locations, alluvial monitoring wells, and springs, except for those assigned to the TA-16 260 monitoring group. The general surveillance group also includes some wells completed in perched-intermediate zones and in the regional aquifer that are not associated with area-specific monitoring groups. The objectives, scope, and COPCs for this monitoring group are described in section 8.0 in the main body of the Interim Plan.

General surveillance monitoring locations are dispersed across the Pajarito Plateau. In most cases, contaminant concentrations measured at general surveillance locations are typically low, and in some cases, are decreasing with time. Base-flow and alluvial groundwater are well characterized and either show minimal contamination, or if contaminants are present, may show steady or declining levels of contamination over time. Intermediate and regional monitoring wells that are included in the General Surveillance group may be distally located in the watersheds and do not need to be monitored at the same frequencies as deeper wells in area-specific monitoring groups.

This section defines default analytical suites and frequencies for the watershed-specific general surveillance group, as modified for individual monitoring locations based on site-specific considerations. Characterization suites and sampling frequencies for newly installed wells (wells installed on or after October 1, 2010) are listed in Table D-8.1-1. These suites and frequencies apply to all newly completed deep wells in the general surveillance monitoring group, regardless of the watershed in which they are located. They also apply to wells following redevelopment or conversion to a different configuration.

D-8.2 Los Alamos/Pueblo Watershed

This subgroup consists of base-flow stations, springs, alluvial wells, and deep wells located in three subwatersheds: upper Los Alamos, Pueblo, and lower Los Alamos, as well as one spring in Guaje Canyon. Many of the deep wells in this watershed are assigned to the TA-21 monitoring group (section D-2.0).

- Table D-8.2-1 summarizes analytes detected at least twice above one-half standard for each location assigned to general surveillance in this watershed.
- Table D-8.2-2 defines default suites and frequencies for each hydrologic zone assigned to general surveillance in this watershed.
- Table D-8.2-3 lists monitoring locations assigned to general surveillance in this watershed and documents the basis for changes in sampling suite and frequency compared with the 2010 Interim Plan.

D-8.3 Sandia Watershed

This subgroup consists of base-flow stations, alluvial wells, and deep wells in Sandia watershed. Most deep wells in Sandia Canyon are assigned to the chromium investigation monitoring group (section D-3.0).

- Table D-8.3-1 summarizes analytes detected at least twice above one-half standard for each location assigned to general surveillance in this watershed.
- Table D-8.3-2 defines default suites and frequencies for each hydrologic zone assigned to general surveillance in this watershed.

- Table D-8.3-3 lists monitoring locations assigned to general surveillance in this watershed and documents the basis for changes in sampling suite and frequency compared with the 2010 Interim Plan (LANL 2010, 109830).

D-8.4 Mortandad Watershed

This subgroup consists of base-flow stations, alluvial wells, and regional wells in the Mortandad watershed. All perched-intermediate wells and some regional wells in this watershed are assigned to the chromium investigation (section D-3.0), MDA C (section D-4.0), or TA-54 (section D-5.0) monitoring groups.

- Table D-8.4-1 summarizes analytes detected at least twice above one-half standard for each location assigned to general surveillance in this watershed.
- Table D-8.4-2 defines default suites and frequencies for each hydrologic zone assigned to general surveillance in this watershed.
- Table D-8.4-3 lists monitoring locations assigned to general surveillance in this watershed and documents the basis for changes in sampling suite and frequency compared with the 2010 Interim Plan (LANL 2010, 109830).

D-8.5 Pajarito Watershed

This subgroup consists of base-flow stations, springs, alluvial wells, and deep wells in the Pajarito watershed. Many deep wells in this watershed are assigned to the TA-54 monitoring group (section D-5.0); one regional well is assigned to the TA-16-260 monitoring group (section D-6.0).

- Table D-8.5-1 summarizes analytes detected at least twice above one-half standard for each location assigned to general surveillance in this watershed.
- Table D-8.5-2 defines default suites and frequencies for each hydrologic zone assigned to general surveillance in this watershed.
- Table D-8.5-3 lists monitoring locations assigned to general surveillance in this watershed and documents the basis for changes in sampling suite and frequency compared with the 2010 Interim Plan (LANL 2010, 109830).

D-8.6 Water Canyon/Cañon de Valle Watershed

This subgroup consists of base-flow stations, springs, and alluvial wells in the Water/Cañon de Valle watershed. One base-flow location, most springs, most alluvial wells, and all but two deep wells in this watershed are assigned to the TA-16-260 monitoring group (section D-6.0). Two deep wells are assigned to the MDA AB monitoring group (section D-7.0).

- Table D-8.6-1 summarizes analytes detected at least twice above one-half standard for each location assigned to general surveillance in this watershed.
- Table D-8.6-2 defines default suites and frequencies for each hydrologic zone assigned to general surveillance in this watershed.
- Table D-8.6-3 lists monitoring locations assigned to general surveillance in this watershed and documents the basis for changes in sampling suite and frequency compared with the 2010 Interim Plan (LANL 2010, 109830).

D-8.7 Ancho/Frijoles Watershed

This subgroup consists of one base-flow station, two springs, and one deep well in the Ancho and Frijoles watersheds. Other regional wells in this watershed are assigned to the MDA AB monitoring group (section D-7.0).

- Table D-8.7-1 summarizes analytes detected at least twice above one-half standard for each location assigned to general surveillance in this watershed.
- Table D-8.7-2 defines default suites and frequencies for each hydrologic zone assigned to general surveillance in this watershed.
- Table D-8.7-3 lists monitoring locations assigned to general surveillance in this watershed and documents the basis for changes in sampling suite and frequency compared with the 2010 Interim Plan (LANL 2010, 109830).

D-8.8 White Rock Canyon/Rio Grande

This subgroup consists of base-flow stations and springs in White Rock Canyon and the Rio Grande watershed.

- Table D-8.8-1 summarizes analytes detected at least twice above one-half standard for each location assigned to general surveillance in this watershed.
- Table D-8.8-2 defines default suites and frequencies for each hydrologic zone assigned to general surveillance in this watershed.
- Table D-8.8-3 lists monitoring locations assigned to general surveillance in this watershed and documents the basis for changes in sampling suite and frequency compared with the 2010 Interim Plan (LANL 2010, 109830).

D-9.0 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. This information is also included in text citations. ER IDs are assigned by the Environmental Programs Directorate's Records Processing Facility (RPF) and are used to locate the document at the RPF and, where applicable, in the master reference set.

Copies of the master reference set are maintained at the NMED Hazardous Waste Bureau and the Directorate. The set was developed to ensure that the administrative authority has all material needed to review this document, and it is updated with every document submitted to the administrative authority. Documents previously submitted to the administrative authority are not included.

Koch, R.J., and S. Schmeer, March 2010. "Groundwater Level Status Report for 2009, Los Alamos National Laboratory," Los Alamos National Laboratory report LA-14416-PR, Los Alamos, New Mexico. (Koch and Schmeer 2010, 108926)

LANL (Los Alamos National Laboratory), May 2007. "Groundwater Background Investigation Report, Revision 3," Los Alamos National Laboratory document LA-UR-07-2853, Los Alamos, New Mexico. (LANL 2007, 095817)

- LANL (Los Alamos National Laboratory), August 2009. "R-22 Well Redevelopment Phase I Summary Report," Los Alamos National Laboratory document LA-UR-09-4936, Los Alamos, New Mexico. (LANL 2009, 106796)
- LANL (Los Alamos National Laboratory), October 2009. "Investigation Report for Sandia Canyon," Los Alamos National Laboratory document LA-UR-09-6450, Los Alamos, New Mexico. (LANL 2009, 107453)
- LANL (Los Alamos National Laboratory), May 2010. "Work Plan to Conduct Reliability Assessment of Multiscreened Westbay Wells," Los Alamos National Laboratory document LA-UR-10-1422, Los Alamos, New Mexico. (LANL 2010, 109676)
- LANL (Los Alamos National Laboratory), June 2010. "2010 Interim Facility-Wide Groundwater Monitoring Plan," Los Alamos National Laboratory document LA-UR-10-1777, Los Alamos, New Mexico. (LANL 2010, 109830)
- LANL (Los Alamos National Laboratory), August 2010. "Groundwater Background Investigation Report, Revision 4," Los Alamos National Laboratory document LA-UR-10-4827, Los Alamos, New Mexico. (LANL 2010, 110535)
- 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), July 2011. "Work Plan for the Technical Area 21 Monitoring Well Network Reconfiguration," Los Alamos National Laboratory document LA-UR-11-3674, Los Alamos, New Mexico. (LANL 2011, 204372)
- NMED (New Mexico Environment Department), November 12, 2008. "Notice of Approval with Modifications for 2008 Interim Facility-Wide Groundwater Monitoring Plan," 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, 103642)
- NMED (New Mexico Environment Department), March 26, 2009. "Approval to Waive Requirements to Install Additional Alluvial Wells in Cañada del Buey," 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, 105600)
- NMED (New Mexico Environment Department), March 25, 2011. "Approval with Modification, 2010 Interim Facility-Wide Groundwater Monitoring Plan," 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 2011, 201467)

Table D-1.1-1
Index for Locations Assigned to Monitoring Groups in the 2011 Interim Plan

Row	Location	Zone	Physical Watershed ^a	Assigned Monitoring Group in 2010 Interim Plan ^b	Assigned Monitoring Group in 2011 Interim Plan ^c	Current Status ^d	Table Documenting Status
Base Flow							
1	Acid Above Pueblo (E056)	Base flow	Los Alamos (Pueblo)	Gen Surveillance	Gen Surveillance	Active	D-8.2-3
2	Ancho at Rio Grande	Base flow	White Rock	Gen Surveillance	Gen Surveillance	Active	D-8.8-3
3	Base flow station between E252 and Water at Beta	Base flow	Water/CdV	Gen Surveillance	Gen Surveillance	Active	D-8.6-3
4	Cañon de Valle below MDA P (E256)	Base flow	Water/CdV	Gen Surveillance	TA-16 260	Active	D-6.0-3
5	DP below Meadow at TA-21 (E039)	Base flow	Los Alamos (Upper)	Gen Surveillance	Gen Surveillance	Active	D-8.2-3
6	DP Canyon above TA-21 (E038)	Base flow	Los Alamos (Upper)	Gen Surveillance	Gen Surveillance	Active	D-8.2-3
7	E-1FW	Base flow	Mortandad	Gen Surveillance	Gen Surveillance	Active	D-8.4-3
8	Frijoles at Rio Grande	Base flow	White Rock	Gen Surveillance	Gen Surveillance	Active	D-8.8-3
9	Guaje above Rendija Canyon (E089)	Base flow	Los Alamos (Pueblo)	Gen Surveillance	Gen Surveillance	Active	D-8.2-3
10	Los Alamos above DP Canyon (E030)	Base flow	Los Alamos (Upper)	Gen Surveillance	Gen Surveillance	Active	D-8.2-3
11	Los Alamos above SR-4 (E042)	Base flow	Los Alamos (Upper)	Gen Surveillance	Gen Surveillance	Active	D-8.2-3
12	Los Alamos below LA Weir (E050)	Base flow	Los Alamos (Upper)	Gen Surveillance	Gen Surveillance	Active	D-8.2-3
13	Los Alamos below the Ice Rink (E026)	Base flow	Los Alamos (Upper)	Gen Surveillance	Gen Surveillance	Active	D-8.2-3
14	Los Alamos Canyon near Otowi Bridge (E110)	Base flow	Los Alamos (Lower)	Gen Surveillance	Gen Surveillance	Active	D-8.2-3
15	M-1E	Base flow	Mortandad	Gen Surveillance	Gen Surveillance	Active	D-8.4-3
16	M-1W	Base flow	Mortandad	Gen Surveillance	Gen Surveillance	Active	D-8.4-3
17	M-2E	Base flow	Mortandad	Gen Surveillance	Gen Surveillance	Active	D-8.4-3
18	Middle Sandia Canyon at terminus of persistent base flow	Base flow	Sandia	Cr Investigation	Gen Surveillance	Active	D-8.3-3
19	Mortandad at Rio Grande	Base flow	White Rock	Gen Surveillance	Gen Surveillance	Active	D-8.8-3
20	Mortandad below Effluent Canyon (E200)	Base flow	Mortandad	Gen Surveillance	Gen Surveillance	Active	D-8.4-3
21	Pajarito 0.5 mi above SR-501 (PBF-B)	Base flow	Pajarito	Gen Surveillance	Gen Surveillance	Active	D-8.5-3
22	Pajarito above Two Mile (E243)	Base flow	Pajarito	Gen Surveillance	Gen Surveillance	Active	D-8.5-3

Table D-1.1-1 (continued)

Row	Location	Zone	Physical Watershed ^a	Assigned Monitoring Group in 2010 Interim Plan ^b	Assigned Monitoring Group in 2011 Interim Plan ^c	Current Status ^d	Table Documenting Status
23	Pajarito at Rio Grande	Base flow	White Rock	Gen Surveillance	Gen Surveillance	Active	D-8.8-3
24	Pajarito below confluence of South and North Anchor East Basin (PBF-1)	Base flow	Pajarito	Gen Surveillance	Gen Surveillance	Active	D-8.5-3
25	Pajarito Below TA-18 (PBF-5)	Base flow	Pajarito	Gen Surveillance	Gen Surveillance	Active	D-8.5-3
26	Pueblo 3	Base flow	Los Alamos (Pueblo)	Gen Surveillance	Gen Surveillance	Active	D-8.2-3
27	Pueblo above Acid (E055)	Base flow	Los Alamos (Pueblo)	Gen Surveillance	Gen Surveillance	Active	D-8.2-3
28	Pueblo above SR 502 (E060)	Base flow	Los Alamos (Pueblo)	Gen Surveillance	Gen Surveillance	Active	D-8.2-3
29	Rio de los Frijoles at Bandelier (E350)	Base flow	Frijoles	Gen Surveillance	Gen Surveillance	Active	D-8.7-3
30	Rio Grande at Frijoles	Base flow	White Rock	Gen Surveillance	Gen Surveillance	Active	D-8.8-3
31	Rio Grande at Otowi Bridge	Base flow	White Rock	Gen Surveillance	Gen Surveillance	Active	D-8.8-3
32	Sandia below Wetlands (E123)	Base flow	Sandia	Cr Investigation	Gen Surveillance	Active	D-8.3-3
33	Sandia right fork at Power Plant (E121)	Base flow	Sandia	Cr Investigation	Gen Surveillance	Active	D-8.3-3
34	South fork at Sandia Canyon at E122	Base flow	Sandia	Cr Investigation	Gen Surveillance	Active	D-8.3-3
35	TS-1W	Base flow	Mortandad	Gen Surveillance	Gen Surveillance	Active	D-8.4-3
36	TS-2E	Base flow	Mortandad	Gen Surveillance	Gen Surveillance	Active	D-8.4-3
37	Two Mile above Pajarito (E244)	Base flow	Pajarito	Gen Surveillance	Gen Surveillance	Active	D-8.5-3
38	Two Mile Canyon below TA-59 (PBF-2)	Base flow	Pajarito	Gen Surveillance	Gen Surveillance	Active	D-8.5-3
39	Water Above SR-501 (E252)	Base flow	Water/CdV	Gen Surveillance	Gen Surveillance	Active	D-8.6-3
40	Water at Beta	Base flow	Water/CdV	Gen Surveillance	Gen Surveillance	Active	D-8.6-3
Springs							
41	Ancho Spring	Spring	White Rock	Gen Surveillance	Gen Surveillance	Active	D-8.8-3
42	Anderson Spring	Spring	Pajarito	Gen Surveillance	Gen Surveillance	Active	D-8.5-3
43	Barbara Spring	Spring	Frijoles	Gen Surveillance	Gen Surveillance	Active	D-8.7-3
44	Basalt Spring / Vine Tree Spring	Spring	Los Alamos (Lower)	Gen Surveillance	Gen Surveillance	Active	D-8.2-3

Table D-1.1-1 (continued)

Row	Location	Zone	Physical Watershed ^a	Assigned Monitoring Group in 2010 Interim Plan ^b	Assigned Monitoring Group in 2011 Interim Plan ^c	Current Status ^d	Table Documenting Status
45	Bulldog Spring	Spring	Pajarito	Gen Surveillance	Gen Surveillance	Active	D-8.5-3
46	Burning Ground Spring	Spring	Water/CdV	Gen Surveillance	TA-16 260	Active	D-6.0-3
47	Campsite Spring	Spring	Los Alamos (Guaje)	Gen Surveillance	Gen Surveillance	Active	D-8.2-3
48	CdV-5.0 Spring	Spring	Water/CdV	Gen Surveillance	Gen Surveillance	Active	D-8.6-3
49	Charlie's Spring	Spring	Pajarito	Gen Surveillance	Gen Surveillance	Active	D-8.5-3
50	DP Spring	Spring	Los Alamos (Upper)	Gen Surveillance	Gen Surveillance	Active	D-8.2-3
51	Fish Ladder Spring	Spring	Water/CdV	Gen Surveillance	TA-16 260	Active	D-6.0-3
52	Homestead Spring	Spring	Pajarito	Gen Surveillance	Gen Surveillance	Active	D-8.5-3
53	Kieling Spring	Spring	Pajarito	Gen Surveillance	Gen Surveillance	Active	D-8.5-3
54	La Mesita Spring	Spring	White Rock	Gen Surveillance	Gen Surveillance	Active	D-8.8-3
55	Los Alamos Spring	Spring	Los Alamos (Lower)	Gen Surveillance	Gen Surveillance	Active	D-8.2-3
56	Martin Spring	Spring	Water/CdV	Gen Surveillance	TA-16 260	Active	D-6.0-3
57	PC Spring	Spring	Pajarito	Gen Surveillance	Gen Surveillance	Active	D-8.5-3
58	Peter Spring	Spring	Water/CdV	Gen Surveillance	TA-16 260	Active	D-6.0-3
59	Sacred Spring	Spring	White Rock	Gen Surveillance	Gen Surveillance	Active	D-8.8-3
60	Sandia Spring	Spring	White Rock	Gen Surveillance	Gen Surveillance	Active	D-8.8-3
61	Spring 1	Spring	White Rock	Gen Surveillance	Gen Surveillance	Active	D-8.8-3
62	Spring 2	Spring	White Rock	Gen Surveillance	Gen Surveillance	Active	D-8.8-3
63	Spring 2B	Spring	White Rock	—	Gen Surveillance	Active	D-8.8-3
64	Spring 3	Spring	White Rock	Gen Surveillance	Gen Surveillance	Active	D-8.8-3
65	Spring 3A	Spring	White Rock	Gen Surveillance	Gen Surveillance	Active	D-8.8-3
66	Spring 3AA	Spring	White Rock	Gen Surveillance	Gen Surveillance	Active	D-8.8-3
67	Spring 4	Spring	White Rock	Gen Surveillance	Gen Surveillance	Active	D-8.8-3
68	Spring 4A	Spring	White Rock	Gen Surveillance	Gen Surveillance	Active	D-8.8-3
69	Spring 4AA	Spring	White Rock	Gen Surveillance	Gen Surveillance	Active	D-8.8-3

Table D-1.1-1 (continued)

Row	Location	Zone	Physical Watershed ^a	Assigned Monitoring Group in 2010 Interim Plan ^b	Assigned Monitoring Group in 2011 Interim Plan ^c	Current Status ^d	Table Documenting Status
70	Spring 4B	Spring	White Rock	Gen Surveillance	Gen Surveillance	Active	D-8.8-3
71	Spring 5	Spring	White Rock	Gen Surveillance	Gen Surveillance	Active	D-8.8-3
72	Spring 5A	Spring	White Rock	Gen Surveillance	Gen Surveillance	Active	D-8.8-3
73	Spring 5B	Spring	White Rock	—	Gen Surveillance	Active	D-8.8-3
74	Spring 6	Spring	White Rock	Gen Surveillance	Gen Surveillance	Active	D-8.8-3
75	Spring 6A	Spring	White Rock	Gen Surveillance	Gen Surveillance	Active	D-8.8-3
76	Spring 7/Spring 8	Spring	White Rock	Gen Surveillance	—	Inactive	D-8.8-3
77	Spring 8A	Spring	White Rock	Gen Surveillance	Gen Surveillance	Active	D-8.8-3
78	Spring 9	Spring	White Rock	Gen Surveillance	Gen Surveillance	Active	D-8.8-3
79	Spring 9A	Spring	White Rock	Gen Surveillance	Gen Surveillance	Active	D-8.8-3
80	Spring 9B	Spring	White Rock	Gen Surveillance	Gen Surveillance	Active	D-8.8-3
81	Starmer Spring	Spring	Pajarito	Gen Surveillance	Gen Surveillance	Active	D-8.5-3
82	SWSC Spring	Spring	Water/CdV	Gen Surveillance	TA-16 260	Active	D-6.0-3
83	TA-18 Spring	Spring	Pajarito	Gen Surveillance	Gen Surveillance	Active	D-8.5-3
84	Threemile Spring	Spring	Pajarito	Gen Surveillance	Gen Surveillance	Active	D-8.5-3
85	TW-1.72 Spring	Spring	Pajarito	Gen Surveillance	Gen Surveillance	Active	D-8.5-3
86	Water Canyon Gallery	Spring	Water/CdV	Gen Surveillance	Gen Surveillance	Active	D-8.6-3
Alluvial Groundwater							
87	18-BG-1	Alluvial	Pajarito	Gen Surveillance	Gen Surveillance	Active	D-8.5-3
88	18-MW-8	Alluvial	Pajarito	Gen Surveillance	Gen Surveillance	Active	D-8.5-3
89	18-MW-9	Alluvial	Pajarito	Gen Surveillance	Gen Surveillance	Active	D-8.5-3
90	18-MW-11	Alluvial	Pajarito	Gen Surveillance	Gen Surveillance	Active	D-8.5-3
91	18-MW-18	Alluvial	Pajarito	Gen Surveillance	Gen Surveillance	Active	D-8.5-3
92	3MAO-2	Alluvial	Pajarito	Gen Surveillance	Gen Surveillance	Active	D-8.5-3
93	APCO-1	Alluvial	Los Alamos (Pueblo)	Gen Surveillance	Gen Surveillance	Active	D-8.2-3

Table D-1.1-1 (continued)

Row	Location	Zone	Physical Watershed ^a	Assigned Monitoring Group in 2010 Interim Plan ^b	Assigned Monitoring Group in 2011 Interim Plan ^c	Current Status ^d	Table Documenting Status
94	CDBO-4	Alluvial	Mortandad (CdB)	Gen Surveillance	Gen Surveillance	WL only	D-8.4-3
95	CDBO-5	Alluvial	Mortandad (CdB)	Gen Surveillance	Gen Surveillance	WL only	D-8.4-3
96	CDBO-6	Alluvial	Mortandad (CdB)	Gen Surveillance	Gen Surveillance	Active	D-8.4-3
97	CDBO-7	Alluvial	Mortandad (CdB)	Gen Surveillance	Gen Surveillance	Active	D-8.4-3
98	CDBO-8	Alluvial	Mortandad (CdB)	Gen Surveillance	Gen Surveillance	WL only	D-8.4-3
99	CDBO-9	Alluvial	Mortandad (CdB)	Gen Surveillance	Gen Surveillance	WL only	D-8.4-3
100	CdV-16-02655	Alluvial	Water/CdV	TA-16 260	TA-16 260	Active	D-6.0-3
101	CdV-16-02656	Alluvial	Water/CdV	TA-16 260	TA-16 260	Active	D-6.0-3
102	CdV-16-02657	Alluvial	Water/CdV	TA-16 260	TA-16 260	Active	D-6.0-3
103	CdV-16-02658	Alluvial	Water/CdV	TA-16 260	TA-16 260	Active	D-6.0-3
104	CdV-16-02659	Alluvial	Water/CdV	TA-16 260	TA-16 260	Active	D-6.0-3
105	FLC-16-25278	Alluvial	Water/CdV	TA-16 260	TA-16 260	Active	D-6.0-3
106	FLC-16-25279	Alluvial	Water/CdV	TA-16 260	TA-16 260	Active	D-6.0-3
107	FLC-16-25280	Alluvial	Water/CdV	TA-16 260	TA-16 260	Active	D-6.0-3
108	LAO-0.3	Alluvial	Los Alamos (Upper)	Gen Surveillance	Gen Surveillance	Active	D-8.2-3
109	LAO-0.6	Alluvial	Los Alamos (Upper)	Gen Surveillance	Gen Surveillance	Active	D-8.2-3
110	LAO-1	Alluvial	Los Alamos (Upper)	Gen Surveillance	Gen Surveillance	Active	D-8.2-3
111	LAO-1.6g	Alluvial	Los Alamos (Upper)	Gen Surveillance	Gen Surveillance	Active	D-8.2-3
112	LAO-2	Alluvial	Los Alamos (Upper)	Gen Surveillance	Gen Surveillance	Active	D-8.2-3
113	LAO-3a	Alluvial	Los Alamos (Upper)	Gen Surveillance	Gen Surveillance	Active	D-8.2-3
114	LAO-4.5c	Alluvial	Los Alamos (Upper)	Gen Surveillance	Gen Surveillance	Active	D-8.2-3
115	LAO-6a / LAO-5	Alluvial	Los Alamos (Upper)	Gen Surveillance	Gen Surveillance	Active	D-8.2-3
116	LAO-B	Alluvial	Los Alamos (Upper)	Gen Surveillance	Gen Surveillance	Active	D-8.2-3
117	LAUZ-1	Alluvial	Los Alamos (Upper)	Gen Surveillance	Gen Surveillance	Active	D-8.2-3
118	LLAO-1b	Alluvial	Los Alamos (Lower)	Gen Surveillance	Gen Surveillance	Active	D-8.2-3

Table D-1.1-1 (continued)

Row	Location	Zone	Physical Watershed ^a	Assigned Monitoring Group in 2010 Interim Plan ^b	Assigned Monitoring Group in 2011 Interim Plan ^c	Current Status ^d	Table Documenting Status
119	LLAO-4	Alluvial	Los Alamos (Lower)	Gen Surveillance	Gen Surveillance	Active	D-8.2-3
120	MCA-1	Alluvial	Mortandad	Gen Surveillance	Gen Surveillance	Active	D-8.4-3
121	MCO-0.6	Alluvial	Mortandad	Gen Surveillance	Gen Surveillance	Active	D-8.4-3
122	MCO-2	Alluvial	Mortandad	Gen Surveillance	Gen Surveillance	Active	D-8.4-3
123	MCO-3	Alluvial	Mortandad	Gen Surveillance	Gen Surveillance	Active	D-8.4-3
124	MCO-4B	Alluvial	Mortandad	Gen Surveillance	Gen Surveillance	Active	D-8.4-3
125	MCO-5	Alluvial	Mortandad	Gen Surveillance	Gen Surveillance	Active	D-8.4-3
126	MCO-6	Alluvial	Mortandad	Gen Surveillance	Gen Surveillance	Active	D-8.4-3
127	MCO-7	Alluvial	Mortandad	Gen Surveillance	Gen Surveillance	Active	D-8.4-3
128	MCO-7.5	Alluvial	Mortandad	Gen Surveillance	Gen Surveillance	Active	D-8.4-3
129	MCWB-5	Alluvial	Mortandad	Gen Surveillance	Gen Surveillance	WL only	D-8.4-3
130	MCWB-5.5b	Alluvial	Mortandad	Gen Surveillance	Gen Surveillance	WL only	D-8.4-3
131	MCWB-6.2a	Alluvial	Mortandad	Gen Surveillance	Gen Surveillance	WL only	D-8.4-3
132	MCWB-6.5e	Alluvial	Mortandad	Gen Surveillance	Gen Surveillance	WL only	D-8.4-3
133	MCWB-7.4b	Alluvial	Mortandad	Gen Surveillance	Gen Surveillance	WL only	D-8.4-3
134	MCWB-7.7b	Alluvial	Mortandad	Gen Surveillance	Gen Surveillance	WL only	D-8.4-3
135	MCWB-7a	Alluvial	Mortandad	Gen Surveillance	Gen Surveillance	WL only	D-8.4-3
136	MSC-16-06293	Alluvial	Water/CdV	TA-16 260	TA-16 260	Active	D-6.0-3
137	MSC-16-06294	Alluvial	Water/CdV	TA-16 260	TA-16 260	Active	D-6.0-3
138	MSC-16-06295	Alluvial	Water/CdV	TA-16 260	TA-16 260	Active	D-6.0-3
139	MT-3	Alluvial	Mortandad	Gen Surveillance	Gen Surveillance	Active	D-8.4-3
140	MT-4	Alluvial	Mortandad	Gen Surveillance	Gen Surveillance	WL only	D-8.4-3
141	PAO-1	Alluvial	Los Alamos (Pueblo)	Gen Surveillance	Gen Surveillance	Active	D-8.2-3
142	PAO-2	Alluvial	Los Alamos (Pueblo)	Gen Surveillance	Gen Surveillance	Active	D-8.2-3
143	PAO-4	Alluvial	Los Alamos (Pueblo)	Gen Surveillance	Gen Surveillance	Active	D-8.2-3

Table D-1.1-1 (continued)

Row	Location	Zone	Physical Watershed ^a	Assigned Monitoring Group in 2010 Interim Plan ^b	Assigned Monitoring Group in 2011 Interim Plan ^c	Current Status ^d	Table Documenting Status
144	PCAO-5	Alluvial	Pajarito	Gen Surveillance	Gen Surveillance	Active	D-8.5-3
145	PCAO-6	Alluvial	Pajarito	Gen Surveillance	Gen Surveillance	Active	D-8.5-3
146	PCAO-7a	Alluvial	Pajarito	Gen Surveillance	Gen Surveillance	Active	D-8.5-3
147	PCAO-7b1	Alluvial	Pajarito	Gen Surveillance	Gen Surveillance	WL only	D-8.5-3
148	PCAO-7b2	Alluvial	Pajarito	Gen Surveillance	Gen Surveillance	Active	D-8.5-3
149	PCAO-7c	Alluvial	Pajarito	Gen Surveillance	Gen Surveillance	Active	D-8.5-3
150	PCAO-8	Alluvial	Pajarito	Gen Surveillance	Gen Surveillance	Active	D-8.5-3
151	PCAO-9	Alluvial	Pajarito	Gen Surveillance	Gen Surveillance	Active	D-8.5-3
152	PCO-2	Alluvial	Pajarito	Gen Surveillance	Gen Surveillance	Active	D-8.5-3
153	PCO-3	Alluvial	Pajarito	Gen Surveillance	Gen Surveillance	WL only	D-8.5-3
154	SCA-1	Alluvial	Sandia	Cr Investigation	Gen Surveillance	WL only	D-8.3-3
155	SCA-1-DP	Alluvial	Sandia	Cr Investigation	Gen Surveillance	Active	D-8.3-3
156	SCA-2	Alluvial	Sandia	Cr Investigation	Gen Surveillance	Active	D-8.3-3
157	SCA-3	Alluvial	Sandia	Cr Investigation	Gen Surveillance	Active	D-8.3-3
158	SCA-4	Alluvial	Sandia	Cr Investigation	Gen Surveillance	Active	D-8.3-3
159	SCA-5	Alluvial	Sandia	Cr Investigation	Gen Surveillance	Active	D-8.3-3
160	SCP-1abc	Alluvial	Sandia	Gen Surveillance	—	P&A	D-8.3-3
161	SCP-2a	Alluvial	Sandia	Gen Surveillance	Gen Surveillance	WL only	D-8.3-3
162	SCP-2b	Alluvial	Sandia	Gen Surveillance	Gen Surveillance	WL only	D-8.3-3
163	TMO-1	Alluvial	Pajarito	Gen Surveillance	Gen Surveillance	Active	D-8.5-3
164	TSCA-6	Alluvial	Mortandad	Gen Surveillance	—	Inactive	D-8.4-3
165	WCO-1r	Alluvial	Water/CdV	Gen Surveillance	Gen Surveillance	Active	D-8.6-3
166	WCO-2	Alluvial	Water/CdV	Gen Surveillance	Gen Surveillance	Active	D-8.6-3
167	WCO-3r	Alluvial	Water/CdV	Gen Surveillance	Gen Surveillance	Active	D-8.6-3

Table D-1.1-1 (continued)

Row	Location	Zone	Physical Watershed ^a	Assigned Monitoring Group in 2010 Interim Plan ^b	Assigned Monitoring Group in 2011 Interim Plan ^c	Current Status ^d	Table Documenting Status
Intermediate Perched Groundwater							
168	03-B-13	Intermediate	Pajarito	Gen Surveillance	Gen Surveillance	Active	D-8.5-3
169	16-26644	Intermediate	Water/CdV	Gen Surveillance	TA-16 260	Active	D-6.0-3
170	90LP-SE-16-02669	Intermediate	Water/CdV	Gen Surveillance	TA-16 260	WL only	D-6.0-3
171	CdV-16-1(i)	Intermediate	Water/CdV	TA-16 260	TA-16 260	Active	D-6.0-3
172	CdV-16-2(i)r	Intermediate	Water/CdV	TA-16 260	TA-16 260	Active	D-6.0-3
173	CdV-16-4ip screen 1	Intermediate	Water/CdV	—	TA-16 260	Active	D-6.0-3
174	CdV-16-4ip screen 2	Intermediate	Water/CdV	—	TA-16 260	Inactive	D-6.0-3
175	Cdv-37-1(i)	Intermediate	Water/CdV	TA-16 260	TA-16 260	Active	D-6.0-3
176	CdV-R-15-3 screen 1	Intermediate	Water/CdV	TA-16 260	TA-16 260	Nonfunctional;P&A	D-6.0-3
177	CdV-R-15-3 screen 2	Intermediate	Water/CdV	TA-16 260	TA-16 260	Nonfunctional;P&A	D-6.0-3
178	CdV-R-15-3 screen 3	Intermediate	Water/CdV	TA-16 260	TA-16 260	Nonfunctional;P&A	D-6.0-3
179	CdV-R-37-2 screen 1	Intermediate	Water/CdV	TA-16 260	TA-16 260	Nonfunctional;P&A	D-6.0-3
180	LADP-3	Intermediate	Los Alamos	TA-21	TA-21	Active	D-2.0-3
181	LAOI(a)-1.1	Intermediate	Los Alamos (Upper)	TA-21	TA-21	Active	D-2.0-3
182	LAOI-3.2	Intermediate	Los Alamos (Upper)	TA-21	TA-21	Active	D-2.0-3
183	LAOI-3.2a	Intermediate	Los Alamos (Upper)	TA-21	TA-21	Active	D-2.0-3
184	LAOI-7	Intermediate	Los Alamos (Upper)	TA-21	Gen Surveillance	Active	D-8.2-3
185	MCOI-4	Intermediate	Mortandad	Cr Investigation	Cr Investigation	Active	D-3.0-3
186	MCOI-5	Intermediate	Mortandad	Cr Investigation	Cr Investigation	Active	D-3.0-3
187	MCOI-6	Intermediate	Mortandad	Cr Investigation	Cr Investigation	Active	D-3.0-3
188	MCOI-8	Intermediate	Mortandad	Gen Surveillance	—	Inactive	D-3.0-3
189	MSC-16-02665	Intermediate	Water/CdV	Gen Surveillance	TA-16 260	Active	D-6.0-3
190	PCI-2	Intermediate	Pajarito	MDA C	Gen Surveillance	Active	D-8.5-3
191	POI-4	Intermediate	Los Alamos (Pueblo)	Gen Surveillance	Gen Surveillance	Active	D-8.2-3

Table D-1.1-1 (continued)

Row	Location	Zone	Physical Watershed ^a	Assigned Monitoring Group in 2010 Interim Plan ^b	Assigned Monitoring Group in 2011 Interim Plan ^c	Current Status ^d	Table Documenting Status
192	R-3i	Intermediate	Los Alamos (Pueblo)	Gen Surveillance	Gen Surveillance	Active	D-8.2-3
193	R-5 screen 1	Intermediate	Los Alamos (Pueblo)	Gen Surveillance	TA-21	WL only; conversion ^e	D-2.0-3
194	R-5 screen 2	Intermediate	Los Alamos (Pueblo)	Gen Surveillance	TA-21	Active; conversion ^e	D-2.0-3
195	R-6i	Intermediate	Los Alamos	TA-21	TA-21	Active	D-2.0-3
196	R-7 screen 1	Intermediate	Los Alamos	TA-21	TA-21	WL only	D-2.0-3
197	R-7 screen 2	Intermediate	Los Alamos	TA-21	TA-21	WL only	D-2.0-3
198	R-9i screen 1	Intermediate	Los Alamos	TA-21	Gen Surveillance	Active; conversion ^e	D-8.2-3
199	R-9i screen 2	Intermediate	Los Alamos	TA-21	Gen Surveillance	Active; conversion ^e	D-8.2-3
200	R-12 screen 1	Intermediate	Sandia	TA-21	Gen Surveillance	Active	D-8.3-3
201	R-12 screen 2	Intermediate	Sandia	TA-21	Gen Surveillance	Active	D-8.3-3
202	R-19 screen 1	Intermediate	Pajarito	Gen Surveillance	Gen Surveillance	WL only	D-8.5-3
203	R-19 screen 2	Intermediate	Pajarito	Gen Surveillance	Gen Surveillance	Active	D-8.5-3
204	R-23i piezometer (port 1)	Intermediate	Pajarito	Gen Surveillance	TA-54	Active	D-5.0-3
205	R-23i screen 1 (port 2)	Intermediate	Pajarito	Gen Surveillance	TA-54	Active	D-5.0-3
206	R-23i screen 2 (port 3)	Intermediate	Pajarito	Gen Surveillance	TA-54	Active	D-5.0-3
207	R-25 screen 1	Intermediate	Water/CdV	TA-16 260	TA-16 260	Active	D-6.0-3
208	R-25 screen 2	Intermediate	Water/CdV	TA-16 260	TA-16 260	Active	D-6.0-3
209	R-25 screen 3	Intermediate	Water/CdV	TA-16 260	TA-16 260	WL only	D-6.0-3
210	R-25 screen 4	Intermediate	Water/CdV	TA-16 260	TA-16 260	Active	D-6.0-3
211	R-25b	Intermediate	Water/CdV	TA-16 260	TA-16 260	Active	D-6.0-3
212	R-25c	Intermediate	Water/CdV	TA-16 260	TA-16 260	WL only	D-6.0-3
213	R-26 PZ-1	Intermediate	Water/CdV	TA-16 260	TA-16 260	WL only	D-6.0-3
214	R-26 PZ-2	Intermediate	Water/CdV	TA-16 260	TA-16 260	Active	D-6.0-3
215	R-26 screen 1	Intermediate	Water/CdV	TA-16 260	TA-16 260	Active; conversion	D-6.0-3
216	R-27i	Intermediate	Water/CdV	MDA AB	MDA AB	Active	D-7.0-3

Table D-1.1-1 (continued)

Row	Location	Zone	Physical Watershed ^a	Assigned Monitoring Group in 2010 Interim Plan ^b	Assigned Monitoring Group in 2011 Interim Plan ^c	Current Status ^d	Table Documenting Status
217	R-31 screen 1	Intermediate	Ancho	Gen Surveillance	Gen Surveillance	WL only	D-8.7-3
218	R-37 screen 1	Intermediate	Mortandad (CdB)	TA-54	TA-54	Active	D-5.0-3
219	R-40 screen 1	Intermediate	Pajarito	TA-54	TA-54	Active	D-5.0-3
220	R-40i	Intermediate	Pajarito	TA-54	TA-54	Active	D-5.0-3
221	R-41 screen 1	Intermediate	Mortandad (CdB)	TA-54	TA-54	WL only	D-5.0-3
222	R-47i	Intermediate	Water/CdV	TA-16 260	TA-16 260	Active	D-6.0-3
223	R-55i	Intermediate	Mortandad (CdB)	—	TA-54	Active	D-5.0-3
224	SCI-1	Intermediate	Sandia	Cr Investigation	Cr Investigation	Active	D-3.0-3
225	SCI-2	Intermediate	Sandia	Cr Investigation	Cr Investigation	Active	D-3.0-3
226	SCI-3	Intermediate	Sandia	—	Cr Investigation	Active	D-3.0-3
227	SCI-4	Intermediate	Sandia	—	Cr Investigation	Placeholder	D-3.0-3
228	TA-53i	Intermediate	Los Alamos	TA-21	TA-21	Active	D-2.0-3
229	TW-2Ar	Intermediate	Los Alamos	Gen Surveillance	Gen Surveillance	Active	D-8.2-3
Regional Groundwater							
230	CdV-R-15-3 screen 4	Regional	Water/CdV	TA-16 260	TA-16 260	Nonfunctional; conversion ^e	D-6.0-3
231	CdV-R-15-3 screen 5	Regional	Water/CdV	TA-16 260	—	Nonfunctional; conversion ^e	D-6.0-3
232	CdV-R-15-3 screen 6	Regional	Water/CdV	TA-16 260	—	Nonfunctional; conversion ^e	D-6.0-3
233	CdV-R-37-2 screen 2	Regional	Water/CdV	TA-16 260	—	Nonfunctional; conversion ^e	D-6.0-3
234	CdV-R-37-2 screen 3	Regional	Water/CdV	TA-16 260	TA-16 260	Nonfunctional; conversion ^e	D-6.0-3
235	CdV-R-37-2 screen 4	Regional	Water/CdV	TA-16 260	—	Nonfunctional; conversion ^e	D-6.0-3
236	R-1	Regional	Mortandad	Gen Surveillance	Cr Investigation	Active	D-3.0-3

Table D-1.1-1 (continued)

Row	Location	Zone	Physical Watershed ^a	Assigned Monitoring Group in 2010 Interim Plan ^b	Assigned Monitoring Group in 2011 Interim Plan ^c	Current Status ^d	Table Documenting Status
237	R-2	Regional	Los Alamos (Pueblo)	Gen Surveillance	Gen Surveillance	Active	D-8.2-3
238	R-3	Regional	Los Alamos (Pueblo)	Gen Surveillance	Gen Surveillance	Active	D-8.2-3
239	R-4	Regional	Los Alamos (Pueblo)	Gen Surveillance	Gen Surveillance	Active	D-8.2-3
240	R-5 screen 3	Regional	Los Alamos (Pueblo)	Gen Surveillance	TA-21	Active; conversion ^e	D-2.0-3
241	R-5 screen 4	Regional	Los Alamos (Pueblo)	Gen Surveillance	TA-21	Active; conversion ^e	D-2.0-3
242	R-6	Regional	Los Alamos	TA-21	TA-21	Active	D-2.0-3
243	R-7 screen 3	Regional	Los Alamos	TA-21	TA-21	WL only; conversion ^e	D-2.0-3
244	R-8 screen 1	Regional	Los Alamos	TA-21	Gen Surveillance	Active; conversion ^e	D-8.2-3
245	R-8 screen 2	Regional	Los Alamos	TA-21	Gen Surveillance	Active; conversion ^e	D-8.2-3
246	R-9	Regional	Los Alamos	TA-21	Gen Surveillance	Active	D-8.2-3
247	R-10 screen 1	Regional	Sandia	Gen Surveillance	Gen Surveillance	Active	D-8.3-3
248	R-10 screen 2	Regional	Sandia	Gen Surveillance	Gen Surveillance	Active	D-8.3-3
249	R-10a	Regional	Sandia	Gen Surveillance	Gen Surveillance	Active	D-8.3-3
250	R-11	Regional	Sandia	Cr Investigation	Cr Investigation	Active	D-3.0-3
251	R-13	Regional	Mortandad	Cr Investigation	Cr Investigation	Active	D-3.0-3
252	R-14	Regional	Mortandad	MDA C	MDA C	Active	D-4.0-3
253	R-15	Regional	Mortandad	Cr Investigation	Cr Investigation	Active	D-3.0-3
254	R-16 screen 2	Regional	Mortandad (CdB)	Gen Surveillance	Gen Surveillance	Active	D-8.4-3
255	R-16 screen 4	Regional	Mortandad (CdB)	Gen Surveillance	Gen Surveillance	Active	D-8.4-3
256	R-16r	Regional	Mortandad (CdB)	Gen Surveillance	Gen Surveillance	Active	D-8.4-3
257	R-17 screen 1	Regional	Pajarito	MDA C	Gen Surveillance	Active	D-8.5-3
258	R-17 screen 2	Regional	Pajarito	MDA C	Gen Surveillance	Active	D-8.5-3
259	R-18	Regional	Pajarito	TA-16 260	TA-16 260	Active	D-6.0-3
260	R-19 screen 3	Regional	Pajarito	Gen Surveillance	Gen Surveillance	Active	D-8.5-3
261	R-19 screen 4	Regional	Pajarito	Gen Surveillance	Gen Surveillance	Active	D-8.5-3

Table D-1.1-1 (continued)

Row	Location	Zone	Physical Watershed ^a	Assigned Monitoring Group in 2010 Interim Plan ^b	Assigned Monitoring Group in 2011 Interim Plan ^c	Current Status ^d	Table Documenting Status
262	R-19 screen 5	Regional	Pajarito	Gen Surveillance	Gen Surveillance	WL only	D-8.5-3
263	R-19 screen 6	Regional	Pajarito	Gen Surveillance	Gen Surveillance	WL only	D-8.5-3
264	R-19 screen 7	Regional	Pajarito	Gen Surveillance	Gen Surveillance	WL only	D-8.5-3
265	R-20 screen 1	Regional	Pajarito	TA-54	TA-54	Active	D-5.0-3
266	R-20 screen 2	Regional	Pajarito	TA-54	TA-54	Active	D-5.0-3
267	R-21	Regional	Mortandad (CdB)	TA-54	TA-54	Active	D-5.0-3
268	R-22 screens 1 through 5	Regional	Pajarito	TA-54	TA-54	Nonfunctional; conversion ^e	D-5.0-3
269	R-23	Regional	Pajarito	Gen Surveillance	TA-54	Active	D-5.0-3
270	R-24	Regional	Los Alamos (Pueblo)	Gen Surveillance	Gen Surveillance	Active	D-8.2-3
271	R-25 screen 5	Regional	Water/CdV	TA-16 260	TA-16 260	Active	D-6.0-3
272	R-25 screen 6	Regional	Water/CdV	TA-16 260	TA-16 260	Active	D-6.0-3
273	R-25 screen 7	Regional	Water/CdV	TA-16 260	TA-16 260	Active	D-6.0-3
274	R-25 screen 8	Regional	Water/CdV	TA-16 260	TA-16 260	Active	D-6.0-3
275	R-26 screen 2	Regional	Water/CdV	TA-16 260	TA-16 260	P&A	D-6.0-3
276	R-27	Regional	Water/CdV	MDA AB	MDA AB	Active	D-7.0-3
277	R-28	Regional	Mortandad	Cr Investigation	Cr Investigation	Active	D-3.0-3
278	R-29	Regional	Ancho	MDA AB	MDA AB	Active	D-7.0-3
279	R-30	Regional	Ancho	MDA AB	MDA AB	Active	D-7.0-3
280	R-31 screen 2	Regional	Ancho	Gen Surveillance	Gen Surveillance	WL only	D-8.7-3
281	R-31 screen 3	Regional	Ancho	Gen Surveillance	Gen Surveillance	WL only	D-8.7-3
282	R-31 screen 4	Regional	Ancho	Gen Surveillance	Gen Surveillance	Active	D-8.7-3
283	R-31 screen 5	Regional	Ancho	Gen Surveillance	Gen Surveillance	Active	D-8.7-3
284	R-32	Regional	Pajarito	TA-54	TA-54	Active	D-5.0-3
285	R-33 screen 1	Regional	Mortandad	Gen Surveillance	Gen Surveillance	Active	D-8.4-3
286	R-33 screen 2	Regional	Mortandad	Gen Surveillance	Gen Surveillance	Active	D-8.4-3

Table D-1.1-1 (continued)

Row	Location	Zone	Physical Watershed ^a	Assigned Monitoring Group in 2010 Interim Plan ^b	Assigned Monitoring Group in 2011 Interim Plan ^c	Current Status ^d	Table Documenting Status
287	R-34	Regional	Mortandad	Gen Surveillance	Gen Surveillance	Active	D-8.4-3
288	R-35a	Regional	Sandia	Cr Investigation	Cr Investigation	Active	D-3.0-3
289	R-35b	Regional	Sandia	Cr Investigation	Cr Investigation	Active	D-3.0-3
290	R-36	Regional	Sandia	Cr Investigation	Cr Investigation	Active	D-3.0-3
291	R-37 Screen 2	Regional	Mortandad (CdB)	TA-54	TA-54	Active	D-5.0-3
292	R-38	Regional	Mortandad (CdB)	TA-54	TA-54	Active	D-5.0-3
293	R-39	Regional	Pajarito	TA-54	TA-54	Active	D-5.0-3
294	R-40 screen 2	Regional	Pajarito	TA-54	TA-54	Active	D-5.0-3
295	R-41 screen 2	Regional	Mortandad (CdB)	TA-54	TA-54	Active	D-5.0-3
296	R-42	Regional	Mortandad	Cr Investigation	Cr Investigation	Active	D-3.0-3
297	R-43 screen 1	Regional	Sandia	Cr Investigation	Cr Investigation	Active	D-3.0-3
298	R-43 screen 2	Regional	Sandia	Cr Investigation	Cr Investigation	Active	D-3.0-3
299	R-44 screen 1	Regional	Mortandad	Cr Investigation	Cr Investigation	Active	D-3.0-3
300	R-44 screen 2	Regional	Mortandad	Cr Investigation	Cr Investigation	Active	D-3.0-3
301	R-45 screen 1	Regional	Mortandad	Cr Investigation	Cr Investigation	Active	D-3.0-3
302	R-45 screen 2	Regional	Mortandad	Cr Investigation	Cr Investigation	Active	D-3.0-3
303	R-46	Regional	Mortandad	MDA C	MDA C	Active	D-4.0-3
304	R-47	Regional	Water/CdV	TA-16 260	—	Cancelled	D-6.0-3
305	R-48	Regional	Water/CdV	TA-16 260	TA-16 260	Active	D-6.0-3
306	R-49 screen 1	Regional	Pajarito	TA-54	TA-54	Active	D-5.0-3
307	R-49 Screen 2	Regional	Pajarito	TA-54	TA-54	Active	D-5.0-3
308	R-50 screen 1	Regional	Mortandad	Cr Investigation	Cr Investigation	Active	D-3.0-3
309	R-50 screen 2	Regional	Mortandad	Cr Investigation	Cr Investigation	Active	D-3.0-3
310	R-51 screen 1	Regional	Pajarito	TA-54	TA-54	Active	D-5.0-3
311	R-51 screen 2	Regional	Pajarito	TA-54	TA-54	Active	D-5.0-3

Table D-1.1-1 (continued)

Row	Location	Zone	Physical Watershed ^a	Assigned Monitoring Group in 2010 Interim Plan ^b	Assigned Monitoring Group in 2011 Interim Plan ^c	Current Status ^d	Table Documenting Status
312	R-52 screen 1	Regional	Mortandad (CdB)	TA-54	TA-54	Active	D-5.0-3
313	R-52 screen 2	Regional	Mortandad (CdB)	TA-54	TA-54	Active	D-5.0-3
314	R-53 screen 1	Regional	Mortandad (CdB)	TA-54	TA-54	Active	D-5.0-3
315	R-53 screen 2	Regional	Mortandad (CdB)	TA-54	TA-54	Active	D-5.0-3
316	R-54 screen 1	Regional	Pajarito	TA-54	TA-54	Active	D-5.0-3
317	R-54 screen 2	Regional	Pajarito	TA-54	TA-54	Active	D-5.0-3
318	R-55 screen 1	Regional	Mortandad (CdB)	TA-54	TA-54	Active	D-5.0-3
319	R-55 screen 2	Regional	Mortandad (CdB)	TA-54	TA-54	Active	D-5.0-3
320	R-56 screen 1	Regional	Mortandad (CdB)	TA-54	TA-54	Active	D-5.0-3
321	R-56 screen 2	Regional	Mortandad (CdB)	TA-54	TA-54	Active	D-5.0-3
322	R-57 screen 1	Regional	Mortandad (CdB)	TA-54	TA-54	Active	D-5.0-3
323	R-57 screen 2	Regional	Mortandad (CdB)	TA-54	TA-54	Active	D-5.0-3
324	R-59	Regional	Mortandad (CdB)	MDA C	—	Canceled	D-4.0-3
325	R-60	Regional	Pajarito	MDA C	MDA C	Active	D-4.0-3
326	R-61 screen 1	Regional	Mortandad	—	Cr Investigation	Active	D-3.0-3
327	R-61 screen 2	Regional	Mortandad	—	Cr Investigation	Active	D-3.0-3
328	R-62 screen 1	Regional	Mortandad	—	Cr Investigation	Active	D-3.0-3
329	R-62 screen 2	Regional	Mortandad	—	Cr Investigation	Active	D-3.0-3
330	R-63	Regional	Water/CdV	—	TA-16 260	Active	D-6.0-3
331	R-64	Regional	Los Alamos	—	TA-21	Active	D-2.0-3
332	R-65	Regional	Los Alamos	—	TA-21	Active	D-2.0-3
333	R-66	Regional	Los Alamos	—	TA-21	Placeholder	D-2.0-3
334	Test Well DT-10	Regional	Ancho	MDA AB	—	Inactive	D-7.0-3
335	Test Well DT-5A	Regional	Ancho	MDA AB	—	Inactive	D-7.0-3

Table D-1.1-1 (continued)

Row	Location	Zone	Physical Watershed ^a	Assigned Monitoring Group in 2010 Interim Plan ^b	Assigned Monitoring Group in 2011 Interim Plan ^c	Current Status ^d	Table Documenting Status
336	Test Well DT-9	Regional	Ancho	MDA AB	—	Inactive	D-7.0-3
337	TW-3	Regional	Los Alamos	TA-21	—	P&A	D-2.0-3

^a Parentheses indicate subwatersheds: CdB = Cañada del Buey, CdV = Cañon de Valle.

^b Assigned monitoring group as indicated on sampling tables in 2010 Interim Plan; — = not applicable because not included in 2010 Interim Plan.

^c Assigned monitoring group as indicated on sampling tables in this Interim Plan; — = not applicable because not included in 2011 Interim Plan.

^d Current status as indicated on sampling tables in this Interim Plan:

- Active = Scheduled for water-quality sampling. Includes wells scheduled for completion before November 1, 2011.
- Canceled = A placeholder for this well was included in 2010 Interim Plan, but plans for this well have since been canceled or are being reevaluated.
- Conversion = Well equipped with a Westbay sampling system that was recently converted or is scheduled for conversion to a single-screen or dual-screen well with purgeable sampling system in the near future (e.g., within a few months).
- Inactive = Well was included in 2010 Interim Plan but is removed from the 2011 Interim Plan for reasons documented in the referenced table.
- Nonfunctional = Screen is not usable for water-quality sampling or water-level monitoring.
- P&A = Plugged and abandoned. Includes screens scheduled for P&A in the near future (e.g., within a few months).
- Placeholder = Planned well scheduled to be completed during the monitoring year that starts October 1, 2011.
- WL only = Scheduled only for water-level (WL) monitoring.

^e The final configuration for the well after conversion, such as which screens will be retained, has not been determined.

Table D-1.1-2
Locations Used for the Determination of Background Water Quality for Regional and Perched-Intermediate Aquifers

Location	Source Aquifer	Physical Watershed	Groundwater Background Investigation Report		Table Documenting Sampling Status in 2011 Interim Plan
			Rev 3 (LANL 2007, 095817)	Rev 4 (LANL 2010, 110535)	
Ancho Spring	Regional	Ancho	•	•	Table D-8.8-3
Barbara Spring	Intermediate	Frijoles	•	•	Table D-8.7-3
Campsite Spring	Intermediate	Guaje	•	•	Table D-8.2-3
CdV-5.0 Spring	Intermediate	Water/CdV	•	•	Table D-8.6-3
G-1A water supply well	Regional	Guaje	•	•	Not applicable; sampled under MOU with Los Alamos County
G-2A water supply well	Regional	Guaje	•	•	Not applicable; sampled under MOU with Los Alamos County
G-3A water supply well	Regional	Guaje	•	•	Not applicable; sampled under MOU with Los Alamos County
G-4A water supply well	Regional	Guaje	•	•	Not applicable; sampled under MOU with Los Alamos County
G-5A water supply well	Regional	Guaje	•	•	Not applicable; sampled under MOU with Los Alamos County
LAOI(a)-1.1	Intermediate	Los Alamos	•	•	Table D-2.0-3
PC Spring	Intermediate	Pajarito	—	•	Table D-8.5-3
PCI-2	Intermediate	Pajarito	—	•	Table D-4.0-3
PM-2 water supply well	Regional	Pajarito	•	•	Not applicable; sampled under MOU with Los Alamos County
PM-4 water supply well	Regional	Mortandad	•	•	Not applicable; sampled under MOU with Los Alamos County
PM-5 water supply well	Regional	Mortandad	•	•	Not applicable; sampled under MOU with Los Alamos County
R-1	Regional	Mortandad	•	—	Table D-3.0-3
R-2	Regional	Los Alamos	—	•	Table D-8.2-3
R-6	Regional	Los Alamos	—	•	Table D-2.0-3
R-10 screen 1	Regional	Sandia	—	•	Table D-8.3-3
R-10 screen 2	Regional	Sandia	—	•	Table D-8.3-3
R-13	Regional	Mortandad	•	—	Table D-3.0-3
R-14	Regional	Mortandad	—	•	Table D-4.0-3
R-16r	Regional	Mortandad	—	•	Table D-8.4-3
R-17 screen 1	Regional	Pajarito	—	•	Table D-4.0-3

Table D-1.1-2 (continued)

Location	Source Aquifer	Physical Watershed	Groundwater Background Investigation Report		Table Documenting Sampling Status in 2011 Interim Plan
			Rev 3 (LANL 2007, 095817)	Rev 4 (LANL 2010, 110535)	
R-17 screen 2	Regional	Pajarito	—	•	Table D-4.0-3
R-21	Regional	Mortandad	•	•	Table D-5.0-3
R-24	Regional	Pueblo	—	•	Table D-8.2-3
R-27	Regional	Water/CdV	—	•	Table D-7.0-3
R-33 screen 1	Regional	Mortandad	—	•	Table D-8.4-3
R-33 screen 2	Regional	Mortandad	—	•	Table D-8.4-3
R-34	Regional	Mortandad	—	•	Table D-8.4-3
R-49 screen 2	Regional	Pajarito	—	•	Table D-5.0-3
Sacred Spring	Intermediate*	White Rock Canyon	•	•	Table D-8.8-3
Sandia Spring	Intermediate	White Rock Canyon	—	•	Table D-8.8-3
Seven Springs	Intermediate	Jemez Mountains	•	—	Not applicable; not currently sampled
Spring 1	Intermediate*	White Rock Canyon	•	•	Table D-8.8-3
Spring 5B	Regional	White Rock Canyon	•	—	Table D-8.8-3
Spring 6	Regional	White Rock Canyon	•	•	Table D-8.8-3
Spring 6A	Regional	White Rock Canyon	•	•	Table D-8.8-3
Spring 8A	Regional	White Rock Canyon	•	—	Table D-8.8-3
Spring 9	Regional	White Rock Canyon	•	•	Table D-8.8-3
Spring 9A	Regional	White Rock Canyon	•	•	Table D-8.8-3
Spring 9B	Regional	White Rock Canyon	•	•	Table D-8.8-3
Water Canyon Gallery	Intermediate	Water/CdV	•	•	Table D-8.6-3

Notes: • = The location is included in this revision of the groundwater background investigation report; — = the location is not included in this revision of the groundwater background investigation report.

*Classified as representative of the regional aquifer in the Groundwater Background Investigation Report, Rev 3 (LANL 2007, 095817).

Table D-1.2-1
Guidelines for Assigning Default Minimum Sampling Frequencies for Analytical Suites for Monitoring Groups or Watersheds

Hydrologic Zone	COPC for Monitoring Group or Watershed				Not a COPC for Monitoring Group or Watershed			
	Not Detected ^a		Detected ^a		Not Detected		Detected	
	COPC Has Low Mobility in Water	COPC Has Moderate to High Mobility in Water	COPC Nature and Extent Is Well-Characterized	COPC Nature and Extent Is Not Well-Characterized or Data Are Needed for Decision-Making	Low Mobility in Water	Moderate to High Mobility in Water	Nature and Extent Is Well-Characterized	Nature and Extent Is Not Well-Characterized or Data Are Needed for Decision-Making
Analytical Suites for Inorganic Constituents (General Inorganics, Metals, Perchlorate)								
Base flow	A	A	A	S	A	A	A	S
Springs	A	A	A	S	A	A	A	S
Alluvial	A	A	A	S	A	A	A	S
Intermediate	A	A	A	Q	A	A	A	S
Regional	A	A	A	Q	A	A	A	S
Characterization	Q	Q	Q	Q	S	Q	Q	Q
Analytical Suites for Organic Constituents (SVOCs, VOCs, Dioxins/Furans, HEXP, PCBs, Pesticides)								
Base flow	T	A	A	S	T	A	A	S
Springs	T	A	A	S	T	A	A	S
Alluvial	T	A	A	S	T	A	A	S
Intermediate	T	A	A	S	T	A	A	S
Regional	T	A	A	S	T	A	A	S
Characterization	S	Q	Q	Q	S	Q	Q	Q
Analytical Suites for Radionuclides (excluding Tritium)								
Base flow; alluvial	B	A	A	S	B	B	A	A
Springs; deep groundwater	B	A	A	S	B	B	A	A
Characterization	S	Q	Q	Q	S	Q	Q	Q

Table D-1.2-1 (continued)

Hydrologic Zone	COPC for Monitoring Group or Watershed				Not a COPC for Monitoring Group or Watershed			
	Not Detected ^a		Detected ^a		Not Detected		Detected	
	COPC Has Low Mobility in Water	COPC Has Moderate to High Mobility in Water	COPC Nature and Extent Is Well-Characterized	COPC Nature and Extent Is Not Well-Characterized or Data Are Needed for Decision-Making	Low Mobility in Water	Moderate to High Mobility in Water	Nature and Extent Is Well-Characterized	Nature and Extent Is Not Well-Characterized or Data Are Needed for Decision-Making
Analytical Suites for Tritium								
Base flow; alluvial	— ^b	A	A	S	—	A	A	S
Springs; deep groundwater	—	A	A	S	—	A	A	A
Characterization	—	Q	Q	Q	—	Q	Q	Q

Notes: Sampling frequencies shown in this table are recommended minimum frequencies. Higher frequencies may be established consistent with site-specific conditions, permit requirements, other New Mexico Environment Department requirements, or memoranda of understanding.

Sampling Frequency Abbreviations: Q = quarterly (4 times/yr); S = semiannual (2 times/yr); A = annual (1 time/yr); B = biennial (once every 2 yr); T = triennial (once every 3 yr).

^a For the purposes of this table, detection status is determined relative to one-half of the lowest applicable regulatory standard or other screening level used in Appendix B. "Detected" means the analyte was detected more than once above one-half the standard and at more than one location in the same zone in the same monitoring group. "Not detected" means the analyte was not detected above one-half the standard more than once or not at more than one location in the same hydrologic zone in the same monitoring group. These rules of thumb serve to minimize the potential that area-wide sampling plans will be based on spurious analytical detections or otherwise unreliable data, or on localized contaminants for which effects are limited to a single monitoring location. Localized contaminant issues can be addressed by assigning higher frequencies to the individual locations to which they are pertinent rather than to all locations in that sampling group.

^b — = Not applicable. The category "Low mobility" is not applicable because tritium is highly mobile.

Table D-1.2-2

Analytes Detected Two or More Times abovec One-Half Standard at More than One Location: Area-Specific Monitoring Groups

Analytical Suite	Analyte Exceeding One-Half Standard at Least Twice (at any location in a monitoring group)	Analyte Exceeds One-Half Standard ^a at Least Twice at More than One Location in a Category												
		TA-21		Chromium Investigation		MDA C	TA-54		TA-16 260					MDA AB
		Intermediate Wells	Regional Wells	Intermediate Wells	Regional Wells	Regional Wells	Intermediate Wells	Regional Wells	Base Flow ^b	Spring	Alluvial Wells	Intermediate Wells	Regional Wells	Regional Wells
Dioxins/Furans	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Gen Inorganics	Fluoride	—	—	—	—	—	—	—	—	—	—	—	—	—
Gen Inorganics	Nitrate-Nitrite	—	—	☐	●	—	—	—	—	—	—	—	—	—
Gen Inorganics	Perchlorate	☐	—	☐	—	—	—	—	—	—	—	—	—	—
Gen Inorganics	Total Dissolved Solids	—	—	—	—	—	—	—	—	—	—	—	—	—
HEXP	RDX ^c	—	—	—	—	—	—	—	—	☐	☐	☐	—	—
Metals	Aluminum	—	—	—	—	—	—	—	—	●	☐	—	—	—
Metals	Antimony	—	—	—	—	—	—	—	—	—	—	—	—	—
Metals	Arsenic	—	—	—	—	—	—	—	—	—	☐	—	—	—
Metals	Barium	—	—	—	—	—	—	—	—	—	☐	—	—	—
Metals	Beryllium	—	—	—	—	—	—	—	—	—	☐	—	—	—
Metals	Boron	—	—	—	—	—	—	—	—	—	—	—	—	—
Metals	Cadmium	—	—	—	—	—	—	—	—	—	—	—	—	—
Metals	Chromium	—	—	☐	☐	—	—	—	—	—	—	—	—	—
Metals	Iron	—	—	—	—	—	—	☐	—	☐	☐	—	☐	—
Metals	Lead	—	—	—	—	—	—	—	—	—	—	—	—	—
Metals	Manganese	—	—	●	—	—	☐	☐	—	☐	☐	—	☐	—
Metals	Nickel	—	—	—	—	—	—	—	—	—	—	—	—	—
Metals	Thallium	—	—	—	—	—	—	—	●	—	—	—	—	—
PCBs	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Pesticides	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Rad	Gross alpha ^d	—	—	—	—	—	—	—	—	—	—	—	—	—

Table D-1.2-2 (continued)

Analytical Suite	Analyte Exceeding One-Half Standard at Least Twice (at any location in a monitoring group)	Analyte Exceeds One-Half Standard ^a at Least Twice at More than One Location in a Category												
		TA-21		Chromium Investigation		MDA C	TA-54		TA-16 260					MDA AB
		Intermediate Wells	Regional Wells	Intermediate Wells	Regional Wells	Regional Wells	Intermediate Wells	Regional Wells	Base Flow ^b	Spring	Alluvial Wells	Intermediate Wells	Regional Wells	Regional Wells
Rad	Radium-228	—	—	—	—	—	—	—	—	—	—	—	—	—
Rad	Tritium	—	—	■	—	—	—	—	—	—	—	—	—	—
SVOC	Benzo(a)pyrene	—	—	—	—	—	—	—	—	—	—	—	—	—
SVOC	Benzo(b)fluoranthene	—	—	—	—	—	—	—	—	—	—	—	—	—
SVOC	Bis(2-ethylhexyl)phthalate	—	—	—	—	●	—	●	—	—	—	—	—	—
SVOC	Dioxane[1,4-]	—	—	■	—	—	—	—	—	—	—	—	—	—
VOC	Bromomethane	—	—	—	—	—	—	—	—	—	—	—	—	—
VOC	Tetrachloroethene	—	—	—	—	—	—	—	—	—	—	—	—	—
VOC	Trichloroethene	—	—	—	—	—	—	—	—	—	—	●	—	—

Sources: Tables B1-3 and B1-4 in Attachment B-1.

Notes: ● = Detected above or at one-half standard more than once; ■ = detected at least once above standard; — = not detected above one-half standard more than once or at more than one location in this hydrologic zone.

^a The term “standard” refers to the lowest applicable regulatory standard or other screening level.

^b Only one base-flow location (Cañon de Valle below MDA P) is assigned to the TA-16 260 monitoring group. Consequently, this table identifies analytes detected more than once at this location at concentrations exceeding one-half standard.

^c RDX = Hexahydro-1,3,5-trinitro-1,3,5-triazine.

^d The gross alpha standard (15 pCi/L) applies to total alpha after subtracting alpha contributions from radium-226 and radium-228. The reported data have not been adjusted for contributions from radium isotopes.

Table D-1.2-3

Organic Analytes Detected Two or More Times at More than One Location: Area-Specific Monitoring Groups

Analytical Suite	Analyte Detected at Least Twice (in at least one location in an area-specific monitoring group)	Number of Locations (2 or more) at which Analyte Was Detected ^a at Least Twice in a Hydrologic Zone												
		TA-21		Chromium Investigation		MDA C	TA-54		TA-16 260					MDA AB
		Intermediate Wells	Regional Wells	Intermediate Wells	Regional Wells	Regional Wells	Intermediate Wells	Regional Wells	Base Flow ^b	Spring	Alluvial Wells	Intermediate Wells	Regional Wells	Regional Wells
Dioxins/Furans ^c	Heptachlorodibenzodioxins (Total)	— ^d	—	2	4	—	—	—	—	—	—	—	—	—
Dioxins/Furans	Heptachlorodibenzofurans (Total)	—	—	—	—	—	—	—	—	—	—	—	—	—
Dioxins/Furans	Hexachlorodibenzodioxins (Total)	—	—	—	—	—	—	—	—	—	—	—	—	—
Dioxins/Furans	Hexachlorodibenzofurans (Total)	—	—	—	—	—	—	—	—	—	—	—	—	—
Dioxins/Furans	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	—	—	2	3	—	—	—	—	—	—	—	—	—
Dioxins/Furans	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	—	—	—	—	—	—	—	—	—	—	—	—	—
Dioxins/Furans	Pentachlorodibenzodioxins (Total)	—	—	—	—	—	—	—	—	—	—	—	—	—
Dioxins/Furans	Pentachlorodibenzofurans (Total)	—	—	—	—	—	—	—	—	—	—	—	—	—
Dioxins/Furans	Tetrachlorodibenzodioxin[2,3,7,8-]	—	—	—	—	—	—	—	—	—	—	—	—	—
Dioxins/Furans	Tetrachlorodibenzodioxins (Total)	—	—	—	—	—	—	—	—	—	—	—	—	—
Dioxins/Furans	Tetrachlorodibenzofurans (Total)	—	—	—	—	—	—	—	—	—	—	—	—	—
HEXP	2,4-Diamino-6-nitrotoluene	—	—	—	—	—	—	—	—	—	—	—	—	—
HEXP	3,5-Dinitroaniline	—	—	—	—	—	—	—	—	3	—	—	—	—
HEXP	Amino-2,6-dinitrotoluene[4-]	—	—	—	—	—	—	—	1	3	3	5	3	—
HEXP	Amino-4,6-dinitrotoluene[2-]	—	—	—	—	—	—	—	1	3	2	4	—	—
HEXP	Dinitrotoluene[2,4-]	—	—	—	—	—	—	—	—	—	—	—	—	—
HEXP	DNX ^e	—	—	—	—	—	—	—	1	2	—	4	—	—
HEXP	HMX ^f	—	—	—	—	—	—	—	1	5	10	9	2	—
HEXP	MNX ^g	—	—	—	—	—	—	—	1	3	3	5	—	—
HEXP	Nitrotoluene[2-]	—	—	—	—	—	—	—	—	—	—	—	—	—
HEXP	RDX	—	—	—	—	—	—	—	1	5	10	9	5	—

Table D-1.2-3 (continued)

Analytical Suite	Analyte Detected at Least Twice (in at least one location in an area-specific monitoring group)	Number of Locations (2 or more) at which Analyte Was Detected ^a at Least Twice in a Hydrologic Zone												
		TA-21		Chromium Investigation		MDA C	TA-54		TA-16 260					MDA AB
		Intermediate Wells	Regional Wells	Intermediate Wells	Regional Wells	Regional Wells	Intermediate Wells	Regional Wells	Base Flow ^b	Spring	Alluvial Wells	Intermediate Wells	Regional Wells	Regional Wells
HEXP	TNX ^h	—	—	—	—	—	—	—	1	3	2	4	—	—
HEXP	Trinitrobenzene[1,3,5-]	—	—	—	—	—	—	—	—	3	—	4	—	—
HEXP	Trinitrotoluene[2,4,6-]	—	—	—	—	—	—	—	—	2	—	2	2	—
PCBs	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Pesticides	—	—	—	—	—	—	—	—	—	—	—	—	—	—
SVOC	Benzo(a)pyrene	—	—	—	—	—	—	—	—	—	—	—	—	—
SVOC	Benzo(b)fluoranthene	—	—	—	—	—	—	—	—	—	—	—	—	—
SVOC	Benzo(g,h,i)perylene	—	—	—	—	—	—	—	—	—	—	—	—	—
SVOC	Bis(2-ethylhexyl)phthalate	2	—	—	2	2	—	2	—	—	—	—	—	—
SVOC	Diethylphthalate	—	—	—	—	—	—	2	—	—	—	—	—	—
SVOC	Dioxane[1,4-]	—	—	3	—	—	—	—	—	—	—	—	—	—
VOC	Acetone	—	—	2	6	3	—	4	—	4	5	—	2	—
VOC	Benzene	—	—	—	—	—	—	—	—	—	—	—	—	—
VOC	Bromomethane	—	—	—	—	—	—	—	—	—	—	—	—	—
VOC	Butanone[2-]	—	—	—	—	—	—	—	—	—	—	—	—	—
VOC	Chloroform	—	—	3	—	—	—	—	—	—	—	—	—	—
VOC	Chloromethane	—	—	—	2	—	—	2	—	—	—	—	—	—
VOC	Dichloroethene[cis-1,2-]	—	—	—	—	—	—	—	—	—	—	—	—	—
VOC	Ethylbenzene	—	—	—	—	—	—	—	—	—	—	—	—	—
VOC	Isopropylbenzene	—	—	—	—	—	—	—	—	—	—	—	—	—
VOC	Methyl tert-Butyl Ether	—	—	—	—	—	—	—	—	—	—	6	—	—
VOC	Methyl-2-pentanone[4-]	—	—	—	—	—	—	—	—	—	—	—	—	—

Table D-1.2-3 (continued)

Analytical Suite	Analyte Detected at Least Twice (in at least one location in an area-specific monitoring group)	Number of Locations (2 or more) at which Analyte Was Detected ^a at Least Twice in a Hydrologic Zone												
		TA-21		Chromium Investigation		MDA C	TA-54		TA-16 260					MDA AB
		Intermediate Wells	Regional Wells	Intermediate Wells	Regional Wells	Regional Wells	Intermediate Wells	Regional Wells	Base Flow ^b	Spring	Alluvial Wells	Intermediate Wells	Regional Wells	Regional Wells
VOC	Styrene	—	—	—	—	—	—	—	—	—	—	—	—	—
VOC	Tetrachloroethene	—	—	—	—	—	—	—	—	3	2	10	—	—
VOC	Toluene	—	—	2	3	—	2	7	—	—	4	6	—	—
VOC	Trichloroethene	—	—	—	—	—	—	—	—	3	—	7	—	—
VOC	Xylene[1,2-]	—	—	—	—	—	—	—	—	—	—	—	—	—
VOC	Xylene[1,3-]+Xylene[1,4-]	—	—	—	—	—	—	—	—	—	—	—	—	—

Sources: Tables B1-3 and B1-4 in Attachment B-1.

^a For the purposes of this table, detection status is based on the secondary validation flag (i.e., the result is not flagged as “U” or “UJ”) regardless of whether or not a regulatory standard or other screening level is applicable to the analyte. Numbers shown in this table indicate the number of locations at which the analyte is detected in the subgroup.

^b Only one base-flow location (Cañon de Valle below MDA P) is assigned to the TA-16 260 monitoring group. Consequently, the frequency of detection at this location is noted for any organic analyte detected at least twice.

^c Dioxins/Furans—The summary of detection statistics shown in this table for the dioxin/furan analytical suite is based on data for

- total dioxin isomer groups, such as heptachlorodibenzodioxins (total),
- total furan isomer groups, such as heptachlorodibenzofurans (total),
- octachlorodibenzodioxin[1,2,3,4,6,7,8,9-] and octachlorodibenzofuran[1,2,3,4,6,7,8,9-], which do not have isomers, and
- tetrachlorodibenzodioxin[2,3,7,8-], the only dioxin/furan isomer for which a regulatory standard exists.

^d — = The analyte was not detected more than once or at more than one location in this subgroup.

^e DNX = Hexahydro-1,3-dinitroso-1,3,5-triazine.

^f HMX = Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine.

^g MNX = Hexahydro-1-nitroso-3,5-dinitro-1,3,5-triazine.

^h TNX = Hexahydro-1,3,5-trinitroso-1,3,5-triazine.

Table D-1.2-4

Analytes Detected Two or More Times above One-Half Standard at Two or More Locations: General Surveillance

Analytical Suite	Analyte Exceeding One-Half Standard ^a at Least Twice (in at least one general surveillance location)	Analyte Exceeding One-Half Standard at Least Twice at More than One Location in a Category					Locations Exceeding Standard or One-Half Standard at Least Twice ^b
		Base Flow	Springs	Alluvial	Intermediate	Regional	
Dioxins/Furans	—	—	—	—	—	—	No analytes meet all criteria, i.e., none are detected two or more times above one-half standard at two or more locations in the same water type. Note that a standard exists only for one analyte in this analytical suite: tetrachlorodibenzodioxin[2,3,7,8-] (TCDD).
Gen Inorganics	Chloride	—	—	■	■	—	<ul style="list-style-type: none"> Alluvial wells in Mortandad and Pajarito Canyons Intermediate wells (2) in Pajarito Canyon at TA-03
Gen Inorganics	Fluoride	—	—	■	—	—	<ul style="list-style-type: none"> Alluvial wells with highest concentrations are primarily in Mortandad Canyon
Gen Inorganics	Nitrate-Nitrite	—	—	—	—	—	<ul style="list-style-type: none"> One location each in spring, alluvial, and intermediate types of water
Gen Inorganics	Perchlorate	—	—	■	●	—	<ul style="list-style-type: none"> Alluvial wells in Mortandad Canyon Intermediate wells in Los Alamos (2) Canyon
Gen Inorganics	Total Dissolved Solids	—	—	■	■	—	<ul style="list-style-type: none"> Alluvial wells in Los Alamos (1), Mortandad (3), Pajarito (4), and Sandia (2) Canyons Intermediate wells in Pajarito Canyon (2 at TA-03)
HEXP	RDX	—	—	—	—	—	<ul style="list-style-type: none"> One spring in Pajarito Canyon
Metals	Aluminum	■	■	■	■	—	<ul style="list-style-type: none"> Base-flow locations in Los Alamos (3), Mortandad (5), Pajarito (5), and Water (3) Canyons Alluvial wells in Mortandad (2) and Pajarito (1) Canyons Springs (6) in Pajarito Canyon Intermediate wells (2) in Pajarito Canyon at TA-03
Metals	Antimony	—	—	—	—	—	<ul style="list-style-type: none"> One spring in Pajarito Canyon
Metals	Arsenic	●	●	■	—	—	<ul style="list-style-type: none"> Base-flow stations in Pueblo (1), Mortandad (1), and Sandia (3) Canyons Alluvial wells in Sandia (3), Mortandad (1), and Los Alamos (1) Canyons Springs (2) in White Rock Canyon One regional well in Mortandad Canyon
Metals	Barium	—	—	■	—	—	<ul style="list-style-type: none"> Alluvial wells in Mortandad (2) and Pajarito (2) Canyons
Metals	Beryllium	—	—	●	—	—	<ul style="list-style-type: none"> Alluvial wells in Mortandad (1) and Sandia (1) Canyons

Table D-1.2-4 (continued)

Analytical Suite	Analyte Exceeding One-Half Standard ^a at Least Twice (in at least one general surveillance location)	Analyte Exceeding One-Half Standard at Least Twice at More than One Location in a Category					Locations Exceeding Standard or One-Half Standard at Least Twice ^b
		Base Flow	Springs	Alluvial	Intermediate	Regional	
Metals	Cadmium	—	—	—	—	—	• One base-flow location in Mortandad Canyon
Metals	Chromium	—	—	—	—	—	• One alluvial well in Mortandad Canyon
Metals	Cobalt	—	—	—	—	—	• One alluvial well in Mortandad Canyon
Metals	Copper	☐	—	—	—	—	• Base-flow stations in Pueblo (3), Mortandad (5), Pajarito (1), Sandia (3) and White Rock (1) Canyons
Metals	Iron	—	☐	☐	☐	☐	<ul style="list-style-type: none"> • Alluvial wells in Pueblo (4), Mortandad (3), Pajarito (2), and Sandia (1) Canyons • Springs in Pajarito (7) and Water (1) Canyons • Intermediate wells in Pajarito (2 at TA-03) and Sandia (1) Canyons • Regional well (2 screens in one well) in Ancho Canyon
Metals	Lead	•	—	☐	☐	—	<ul style="list-style-type: none"> • Base-flow stations in Pajarito (2) Canyon • Alluvial well in Mortandad (2) and Sandia (2) Canyons • Intermediate wells in Pajarito Canyon (2 at TA-03)
Metals	Manganese	—	☐	☐	☐	☐	<ul style="list-style-type: none"> • One base-flow station in Pueblo Canyon • Alluvial wells in Los Alamos/Pueblo (3), Mortandad (2), Pajarito (2), and Sandia (1) Canyons • Springs in Pajarito (1), Water (1), and White Rock (1) Canyons • Intermediate wells in Pajarito (2 at TA-03) and Sandia (1) Canyons • Regional wells in Ancho (2 screens in one well), Pueblo (1), and Sandia (1) Canyons
Metals	Nickel	—	—	—	—	—	• One intermediate well in Los Alamos Canyon
Metals	Selenium	—	—	—	—	—	• One base-flow station in Sandia Canyon
Metals	Thallium	☐	—	—	—	—	• Base-flow stations in Los Alamos (2), Mortandad (2), Pajarito (3), Sandia (2), and Water (3) Canyons
Metals	Zinc	•	—	—	—	—	• Base-flow stations in Los Alamos (1), Mortandad (1), and Sandia (1) Canyons
PCBs	—	—	—	—	—	—	No analytes meet all criteria
Pesticides	—	—	—	—	—	—	No analytes meet all criteria

Table D-1.2-4 (continued)

Analytical Suite	Analyte Exceeding One-Half Standard ^a at Least Twice (in at least one general surveillance location)	Analyte Exceeding One-Half Standard at Least Twice at More than One Location in a Category					Locations Exceeding Standard or One-Half Standard at Least Twice ^b
		Base Flow	Springs	Alluvial	Intermediate	Regional	
Rad	Cesium-137	●	—	—	—	—	● Base-flow stations in Mortandad (2) Canyon
Rad	Gross Alpha ^c	●	—	—	—	—	<ul style="list-style-type: none"> ● Base-flow stations in Los Alamos (2) and Mortandad (4) Canyons ● One intermediate well in Pajarito Canyon at TA-03 ● One spring in White Rock Canyon
Rad	Plutonium-239/240	—	—	—	—	—	● One alluvial well in Pueblo Canyon
Rad	Radium-228	—	—	■	—	—	● Alluvial wells in Mortandad (1) and Sandia (1) Canyons
Rad	Strontium-90 ^d	—	—	■	—	—	<ul style="list-style-type: none"> ● Alluvial wells in Los Alamos (4) and Mortandad (5) Canyons ● 1 spring in Los Alamos Canyon
SVOC	Dioxane[1,4-]	—	—	—	■	—	● Intermediate wells in Pajarito Canyon (2 at TA-03)
VOC	Dichloroethene[1,1-]	—	—	—	■	—	● Intermediate wells in Pajarito Canyon (2 at TA-03)
VOC	Trichloroethane[1,1,1-]	—	—	—	■	—	● Intermediate wells in Pajarito Canyon (3 at TA-03)

Sources: Tables B1-3 and B1-4 in Attachment B-1.

Notes: ● = Detected ≥ one-half standard more than once and at more than one location; ■ = detected above standard more than once and at more than one location; — = not detected above one-half standard more than once and at more than location in this hydrologic zone.

^a The term “standard” refers to the lowest applicable regulatory standard or other screening level.

^b Numbers shown in parentheses indicate the number of locations at which these criteria are met in the watershed.

^c Tables B1-3 and B1-4 in Attachment B-1 use the U.S. Environmental Protection Agency (EPA) maximum contaminant level (MCL) of 15 pCi/L for adjusted gross alpha as the screening level for gross alpha activities in water samples. This approach is conservative insofar as the EPA MCL for adjusted gross alpha excludes alpha-particle activity from radon and uranium. Data in Tables B1-3 and B1-4 have not been adjusted to subtract contributions from radon or uranium.

^d Tables B1-3 and B1-4 in Attachment B-1 use 8 pCi/L as a screening level for strontium-90 in water samples. This value is not an EPA MCL but rather the average annual concentration assumed to produce a dose of 4 mrem/yr (the EPA MCL for beta particle and photon radioactivity). If two or more radionuclides are present, the sum of their annual dose from beta particle and photon radioactivity must not exceed the MCL of 4 mrem/yr. The additive effect of other radionuclides is not addressed in Tables B1-3 and B1-4.

Table D-1.2-5
Organic Analytes Detected Two or More Times at More than One Location: General Surveillance

Analytical Suite	Analyte Detected ^a at Least Twice (in at least one general surveillance location)	Number of Locations (2 or more) at which Analyte Was Detected at Least Twice in a Hydrologic Zone ^b					Number of Locations (2 or more) at which Analyte Was Detected at Least Twice in a Hydrologic Zone ^c
		Base Flow	Springs	Alluvial	Intermediate	Regional	
Dioxins/Furans ^d	Heptachlorodibenzodioxins (Total)	13	—	9	—	—	<ul style="list-style-type: none"> Base-flow locations in Los Alamos (3), Pueblo (2), and Mortandad (8) Canyons. Includes Los Alamos above DP Canyon, although data for this analyte are available for only one sample for this location in Table B1-4 of Attachment B-1. Alluvial wells in Pueblo (2) and Mortandad (7) Canyons
Dioxins/Furans	Heptachlorodibenzofurans (Total)	9	—	5	—	—	<ul style="list-style-type: none"> Base-flow locations in Los Alamos (2), Pueblo (2), and Mortandad (5) Canyons. Includes Los Alamos above DP Canyon, although data for this analyte are available for only one sample for this location in Table B1-4. Alluvial wells in Pueblo (2) and Mortandad (3) Canyons
Dioxins/Furans	Hexachlorodibenzodioxins (Total)	5	—	—	—	—	<ul style="list-style-type: none"> Base-flow locations in Los Alamos (1), Pueblo (1), and Mortandad (3) Canyons. Includes Los Alamos above DP Canyon, although data for this analyte are available for only one sample for this location in Table B1-4. One alluvial well in Mortandad Canyon
Dioxins/Furans	Hexachlorodibenzofurans (Total)	9	—	4	—	—	<ul style="list-style-type: none"> Base-flow locations in Los Alamos (2), Pueblo (2), and Mortandad (4) Canyons. Includes Los Alamos above DP Canyon, although data for this analyte are available for only one sample for this location in Table B1-4. Alluvial wells in Pueblo (1) and Mortandad (3) Canyons.
Dioxins/Furans	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	10	—	8	—	—	<ul style="list-style-type: none"> Base-flow locations in Los Alamos (2), Pueblo (2), Mortandad (5), and Water (1) Canyons Alluvial wells in Pueblo (2), Mortandad (5), and Pajarito (1) Canyons
Dioxins/Furans	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	10	—	5	—	—	<ul style="list-style-type: none"> Base-flow locations in Los Alamos (1), Pueblo (2), and Mortandad (3) Canyons Alluvail wells in Pueblo (2) and Mortandad (3) Canyons

Table D-1.2-5 (continued)

Analytical Suite	Analyte Detected ^a at Least Twice (in at least one general surveillance location)	Number of Locations (2 or more) at which Analyte Was Detected at Least Twice in a Hydrologic Zone ^b					Number of Locations (2 or more) at which Analyte Was Detected at Least Twice in a Hydrologic Zone ^c
		Base Flow	Springs	Alluvial	Intermediate	Regional	
Dioxins/Furans	Pentachlorodibenzodioxins (Total)	3	—	—	—	—	<ul style="list-style-type: none"> Base-flow locations in Pueblo (2) and Mortandad (1) Canyons
Dioxins/Furans	Pentachlorodibenzofurans (Total)	7	—	4	—	—	<ul style="list-style-type: none"> Base-flow locations in Los Alamos (2), Pueblo (2), and Mortandad (3) Canyons. Includes Los Alamos above DP Canyon, although data for this analyte are available for only one sample for this location in Table B1-4. Alluvial wells in Pueblo (2) and Mortandad (2) Canyons One spring in White Rock Canyon
Dioxins/Furans	Tetrachlorodibenzodioxin[2,3,7,8-]	—	—	—	—	—	<ul style="list-style-type: none"> One base-flow location in Pueblo Canyon
Dioxins/Furans	Tetrachlorodibenzodioxins (Total)	3	—	—	—	—	<ul style="list-style-type: none"> Base-flow locations in Los Alamos (1) and Pueblo (2) Canyons
Dioxins/Furans	Tetrachlorodibenzofurans (Total)	3	—	2	—	—	<ul style="list-style-type: none"> Base-flow locations in Pueblo (2) and Mortandad (1) Canyons Alluvial wells in Pueblo (1) and Mortandad (1) Canyons
HEXP	2,4-Diamino-6-nitrotoluene	—	—	—	—	—	<ul style="list-style-type: none"> One base-flow location in Sandia Canyon
HEXP	Amino-2,6-dinitrotoluene[4-]	2	—	—	—	—	<ul style="list-style-type: none"> Base-flow locations in Water (2) Canyon. Includes the location in Water Canyon that is assigned to the TA-16 260 monitoring group.
HEXP	Amino-4,6-dinitrotoluene[2-]	2	—	—	—	—	<ul style="list-style-type: none"> Base-flow locations in Water (2) Canyon, including the location assigned to TA-16 260 monitoring group
HEXP	DNX	—	—	—	—	—	<ul style="list-style-type: none"> One base-flow location in Water Canyon (assigned to TA-16 260 monitoring group)
HEXP	MNX	—	—	—	—	—	<ul style="list-style-type: none"> One base-flow location in Water Canyon (assigned to TA-16 260 monitoring group)
HEXP	TNX	—	—	—	—	—	<ul style="list-style-type: none"> One base-flow location in Water Canyon (assigned to TA-16 260 monitoring group)

Table D-1.2-5 (continued)

Analytical Suite	Analyte Detected ^a at Least Twice (in at least one general surveillance location)	Number of Locations (2 or more) at which Analyte Was Detected at Least Twice in a Hydrologic Zone ^b					Number of Locations (2 or more) at which Analyte Was Detected at Least Twice in a Hydrologic Zone ^c
		Base Flow	Springs	Alluvial	Intermediate	Regional	
HEXP	HMX	6	2	—	—	—	<ul style="list-style-type: none"> Base-flow locations in Pajarito (3) and Water (3) Canyons. Includes the location in Water Canyon that is assigned to the TA-16 260 monitoring group. Springs in Pajarito (2) Canyon
HEXP	RDX	5	2	—	—	—	<ul style="list-style-type: none"> Base-flow locations in Pajarito (2) and Water (3) Canyons. Includes the location in Water Canyon that is assigned to the TA-16 260 monitoring group. Springs in Pajarito (2) Canyon
PCBs	Aroclor-1254	—	—	—	—	—	<ul style="list-style-type: none"> One base-flow location in Sandia Canyon
PCBs	Aroclor-1260	—	—	—	—	—	<ul style="list-style-type: none"> One base-flow location in Sandia Canyon One alluvial well in Sandia Canyon
PCB Congener	Total PCB	—	—	—	—	—	<ul style="list-style-type: none"> One base-flow location in Los Alamos Canyon
Pesticides	Heptaclor	—	—	—	—	—	<ul style="list-style-type: none"> One regional well in Ancho Canyon
Pesticides	DDD ^e [4,4'-] ^j	—	—	—	—	—	<ul style="list-style-type: none"> One alluvial well in Pajarito Canyon
Pesticides	DDE ^f [4,4'-]	—	—	—	—	—	<ul style="list-style-type: none"> One alluvial well in Pajarito Canyon
Pesticides	DDT ^g [4,4'-]	—	—	—	—	—	<ul style="list-style-type: none"> One alluvial well in Pajarito Canyon
SVOC	Bis(2-ethylhexyl)phthalate	3	—	—	—	2	<ul style="list-style-type: none"> Base-flow locations in Pueblo (1), Pajarito (1), and White Rock (1) Canyons One alluvial well in Mortandad Canyon Regional wells in Mortandad (1) and Sandia (1) Canyons
SVOC	Diethylphthalate	—	—	—	—	—	<ul style="list-style-type: none"> One spring in White Rock Canyon
SVOC	Dioxane[1,4-]	—	—	—	3	—	<ul style="list-style-type: none"> One base-flow location in Sandia Canyon Intermediate wells in Pueblo (1) and Pajarito (2 at TA-03) Canyons

Table D-1.2-5 (continued)

Analytical Suite	Analyte Detected ^a at Least Twice (in at least one general surveillance location)	Number of Locations (2 or more) at which Analyte Was Detected at Least Twice in a Hydrologic Zone ^b					Number of Locations (2 or more) at which Analyte Was Detected at Least Twice in a Hydrologic Zone ^c
		Base Flow	Springs	Alluvial	Intermediate	Regional	
VOC	Acetone	17	2	8	3	5	<ul style="list-style-type: none"> Base-flow locations in Ancho (1), Los Alamos (1), Mortandad (8), Pajarito (2), Sandia (3), and Water (2) Canyons Alluvial wells in Mortandad (4), Pajarito (3), and Sandia (1) Canyons Springs in Pajarito (1), and White Rock (1) Canyons Intermediate wells in Pueblo (1), Pajarito (1), and Sandia (1) Canyons Regional wells in Ancho (2 screens in 1 well), Mortandad (1), and Sandia (2) Canyons
VOC	Bromodichloromethane	—	—	—	—	—	<ul style="list-style-type: none"> One base-flow location in Sandia Canyon
VOC	Bromoform	—	—	—	—	—	<ul style="list-style-type: none"> One base-flow location in Sandia Canyon
VOC	Butanone[2-]	—	9	5	2	—	<ul style="list-style-type: none"> One base-flow location in Pueblo Canyon Springs in Pajarito (5) and White Rock (4) Canyons Alluvial wells in Mortandad (2), Pajarito (2), and Water (1) Canyons Intermediate wells in Pajarito (2 at TA-03) Canyon
VOC	Bromodichloromethane	2	—	—	—	—	<ul style="list-style-type: none"> Base-flow locations in Sandia (2) Canyon
VOC	Chloroform	3	—	2	2	—	<ul style="list-style-type: none"> Base-flow locations in Sandia (3) Canyon One spring in Pajarito Canyon Alluvial wells in Sandia (2) Canyon Intermediate wells in Pajarito (2 at TA-03) Canyon
VOC	Chloromethane	—	—	2	—	—	<ul style="list-style-type: none"> Alluvial wells in Los Alamos (1) and Pajarito (1) Canyons
VOC	Dichlorobenzene[1,3,-]	—	—	—	—	—	<ul style="list-style-type: none"> One alluvial well in Water Canyon
VOC	Dichloroethane[1,1-]	—	—	—	3	—	<ul style="list-style-type: none"> Intermediate wells in Pajarito (3 at TA-03) Canyon
VOC	Dichloroethane[1,2-]	—	—	—	—	—	<ul style="list-style-type: none"> One intermediate well in Pajarito Canyon at TA-03
VOC	Dichloroethene[1,1-]	—	—	—	3	—	<ul style="list-style-type: none"> Intermediate wells in Pajarito (3 at TA-03) Canyon
VOC	Isopropyltoluene[4-]	—	—	—	—	—	<ul style="list-style-type: none"> One alluvial well in Mortandad Canyon

Table D-1.2-5 (continued)

Analytical Suite	Analyte Detected ^a at Least Twice (in at least one general surveillance location)	Number of Locations (2 or more) at which Analyte Was Detected at Least Twice in a Hydrologic Zone ^b					Number of Locations (2 or more) at which Analyte Was Detected at Least Twice in a Hydrologic Zone ^c
		Base Flow	Springs	Alluvial	Intermediate	Regional	
VOC	Toluene	—	—	4	—	—	<ul style="list-style-type: none"> One spring in White Rock Canyon Alluvial wells in Mortandad (1), Pajarito (1), and Sandia (2) Canyon One intermediate well in Sandia Canyon One regional well in Pueblo Canyon
VOC	Trichloroethane[1,1,1-]	—	—	—	3	—	<ul style="list-style-type: none"> Intermediate wells in Pajarito Canyon (3 at TA-03)
VOC	Trichloroethane[1,1,2-]	—	—	—	—	—	<ul style="list-style-type: none"> One intermediate well in Pajarito Canyon at TA-03
VOC	Trichloroethene	—	—	—	2	—	<ul style="list-style-type: none"> Intermediate wells in Pajarito Canyon (2 at TA-03) One regional well in Mortandad Canyon

Sources: Table B1-3 and B1-4.

^a For the purposes of this table, detection status is based on the secondary validation flag (i.e., the result is not flagged as “U” or “UU”) regardless of whether or not a regulatory standard or other screening level is applicable to the analyte.

^b Numbers shown in this table indicate the number of locations at which the analyte is detected in the subgroup. — = the analyte was not detected more than once at more than one location in this subgroup.

^c Numbers shown in parentheses indicate the number of locations at which these criteria are met in the watershed.

^d Dioxins/Furans—The summary of detection statistics shown in this table for the dioxin/furan analytical suite is based on data for;

- total dioxin isomer groups, such as heptachlorodibenzodioxins (Total),
- total furan isomer groups, such heptachlorodibenzofurans (Total),
- octachlorodibenzodioxin[1,2,3,4,6,7,8,9-] (OCDD) and octachlorodibenzofuran[1,2,3,4,6,7,8,9-], which do not have isomers, and
- TCDD, the only dioxin/furan isomer for which a regulatory standard exists.

^e DDD = Dichlorodiphenyldichloroethane[4,4'-].

^f DDE = Dichlorodiphenyldichloroethylene[4,4'-].

^g DDT = Dichlorodiphenyltrichloroethane[4,4'-].

Table D-2.0-1
Analytes Detected Two or More Times above One-Half Standard in the TA-21 Monitoring Group

Analytical Suite	Analyte Exceeding One-Half Standard at Least Twice at the Same Location in This Monitoring Group	Intermediate Wells							Regional Wells				
		LADP-3	LAOI(a)-1.1	LAOI-3.2	LAOI-3.2a	R-5 screen 2	R-6i	TA-53i	R-5 Screen 3	R-5 Screen 4	R-6	R-7 Screen 3*	Test Well 3*
Dioxins/Furans	—	—	—	—	—	—	—	—	—	—	—	—	—
General Inorganics	Fluoride	—	—	—	—	●	—	—	—	—	—	—	—
General Inorganics	Perchlorate	—	—	■	■	—	■	—	—	—	—	—	—
HEXP	—	—	—	—	—	—	—	—	—	—	—	—	—
Metals	Lead	—	—	—	—	—	—	—	—	—	—	—	●
Metals	Manganese	—	—	■	—	—	—	—	—	—	—	—	●
PCBs	—	—	—	—	—	—	—	—	—	—	—	—	—
Pesticides	—	—	—	—	—	—	—	—	—	—	—	—	—
Radionuclides	—	—	—	—	—	—	—	—	—	—	—	—	—
SVOC	Bis(2-ethylhexyl)phthalate	—	—	—	—	—	—	■	—	—	—	—	—
SVOC	Dioxane[1,4-]	—	—	—	—	—	●	—	—	—	—	—	—
VOC	—	—	—	—	—	—	—	—	—	—	—	—	—

Source: Table B1-3 in Attachment B-1.

Notes: ● = Detected ≥ one-half standard more than once; ■ = detected at least once above standard; — = not detected above one-half standard more than once at any location in this monitoring group. The term “standard” refers to the lowest applicable regulatory standard or other screening level.

* Analytical data from R-7 screen 3 and Test Well 3 may not be representative of in-situ conditions or reliable because the water chemistry is affected by the presence of residual downhole products in the R-7 screen and casing corrosion in Test Well 3.

Table D-2.0-2
Area-Specific Analytical Suites and Frequencies for the TA-21 Monitoring Group

Location	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Monitoring Group Suite and Frequency
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
Intermediate	2011	A	A	A	T	T	T	T	A	A	A	A	A	— ⁱ	Combined near-field and far-field intermediate groups. Frequencies are reduced to annual for primary analytical suites because of history of nondetects for organics (Tables D-1.2-3 and D-2.0-1) and because inorganic constituents are well characterized and show either stable or decreasing concentrations. Added triennial sampling for other organics as requested by the New Mexico Environment Department (NMED 2011, 201467).
	2010	A	S	S	—	—	—	—	A	S	S	S	S	(A)	New monitoring group. Sampling plan for this new group is based on suites and frequencies specified for general surveillance of this hydrologic zone in the 2009 Interim Plan. Added SVOC suite to complement VOC data and to provide additional data in support of CME decisions.
Intermediate (background and far-field)	2011	—	—	—	—	—	—	—	—	—	—	—	—	—	Combined near-field and far-field intermediate subgroups into a single intermediate subgroup. A separate subgroup for far-field wells is no longer needed because most of these wells have been moved to the general surveillance monitoring group.
	2010	A	A	A	—	—	—	—	A	S	S	S	S	(A)	New monitoring group. Sampling plan for this new group is based on suites and frequencies specified for general surveillance of this hydrologic zone in the 2009 Interim Plan. Reduced VOC frequency to annual because of the greater distance of these locations from TA-21 sources. Added SVOC suite to complement VOC data and to provide additional data in support of CME decisions.

Table D-2.0-2 (continued)

Location	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Monitoring Group Suite and Frequency
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
Regional	2011	A	A	A	T	T	T	T	A	—	A	A	A	—	Added annual sampling of SVOCs to complement VOC data and to provide additional data in support of CME decisions. Added triennial sampling for other organics as requested by NMED (2011, 201467).
	2010	A	A	—	—	—	—	—	A	—	A	A	A	(A)	New monitoring group. Sampling plan for this new group is based on suites and frequencies specified for general surveillance of this hydrologic zone in the 2009 Interim Plan. No change.
Characterization of new deep wells ⁱ	2011	Q	Q	Q	S	S	S	S	Q	—	Q	Q	Q	S	Increased SVOC sampling to quarterly to complement VOC data and to provide additional data in support of CME decisions.
	2010	Q	Q	S	S	S	S	S	Q	—	Q	Q	Q	S	New monitoring group. Same characterization suites and frequencies as for new general surveillance wells.

Table D-2.0-2 (continued)

Notes: Sampling suites and frequencies for last year's Interim Plan are shown in gray text in order to set this information apart from that for the current Interim Plan. Sampling frequency: Q = quarterly (4 times/yr); S = semiannual (2 times/yr); A = annual (1 time/yr); B = biennial (once every 2 yr); T = triennial (once every 3 yr). For simplicity, sample collection frequencies for analysis of suspended sediment concentrations and field parameters are not listed in this table. Field parameters are routinely collected for every sampling event at every type of location, and samples for suspended sediment concentrations are collected for every sampling event at base-flow stations and springs. Nonfiltered and filtered samples will be collected for general inorganics (excluding anions) and metals. Anions and perchlorate samples will be filtered. Samples collected for radionuclide analysis will be nonfiltered only for all water media. Organic and HEXP constituents are nonfiltered for all water media. Stable isotope samples for nitrogen isotopes are filtered; stable isotope samples for deuterium and oxygen isotopes are not filtered.

- ^a Metals analysis includes the 23 target analyte list (TAL) metals (Ag, Al, As, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, Hg, K, Mg, Mn, Na, Ni, Pb, Sb, Se, Ti, V, Zn), plus boron, molybdenum, silicon dioxide, strontium, tin, and uranium.
- ^b VOC = Volatile organic compounds; SVOC = semivolatile organic compounds.
- ^c PCB = Polychlorinated biphenyl [compound].
- ^d The analytical suite of explosive compounds (HEXP) includes the Compliance Order on Consent (Consent Order) list of the normal SW-846:8330 analytes plus pentaerythritol tetranitrate (PETN); triaminotrinitrobenzene (TATB); 3,5-dinitroaniline; tri(o-cresyl)phosphate (TOCP); 2,4-diamino-6-nitrotoluene; and 2,6-diamino-4-nitrotoluene.
- ^e The radionuclide suite includes gross alpha, gross beta, alpha spectroscopy, gamma spectroscopy, and strontium-90.
- ^f Tritium samples may be submitted for analysis by liquid scintillation if average activities are anticipated to exceed 200 pCi/L. Low-level tritium is analyzed using electrolytic enrichment or direct counting.
- ^g General inorganic analysis includes major anions (bromide, chloride, fluoride, sulfate), major cations (calcium, magnesium, sodium, potassium), nitrate plus nitrite (as N), total Kjeldahl nitrogen (TKN), ammonia, total phosphorus, total organic carbon (TOC), total dissolved solids (TDS), alkalinity, specific conductivity, pH, and hardness.
- ^h Analysis for stable isotopes of nitrogen, hydrogen, and oxygen. The collection of samples for stable isotope analysis is considered a special sampling campaign that is outside the scope of the regulatory process. In general, these samples are collected semiannually from "new" wells (those which completed construction, rehabilitation, or conversion on or after October 1, 2010) until at least four sets of data have been collected. Any subsequent sampling for stable isotope analysis will be decided on the basis of site-specific conditions. In the 2010 Interim Plan, the entry "(A)" for intermediate and regional wells signifies samples will be collected annually until four sets of nitrogen isotope data have been collected.
- ⁱ — = This analytical suite is not scheduled to be collected for this type of water at locations assigned to this area-specific monitoring group. Some locations are assigned analytical suites or frequencies that differ from those shown in this table, for site-specific reasons as described in the text for this monitoring group, and as summarized in Table D-2.0-3.
- ^j Characterization suites and frequencies apply to new intermediate perched or regional groundwater wells. "New" wells are defined as those which are completed, rehabilitated, or converted on or after October 1, 2010. Any planned exceptions to this general protocol are documented in Table D-2.0-3.

Table D-2.0-3
Sampling Frequencies and Analytical Suites Assigned to Locations in the TA-21 Monitoring Group

Location	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Monitoring Group Suite and Frequency
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
Intermediate	2011	A	A	A	T	T	T	T	A	A	A	A	A	—	Rationale for suites and frequencies assigned to this monitoring group is provided in Table D-2.0-2. Note: Intermediate wells LAOI-7, R-9i, and R-12 were moved to the general surveillance monitoring group (Tables D-8.2-3 and D-8.3-3).
	2010	A	S	S	—	—	—	—	A	S	S	S	S	(A)	New monitoring group. Rationale for suites and frequencies assigned to this monitoring group is provided in Table D-1.0-1.
LADP-3	2011	A	A	A	T	T	T	T	A	—	A	A	A	A	Changes reflect updated suites and frequencies for intermediate groundwater wells in this monitoring group. Retained annual frequency for stable isotopes at this location to acquire longer data record.
	2010	A	S	S	—	—	—	—	A	—	S	S	S	A	Reassigned to suites and frequencies for new TA-21 monitoring group (near-field).
LAOI(a)-1.1	2011	A	A	A	T	T	T	T	A	—	A	A	A	—	Changes reflect updated suites and frequencies for intermediate groundwater wells in this monitoring group. Background location in Groundwater Background Investigation Report, Revision 3 (GBIR, R3) (LANL 2007, 095817) and GBIR, R4 (LANL 2010, 110535).
	2010	A	A	A	—	—	—	—	A	—	S	S	S	—	Reassigned to suites and frequencies for new TA-21 monitoring group (upgradient). Background location in GBIR, R3 and approved for inclusion in GBIR, R4.

Table D-2.0-3 (continued)

Location	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Monitoring Group Suite and Frequency
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
LAOI-3.2	2011	A	A	A	T	T	T	T	A	A	—	A	A	—	Changes reflect updated suites and frequencies for intermediate groundwater wells in this monitoring group. Not eligible for low-level tritium because average activity exceeds 200 pCi/L.
	2010	A	S	S	—	—	—	—	A	S	—	S	S	—	Reassigned to suites and frequencies for new TA-21 monitoring group (near-field).
LAOI-3.2a	2011	A	A	A	T	T	T	T	A	A	—	A	A	—	Changes reflect updated suites and frequencies for intermediate groundwater wells in this monitoring group. Not eligible for low-level tritium because average activity exceeds 200 pCi/L.
	2010	A	S	S	—	—	—	—	A	S	—	S	S	—	Reassigned to suites and frequencies for new TA-21 monitoring group (near-field).
R-5 screen 1	2011	—	—	—	—	—	—	—	—	—	—	—	—	—	Well R-5 is equipped with a Westbay sampling system. Reassigned to TA-21 monitoring group at request of NMED (2011, 201467). Screen is scheduled for P&A following well conversion to a dual-screen well (LANL 2011, 204372). Historically dry. Continue to monitor water levels only (Table 1.10-1).
	2010	—	—	—	—	—	—	—	—	—	—	—	—	—	Historically dry. Continue to monitor for water levels only.

Table D-2.0-3 (continued)

Location	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Monitoring Group Suite and Frequency
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
R-5 screen 2	2011	A	A	—	—	—	—	—	A	—	A	A	A	A	Well R-5 is equipped with a Westbay sampling system. Reassigned to TA-21 monitoring group at request of NMED (2011, 201467). Assigned limited analytical suites because of concerns about the reliability and representativeness of water-quality data obtained from wells with Westbay sampling systems. Well is scheduled to be converted to a configuration with a purgeable sampling system (LANL 2011, 204372). This screen will be assigned to characterization frequencies and suites if it is retained after conversion. Proposed start date for conversion is fiscal year 2012 with the selected sampling system to be installed by October 11, 2012.
	2010	A	A	—	—	—	—	—	A	A		A	A	A	No change. Remains assigned to watershed-specific suites and frequencies.
R-6i	2011	A	A	A	T	T	T	T	A	A	—	A	A	—	Changes reflect updated suites and frequencies for intermediate groundwater wells in this monitoring group. Not eligible for low-level tritium because average activity exceeds 200 pCi/L.
	2010	A	S	S	—	—	—	—	A	S		S	S	A	Reassigned to suites and frequencies for new TA-21 monitoring group (near-field).
R-7 screen 1	2011	—	—	—	—	—	—	—	—	—	—	—	—	—	Well R-7 is equipped with a Westbay sampling system. This screen is scheduled for P&A following well conversion to a single-screen well (LANL 2011, 204372). Screen is historically dry. Continue to monitor water levels only until the Westbay sampling system is removed for well conversion (Table 1.10-1). Proposed start date for conversion is fiscal year 2012 with the selected sampling system to be installed in screen 3 by October 11, 2012.
	2010	—	—	—	—	—	—	—	—	—	—	—	—	—	Reassigned to TA-21 monitoring group. Generally, no water is present in the screen. Monitor water levels only.

Table D-2.0-3 (continued)

Location	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Monitoring Group Suite and Frequency
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
R-7 screen 2	2011	—	—	—	—	—	—	—	—	—	—	—	—	—	Well R-7 is equipped with a Westbay sampling system. This screen is scheduled for P&A following well conversion to a single-screen well (LANL 2011, 204372). Screen is historically dry. Continue to monitor water levels only until the Westbay sampling system is removed for well conversion (Table 1.10-1). Proposed start date for conversion is fiscal year 2012 with the selected sampling system to be installed in screen 3 by October 11, 2012.
	2010	—	—	—	—	—	—	—	—	—	—	—	—	—	Reassigned to TA-21 monitoring group. Generally, no water is present in the screen. Monitor water levels only.
TA-53i	2011	A	A	A	T	T	T	T	A	A	—	A	A	A	Changes reflect updated suites and frequencies for intermediate groundwater wells in this monitoring group. Not eligible for low-level tritium because average activity exceeds 200 pCi/L. Retained annual frequency for stable isotopes at this location to acquire longer data record. Completed March 10, 2009.
	2010	A	S	S	—	—	—	—	A	S	—	S	S	A	Completed characterization sampling. Reassigned to suites and frequencies for new TA-21 monitoring group (near-field).
Regional	2011	A	A	A	T	T	T	T	A	—	A	A	A	—	Rationale for suites and frequencies assigned to this monitoring group is provided in Table D-2.0-2. Note: Regional well R-9 was moved to the general surveillance monitoring group (Table D-8.2-3).
	2010	A	A	—	—	—	—	—	A	—	A	A	A	(A)	New monitoring group. Rationale for suites and frequencies assigned to this monitoring group is provided in Table D-1.0-1.

Table D-2.0-3 (continued)

Location	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Monitoring Group Suite and Frequency
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
R-5 screen 3	2011	A	A	—	—	—	—	—	A	—	A	A	A	A	Well R-5 is equipped with a Westbay sampling system. Reassigned to TA-21 monitoring group at request of NMED (2011, 201467). Assigned limited analytical suites because of concerns about the reliability and representativeness of water-quality data obtained from wells with Westbay sampling systems. Well is scheduled to be converted to a configuration with a purgeable sampling system (LANL 2011, 204372). This screen will be assigned to characterization frequencies and suites if it is retained after conversion. Proposed start date for conversion is fiscal year 2012 with the selected sampling system to be installed by October 11, 2012.
	2010	A	A	—	—	—	—	—	A	—	A	A	A	A	No change. Remains assigned to watershed-specific suites and frequencies.
R-5 screen 4	2011	A	A	—	—	—	—	—	A	—	A	A	A	A	Well R-5 is equipped with a Westbay sampling system. Reassigned to TA-21 monitoring group at request of NMED (2011, 201467). Assigned limited analytical suites because of concerns about the reliability and representativeness of water-quality data obtained from wells with Westbay sampling systems (Table F-3.0-1). Well is scheduled to be converted to a configuration with a purgeable sampling system (LANL 2011, 204372). This screen will be assigned to characterization frequencies and suites if it is retained after conversion. Proposed start date for conversion is fiscal year 2012 with the selected sampling system to be installed in screens 2 and 3 by October 11, 2012.
	2010	A	A	—	—	—	—	—	A	—	A	A	A	A	No change. Remains assigned to watershed-specific suites and frequencies.

Table D-2.0-3 (continued)

Location	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Monitoring Group Suite and Frequency
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
R-6	2011	A	A	A	T	T	T	T	A	—	A	A	A	—	Changes reflect updated suites and frequencies for regional groundwater wells in this monitoring group. Background location in GBIR, R4 (LANL 2010, 110535).
	2010	A	A	—	—	—	—	—	A	A		A	A	—	Reassigned to suites and frequencies for new TA-21 monitoring group. Background location approved for inclusion in GBIR, R4.
R-7 screen 3	2011	—	—	—	—	—	—	—	—	—	—	—	—	—	Well R-5 is equipped with a Westbay sampling system. Sampling suspended per request of NMED (2011, 201467) because of persistent geochemical effects from drilling. Monitor for water level only in accordance with frequency listed in Table 1.10-1. Screen is scheduled to be retained following well conversion to a single-screen well (LANL 2011, 204372) and will be assigned to characterization frequencies and suites after conversion. Proposed start date for conversion is fiscal year 2012 with the selected sampling system to be installed by October 11, 2012.
	2010	—	A	—	—	—	—	—	—	—	A	A ^{INDj} + NH ₃	A	—	Reassigned to suites and frequencies for new TA-21 monitoring group. Well screen continues to show residual effects from drilling and remains assigned to indicator suite. VOCs included, recognizing that analytical results for a few constituents could be biased low by the presence of iron corrosion products. Tritium is included as a key analyte that is unaffected by residual effects of drilling. Perchlorate is included to support the evaluation of redox conditions at this screen.

Table D-2.0-3 (continued)

Location	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Monitoring Group Suite and Frequency
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
TW-3	2011	—	—	—	—	—	—	—	—	—	—	—	—	—	Removed from Interim Plan because its construction is not compliant with Resource Conservation and Recovery Act (RCRA) requirements for monitoring wells. Some water-quality data are not representative as a result of casing corrosion. Well scheduled to be P&A (LANL 2011, 111605). To be replaced by new well R-66.
	2010	—	A	—	—	—	—	—	—	A	—	—	—	A	Reassigned to suites and frequencies for new TA-21 monitoring group. Assigned restricted list of suites and frequencies because well is affected by casing corrosion. Transducer removed February 9, 2006, in preparation for P&A of this well. Well was reopened and sampled in July 2009 and January 2010.
R-64	2011	Q	Q	Q	S	S	S	S	Q	—	Q	Q	Q	S	New single-screen well assigned to characterization suites and frequencies for deep groundwater wells in this monitoring group. Completed July 11, 2011.
R-65	2011	Q	Q	Q	S	S	S	S	Q	—	Q	Q	Q	S	New single-screen well assigned to characterization suites and frequencies for deep groundwater wells in this monitoring group. Scheduled for completion October 30, 2011.
R-66	2011	—	—	—	—	—	—	—	—	—	—	—	—	—	Placeholder for new single-screen well to be assigned to characterization suites and frequencies for deep groundwater wells in this monitoring group. Replaces TW-3. Scheduled for completion December 20, 2011.

Table D-2.0-3 (continued)

Notes: Monitoring group-specific sampling suites and frequencies for individual water types are shown in shaded rows in order to set this information apart from that for the individual sampling locations that follow these rows.

Sampling suites and frequencies for last year's Interim Plan are shown in gray text in order to set this information apart from that for the current Interim Plan. Sampling frequency: Q = quarterly (4 times/yr); S = semiannual (2 times/yr); A = annual (1 time/yr); B = biennial (once every 2 yr); T = triennial (once every 3 yr). For simplicity, sample collection frequencies for analysis of suspended sediment concentrations and field parameters are not listed in this table. Field parameters are routinely collected for every sampling event at every type of location, and samples for suspended sediment concentrations are collected for every sampling event at base-flow stations and springs. Nonfiltered and filtered samples will be collected for general inorganics (excluding anions) and metals. Anions and perchlorate samples will be filtered. Samples collected for radionuclide analysis will be nonfiltered only for all water media. Organic and HEXP constituents are nonfiltered for all water media. Stable isotope samples for nitrogen isotopes are filtered; stable isotope samples for deuterium and oxygen isotopes are not filtered.

^a Metals analysis includes the 23 TAL metals (Ag, Al, As, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, Hg, K, Mg, Mn, Na, Ni, Pb, Sb, Se, Tl, V, Zn), plus boron, molybdenum, silicon dioxide, strontium, tin, and uranium.

^b VOC = Volatile organic compounds; SVOC = semivolatile organic compounds.

^c PCB = Polychlorinated biphenyl [compound].

^d The analytical suite of explosive compounds (HEXP) includes the Consent Order list of the normal SW-846:8330 analytes plus PETN; TATB; 3,5-dinitroaniline; TOCP; 2,4-diamino-6-nitrotoluene; and 2,6-diamino-4-nitrotoluene.

^e The radionuclide suite includes gross alpha, gross beta, alpha spectroscopy, gamma spectroscopy, and strontium-90.

^f Tritium samples may be submitted for analysis by liquid scintillation if average activities are anticipated to exceed 200 pCi/L. Low-level tritium is analyzed using electrolytic enrichment or direct counting.

^g General inorganic analysis includes major anions (bromide, chloride, fluoride, sulfate), major cations (calcium, magnesium, sodium, potassium), nitrate plus nitrite (as N), TKN, ammonia, total phosphorus, TOC, TDS, alkalinity, specific conductivity, pH, and hardness. IND indicates "indicator suite," which includes major anions and cations, nitrate (as N), metals, alkalinity, pH, TOC, and, as needed, sulfide, ammonia, TKN, and perchlorate. Indicator suite samples are submitted to the on-site Earth Systems Observations (EES-14) analytical laboratory, with the exception of samples for TKN and perchlorate analysis, which are submitted to an off-site analytical facility.

^h Analysis for stable isotopes of nitrogen, hydrogen, and oxygen. The collection of samples for stable isotope analysis is considered a special sampling campaign that is outside the scope of the regulatory process. In general, these samples are collected semiannually from "new" wells (those which completed construction, rehabilitation, or conversion on or after October 1, 2010) until at least four sets of data have been collected. Any subsequent sampling for stable isotope analysis will be decided on the basis of site-specific conditions. In the 2010 Interim Plan, the entry "(A)" for intermediate and regional wells signifies samples will be collected annually until four sets of nitrogen isotope data have been collected.

ⁱ — = This analytical suite is not scheduled to be collected for this type of water at locations assigned to this area-specific monitoring group. Some locations are assigned analytical suites or frequencies that differ from those shown in this table, for site-specific reasons as described in the text for this monitoring group, and as summarized in this table.

Table 3.0-1
Analytes Detected Two or More Times above One-Half Standard in the Chromium Investigation Monitoring Group

Analytical Suite	Analyte Exceeding One-Half Standard at Least Twice at the Same Location in This Monitoring Group	Intermediate Perched Groundwater Monitoring Locations					Regional Groundwater Monitoring Locations (Sandia Canyon)						Regional Groundwater Monitoring Locations (Mortandad Canyon)										
		MCOI-4	MCOI-5	MCOI-6	SCI-1	SCI-2	R-11	R-35a	R-35b	R-36	R-43 screen 1	R-43 screen 2	R-1	R-13	R-15	R-28	R-42	R-44 screen 1	R-44 screen 2	R-45 screen 1	R-45 screen 2	R-50 screen 1	R-50 screen 2
Dioxins/Furans	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Inorganics	Nitrate-Nitrite as Nitrogen	☑	●	☑	—	—	●	—	—	—	●	—	—	—	—	●	●	—	—	—	—	—	—
General Inorganics	Perchlorate	☑	☑	☑	—	—	—	—	—	—	—	—	—	—	☑	—	—	—	—	—	—	—	—
General Inorganics	Total Dissolved Solids	—	—	—	●	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
HEXP	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Metals	Antimony	—	☑	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Metals	Chromium	●	—	☑	—	☑	●	—	—	—	—	—	—	—	—	☑	☑	—	—	—	—	☑	—
Metals	Lead	—	●	—	—	—	—	—	—	—	—	—	—	—	☑	—	—	—	—	—	—	—	—
Metals	Manganese	—	●	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
PCBs	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Pesticides	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Radionuclides	Tritium	●	—	●	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
SVOC	Bis(2-ethylhexyl)phthalate	—	—	☑	—	—	—	—	—	☑	—	—	—	—	—	—	—	—	—	—	—	—	—
SVOC	Dioxane[1,4-]	☑	☑	☑	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
VOC	Dioxane[1,4-]	☑	—	☑	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
VOC	Bromomethane	—	—	—	—	—	—	—	—	☑	—	—	—	—	—	—	—	—	—	—	—	—	—

Source: Table B1-3 in Attachment B-1.

Notes: ● = Detected ≥ one-half standard more than once; ■ = detected ≥ standard at least once, as well as ≥ one-half standard more than once; — = not detected above one-half standard more than once at any location in this monitoring group. The term “standard” refers to the lowest applicable regulatory standard or other screening level.

Table D-3.0-2
Area-Specific Sampling Frequencies and Analytical Suites for the Chromium Investigation Monitoring Group

Location	Interim Plan	Metals ^a	VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate	Stable Isotopes ^h	Cr Isotopes ^h	Rationale for Monitoring Group Suite and Frequency
Intermediate (Sandia)	2011	Q	A	A	T	T	T	T	A	—	A	Q	A	—	—	Reduced frequency of tritium sampling to annual, consistent with the frequency for other radionuclides and because tritium is well-characterized in this hydrologic zone, is not a COPC for this monitoring group, and shows stable or decreasing trends of relatively low activities in the perched-intermediate zone beneath the Sandia watershed (Table D-3.0-2). Reduced frequency of perchlorate sampling to annual because this analyte is well characterized in this hydrologic zone, is not a COPC for this monitoring group, and consistently shows concentrations at or below background levels. Added triennial sampling for other organics as requested by NMED (2011, 201467).
	2010	Q	A	A	—	—	—	—	A	—	S	Q	S	A	—	New monitoring group. Sampling plan for this new group is based on suites and frequencies specified for general surveillance of this hydrologic zone in the 2009 Interim Plan, focusing on chromium and general inorganics (particularly nitrate) in deep groundwater. Reduction in sampling frequencies for VOCs, tritium, and perchlorate (relative to 2009 sampling plan) reflects adequacy of data record to demonstrate nature and extent of contaminants in groundwater and the maturation of the site conceptual model (LANL 2009, 107453). Removed PCB suite because of the history of nondetects in this hydrologic zone and limited mobility of PCBs in groundwater.

Table D-3.0-2 (continued)

Location	Interim Plan	Metals ^a	VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate	Stable Isotopes ^h	Cr Isotopes ^h	Rationale for Monitoring Group Suite and Frequency
Intermediate (Mortandad)	2011	Q	A	S	T	T	T	T	A	S	—	Q	S	—	—	Retained semiannual frequencies for SVOCs, perchlorate, and tritium because these are COPCs for this part of the Mortandad watershed and have exceeded one-half standard several times at several locations (Table D-3.0-2). Added triennial sampling for other organics as requested by NMED (2011, 201467).
	2010	Q	A	S	—	—	—	—	A	S		Q	S	A	—	New monitoring group. Sampling plan for this new group is based on suites and frequencies specified for general surveillance of this hydrologic zone in the 2009 Interim Plan, focusing on chromium and general inorganics (particularly nitrate) in deep groundwater. Reduction in sampling frequencies for VOCs, tritium, and perchlorate (relative to 2009 sampling plan) reflects adequacy of data record to demonstrate nature and extent of contaminants in groundwater and the maturation of the site conceptual model (LANL 2009, 107453). Increased frequency for SVOC suite to monitor 1,4-dioxane trends in this hydrologic zone.

Table D-3.0-2 (continued)

Location	Interim Plan	Metals ^a	VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate	Stable Isotopes ^h	Cr Isotopes ^h	Rationale for Monitoring Group Suite and Frequency
Regional	2011	Q	A	A	T	T	T	T	B	—	A	Q	A	—	—	Reduced sampling frequencies for radionuclides to biennial because of history of stable conditions of nondetects and low activities. Reduced frequency of tritium and perchlorate because these analytes are well characterized in this hydrologic zone, are not COPCs for this monitoring group, and show stable concentrations in this hydrologic zone. Added triennial sampling for other organics as requested by NMED (2011, 201467).
	2010	Q	A	A	—	—	—	—	A	—	S	Q	S	A	—	New monitoring group. Sampling plan for this new group is based on suites and frequencies specified for general surveillance of this hydrologic zone in the 2009 Interim Plan, focusing on chromium and general inorganics (particularly nitrate) in deep groundwater. Reduction in sampling frequencies for VOCs, tritium, and perchlorate (relative to 2009 sampling plan) reflects the adequacy of data record to demonstrate nature and extent of contaminants in groundwater and the maturation of the site conceptual model (LANL 2009, 107453). Removed PCB suite because of the history of nondetects in this hydrologic zone and the limited mobility of PCBs in groundwater.

Table D-3.0-2 (continued)

Location	Interim Plan	Metals ^a	VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate	Stable Isotopes ^h	Cr Isotopes ^h	Rationale for Monitoring Group Suite and Frequency
Characterization of new deep wells	2011	Q	Q	Q	S	S	S	S	Q	—	Q	Q	Q	S	—	Increased SVOC frequency to quarterly because of the presence of 1,4-dioxane in intermediate wells (Table D-3.0-1).
	2010	Q	Q	S	S	S	S	S	Q		Q	Q	Q	S	—	New monitoring group. Same characterization suites and frequencies as for new general surveillance wells.

Notes: Sampling suites and frequencies for last year's Interim Plan are shown in gray text in order to set this information apart from that for the current Interim Plan. Sampling frequency: Q = quarterly (4 times/yr); S = semiannual (2 times/yr); A = annual (1 time/yr); B = biennial (once every 2 yr); T = triennial (once every 3 yr). For simplicity, sample collection frequencies for analysis of suspended sediment concentrations and field parameters are not listed in this table. Field parameters are routinely collected for every sampling event at every type of location, and samples for suspended sediment concentrations are collected for every sampling event at base-flow stations and springs. Nonfiltered and filtered samples will be collected for general inorganics (excluding anions) and metals. Anions and perchlorate samples will be filtered. Samples collected for radionuclide analysis will be nonfiltered only for all water media. Organic and HEXP constituents are nonfiltered for all water media. Stable isotope samples for nitrogen isotopes are filtered; stable isotope samples for deuterium and oxygen isotopes are not filtered.

^a Metals analysis includes the 23 TAL metals (Ag, Al, As, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, Hg, K, Mg, Mn, Na, Ni, Pb, Sb, Se, Ti, V, Zn), plus boron, molybdenum, silicon dioxide, strontium, tin, and uranium.

^b VOC = Volatile organic compounds; SVOC = semivolatile organic compounds.

^c PCB = Polychlorinated biphenyl [compound].

^d The analytical suite of explosive compounds (HEXP) includes the Consent Order list of the normal SW-846:8330 analytes plus PETN; TATB; 3,5-dinitroaniline; TOCP; 2,4-diamino-6-nitrotoluene; and 2,6-diamino-4-nitrotoluene.

^e The radionuclide suite includes gross alpha, gross beta, alpha spectroscopy, gamma spectroscopy, and strontium-90.

^f Tritium samples may be submitted for analysis by liquid scintillation if average activities are anticipated to exceed 200 pCi/L. Low-level tritium is analyzed using electrolytic enrichment or direct counting.

^g General inorganic analysis includes major anions (bromide, chloride, fluoride, sulfate), major cations (calcium, magnesium, sodium, potassium), nitrate plus nitrite (as N), TKN, ammonia, total phosphorus, TOC, total dissolved solids TDS, alkalinity, specific conductivity, pH, and hardness.

^h Analysis for stable isotopes of nitrogen, hydrogen, and oxygen. The collection of samples for stable isotope analysis is considered a special sampling campaign that is outside the scope of the regulatory process. In general, these samples are collected semiannually from "new" wells (those which completed construction, rehabilitation, or conversion on or after October 1, 2010) until at least four sets of data have been collected. Any subsequent sampling for stable isotope analysis will be decided on the basis of site-specific conditions.

ⁱ — = This analytical suite is not scheduled to be collected for this type of water at locations assigned to this area-specific monitoring group. Some locations are assigned analytical suites or frequencies that differ from those shown in this table, for site-specific reasons as described in the text for this monitoring group, and as summarized in Table D-3.0-3.

Table D-3.0-3
Sampling Frequencies and Analytical Suites Assigned to Locations in the Chromium Investigation Monitoring Group

Location	Interim Plan	Metals ^a	VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate	Stable Isotopes ^h	Cr isotopes	Rationale for Changes Relative to Previous Interim Plan
Intermediate (Sandia)	2011	Q	A	A	T	T	T	T	A	—	A	Q	A	—	—	Rationale for suites and frequencies assigned to this monitoring group is provided in Table D-3.0-2.
	2010	Q	A	A	—	—	—	—	A	—	S	Q	S	A	—	New monitoring group. Rationale for suites and frequencies assigned to this monitoring group is provided in Table D-1.0-1.
SCI-1	2011	Q	A	A	T	T	T	T	A	—	A	Q	A	A	—	Changes reflect updated suites and frequencies for intermediate groundwater wells in the Sandia watershed assigned to this monitoring group.
	2010	Q	A	A	—	—	—	—	A	S	—	Q	S	A	—	Reassigned to suites and frequencies for new chromium investigation monitoring group (near-field).
SCI-2	2011	Q	A	A	T	T	T	T	A	A	—	Q	A	A	—	Changes reflect updated suites and frequencies for intermediate groundwater wells in the Sandia watershed assigned to this monitoring group. Not eligible for low-level tritium because average activity exceeds 200 pCi/L.
	2010	Q	A	A	—	—	—	—	A	—	S	Q	S	A	—	Completed characterization sampling. Reassigned to suites and frequencies for new chromium investigation monitoring group (near-field).
SCI-3	2011	Q	Q	Q	S	S	S	S	Q	—	Q	Q	Q	S	—	New single-screen well scheduled for completion September 30, 2011. Assigned to characterization suites and frequencies applicable to new intermediate wells that are part of the chromium investigation monitoring group.
SCI-4	2011	—	—	—	—	—	—	—	—	—	—	—	—	—	—	Placeholder for possible new well, to be assigned to characterization suites and frequencies applicable to new intermediate wells in this monitoring group.
Intermediate (Mortandad)	2011	Q	A	S	T	T	T	T	A	S	—	Q	S	—	—	Rationale for suites and frequencies assigned to this monitoring group is provided in Table D-3.0-2.
	2010	Q	A	S	—	—	—	—	A	S	—	Q	S	A	—	New monitoring group. Rationale for suites and frequencies assigned to this monitoring group is provided in Table D-1.0-1.

Table D-3.0-3 (continued)

Location	Interim Plan	Metals ^a	VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate	Stable Isotopes ^h	Cr isotopes	Rationale for Changes Relative to Previous Interim Plan
MCOI-4	2011	Q	A	S	T	T	T	T	A	S	—	Q	S	—	—	Changes reflect updated suites and frequencies for intermediate groundwater wells in the Mortandad watershed assigned to this monitoring group. Not eligible for low-level tritium because average activity exceeds 200 pCi/L.
	2010	Q	A	S	—	—	—	—	A	S	—	Q	S	A	—	Reassigned to suites and frequencies for new chromium investigation monitoring group (Mortandad Canyon wells).
MCOI-5	2011	Q	A	S	T	T	T	T	A	S	—	Q	S	—	—	Changes reflect updated suites and frequencies for intermediate groundwater wells in the Mortandad watershed assigned to this monitoring group. Not eligible for low-level tritium because average activity exceeds 200 pCi/L.
	2010	Q	A	S	—	—	—	—	A	S	—	Q	S	A	—	Reassigned to suites and frequencies for new chromium investigation monitoring group (Mortandad Canyon wells).
MCOI-6	2011	Q	A	S	T	T	T	T	A	S	—	Q	S	—	—	Changes reflect updated suites and frequencies for intermediate groundwater wells in the Mortandad watershed assigned to this monitoring group. Not eligible for low-level tritium because average activity exceeds 200 pCi/L.
	2010	Q	A	S	—	—	—	—	A	S	—	Q	S	A	—	Reassigned to suites and frequencies for new chromium investigation monitoring group (Mortandad Canyon wells).
MCOI-8	2011	—	—	—	—	—	—	—	—	—	—	—	—	—	—	Removed from sampling plan because water level has been measured in the sump of this well since well completion in January 2005 (Koch and Schmeerer 2011, 201566).
	2010	—	—	—	—	—	—	—	—	—	—	—	—	—	—	No change. Water has been measured in sump of well since well completion in January 2005. Continue to monitor water levels only.

Table D-3.0-3 (continued)

Location	Interim Plan	Metals ^a	VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate	Stable Isotopes ^h	Cr isotopes	Rationale for Changes Relative to Previous Interim Plan
Regional (Sandia)	2011	Q	A	A	T	T	T	T	B	—	A	Q	A	—	—	Rationale for suites and frequencies assigned to this monitoring group is provided in Table D-3.0-2.
	2010	Q	A	A	—	—	—	—	A	—	S	Q	S	A	—	New monitoring group. Rationale for suites and frequencies assigned to this monitoring group is provided in Table D-1.0-1.
R-11	2011	Q	A	A	T	T	T	T	B	—	A	Q	A	—	A	Changes reflect updated suites and frequencies for regional groundwater wells assigned to this monitoring group. Annual sampling for Cr isotopes because this well is at or near the perimeter of the regional aquifer Cr plume and will provide information on chromate reduction in the regional aquifer that may be contributing to the relatively steady state behavior of the plume. The frequency of sampling was determined by the number of, and variability in, existing Cr isotope data for this well.
	2010	Q	A	A	—	—	—	—	A	—	S	Q	S	A	—	Reassigned to suites and frequencies for new chromium investigation monitoring group.
R-35a	2011	Q	A	A	T	T	T	T	B	—	A	Q	A	—	A	Changes reflect updated suites and frequencies for regional groundwater wells assigned to this monitoring group. Annual sampling for Cr isotopes because this well is at or near the perimeter of the regional aquifer Cr plume and will provide information on chromate reduction in the regional aquifer that may be contributing to the relatively steady state behavior of the plume. The frequency of sampling was determined by the number of, and variability in, existing Cr isotope data for this well.
	2010	Q	A	A	—	—	—	—	A	—	S	Q	S	A	—	Reassigned to suites and frequencies for new chromium investigation monitoring group.

Table D-3.0-3 (continued)

Location	Interim Plan	Metals ^a	VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate	Stable Isotopes ^h	Cr isotopes	Rationale for Changes Relative to Previous Interim Plan
R-35b	2011	Q	A	A	T	T	T	T	B	—	A	Q	A	—	A	Changes reflect updated suites and frequencies for regional groundwater wells assigned to this monitoring group. Annual sampling for Cr isotopes because this well is at or near the perimeter of the regional aquifer Cr plume and will provide information on chromate reduction in the regional aquifer that may be contributing to the relatively steady state behavior of the plume. The frequency of sampling was determined by the number of, and variability in, existing Cr isotope data for this well.
	2010	Q	A	A	—	—	—	—	A	—	S	Q	S	A	—	Reassigned to suites and frequencies for new chromium investigation monitoring group.
R-36	2011	Q	A	A	T	T	T	T	B	—	A	Q	A	—	—	Changes reflect updated suites and frequencies for regional groundwater wells assigned to this monitoring group.
	2010	Q	A	A	—	—	—	—	A	—	S	Q	S	A	—	Reassigned to suites and frequencies for new chromium investigation monitoring group.
R-43 screen 1	2011	Q	A	A	T	T	T	T	B	—	A	Q	A	A	S	Changes reflect updated suites and frequencies for regional groundwater wells assigned to this monitoring group. Semiannual sampling for Cr isotopes because this well is at or near the perimeter of the regional aquifer Cr plume and will provide information on chromate reduction in the regional aquifer that may be contributing to the relatively steady state behavior of the plume. The frequency of sampling was determined by the number of, and variability in, existing Cr isotope data for this well.
	2010	Q	A	A	—	—	—	—	A	—	S	Q	S	A	—	Characterization sampling completed. Reassigned to suites and frequencies for new chromium investigation monitoring group.

Table D-3.0-3 (continued)

Location	Interim Plan	Metals ^a	VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate	Stable Isotopes ^h	Cr isotopes	Rationale for Changes Relative to Previous Interim Plan
R-43 screen 2	2011	Q	A	A	T	T	T	T	B	—	A	Q	A	A	S	Changes reflect updated suites and frequencies for regional groundwater wells assigned to this monitoring group. Semiannual sampling for Cr isotopes because this well is at or near the perimeter of the regional aquifer Cr plume and will provide information on chromate reduction in the regional aquifer that may be contributing to the relatively steady state behavior of the plume. The frequency of sampling was determined by the number of, and variability in, existing Cr isotope data for this well.
	2010	Q	A	A	—	—	—	—	A	—	S	Q	S	A	—	Characterization sampling completed. Reassigned to suites and frequencies for new chromium investigation monitoring group.
Regional (Mortandad)	2011	Q	A	A	T	T	T	T	B	—	A	Q	A	—	—	Rationale for suites and frequencies assigned to this monitoring group is provided in Table D-3.0-2.
	2010	Q	A	A	—	—	—	—	A	—	S	Q	S	A	—	New monitoring group. Rationale for suites and frequencies assigned to this monitoring group is provided in Table D-1.0-1.

Table D-3.0-3 (continued)

Location	Interim Plan	Metals ^a	VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate	Stable Isotopes ^h	Cr isotopes	Rationale for Changes Relative to Previous Interim Plan
R-1	2011	Q	A	A	T	T	T	T	T	—	A	Q	A	—	—	Reassigned to chromium investigation monitoring group at request of NMED (2011, 201467). Changes reflect updated suites and frequencies for regional groundwater wells assigned to this monitoring group. VOCs decreased to annual because of long history of nondetects and no exceedances of one-half standards (Tables D-1.2-3 and D-3.0-1). VOCs have also not been detected in regional wells assigned to the MDA C monitoring group (other than low acetone concentrations), to which this well is close (Table D-1.2-3). Background location in GBIR, R3 (LANL 2007, 095817).
	2010	Q	Q	A	—	—	—	—	A	—	S	Q	S	A	—	Changes reflect updated suites and frequencies for general surveillance at regional wells in this watershed. Retained quarterly sampling for VOCs because of proximity to new MDA C monitoring group. Background location in GBIR, R3.
R-13	2011	Q	A	A	T	T	T	T	T	—	A	Q	A	—	—	Changes reflect updated suites and frequencies for regional groundwater wells assigned to this monitoring group. Background location in GBIR, R3.
	2010	Q	A	A	—	—	—	—	A	—	S	Q	S	A	—	Reassigned to suites and frequencies for new chromium investigation monitoring group. Background location in GBIR, R3.

Table D-3.0-3 (continued)

Location	Interim Plan	Metals ^a	VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate	Stable Isotopes ^h	Cr isotopes	Rationale for Changes Relative to Previous Interim Plan
R-15	2011	Q	S	S	T	T	T	T	A	—	A	Q	S	—	A	Assigned higher frequencies to R-15 for several analytical suites (compared to default frequencies for this subgroup) because it is a key monitoring well for defining and detecting changes in the nature & extent of contaminants in this part of the regional aquifer. Retained semiannual sampling frequencies for SVOCs and perchlorate because of 1,4-dioxane detections and elevated perchlorate concentrations in perched-intermediate groundwater in this part of the watershed. Increased VOC frequency to semiannual to complement semiannual SVOC data. Retained annual frequency for radionuclides because they are COPCs for this area of Mortandad Canyon. Annual sampling for Cr isotopes because this well is at or near the perimeter of the regional aquifer Cr plume and will provide information on chromate reduction in the regional aquifer that may be contributing to the relatively steady state behavior of the plume. The frequency of sampling was determined by the number of, and variability in, existing Cr isotope data for this well.
	2010	Q	A	S	—	—	—	—	A	—	S	Q	S	A	—	Reassigned to suites and frequencies for new chromium investigation monitoring group, augmented by semiannual frequency for SVOCs because of 1,4-dioxane detections in perched-intermediate groundwater in this watershed.
R-28	2011	Q	A	A	T	T	T	T	B	A	—	Q	A	—	—	Changes reflect updated suites and frequencies for regional groundwater wells assigned to this monitoring group. Not eligible for low-level tritium because average activity exceeds 200 pCi/L.
	2010	Q	A	A	—	—	—	—	A	—	S	Q	S	A	—	Reassigned to suites and frequencies for new chromium investigation monitoring group.

Table D-3.0-3 (continued)

Location	Interim Plan	Metals ^a	VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate	Stable Isotopes ^h	Cr isotopes	Rationale for Changes Relative to Previous Interim Plan
R-42	2011	Q	S	S	T	T	T	T	B	A	—	Q	A	A	—	Retained semiannual sampling frequencies for SVOCs because of 1,4-dioxane detections in perched-intermediate groundwater in this part of the watershed. Increased VOC frequency to semiannual to complement semiannual SVOC data. Not eligible for low-level tritium because average activity exceeds 200 pCi/L. R-42 is a key monitoring well for defining and detecting changes in the nature & extent of the Cr plume in this part of the regional aquifer. It is one of first regional wells to be affected by contaminant migration although it is further downgradient from Mortandad sources than is R-15.
	2010	Q	A	S	—	—	—	—	A	—	S	Q	S	A	—	Characterization sampling completed. Reassigned to suites and frequencies for new chromium investigation monitoring group.
R-44 screen 1	2011	Q	A	A	T	T	T	T	B	—	A	Q	A	A	S	Changes reflect updated suites and frequencies for regional groundwater wells assigned to this monitoring group. Semiannual sampling for Cr isotopes because this well is near the perimeter of the regional aquifer Cr plume and will provide background information on chromate reduction in the regional aquifer that may be contributing to the relatively steady state behavior of the plume. The frequency of sampling was determined by the number of, and variability in, existing Cr isotope data for this well.
	2010	Q	A	A	—	—	—	—	A	—	S	Q	S	A	—	Characterization sampling completed. Reassigned to suites and frequencies for new chromium investigation monitoring group.

Table D-3.0-3 (continued)

Location	Interim Plan	Metals ^a	VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate	Stable Isotopes ^h	Cr isotopes	Rationale for Changes Relative to Previous Interim Plan
R-44 screen 2	2011	Q	A	A	T	T	T	T	B	—	A	Q	A	A	S	Changes reflect updated suites and frequencies for regional groundwater wells assigned to this monitoring group. Semiannual sampling for Cr isotopes because this well is near the perimeter of the regional aquifer Cr plume and will provide background information on chromate reduction in the regional aquifer that may be contributing to the relatively steady state behavior of the plume. The frequency of sampling was determined by the number of, and variability in, existing Cr isotope data for this well.
	2010	Q	A	A	—	—	—	—	A	—	S	Q	S	A	—	Characterization sampling completed. Reassigned to suites and frequencies for new chromium investigation monitoring group.
R-45 screen 1	2011	Q	A	A	T	T	T	T	B	—	A	Q	A	A	S	Changes reflect updated suites and frequencies for regional groundwater wells assigned to this monitoring group. Semiannual sampling for Cr isotopes because this well is near the perimeter of the regional aquifer Cr plume and will provide background information on chromate reduction in the regional aquifer that may be contributing to the relatively steady state behavior of the plume. The frequency of sampling was determined by the number of, and variability in, existing Cr isotope data for this well.
	2010	Q	A	A	—	—	—	—	A	—	S	Q	S	A	—	Characterization sampling completed. Reassigned to suites and frequencies for new chromium investigation monitoring group.

Table D-3.0-3 (continued)

Location	Interim Plan	Metals ^a	VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate	Stable Isotopes ^h	Cr isotopes	Rationale for Changes Relative to Previous Interim Plan
R-45 screen 2	2011	Q	A	A	T	T	T	T	B	—	A	Q	A	A	S	Changes reflect updated suites and frequencies for regional groundwater wells assigned to this monitoring group. Semiannual sampling for Cr isotopes because this well is near the perimeter of the regional aquifer Cr plume and will provide background information on chromate reduction in the regional aquifer that may be contributing to the relatively steady state behavior of the plume. The frequency of sampling was determined by the number of, and variability in, existing Cr isotope data for this well.
	2010	Q	A	A	—	—	—	—	A	—	S	Q	S	A	—	Characterization sampling completed. Reassigned to suites and frequencies for new chromium investigation monitoring group.
R-50 screen 1	2011	Q	A	A	T	T	T	T	B	—	A	Q	A	S	Q	Characterization sampling completed. Reassigned to routine suites and frequencies for chromium investigation monitoring group. Quarterly sampling for Cr isotopes because this well is at or near the perimeter of the regional aquifer Cr plume and will provide information on chromate reduction in the regional aquifer that may be contributing to the relatively steady state behavior of the plume. The frequency of sampling was determined by the number of, and variability in, existing Cr isotope data for this well. Completed February 1, 2010.
	2010	Q	Q	S	S	S	S	S	Q	—	Q	Q	Q	S	—	Newly completed well assigned to characterization suites and frequencies applicable to new regional wells that are part of the new chromium investigation monitoring group.

Table D-3.0-3 (continued)

Location	Interim Plan	Metals ^a	VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate	Stable Isotopes ^h	Cr isotopes	Rationale for Changes Relative to Previous Interim Plan
R-50 screen 2	2011	Q	A	A	T	T	T	T	B	—	A	Q	A	S	Q	Characterization sampling completed. Reassigned to routine suites and frequencies for chromium investigation monitoring group. Quarterly sampling for Cr isotopes because this well is at or near the perimeter of the regional aquifer Cr plume and will provide information on chromate reduction in the regional aquifer that may be contributing to the relatively steady state behavior of the plume. The frequency of sampling was determined by the number of, and variability in, existing Cr isotope data for this well. Completed February 1, 2010.
	2010	Q	Q	S	S	S	S	S	Q	—	Q	Q	Q	S	—	Newly completed well assigned to characterization suites and frequencies applicable to new regional wells that are part of the new chromium investigation monitoring group.
R-61 screen 1	2011	Q	Q	Q	S	S	S	S	Q	—	Q	Q	Q	S	Q	New dual-screen well assigned to characterization suites and frequencies applicable to new regional wells that are part of the chromium investigation monitoring group. Completed May 3, 2011.
R-61 screen 2	2011	Q	Q	Q	S	S	S	S	Q	—	Q	Q	Q	S	Q	New dual-screen well assigned to characterization suites and frequencies applicable to new regional wells that are part of the chromium investigation monitoring group. Completed May 3, 2011.
R-62 screen 1	2011	Q	Q	Q	S	S	S	S	Q	—	Q	Q	Q	S	Q	New dual-screen well scheduled for completion September 16, 2011. Assigned to characterization suites and frequencies applicable to new regional wells that are part of the chromium investigation monitoring group.

Table D-3.0-3 (continued)

Location	Interim Plan	Metals ^a	VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate	Stable Isotopes ^h	Cr isotopes	Rationale for Changes Relative to Previous Interim Plan
R-62 screen 2	2011	Q	Q	Q	S	S	S	S	Q	—	Q	Q	Q	S	Q	New dual-screen well scheduled for completion September 16, 2011. Assigned to characterization suites and frequencies applicable to new regional wells that are part of the chromium investigation monitoring group.

Notes: Watershed-specific and monitoring group-specific sampling suites and frequencies for individual water types are shown in shaded rows in order to set this information apart from that for the individual sampling locations that follow these rows.

Sampling suites and frequencies for last year's Interim Plan are shown in gray text in order to set this information apart from that for the current Interim Plan. Sampling frequency: Q = quarterly (4 times/yr); S = semiannual (2 times/yr); A = annual (1 time/yr); B = biennial (once every 2 yr); T = triennial (once every 3 yr). For simplicity, sample collection frequencies for analysis of suspended sediment concentrations and field parameters are not listed in this table. Field parameters are routinely collected for every sampling event at every type of location, and samples for suspended sediment concentrations are collected for every sampling event at base-flow stations and springs.

Nonfiltered and filtered samples will be collected for general inorganics (excluding anions) and metals. Anions and perchlorate samples will be filtered. Samples collected for radionuclide analysis will be nonfiltered only for all water media. Organic and HEXP constituents are nonfiltered for all water media. Stable isotope samples for nitrogen isotopes are filtered; stable isotope samples for deuterium and oxygen isotopes are not filtered.

^a Metals analysis includes the 23 TAL metals (Ag, Al, As, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, Hg, K, Mg, Mn, Na, Ni, Pb, Sb, Se, Ti, V, Zn), plus boron, molybdenum, silicon dioxide, strontium, tin, and uranium.

^b VOC = Volatile organic compounds; SVOC = semivolatiles organic compounds.

^c PCB = Polychlorinated biphenyl [compound].

^d The analytical suite of explosive compounds (HEXP) includes the Consent Order list of the normal SW-846:8330 analytes plus PETN; TATB; 3,5-dinitroaniline TOCP; 2,4-diamino-6-nitrotoluene; and 2,6-diamino-4-nitrotoluene.

^e The radionuclide suite includes gross alpha, gross beta, alpha spectroscopy, gamma spectroscopy, and strontium-90.

^f Tritium samples may be submitted for analysis by liquid scintillation if average activities are anticipated to exceed 200 pCi/L. Low-level tritium is analyzed using electrolytic enrichment or direct counting.

^g General inorganic analysis includes major anions (bromide, chloride, fluoride, sulfate), major cations (calcium, magnesium, sodium, potassium), nitrate plus nitrite (as N), TKN, ammonia, total phosphorus, TOC, TDS, alkalinity, specific conductivity, pH, and hardness.

^h Analysis for stable isotopes of nitrogen, hydrogen, and oxygen. The collection of samples for stable isotope analysis is considered a special sampling campaign that is outside the scope of the regulatory process. In general, these samples are collected semiannually from "new" wells (those which completed construction, rehabilitation, or conversion on or after October 1, 2010) until at least four sets of data have been collected. Any subsequent sampling for stable isotope analysis will be decided on the basis of site-specific conditions.

ⁱ — = This analytical suite is not scheduled to be collected for this type of water at locations assigned to this area-specific monitoring group. Some locations are assigned analytical suites or frequencies that differ from those shown in this table, for site-specific reasons as described in the text for this monitoring group, and as summarized in this table.

Table D-4.0-1
Analytes Detected Two or More Times above One-Half Standard in the MDA C Monitoring Group

Analytical Suite	Analyte Exceeding One-Half Standard at Least Twice at the Same Location in This Monitoring Group	R-14 (PR)*	R-46	R-60
Dioxins/Furans	—	—	—	—
General Inorganics	—	—	—	—
HEXP	—	—	—	—
Metals	Antimony	—	■	—
PCBs	—	—	—	—
Pesticides	—	—	—	—
Radionuclides	—	—	—	—
SVOC	Bis(2-ethylhexyl)phthalate	—	■	—
SVOC	Benzo(a)pyrene	—	—	■
SVOC	Benzo(b)fluoranthene	—	—	■
VOC	—	—	—	—

Source: Table B1-3 in Attachment B-1.

Notes: ● = Detected $\geq$ one-half standard more than once; ■ = detected $\geq$ standard at least once, as well as $\geq$ one-half standard more than once; — = not detected above one-half standard more than once at any location in this monitoring group. The term “standard” refers to the lowest applicable regulatory standard or other screening level.

*(PR) = Includes only R-14 post-rehabilitation samples.

Table D-4.0-2
Area-Specific Sampling Frequencies and Analytical Suites for the MDA C Monitoring Group

Location	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
Intermediate	2011	I	I	I	I	I	I	I	I	I	I	I	I	I	Not applicable. Intermediate wells were reassigned to the general surveillance monitoring group.
	2010	S	Q	A	—	—	T	—	A	S	—	Q	A	(A)	New monitoring group. Sampling plan is based on suites and frequencies specified for general surveillance of this hydrologic zone in the 2009 Interim Plan, modified to focus on those suites most relevant to potential releases from MDA C. Modified suites and frequencies are the same for intermediate and regional groundwater locations in this monitoring group. Reduced frequencies (relative to 2009 Interim Plan) for metals, tritium, and perchlorate reflect adequacy of data record to demonstrate nature and extent of these contaminants in groundwater in this part of the watershed. Added SVOC suite to complement VOC data. Retained HEXP suite at reduced frequency to address the limited migration potential for these constituents from TA-16 sources.

Table D-4.0-2 (continued)

Location	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
Regional	2011	A	S	A	T	T	T	T	A	—	S	S	A	S	Reduced VOC sampling frequency to semiannual because of history of nondetects (Tables D-1.2-3 and D-4.0-1). Reduced frequency to annual for metals, general inorganics, and perchlorate because of history of nondetects and detections within the range of background concentrations (Table D-4.0-1). Added triennial sampling for other organics as requested by NMED (2011, 201467).
	2010	S	Q	A	—	—	T	—	A	—	S	Q	A	(A)	New monitoring group. Sampling plan is based on suites and frequencies specified for general surveillance of this hydrologic zone in the 2009 Interim Plan, modified to focus on those suites most relevant to potential releases from MDA C. Modified suites and frequencies are the same for intermediate and regional groundwater locations in this monitoring group. Reduced frequencies (relative to 2009 Interim Plan) for metals, tritium, and perchlorate reflect adequacy of data record to demonstrate nature and extent of these contaminants in groundwater in this part of the watershed. Added SVOC suite to complement VOC data. Retained HEXP suite at reduced frequency to address the limited migration potential for these constituents from TA-16 sources.
Characterization of new deep wells ^j	2011	Q	Q	Q	S	S	S	S	Q	—	Q	Q	Q	S	Increased frequency for SVOCs to quarterly to complement quarterly data for VOCs, which are the primary COPCs for this monitoring group.
	2010	Q	Q	S	S	S	S	S	Q	—	Q	Q	Q	S	New monitoring group. Same characterization suites and frequencies as for new general surveillance wells.

Table D-4.0-2 (continued)

Notes: Sampling suites and frequencies for last year's Interim Plan are shown in gray text in order to set this information apart from that for the current Interim Plan. Sampling frequency: Q = quarterly (4 times/yr); S = semiannual (2 times/yr); A = annual (1 time/yr); B = biennial (once every 2 yr); T = triennial (once every 3 yr). For simplicity, sample collection frequencies for analysis of suspended sediment concentrations and field parameters are not listed in this table. Field parameters are routinely collected for every sampling event at every type of location, and samples for suspended sediment concentrations are collected for every sampling event at base-flow stations and springs. Nonfiltered and filtered samples will be collected for general inorganics (excluding anions) and metals. Anions and perchlorate samples will be filtered. Samples collected for radionuclide analysis will be nonfiltered only for all water media. Organic and HEXP constituents are nonfiltered for all water media. Stable isotope samples for nitrogen isotopes are filtered; stable isotope samples for deuterium and oxygen isotopes are not filtered.

- ^a Metals analysis includes the 23 TAL metals (Ag, Al, As, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, Hg, K, Mg, Mn, Na, Ni, Pb, Sb, Se, Tl, V, Zn), plus boron, molybdenum, silicon dioxide, strontium, tin, and uranium.
- ^b VOC = Volatile organic compounds; SVOC = semivolatile organic compounds.
- ^c PCB = Polychlorinated biphenyl [compound].
- ^d The analytical suite of explosive compounds (HEXP) includes the Consent Order list of the normal SW-846:8330 analytes plus PETN; TATB; 3,5-dinitroaniline; TOCP; 2,4-diamino-6-nitrotoluene; and 2,6-diamino-4-nitrotoluene.
- ^e The radionuclide suite includes gross alpha, gross beta, alpha spectroscopy, gamma spectroscopy, and strontium-90.
- ^f Tritium samples may be submitted for analysis by liquid scintillation if average activities are anticipated to exceed 200 pCi/L. Low-level tritium is analyzed using electrolytic enrichment or direct counting.
- ^g General inorganic analysis includes major anions (bromide, chloride, fluoride, sulfate), major cations (calcium, magnesium, sodium, potassium), nitrate plus nitrite (as N), total TKN, ammonia, total phosphorus, TOC, TDS, alkalinity, specific conductivity, pH, and hardness.
- ^h Analysis for stable isotopes of nitrogen, hydrogen, and oxygen. The collection of samples for stable isotope analysis is considered a special sampling campaign that is outside the scope of the regulatory process. In general, these samples are collected semiannually from "new" wells (those which completed construction, rehabilitation, or conversion on or after October 1, 2010) until at least four sets of data have been collected. Any subsequent sampling for stable isotope analysis will be decided on the basis of site-specific conditions. In the 2010 Interim Plan, the entry "(A)" for intermediate and regional wells signifies samples will be collected annually until four sets of nitrogen isotope data have been collected.
- ⁱ — = This analytical suite is not scheduled to be collected for this type of water at locations assigned to this area-specific monitoring group. Some locations are assigned analytical suites or frequencies that differ from those shown in this table, for site-specific reasons as described in the text for this monitoring group, and as summarized in Table D-4.0-3.
- ^j Characterization suites and frequencies apply to new intermediate perched or regional groundwater wells. "New" wells are defined as those which are completed, rehabilitated, or converted on or after October 1, 2010. Any planned exceptions to this general protocol are documented in Table D-4.0-3.

Table D-4.0-3
Sampling Frequencies and Analytical Suites Assigned to Locations in the MDA C Monitoring Group

Location	Interim Plan	Metals ^a	VOCs ^b	SVOCs ^b	Pesticides	PCB ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate	Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
Regional	2011	A	S	A	T	T	T	T	A	—	S	A	A	S	Rationale for suites and frequencies assigned to this monitoring group is provided in Table D-4.0-2.
	2010	S	Q	A	—	—	A	—	A	—	S	Q	A	(A)	New monitoring group. Rationale for suites and frequencies assigned to this monitoring group is provided in Table D-1.0-1.
R-14	2011	A	S	A	T	T	T	T	A	—	S	A	A	S	Changes reflect updated suites and frequencies for regional groundwater wells assigned to this monitoring group. Background location in GBIR, R4 (LANL 2010, 110535).
	2010	S	Q	A	—	—	A	—	A	—	S	Q	A	A	Completed post-conversion characterization sampling. Reassigned to suites and frequencies for new MDA C monitoring group. Background location approved for inclusion in GBIR, R4.
R-46	2011	A	S	A	T	T	T	T	A	—	S	A	A	S	Changes reflect updated suites and frequencies for regional groundwater wells assigned to this monitoring group.
	2010	S	Q	A	—	—	S	—	A	—	S	Q	A	A	Characterization sampling completed. Reassigned to suites and frequencies for new chromium investigation monitoring group.
R-59	2011	—	—	—	—	—	—	—	—	—	—	—	—	—	Plans for this well are canceled. Based on the results from monitoring wells R-46 and R-60, the evaluation of subsurface vapor data, and the proposed vapor monitoring in the deep stratigraphic units, the MDA C Phase III Investigation Report concluded that installation of well R-59 is not recommended at this time (LANL 2011, 204370).
	2010	Q	Q	S	S	S	S	—	Q	—	Q	Q	Q	S	Placeholder for planned new well. Assigned to characterization suites and frequencies for new regional wells in the MDA C monitoring group.

Table D-4.0-3 (continued)

Location	Interim Plan	Metals ^a	VOCs ^b	SVOCs ^b	Pesticides	PCB ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate	Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
R-60	2011	Q	Q	Q	S	S	S	S	Q	—	Q	Q	Q	S	New single-screen well. Assigned to characterization suites and frequencies for new regional wells in the MDA C monitoring group. Completed October 18, 2010.
	2010	Q	Q	S	S	S	S	—	Q	—	Q	Q	Q	S	Placeholder for planned new well. Assigned to characterization suites and frequencies for new regional wells in the MDA C monitoring group.

Notes: Watershed-specific and monitoring group-specific sampling suites and frequencies for individual water types are shown in shaded rows in order to set this information apart from that for the individual sampling locations that follow these rows.

Sampling suites and frequencies for last year's Interim Plan are shown in gray text in order to set this information apart from that for the current Interim Plan. Sampling frequency: Q = quarterly (4 times/yr); S = semiannual (2 times/yr); A = annual (1 time/yr); B = biennial (once every 2 yr); T = triennial (once every 3 yr). For simplicity, sample collection frequencies for analysis of suspended sediment concentrations and field parameters are not listed in this table. Field parameters are routinely collected for every sampling event at every type of location, and samples for suspended sediment concentrations are collected for every sampling event at base-flow stations and springs. Nonfiltered and filtered samples will be collected for general inorganics (excluding anions) and metals. Anions and perchlorate samples will be filtered. Samples collected for radionuclide analysis will be nonfiltered only for all water media. Organic and HEXP constituents are nonfiltered for all water media. Stable isotope samples for nitrogen isotopes are filtered; stable isotope samples for deuterium and oxygen isotopes are not filtered.

^a Metals analysis includes the 23 TAL metals (Ag, Al, As, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, Hg, K, Mg, Mn, Na, Ni, Pb, Sb, Se, Ti, V, Zn), plus boron, molybdenum, silicon dioxide, strontium, tin, and uranium.

^b VOC = Volatile organic compounds; SVOC = semivolatle organic compounds.

^c PCB = Polychlorinated biphenyl [compound].

^d The analytical suite of explosive compounds (HEXP) includes the Consent Order list of the normal SW-846:8330 analytes plus PETN; TATB; 3,5-dinitroaniline; TOCP; 2,4-diamino-6-nitrotoluene; and 2,6-diamino-4-nitrotoluene.

^e The radionuclide suite includes gross alpha, gross beta, alpha spectroscopy, gamma spectroscopy, and strontium-90.

^f Tritium samples may be submitted for analysis by liquid scintillation if average activities are anticipated to exceed 200 pCi/L. Low-level tritium is analyzed using electrolytic enrichment or direct counting.

^g General inorganic analysis includes major anions (bromide, chloride, fluoride, sulfate), major cations (calcium, magnesium, sodium, potassium), nitrate plus nitrite (as N), TKN, ammonia, total phosphorus, TOC, TDS, alkalinity, specific conductivity, pH, and hardness.

^h Analysis for stable isotopes of nitrogen, hydrogen, and oxygen. The collection of samples for stable isotope analysis is considered a special sampling campaign that is outside the scope of the regulatory process. In general, these samples are collected semiannually from "new" wells (those which completed construction, rehabilitation, or conversion on or after October 1, 2010) until at least four sets of data have been collected. Any subsequent sampling for stable isotope analysis will be decided on the basis of site-specific conditions. In the 2010 Interim Plan, the entry "(A)" for intermediate and regional wells signifies samples will be collected annually until four sets of nitrogen isotope data have been collected.

ⁱ — = This analytical suite is not scheduled to be collected for this type of water at locations assigned to this area-specific monitoring group. Some locations are assigned analytical suites or frequencies that differ from those shown in this table, for site-specific reasons as described in the text for this monitoring group, and as summarized in this table.

Table D-5.0-1
Analytes Detected Two or More Times above One-Half Standard in the TA-54 Monitoring Group

Analytical Suite	Analyte Exceeding One-Half Standard at Least Twice at the Same Location in This Monitoring Group	Intermediate Perched Groundwater Monitoring Locations						Regional Groundwater Monitoring Locations ^a																			
		R-23i PZ	R-23i Port 2	R-23i Port 3	R-37 Screen 1	R-40i	R-40 Screen 1	R-20 screen 1 (PR) ^b	R-20 screen 2 (PR)	R-21	R-23	R-32 (PR)	R-37 Screen 2	R-38	R-39	R-40 screen 2	R-41 Screen 2	R-49 Screen 1	R-49 Screen 2	R-51 screen 1	R-51screen 2	R-52 screen 1	R-52screen 2	R-53 screen 1	R-53screen 2	R-54 screen 1	R-54 screen 2
Dioxins/Furans	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Inorganics	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
HEXP	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Metals	Antimony	—	—	—	—	—	☑	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Metals	Iron	—	—	—	—	☑	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	☑	—
Metals	Manganese	—	—	—	—	☑	☑	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	☑	—
PCBs	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Pesticides	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Radionuclides	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
SVOC	Bis(2-ethylhexyl)phthalate	—	—	—	—	—	—	—	—	—	—	☑	—	☑	—	—	—	—	—	—	—	—	—	—	—	—	—
SVOC	Dioxane[1,4-]	—	—	—	●	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
VOC	Trichloroethene	—	—	—	—	—	—	●	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Source: Table B1-3 in Attachment B-1.

Notes: ● = Detected ≥ one-half standard more than once; ■ = detected ≥ standard at least once, as well as ≥ one-half standard more than once; — = not detected above one-half standard more than once at any location in this monitoring group. The term "standard" refers to the lowest applicable regulatory standard or other screening level.

^a This table excludes detections in R-22 screens because the quality of those data are in question. Newly completed dual-screen wells R-55, R-56, and R-57 had completed one sampling round by the end of 2010, which is the endpoint for the period of record included in Table B1-3. Among these wells, two SVOCs were detected above the standard in well R-55 screen 1: benzo(k)fluoranthene and Indeno(1,2,3-cd)pyrene.

^b (PR) = includes only postrehabilitation samples for wells R-20 and R-32.

Table D-5.0-2
Area-Specific Sampling Frequencies and Analytical Suites for the TA-54 Monitoring Group

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate	Stable Isotopes ^h	Rationale for Monitoring Group Suite and Frequency
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/ Furans							
Intermediate	2011	Q	Q	Q	T	T	T	T	A	—	S	Q	A	S	Relatively immobile organic suites reduced from annual to triennial because of history of nondetects (Table D-5.0-1) Triennial sampling for these organic suites is consistent with the request from NMED (2011, 201467). Reduced frequency of tritium sampling to semiannual because average tritium activities are well-established in this hydrologic zone but an annual sampling frequency is inadequate to capture seasonality.
	2010	Q	Q	Q	A	A	A	A	A	—	Q	Q	Q	S	Newly assigned hydrologic zone for this monitoring group. The sampling plan is identical to that defined for regional groundwater wells in this monitoring group. This plan addresses RCRA monitoring requirements and also reflects data collected to date from wells in the TA-54 network.
Regional	2011	Q	Q	Q	T	T	T	T	A	—	S	Q	A	S	Relatively immobile organic suites reduced from annual to triennial because of history of nondetects (Table D-5.0-1) Triennial sampling for these organic suites is consistent with the request from NMED (2011, 201467). Reduced frequency of tritium sampling to semiannual because average tritium activities are well-established in this hydrologic zone but additional data are needed to define their variability.
	2010	Q	Q	Q	A	A	A	A	A	—	Q	Q	Q	S	No change (other than reduced sampling frequency for stable isotopes).

Table D-5.0-2 (continued)

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate	Stable Isotopes ^h	Rationale for Monitoring Group Suite and Frequency
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/ Furans							
Characterization of new deep wells ^j	2011	Q	Q	Q	Q	Q	Q	Q	Q	—	Q	Q	Q	S	No change.
	2010	Q	Q	Q	Q	Q	Q	Q	Q	—	Q	Q	Q	S	No change from characterization suites and frequencies specified for this monitoring group in the 2009 Interim Plan (other than reduction in sampling frequency from quarterly to semiannual for stable isotopes).

Notes: Sampling suites and frequencies for last year's Interim Plan are shown in gray text in order to set this information apart from that for the current Interim Plan. Sampling frequency: Q = quarterly (4 times/yr); S = semiannual (2 times/yr); A = annual (1 time/yr); B = biennial (once every 2 yr); T = triennial (once every 3 yr). For simplicity, sample collection frequencies for analysis of suspended sediment concentrations and field parameters are not listed in this table. Field parameters are routinely collected for every sampling event at every type of location, and samples for suspended sediment concentrations are collected for every sampling event at base-flow stations and springs. Nonfiltered and filtered samples will be collected for general inorganics (excluding anions) and metals. Anions and perchlorate samples will be filtered. Samples collected for radionuclide analysis will be nonfiltered only for all water media. Organic and HEXP constituents are nonfiltered for all water media. Stable isotope samples for nitrogen isotopes are filtered; stable isotope samples for deuterium and oxygen isotopes are not filtered.

^a Metals analysis includes the 23 TAL metals (Ag, Al, As, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, Hg, K, Mg, Mn, Na, Ni, Pb, Sb, Se, Ti, V, Zn), plus boron, molybdenum, silicon dioxide, strontium, tin, and uranium.

^b VOC = Volatile organic compounds; SVOC = semivolatile organic compounds.

^c PCB = Polychlorinated biphenyl [compound].

^d The analytical suite of explosive compounds (HEXP) includes the Consent Order list of the normal SW-846:8330 analytes plus PETN; TATB; 3,5-dinitroaniline, TOCP; 2,4-diamino-6-nitrotoluene; and 2,6-diamino-4-nitrotoluene.

^e The radionuclide suite includes gross alpha, gross beta, alpha spectroscopy, gamma spectroscopy, and strontium-90.

^f Tritium samples may be submitted for analysis by liquid scintillation if average activities are anticipated to exceed 200 pCi/L. Low-level tritium is analyzed using electrolytic enrichment or direct counting.

^g General inorganic analysis includes major anions (bromide, chloride, fluoride, sulfate), major cations (calcium, magnesium, sodium, potassium), nitrate plus nitrite (as N), TKN, ammonia, total phosphorus, TOC, TDS, alkalinity, specific conductivity, pH, and hardness.

^h Analysis for stable isotopes of nitrogen, hydrogen, and oxygen. The collection of samples for stable isotope analysis is considered a special sampling campaign that is outside the scope of the regulatory process. In general, these samples are collected semiannually from "new" wells (those which completed construction, rehabilitation, or conversion on or after October 1, 2010) until at least four sets of data have been collected. Any subsequent sampling for stable isotope analysis will be decided on the basis of site-specific conditions.

ⁱ — = This analytical suite is not scheduled to be collected for this type of water at locations assigned to this area-specific monitoring group. Some locations are assigned analytical suites or frequencies that differ from those shown in this table, for site-specific reasons as described in the text for this monitoring group, and as summarized in Table D-5.0-3.

^j Characterization suites and frequencies apply to new intermediate perched or regional groundwater wells. "New" wells are defined as those which are completed, rehabilitated, or converted on or after October 1, 2010. Any planned exceptions to this general protocol are documented in Table D-5.0-3.

Table D-5.0-3
Sampling Frequencies and Analytical Suites Assigned to Locations in the TA-54 Monitoring Group

Location	Interim Plan	Metals ^a	VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate	Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
Intermediate (Mortandad)	2011	Q	Q	Q	T	T	T	T	A	—	S	Q	A	S	Rationale for suites and frequencies assigned to this monitoring group is provided in Table D-5.0-2.
	2010	Q	Q	Q	A	A	A	A	A	—	Q	Q	Q	S	New hydrologic zone for this monitoring group. Rationale for suites and frequencies assigned to this monitoring group is provided in Table D-1.0-1.
R-37 screen 1	2011	Q	Q	Q	T	T	T	T	A	—	S	Q	A	S	Changes reflect updated suites and frequencies for regional groundwater wells assigned to this monitoring group. Assigned to Watch List (Table F-3.0-1) because of drilling-related issues.
	2010	Q	Q	Q	A	A	A	A	A	—	Q	Q	Q	S	Completed characterization sampling. Assigned to routine suites and frequencies for TA-54 monitoring group.
Intermediate (Pajarito)	2011	Q	Q	Q	T	T	T	T	A	—	S	Q	A	S	Rationale for suites and frequencies assigned to this monitoring group is provided in Table D-5.0-2.
	2010	Q	Q	Q	A	A	A	A	A	—	Q	Q	Q	S	New hydrologic zone for this monitoring group. Rationale for suites and frequencies assigned to this monitoring group is provided in Table D-1.0-1.
R-23i piezometer (port 1)	2011	Q	Q	Q	T	T	T	T	A	S	—	Q	A	S	Reassigned to TA-54 monitoring group at request of NMED (NMED, 2011, 201467). Changes reflect updated suites and frequencies for regional groundwater wells assigned to this monitoring group. Not eligible for low-level tritium because average activity exceeds 200 pCi/L.
	2010	Q	Q	S	—	—	S	—	A	—	S	Q	S	A	Remains assigned to suites and frequencies for general surveillance at intermediate wells in this watershed, augmented by quarterly sampling for metals, VOCs, and general inorganics because of the location of this well downgradient of TA-54. Removed sampling for pesticides, PCBs, and dioxins/furans because of history of nondetects.

Table D-5.0-3 (continued)

Location	Interim Plan	Metals ^a	VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate	Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
R-23i screen 1 (port 2)	2011	Q	Q	Q	T	T	T	T	A	—	S	Q	A	S	Reassigned to TA-54 monitoring group at request of NMED (NMED, 2011, 201467). Changes reflect updated suites and frequencies for regional groundwater wells assigned to this monitoring group.
	2010	Q	Q	S	—	—	S	—	A	—	S	Q	S	A	Remains assigned to suites and frequencies for general surveillance at intermediate wells in this watershed, augmented by quarterly sampling for metals, VOCs, and general inorganics because of the location of this well downgradient of TA-54. Removed sampling for pesticides, PCBs, and dioxins/furans because of history of nondetects.
R-23i screen 2 (port 3)	2011	Q	Q	Q	T	T	T	T	A	—	S	Q	A	S	Reassigned to TA-54 monitoring group at request of NMED (NMED, 2011, 201467). Changes reflect updated suites and frequencies for regional groundwater wells assigned to this monitoring group.
	2010	Q	Q	S	—	—	S	—	A	—	S	Q	S	A	Remains assigned to suites and frequencies for general surveillance at intermediate wells in this watershed, augmented by quarterly sampling for metals, VOCs, and general inorganics because of the location of this well downgradient of TA-54. Removed sampling for pesticides, PCBs, and dioxins/furans because of history of nondetects.
R-40i	2011	Q	Q	Q	T	T	T	T	A	—	S	Q	A	S	Changes reflect updated suites and frequencies for regional groundwater wells assigned to this monitoring group. Assigned to Watch List (Table F-3.0-1) because of drilling-related issues.
	2010	Q	Q	Q	A	A	A	A	A	—	Q	Q	Q	S	Completed characterization sampling. Assigned to routine suites and frequencies for TA-54 monitoring group.

Table D-5.0-3 (continued)

Location	Interim Plan	Metals ^a	VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate	Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
R-40 screen 1	2011	—	—	—	—	—	—	—	—	—	—	—	—	—	Water-level only. Located in tight formation and takes 2 weeks to recover from purging of 1 casing volume (Appendix F).
	2010	Q	Q	Q	A	A	A	A	A	—	Q	Q	Q	S	Completed characterization sampling. Assigned to routine suites and frequencies for TA-54 monitoring group.
R-41 screen 1	2011	—	—	—	—	—	—	—	—	—	—	—	—	—	Dry. Water level only (Table 1.10-1).
	2010	Q	Q	Q	A	A	A	A	A	—	Q	Q	Q	S	Completed characterization sampling. Assigned to routine suites and frequencies for TA-54 monitoring group.
R-55i	2011	Q	Q	Q	Q	Q	Q	Q	Q	—	Q	Q	Q	S	New single-screen well. Assigned to characterization suites and frequencies for new intermediate wells in the TA-54 monitoring group. Completed January 18, 2011.
Regional (Mortandad)	2011	Q	Q	Q	T	T	T	T	A	—	S	Q	A	S	Rationale for suites and frequencies assigned to this monitoring group is provided in Table D-5.0-2.
	2010	Q	Q	Q	A	A	A	A	A	Q		Q	Q	S	No change (other than reduction in sampling frequency for stable isotopes). Suites and frequencies for TA-54 monitoring group in 2010 Interim Plan.
R-21	2011	Q	Q	Q	T	T	T	T	A	—	S	Q	A	S	Changes reflect updated suites and frequencies for regional groundwater wells assigned to this monitoring group. Background location in GBIR, R3 (LANL 2007, 095817) and GBIR, R4 (LANL 2010, 110535).
	2010	Q	Q	Q	A	A	A	A	A	Q		Q	Q	S	No change (other than reduced frequency for stable isotopes). Assigned to analytical suites and frequencies applicable to wells that are part of TA-54 monitoring well network. Background location in GBIR, R3 and approved for inclusion in GBIR, R4.

Table D-5.0-3 (continued)

Location	Interim Plan	Metals ^a	VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate	Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
R-37 screen 2	2011	Q	Q	Q	T	T	T	T	A	—	S	Q	A	S	Changes reflect updated suites and frequencies for regional groundwater wells assigned to this monitoring group.
	2010	Q	Q	Q	A	A	A	A	A	Q		Q	Q	S	Completed characterization sampling. Assigned to routine suites and frequencies for TA-54 monitoring group.
R-38	2011	Q	Q	Q	T	T	T	T	A	—	S	Q	A	S	Changes reflect updated suites and frequencies for regional groundwater wells assigned to this monitoring group.
	2010	Q	Q	Q	A	A	A	A	A	Q		Q	Q	S	Completed characterization sampling. Assigned to routine suites and frequencies for TA-54 monitoring group.
R-41 screen 2	2011	Q	Q	Q	T	T	T	T	A	—	S	Q	A	S	Changes reflect updated suites and frequencies for regional groundwater wells assigned to this monitoring group.
	2010	Q	Q	Q	A	A	A	A	A	Q		Q	Q	S	Completed characterization sampling. Assigned to routine suites and frequencies for TA-54 monitoring group.
R-52 screen 1	2011	Q	Q	Q	T	T	T	T	A	—	S	Q	A	S	Completed characterization sampling. Assigned to routine suites and frequencies for TA-54 monitoring group. Well completed March 31, 2010.
	2010	Q	Q	Q	Q	Q	Q	Q	Q	Q		Q	Q	S	Newly completed well. Assigned to characterization suites and frequencies for new regional wells in the TA-54 monitoring group.
R-52 screen 2	2011	Q	Q	Q	T	T	T	T	A	—	S	Q	A	S	Completed characterization sampling. Assigned to routine suites and frequencies for TA-54 monitoring group. Well completed March 31, 2010.
	2010	Q	Q	Q	Q	Q	Q	Q	Q	Q		Q	Q	S	Newly completed well. Assigned to characterization suites and frequencies for new regional wells in the TA-54 monitoring group.

Table D-5.0-3 (continued)

Location	Interim Plan	Metals ^a	VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate	Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
R-53 screen 1	2011	Q	Q	Q	T	T	T	T	A	—	S	Q	A	S	Completed characterization sampling. Assigned to routine suites and frequencies for TA-54 monitoring group. Well completed March 29, 2010.
	2010	Q	Q	Q	Q	Q	Q	Q	Q	Q		Q	Q	S	Newly completed well. Assigned to characterization suites and frequencies for new regional wells in the TA-54 monitoring group.
R-53 screen 2	2011	Q	Q	Q	T	T	T	T	A	—	S	Q	A	S	Completed characterization sampling. Assigned to routine suites and frequencies for TA-54 monitoring group. Well completed March 29, 2010.
	2010	Q	Q	Q	Q	Q	Q	Q	Q	Q		Q	Q	S	Newly completed well. Assigned to characterization suites and frequencies for new regional wells in the TA-54 monitoring group.
R-55 screen 1	2011	Q	Q	Q	T	T	T	T	A	—	S	Q	A	S	Completed characterization sampling and assigned to routine suites and frequencies for the TA-54 monitoring group. Completed August 25, 2010.
	2010	Q	Q	Q	Q	Q	Q	Q	Q	Q		Q	Q	S	Placeholder for planned new well. Assigned to characterization suites and frequencies for new regional wells in the TA-54 monitoring group.
R-55 screen 2	2011	Q	Q	Q	T	T	T	T	A	—	S	Q	A	S	Completed characterization sampling and assigned to routine suites and frequencies for the TA-54 monitoring group. Completed August 25, 2010.
	2010	Q	Q	Q	Q	Q	Q	Q	Q	Q		Q	Q	S	Placeholder for planned new well. Assigned to characterization suites and frequencies for new regional wells in the TA-54 monitoring group.
R-56 screen 1	2011	Q	Q	Q	T	T	T	T	A	—	S	Q	A	S	Completed characterization sampling and assigned to routine suites and frequencies for the TA-54 monitoring group. Completed July 19, 2010.
	2010	Q	Q	Q	Q	Q	Q	Q	Q	Q		Q	Q	S	Placeholder for planned new well. Assigned to characterization suites and frequencies for new regional wells in the TA-54 monitoring group.

Table D-5.0-3 (continued)

Location	Interim Plan	Metals ^a	VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate	Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
R-56 screen 2	2011	Q	Q	Q	T	T	T	T	A	—	S	Q	A	S	Completed characterization sampling and assigned to routine suites and frequencies for the TA-54 monitoring group. Completed July 19, 2010.
	2010	Q	Q	Q	Q	Q	Q	Q	Q	Q		Q	Q	S	Placeholder for planned new well. Assigned to characterization suites and frequencies for new regional wells in the TA-54 monitoring group.
R-57 screen 1	2011	Q	Q	Q	T	T	T	T	A	—	S	Q	A	S	Completed characterization sampling and assigned to routine suites and frequencies for the TA-54 monitoring group. Completed June 8, 2010.
	2010	Q	Q	Q	Q	Q	Q	Q	Q	Q		Q	Q	S	Placeholder for planned new well. Assigned to characterization suites and frequencies for new regional wells in the TA-54 monitoring group.
R-57 screen 2	2011	Q	Q	Q	T	T	T	T	A	—	S	Q	A	S	Completed characterization sampling and assigned to routine suites and frequencies for the TA-54 monitoring group. Completed June 8, 2010.
	2010	Q	Q	Q	Q	Q	Q	Q	Q	Q		Q	Q	S	Placeholder for planned new well. Assigned to characterization suites and frequencies for new regional wells in the TA-54 monitoring group.
Regional (Pajarito)	2011	Q	Q	Q	T	T	T	T	A	—	S	Q	A	S	Rationale for suites and frequencies assigned to this monitoring group is provided in Table D-5.0-2.
	2010	Q	Q	Q	A	A	A	A	A	Q		Q	Q	S	No change (other than reduction in sampling frequency for stable isotopes). Suites and frequencies for TA-54 monitoring group in 2010 Interim Plan.
R-20 screen 1	2011	Q	Q	Q	T	T	T	T	A	—	S	Q	A	S	Completed characterization sampling for rehabilitated and converted wells and assigned to routine suites and frequencies for the TA-54 monitoring group.
	2010	Q	Q	Q	A	A	A	A	A	Q		Q	Q	S	No change (other than reduced frequency for stable isotopes). Assigned to analytical suites and frequencies applicable to regional wells that are part of TA-54 monitoring well network.

Table D-5.0-3 (continued)

Location	Interim Plan	Metals ^a	VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate	Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
R-20 screen 2	2011	Q	Q	Q	T	T	T	T	A	—	S	Q	A	S	Completed characterization sampling for rehabilitated and converted wells and assigned to routine suites and frequencies for the TA-54 monitoring group.
	2010	Q	Q	Q	A	A	A	A	A	Q		Q	Q	S	No change (other than reduced frequency for stable isotopes). Assigned to analytical suites and frequencies applicable to regional wells that are part of TA-54 monitoring well network.
R-22 screens 1 to 5	2011	—	—	—	—	—	—	—	—	—	—	—	—	—	Placeholder for rehabilitated and converted well. The Westbay sampling system was removed from well R-22 between April 19 and May 3, 2009 (LANL 2009, 106796).
	2010	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD		TBD	TBD	TBD	Assigned to TA-54 monitoring group. Assignment of analytical suites and frequencies to be determined following completion of rehabilitation and conversion activities in progress at this well.
R-23	2011	Q	Q	Q	T	T	T	T	A	—	S	Q	A	S	Reassigned to TA-54 monitoring group at request of NMED (NMED, 2011, 201467). Changes reflect updated suites and frequencies for regional groundwater wells assigned to this monitoring group.
	2010	Q	Q	Q	A	A	A	A	A	Q		Q	Q	A	No change (other than reduced frequency for stable isotopes). Assigned to analytical suites and frequencies applicable to wells that are part of TA-54 monitoring well network in order to provide baseline characterization data for this area downgradient of TA-54.

Table D-5.0-3 (continued)

Location	Interim Plan	Metals ^a	VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate	Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
R-32	2011	Q	Q	Q	T	T	T	T	A	—	S	Q	A	S	Changes reflect updated suites and frequencies for regional groundwater wells assigned to this monitoring group.
	2010	Q	Q	Q	A	A	A	A	A	Q		Q	Q	S	No change (other than reduced frequency for stable isotopes). Assigned to analytical suites and frequencies applicable to wells that are part of TA-54 monitoring well network.
R-39	2011	Q	Q	Q	T	T	T	T	A	—	S	Q	A	S	Changes reflect updated suites and frequencies for regional groundwater wells assigned to this monitoring group.
	2010	Q	Q	Q	A	A	A	A	A	Q		Q	Q	S	Completed characterization sampling. Assigned to routine suites and frequencies for TA-54 monitoring group.
R-40 screen 2	2011	Q	Q	Q	T	T	T	T	A	—	S	Q	A	S	Changes reflect updated suites and frequencies for regional groundwater wells assigned to this monitoring group.
	2010	Q	Q	Q	A	A	A	A	A	Q		Q	Q	S	Completed characterization sampling. Assigned to routine suites and frequencies for TA-54 monitoring group.
R-49 screen 1	2011	Q	Q	Q	T	T	T	T	A	—	S	Q	A	S	Completed characterization sampling. Assigned to routine suites and frequencies for TA-54 monitoring group. Well completed June 1, 2009.
	2010	Q	Q	Q	Q	Q	Q	Q	Q	Q		Q	Q	S	Newly completed well. Assigned to characterization suites and frequencies for new regional wells in the TA-54 monitoring group.
R-49 screen 2	2011	Q	Q	Q	T	T	T	T	A	—	S	Q	A	S	Completed characterization sampling. Assigned to routine suites and frequencies for TA-54 monitoring group. Well completed June 1, 2009.
	2010	Q	Q	Q	Q	Q	Q	Q	Q	Q		Q	Q	S	Newly completed well. Assigned to characterization suites and frequencies for new regional wells in the TA-54 monitoring group.

Table D-5.0-3 (continued)

Location	Interim Plan	Metals ^a	VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate	Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
R-51 screen 1	2011	Q	Q	Q	T	T	T	T	A	—	S	Q	A	S	Completed characterization sampling. Assigned to routine suites and frequencies for TA-54 monitoring group. Well completed February 10, 2010.
	2010	Q	Q	Q	Q	Q	Q	Q	Q	Q		Q	Q	S	Newly completed well. Assigned to characterization suites and frequencies for new regional wells in the TA-54 monitoring group.
R-51 screen 2	2011	Q	Q	Q	T	T	T	T	A	—	S	Q	A	S	Completed characterization sampling. Assigned to routine suites and frequencies for TA-54 monitoring group. Well completed February 10, 2010.
	2010	Q	Q	Q	Q	Q	Q	Q	Q	Q		Q	Q	S	Newly completed well. Assigned to characterization suites and frequencies for new regional wells in the TA-54 monitoring group.
R-54 screen 1	2011	Q	Q	Q	T	T	T	T	A	—	S	Q	A	S	Completed characterization sampling. Assigned to routine suites and frequencies for TA-54 monitoring group. Well completed January 29, 2010.
	2010	Q	Q	Q	Q	Q	Q	Q	Q	Q		Q	Q	S	Newly completed well. Assigned to characterization suites and frequencies for new regional wells in the TA-54 monitoring group.

Table D-5.0-3 (continued)

Location	Interim Plan	Metals ^a	VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate	Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
R-54 screen 2	2011	Q	Q	Q	T	T	T	T	A	—	S	Q	A	S	Completed characterization sampling. Assigned to routine suites and frequencies for TA-54 monitoring group. Well completed January 29, 2010.
	2010	Q	Q	Q	Q	Q	Q	Q	Q	Q		Q	Q	S	Newly completed well. Assigned to characterization suites and frequencies for new regional wells in the TA-54 monitoring group.

Notes: Watershed-specific and monitoring group-specific sampling suites and frequencies for individual water types are shown in shaded rows in order to set this information apart from that for the individual sampling locations that follow these rows.

Sampling suites and frequencies for last year's Interim Plan are shown in gray text in order to set this information apart from that for the current Interim Plan. Sampling frequency: Q = quarterly (4 times/yr); S = semiannual (2 times/yr); A = annual (1 time/yr); B = biennial (once every 2 yr); T = triennial (once every 3 yr); TBD = to be determined. For simplicity, sample collection frequencies for analysis of suspended sediment concentrations and field parameters are not listed in this table. Field parameters are routinely collected for every sampling event at every type of location, and samples for suspended sediment concentrations are collected for every sampling event at base-flow stations and springs.

Nonfiltered and filtered samples will be collected for general inorganics (excluding anions) and metals. Anions and perchlorate samples will be filtered. Samples collected for radionuclide analysis will be nonfiltered only for all water media. Organic and HEXP constituents are nonfiltered for all water media. Stable isotope samples for nitrogen isotopes are filtered; stable isotope samples for deuterium and oxygen isotopes are not filtered.

^a Metals analysis includes the 23 TAL metals (Ag, Al, As, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, Hg, K, Mg, Mn, Na, Ni, Pb, Sb, Se, Tl, V, Zn), plus boron, molybdenum, silicon dioxide, strontium, tin, and uranium.

^b VOC = Volatile organic compounds; SVOC = semivolatile organic compounds.

^c PCB = Polychlorinated biphenyl [compound].

^d The analytical suite of explosive compounds (HEXP) includes the Consent Order list of the normal SW-846:8330 analytes plus PETN; TATB; 3,5-dinitroaniline; TOCP; 2,4-diamino-6-nitrotoluene; and 2,6-diamino-4-nitrotoluene.

^e The radionuclide suite includes gross alpha, gross beta, alpha spectroscopy, gamma spectroscopy, and strontium-90.

^f Tritium samples may be submitted for analysis by liquid scintillation if average activities are anticipated to exceed 200 pCi/L. Low-level tritium is analyzed using electrolytic enrichment or direct counting.

^g General inorganic analysis includes major anions (bromide, chloride, fluoride, sulfate), major cations (calcium, magnesium, sodium, potassium), nitrate plus nitrite (as N), TKN, ammonia, total phosphorus, TOC, TDS, alkalinity, specific conductivity, pH, and hardness.

^h Analysis for stable isotopes of nitrogen, hydrogen, and oxygen. The collection of samples for stable isotope analysis is considered a special sampling campaign that is outside the scope of the regulatory process. In general, these samples are collected semiannually from "new" wells (those which completed construction, rehabilitation, or conversion on or after October 1, 2010) until at least four sets of data have been collected. Any subsequent sampling for stable isotope analysis will be decided on the basis of site-specific conditions.

ⁱ — = This analytical suite is not scheduled to be collected for this type of water at locations assigned to this area-specific monitoring group. Some locations are assigned analytical suites or frequencies that differ from those shown in this table, for site-specific reasons as described in the text for this monitoring group, and as summarized in this table.

Table D-6.0-1
Analytes Detected Two or More Times above One-Half Standard in the TA-16 260 Monitoring Group

Analytical Suite	Analyte Exceeding One-Half Standard at Least Twice at the Same Location in This Monitoring Group	Base Flow	Springs					Alluvial Groundwater Monitoring Locations										Intermediate Perched Groundwater Monitoring Locations							
		Cañon de Valle below MDA P (E256)	Burning Ground Spring	Fish Ladder Spring	Martin Spring	Peter Spring	SWSC Spring	CDV-16-02655	CDV-16-02656	CDV-16-02657	CDV-16-02658	CDV-16-02659	FLC-16-25278	FLC-16-25279	FLC-16-25280	MSC-16-06293	MSC-16-06294	MSC-16-06295	16-26644	CdV-16-1(i)	CdV-16-2(i)r	CdV-16-4ip Screen 1	CdV-16-4ip Screen 2	CDV-37-1(i)	MSC-16-02665
Dioxins/Furans	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Inorganics	Total Dissolved Solids	—	—	—	—	—	—	●	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
HEXP	RDX	—	☐	—	☐	—	☐	—	☐	☐	☐	☐	—	—	☐	—	—	—	☐	☐	☐	☐ ^a	☐	—	☐
HEXP	Dinitrotoluene[2,4-]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Metals	Aluminum	—	—	☐	●	—	—	☐	—	—	—	—	☐	☐	☐	—	☐	☐	—	—	—	—	—	—	—
Metals	Arsenic	—	—	—	—	—	—	☐	—	☐	—	—	—	—	—	—	—	●	—	—	—	—	—	—	☐
Metals	Barium	—	—	—	—	☐	—	—	☐	☐	☐	☐	—	—	—	—	—	—	—	—	—	—	—	—	—
Metals	Beryllium	—	—	—	—	—	—	☐	—	☐	—	—	—	—	—	—	—	—	—	—	—	—	—	—	☐
Metals	Boron	—	—	—	☐	—	—	—	—	—	—	—	—	—	—	☐	—	—	—	—	—	—	—	—	☐
Metals	Cadmium	—	—	—	—	—	—	☐	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Metals	Iron	—	●	☐	☐	—	☐	☐	●	—	—	—	☐	☐	☐	☐	☐	☐	—	—	—	—	—	—	☐
Metals	Lead	—	—	●	—	—	—	☐	—	☐	—	—	—	—	☐	—	—	—	—	—	—	—	—	—	☐
Metals	Manganese	—	—	☐	—	☐	—	—	—	—	☐	—	☐	☐	—	—	☐	☐	—	—	—	—	—	—	—
Metals	Nickel	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Metals	Thallium	☐	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
PCBs	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Pesticides	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Radionuclides	Gross alpha ^b	—	—	—	—	—	—	—	—	—	—	—	—	●	—	—	—	—	—	—	—	—	—	—	—
SVOC	Bis(2-ethylhexyl)phthalate	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	☐	—
SVOC	Chrysene	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	●
VOC	Tetrachloroethene	—	—	—	—	—	—	—	—	—	—	—	—	—	☐	—	—	—	●	—	—	—	—	—	—
VOC	Trichloroethene	—	—	—	—	—	—	—	—	—	—	—	—	—	☐	—	—	—	●	—	—	—	—	—	☐

Table D-6.0-1 (continued)

Analytical Suite	Analyte Exceeding One-Half Standard at Least Twice at the Same Location in This Monitoring Group	Intermediate Perched Groundwater Monitoring Locations (continued)							Regional Groundwater Monitoring Locations											
		R-25 Screen 1 ^c	R-25 Screen 2 ^c	R-25 Screen 4 ^c	R-265b	R-26 PZ-2	R-26 Screen 1	R-47i	R-18	CdV-R-15-3 Screen 4	CdV-R-15-3 Screen 5 ^c	CdV-R-15-3 Screen 6 ^c	CdV-R-37-2 Screen 2 ^c	CdV-R-37-2 Screen 3	CdV-R-37-2 Screen 4 ^c	R-25 Screen 5 ^c	R-25 Screen 6	R-25 Screen 7	R-25 Screen 8	R-48
Dioxins/Furans	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Inorganics	Total Dissolved Solids	—	—	—	—	—	—	●	—	—	—	—	—	—	—	—	—	—	—	—
HEXP	RDX	☐	☐	☐	☐	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
HEXP	Dinitrotoluene[2,4-]	●	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Metals	Aluminum	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Metals	Arsenic	—	—	—	—	—	—	—	—	—	—	—	●	—	—	—	—	—	—	—
Metals	Barium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Metals	Beryllium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Metals	Boron	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Metals	Cadmium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Metals	Iron	—	—	—	—	—	—	—	—	—	—	—	☐	—	☐	—	—	—	—	—
Metals	Lead	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Metals	Manganese	☐	—	—	—	—	—	—	—	—	☐	●	☐	—	—	—	—	—	—	—
Metals	Nickel	☐	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Metals	Thallium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
PCBs	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Pesticides	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Radionuclides	Gross alpha ^c	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
SVOC	Bis(2-ethylhexyl)phthalate	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
SVOC	Chrysene	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Table D-6.0-1 (continued)

Analytical Suite	Analyte Exceeding One-Half Standard at Least Twice at the Same Location in This Monitoring Group	Intermediate Perched Groundwater Monitoring Locations (continued)							Regional Groundwater Monitoring Locations											
		R-25 Screen 1 ^c	R-25 Screen 2 ^c	R-25 Screen 4 ^c	R-265b	R-26 PZ-2	R-26 Screen 1	R-47i	R-18	CdV-R-15-3 Screen 4	CdV-R-15-3 Screen 5 ^c	CdV-R-15-3 Screen 6 ^c	CdV-R-37-2 Screen 2 ^c	CdV-R-37-2 Screen 3	CdV-R-37-2 Screen 4 ^c	R-25 Screen 5 ^c	R-25 Screen 6	R-25 Screen 7	R-25 Screen 8	R-48
VOC	Tetrachloroethene	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
VOC	Trichloroethene	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Source: Tables B1-3 and B1-4 in Attachment B-1.

Notes: ● = Detected ≥ one-half standard more than once; ■ = detected ≥ standard at least once, as well as ≥ one-half standard more than once; — = not detected above one-half standard more than once at any location in this monitoring group. The term "standard" refers to the lowest applicable regulatory standard or other screening level.

^a Well CdV-16-4ip screen 1 had completed one sampling round for the HEXP analytical suite by the end of 2010. RDX was detected above one-half standard in this sample.

^b The gross alpha standard (15 pCi/L) applies to total Aalpha after subtracting alpha contributions from radium-226 and radium-228. The reported data have not been adjusted for contributions from radium isotopes.

^c Water-quality data from CdV-R-15-3 screens 5 and 6, CdV-R-37-2 screens 2 and 4, and R-25 screens 1, 2, 4, and 5 may not be reliable and representative because of residual drilling effects (Appendix F).

Table D-6.0-2
Area-Specific Sampling Frequencies and Analytical Suites for the TA-16 260 Monitoring Group

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate	Stable Isotopes ^h	Rationale for Monitoring Group Suite and Frequency
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans							
Base Flow	2011	S	S	A	T	T	S ^{RDX-DP}	T	B	—	—	S	A	—	New category added to TA-16 260 monitoring group to accommodate the addition of base-flow station Cañon de Valle below MDA P. Changes are described relative to those for this locatin in the 2010 Interim Plan. Reduced sampling frequency to biennial for radionuclides because of history of stable trends of nondetects and low activities within range of background. Increased sampling frequency from semiannual for general inorganics to complement metals data in support of the Water Canyon investigation and TA-16 network evaluation reports. Added triennial sampling for other organics as requested by NMED (2011, 201467).
	2010	S	S	A	—	—	S ^{RDX-DP}	—	A	—	—	A	A	—	No change
Springs	2011	S	S	A	T	T	S ^{RDX-DP}	T	B	—	A	S	A	(A)	New category added to TA-16 260 monitoring group to accommodate the addition of several springs previously assigned to general surveillance in the Water/CdV watershed. Changes are described relative to those for springs in this watershed in the 2010 Interim Plan. Reduced sampling frequency to biennial for radionuclides baecause of history of stable trends of nondetects and low activities within range of background. Increased sampling frequency from semiannual for general inorganics to complement metals data in support of Water Canyon investigation and TA-16 network evaluation reports. Added triennial sampling for other organics as requested by NMED (2011, 201467).
	2010	S	S	A	—	—	S ^{RDX-DP}	—	A	—	A	A	A	A	No change

Table D-6.0-2 (continued)

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate	Stable Isotopes ^h	Rationale for Monitoring Group Suite and Frequency
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans							
Alluvial	2011	S	S	A	T	T	S ^{RDX-DP}	T	B	—	—	S	A	—	New category added to TA-16 260 monitoring group to accommodate the addition of several alluvial wells previously assigned to general surveillance in the Water/CdV watershed. Changes are described relative to those for alluvial wells in this watershed in the 2010 Interim Plan. Reduced sampling frequency to biennial for radionuclides because of history of stable trends of nondetects and low activities within range of background. Increased sampling frequency from semiannual for general inorganics to complement metals data in support of Water Canyon investigation and TA-16 network evaluation reports. Suspended tritium sampling. Added triennial sampling for other organics as requested by NMED (2011, 201467).
	2010	S	S	A	—	—	S ^{RDX-DP}	—	A	—	A	A	A	—	No change
Intermediate	2011	S	S	A	T	T	S ^{RDX-DP}	T	B	—	A	S	A	(A)	Reduced sampling frequency to biennial for radionuclides because of history of stable trends of nondetects and low activities within range of background. Added triennial sampling for other organics as requested by NMED (2011, 201467).
	2010	S	S	A	—	—	S ^{RDX-DP}	—	A	—	A	S	A	A	New monitoring group. Sampling plan is based on suites and frequencies specified for general surveillance of this hydrologic zone in the 2009 Interim Plan. Specified RDX-degradation product suite in support of CME. No change.

Table D-6.0-2 (continued)

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate	Stable Isotopes ^h	Rationale for Monitoring Group Suite and Frequency
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans							
Regional	2011	S	S	A	T	T	S ^{RDX-DP}	T	B	—	A	S	A	(A)	Reduced sampling frequency to biennial for radionuclides because of history of stable trends of nondetects and low activities within range of background. Added triennial sampling for other organics as requested by NMED (2011, 201467).
	2010	S	S	A	—	—	S ^{RDX-DP}	—	A	—	A	S	S	A	New monitoring group. Sampling plan is based on suites and frequencies specified for general surveillance of this hydrologic zone in the 2009 Interim Plan. Specified RDX-degradation product suite in support of CME. No change.
Characterization of new deep wells ⁱ	2011	Q	Q	Q	S	S	Q ^{RDX-DP}	S	Q	—	Q	Q	Q	S	Increased frequency for SVOCs to quarterly to complement quarterly data for VOCs, which are one of the primary COPCs for this monitoring group.
	2010	Q	Q	S	S	S	Q ^{RDX-DP}	S	Q	—	Q	Q	Q	S	New monitoring group. Same characterization suites and frequencies as for new general surveillance wells. Extended HEXP suite includes RDX-degradation products.

Table D-6.0-2 (continued)

Notes: Sampling suites and frequencies for last year's Interim Plan are shown in gray text in order to set this information apart from that for the current Interim Plan. Sampling frequency: Q = quarterly (4 times/yr); S = semiannual (2 times/yr); A = annual (1 time/yr); B = biennial (once every 2 yr); T = triennial (once every 3 yr). For simplicity, sample collection frequencies for analysis of suspended sediment concentrations and field parameters are not listed in this table. Field parameters are routinely collected for every sampling event at every type of location, and samples for suspended sediment concentrations are collected for every sampling event at base-flow stations and springs. Nonfiltered and filtered samples will be collected for general inorganics (excluding anions) and metals. Anions and perchlorate samples will be filtered. Samples collected for radionuclide analysis will be nonfiltered only for all water media. Organic and HEXP constituents are nonfiltered for all water media. Stable isotope samples for nitrogen isotopes are filtered; stable isotope samples for deuterium and oxygen isotopes are not filtered.

^a Metals analysis includes the 23 TAL metals (Ag, Al, As, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, Hg, K, Mg, Mn, Na, Ni, Pb, Sb, Se, Tl, V, Zn), plus boron, molybdenum, silicon dioxide, strontium, tin, and uranium.

^b VOC = Volatile organic compounds; SVOC = semivolatile organic compounds.

^c PCB = Polychlorinated biphenyl [compound].

^d The analytical suite of explosive compounds (HEXP) includes the Consent Order list of the normal SW-846:8330 analytes plus PETN; TATB; 3,5-dinitroaniline; TOCP; 2,4-diamino-6-nitrotoluene; and 2,6-diamino-4-nitrotoluene. The superscript RDX-DP indicates the analysis of RDX-degradation products MNX; DNX; and TNX.

^e The radionuclide suite includes gross alpha, gross beta, alpha spectroscopy, gamma spectroscopy, and strontium-90.

^f Tritium samples may be submitted for analysis by liquid scintillation if average activities are anticipated to exceed 200 pCi/L. Low-level tritium is analyzed using electrolytic enrichment or direct counting.

^g General inorganic analysis includes major anions (bromide, chloride, fluoride, sulfate), major cations (calcium, magnesium, sodium, potassium), nitrate plus nitrite (as N), TKN, ammonia, total phosphorus, TOC, TDS, alkalinity, specific conductivity, pH, and hardness.

^h Analysis for stable isotopes of nitrogen, hydrogen, and oxygen. The collection of samples for stable isotope analysis is considered a special sampling campaign that is outside the scope of the regulatory process. In general, these samples are collected semiannually from "new" wells (those which completed construction, rehabilitation, or conversion on or after October 1, 2010) until at least four sets of data have been collected. Any subsequent sampling for stable isotope analysis will be decided on the basis of site-specific conditions. In the 2010 Interim Plan, the entry "(A)" for intermediate and regional wells signifies samples will be collected annually until four sets of nitrogen isotope data have been collected.

ⁱ — = This analytical suite is not scheduled to be collected for this type of water at locations assigned to this area-specific monitoring group. Some locations are assigned analytical suites or frequencies that differ from those shown in this table, for site-specific reasons as described in the text for this monitoring group, and as summarized in Table D-6.0-3.

^j Characterization suites and frequencies apply to new intermediate perched or regional groundwater wells. "New" wells are defined as those which are completed, rehabilitated, or converted on or after October 1, 2010. Any planned exceptions to this general protocol are documented in Table D-6.0-3.

Table D-6.0-3
Sampling Frequencies and Analytical Suites Assigned to Locations in the TA-16 260 Monitoring Group

Location	Interim Plan	Metals ^a	VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate	Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
Baseflow	2011	S	S	A	T	T	S ^{RDX-DP}	T	B	—	—	S	A	—	Rationale for suites and frequencies assigned to this monitoring group is provided in Table D-6.0-2.
	2010	S	S	A	—	—	S ^{RDX-DP}	—	A	—	—	A	A	—	No change
Cañon de Valle below MDA P (E256)	2011	S	S	A	T	T	S ^{RDX-DP}	T	B	—	—	S	A	—	Reassigned to TA-16 260 monitoring group. Changes reflect updated suites and frequencies for base-flow locations assigned to this monitoring group.
	2010	S	S	A	—	—	S ^{RDX-DP}	—	A	—	—	A	A	—	No change. Assigned to watershed-specific suites and frequencies.
Springs	2011	S	S	A	T	T	S ^{RDX-DP}	T	B	—	A	S	A	(A)	Rationale for suites and frequencies assigned to this monitoring group is provided in Table D-6.0-2.
	2010	S	S	A	—	—	S ^{RDX-DP}	—	A	—	A	A	A	A	No change
Burning Ground Spring	2011	S	S	A	T	T	S ^{RDX-DP}	T	B	—	A	S	A	—	Reassigned to TA-16 260 monitoring group. Changes reflect updated suites and frequencies for springs assigned to this monitoring group.
	2010	S	S	A	—	—	S ^{RDX-DP}	—	A	—	A	A	A	A	No change. Assigned to watershed-specific suites and frequencies. Note that additional monitoring at this spring is conducted as part of the TA-16 260 Alluvial corrective measures implantation (CMI) monitoring group.

Table D-6.0-3 (continued)

Location	Interim Plan	Metals ^a	VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate	Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
Fish Ladder Spring	2011	S	S	A	T	T	S ^{RDX-DP}	T	B	—	A	S	A	—	Reassigned to TA-16 260 monitoring group. Changes reflect updated suites and frequencies for springs assigned to this monitoring group.
	2010	S	S	A	—	—	S ^{RDX-DP}	—	A	—	A	A	A	A	No change. Assigned to watershed-specific suites and frequencies.
Martin Spring	2011	S	S	A	T	T	S ^{RDX-DP}	T	B	—	A	S	A	—	Reassigned to TA-16 260 monitoring group. Changes reflect updated suites and frequencies for springs assigned to this monitoring group.
	2010	S	S	A	—	—	S ^{RDX-DP}	—	A	—	A	A	A	A	No change. Assigned to watershed-specific suites and frequencies. Additional monitoring at this spring is conducted as part of the TA-16 260 Alluvial CMI monitoring group.
Peter Spring	2011	S	S	A	T	T	S ^{RDX-DP}	T	B	—	A	S	A	—	Reassigned to TA-16 260 monitoring group. Changes reflect updated suites and frequencies for springs assigned to this monitoring group.
	2010	S	S	A	—	—	S ^{RDX-DP}	—	A	—	A	A	A	A	Assigned to watershed-specific suites and frequencies.
SWSC Spring	2011	S	S	A	T	T	S ^{RDX-DP}	T	B	—	A	S	A	—	Reassigned to TA-16 260 monitoring group. Changes reflect updated suites and frequencies for springs assigned to this monitoring group.
	2010	S	S	A	—	—	S ^{RDX-DP}	—	A	—	A	A	A	A	No change. Assigned to watershed-specific suites and frequencies. Additional monitoring at this spring is conducted as part of the TA-16 260 Alluvial CMI monitoring group.

Table D-6.0-3 (continued)

Location	Interim Plan	Metals ^a	VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate	Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
Alluvial	2011	S	S	A	T	T	S ^{RDX-DP}	T	B	—	—	S	A	—	Rationale for suites and frequencies assigned to this monitoring group is provided in Table D-6.0-2.
	2010	S	S	A	—	—	S ^{RDX-DP}	—	A	—	A	A	A	—	No change
CdV-16-02655	2011	S	S	A	T	T	S ^{RDX-DP}	T	B	—	—	S	A	—	Reassigned to TA-16 260 monitoring group. Changes reflect updated suites and frequencies for alluvial wells assigned to this monitoring group.
	2010	S	S	A	—	—	S ^{RDX-DP}	—	A	—	A	A	A	—	No change (other than removal of stable isotopes). Assigned to watershed-specific suites and frequencies.
CdV-16-02656	2011	S	S	A	T	T	S ^{RDX-DP}	T	B	—	—	S	A	—	Reassigned to TA-16 260 monitoring group. Changes reflect updated suites and frequencies for alluvial wells assigned to this monitoring group.
	2010	S	S	A	—	—	S ^{RDX-DP}	—	A	—	A	A	A	—	No change (other than removal of stable isotopes). Assigned to watershed-specific suites and frequencies.
CdV-16-02657	2011	S	S	A	T	T	S ^{RDX-DP}	T	B	—	—	S	A	—	Reassigned to TA-16 260 monitoring group. Changes reflect updated suites and frequencies for alluvial wells assigned to this monitoring group.
	2010	S	S	A	—	—	S ^{RDX-DP}	—	A	—	A	A	A	—	No change (other than removal of stable isotopes). Assigned to watershed-specific suites and frequencies.

Table D-6.0-3 (continued)

Location	Interim Plan	Metals ^a	VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate	Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
CdV-16-02658	2011	S	S	A	T	T	S ^{RDX-DP}	T	B	—	—	S	A	—	Reassigned to TA-16 260 monitoring group. Changes reflect updated suites and frequencies for alluvial wells assigned to this monitoring group.
	2010	S	S	A	—	—	S ^{RDX-DP}	—	A	—	A	A	A	—	No change (other than removal of stable isotopes). Assigned to watershed-specific suites and frequencies.
CdV-16-02659	2011	S	S	A	T	T	S ^{RDX-DP}	T	B	—	—	S	A	—	Reassigned to TA-16 260 monitoring group. Changes reflect updated suites and frequencies for alluvial wells assigned to this monitoring group.
	2010	S	S	A	—	—	S ^{RDX-DP}	—	A	—	A	A	A	—	No change (other than removal of stable isotopes). Assigned to watershed-specific suites and frequencies.
FLC-16-25278	2011	S	S	A	T	T	S ^{RDX-DP}	T	B	—	—	S	A	—	Reassigned to TA-16 260 monitoring group. Changes reflect updated suites and frequencies for alluvial wells assigned to this monitoring group.
	2010	S	S	A	—	—	S ^{RDX-DP}	—	A	—	A	A	A	—	No change (other than removal of stable isotopes). Assigned to watershed-specific suites and frequencies.
FLC-16-25279	2011	S	S	A	T	T	S ^{RDX-DP}	T	B	—	—	S	A	—	Reassigned to TA-16 260 monitoring group. Changes reflect updated suites and frequencies for alluvial wells assigned to this monitoring group.
	2010	S	S	A	—	—	S ^{RDX-DP}	—	A	—	A	A	A	—	No change (other than removal of stable isotopes). Assigned to watershed-specific suites and frequencies.

Table D-6.0-3 (continued)

Location	Interim Plan	Metals ^a	VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate	Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
FLC-16-25280	2011	S	S	A	T	T	S ^{RDX-DP}	T	B	—	—	S	A	—	Reassigned to TA-16 260 monitoring group. Changes reflect updated suites and frequencies for alluvial wells assigned to this monitoring group.
	2010	S	S	A	—	—	S ^{RDX-DP}	—	A	—	A	A	A	—	No change (other than removal of stable isotopes). Assigned to watershed-specific suites and frequencies.
MSC-16-06293	2011	S	S	A	T	T	S ^{RDX-DP}	T	B	—	—	S	A	—	Reassigned to TA-16 260 monitoring group. Changes reflect updated suites and frequencies for alluvial wells assigned to this monitoring group.
	2010	S	S	A	—	—	S ^{RDX-DP}	—	A	—	A	A	A	—	No change (other than removal of stable isotopes). Assigned to watershed-specific suites and frequencies.
MSC-16-06294	2011	S	S	A	T	T	S ^{RDX-DP}	T	B	—	—	S	A	—	Reassigned to TA-16 260 monitoring group. Changes reflect updated suites and frequencies for alluvial wells assigned to this monitoring group.
	2010	S	S	A	—	—	S ^{RDX-DP}	—	A	—	A	A	A	—	No change (other than removal of stable isotopes). Assigned to watershed-specific suites and frequencies.
MSC-16-06295	2011	S	S	A	T	T	S ^{RDX-DP}	T	B	—	—	S	A	—	Reassigned to TA-16 260 monitoring group. Changes reflect updated suites and frequencies for alluvial wells assigned to this monitoring group.
	2010	S	S	A	—	—	S ^{RDX-DP}	—	A	—	A	A	A	—	No change (other than removal of stable isotopes). Assigned to watershed-specific suites and frequencies.

Table D-6.0-3 (continued)

Location	Interim Plan	Metals ^a	VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate	Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
Intermediate	2011	S	S	A	T	T	S ^{RDX-DP}	T	B	—	A	S	A	(A)	Rationale for suites and frequencies assigned to this monitoring group is provided in Table D-6.0-2.
	2010	S	S	A	—	—	S ^{RDX-DP}	—	A	—	A	S	A	A	New monitoring group. Rationale for suites and frequencies assigned to this monitoring group is provided in Table D-1.0-1.
16-26644	2011	S	S	A	T	T	S ^{RDX-DP}	T	B	—	A	S	A	—	Added to sampling under the Interim Plan and assigned to TA-16 260 monitoring group. Well 16-26644 has been wet during times with heavy snowmelt runoff (Koch and Schmeer 2011, 201566).
	2010	—	—	—	—	—	—	—	—	—	—	—	—	—	No change. Continue to monitor for water-level only.
90LP-SE-16-02669	2011	—	—	—	—	—	—	—	—	—	—	—	—	—	Reassign to TA-16 260 monitoring group. Continue to monitor for water-level only.
	2010	—	—	—	—	—	—	—	—	—	—	—	—	—	No change. Continue to monitor for water-level only.
CdV-16-1(i)	2011	S	S	A	T	T	S ^{RDX-DP}	T	B	—	A	S	A	—	Changes reflect updated suites and frequencies for intermediate wells assigned to this monitoring group.
	2010	S	S	A	—	—	S ^{RDX-DP}	—	A	—	A	S	A	A	Reassigned to suites and frequencies for new TA-16 260 deep groundwater (GW) monitoring group. No changes.
CdV-16-2(i)r	2011	S	S	A	T	T	S ^{RDX-DP}	T	B	—	A	S	A	A	Changes reflect updated suites and frequencies for intermediate wells assigned to this monitoring group.
	2010	S	S	A	—	—	S ^{RDX-DP}	—	A	—	A	S	A	A	Reassigned to suites and frequencies for new TA-16 260 deep GW monitoring group. No changes.

Table D-6.0-3 (continued)

Location	Interim Plan	Metals ^a	VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate	Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
CdV-16-4(i)p screen 1	2011	Q	Q	Q	S	S	Q ^{RDX-DP}	S	Q	—	Q	Q	Q	S	Newly completed hydrotest well. Completed August 23, 2010. A final sampling configuration will be proposed for this well in the TA-16 network evaluation report due to NMED in December 2011.
CdV-16-4(i)p screen 2	2011	—	—	—	—	—	—	—	—	—	—	—	—	—	Newly completed hydrotest well. Completed August 23, 2010. Screen 2 is retained until a final sampling configuration has been determined for this well.
CdV-37-1(i)	2011	S	S	A	T	T	S ^{RDX-DP}	T	B	—	A	S	A	A	Completed characterization sampling. Assigned to routine suites and frequencies for TA-16 260 monitoring group. Well completed December 2, 2009.
	2010	Q	Q	S	S	S	Q ^{RDX-DP}	S	Q	—	Q	Q	Q	S	Newly completed well. Reassigned to characterization suites and frequencies applicable to new intermediate wells assigned to TA-16 260 deep GW monitoring group. No changes (other than frequency for stable isotopes).
CdV-R-15-3 screens 1, 2, and 3	2011	—	—	—	—	—	—	—	—	—	—	—	—	—	Nonfunctional historically dry screens removed from Interim Plan. The Westbay sampling system was removed from Well CdV-R-15-3 as part of a reliability assessment study of wells containing Westbay sampling systems (LANL 2010, 109676). Screens 1, 2 and 3 are scheduled for P&A following well conversion to a configuration with a purgeable sampling system (LANL 2011, 204372).
	2010	—	—	—	—	—	—	—	—	—	—	—	—	—	No change. Continue to monitor for water-level only.

Table D-6.0-3 (continued)

Location	Interim Plan	Metals ^a	VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate	Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
CdV-R-37-2 screen 1	2011	—	—	—	—	—	—	—	—	—	—	—	—	—	Nonfunctional historically-dry screen removed from Interim Plan. The Westbay sampling system was removed from Well CdV-R-37-2 as part of a reliability assessment study of wells containing Westbay sampling systems (LANL 2010, 109676). Screen 1 is scheduled for P&A following well conversion to a configuration with a purgeable sampling system (LANL 2011, 204372).
	2010	—	—	—	—	—	—	—	—	—	—	—	—	—	No change. Continue to monitor for water-level only.
MSC-16-02665	2011	S	S	A	T	T	S ^{RDX-DP}	T	B	—	A	S	A	A	Added to sampling under the Interim Plan and assigned to TA-16 260 monitoring group. Well intermittently wets up (Koch and Schmeer 2011, 201566) and has shown trichloroethene and other contaminants (Table D-6.0-1).
	2010	—	—	—	—	—	—	—	—	—	—	—	—	—	No change. Continue to monitor for water-level only.

Table D-6.0-3 (continued)

Location	Interim Plan	Metals ^a	VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate	Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
R-25 screen 1	2011	A	S	—	—	—	S ^{RDX-DP}	—	B	—	A	A	A	—	Assigned limited analytical suites because of concerns about the reliability and representativeness of water-quality data obtained from wells equipped with Westbay sampling systems (Appendix F).
	2010	S	S	A	—	—	S ^{RDX-DP}	—	A	—	A	S ^{IND}	S	A	Reassigned to TA-16 260 deep GW monitoring group indicator suite augmented with group-specific analytical suites. Impacted by casing corrosion and residual drilling products. VOC and HEXP suites are included as analytes of potential concern known to be present at this location, recognizing that analytical results for a few constituents could be biased low by the presence of iron-corrosion products. Perchlorate included because of its usefulness for evaluating redox conditions at this screen. This screen is added back to the Interim Plan to acquire additional water-quality data in support of CME activities for TA-16 260 Outfall. Although nearby well R-25b was installed in November 2008 as a replacement for this screen, contaminant concentrations are significantly different in the two screens, reflecting the heterogeneity of the perched-intermediate system in this area.

Table D-6.0-3 (continued)

Location	Interim Plan	Metals ^a	VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate	Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
R-25 screen 2	2011	A	S	—	—	—	S ^{RDX-DP}	—	B	—	A	A	A	—	Assigned limited analytical suites because of concerns about the reliability and representativeness of water-quality data obtained from wells equipped with Westbay sampling systems (Appendix F).
	2010	—	S	A	—	—	S ^{RDX-DP}	—	A	—	A	S	S	A	Reassigned to TA-16 260 deep GW monitoring group indicator suite, augmented with group-specific analytical suites. VOC and HEXP suites are included as analytes of potential concern known to be present at this location, recognizing that analytical results for a few constituents could be biased low by the presence of iron corrosion products. Perchlorate included because of its usefulness for evaluating redox conditions at this screen.
R-25 screen 4	2011	A	S	—	—	—	S ^{RDX-DP}	—	B	—	A	A	A	—	Assigned limited analytical suites because of concerns about the reliability and representativeness of water-quality data obtained from wells equipped with Westbay sampling systems (Appendix F).
	2010	S	S	A	—	—	S ^{RDX-DP}	—	A	—	A	S	S	A	Reassigned to suites and frequencies for new TA-16 260 deep GW monitoring group. No changes.
R-25b	2011	S	S	A	T	T	S ^{RDX-DP}	T	B	—	A	S	A	A	Changes reflect updated suites and frequencies for intermediate groundwater wells assigned to this monitoring group.
	2010	S	S	A	—	—	S ^{RDX-DP}	—	A	—	A	S	S	A	Characterization sampling completed. Reassigned to TA-16 260 deep GW monitoring group. Intended to replace R-25 screen 1.

Table D-6.0-3 (continued)

Location	Interim Plan	Metals ^a	VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate	Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
R-25c	2011	—	—	—	—	—	—	—	—	—	—	—	—	—	Water present only in sump. Monitor for water levels only.
	2010	S	S	A	—	—	S ^{RDX-DP}	—	A	—	A	S	S	A	Characterization sampling completed. Reassigned to TA-16 260 deep GW monitoring group. Intended to replace R-25 screen 3. Water present only in sump. Monitoring for water levels will continue and screen will be sampled if water is present.
R-26 PZ-1	2011	—	—	—	—	—	—	—	—	—	—	—	—	—	No change. Historically dry, monitor water levels only.
	2010	—	—	—	—	—	—	—	—	—	—	—	—	—	Historically dry since its installation in October 2003. Monitor water levels only.
R-26 PZ-2	2011	S	S	A	T	T	S ^{RDX-DP}	T	B	—	A	S	A	A	Changes reflect updated suites and frequencies for intermediate groundwater wells assigned to this monitoring group.
	2010	S	S	A	—	—	S ^{RDX-DP}	—	A	—	A	S	A	A	Reassigned to suites and frequencies for new TA-16 260 deep GW monitoring group. No changes.
R-26 screen 1	2011	Q	Q	Q	S	S	Q ^{RDX-DP}	S	Q	—	Q	Q	Q	Q	Screen 1 was retained when well R-26 was converted to a single-screen well. Assigned to characterization suites and frequencies applicable to new deep wells assigned to TA-16 260 monitoring group. Dedicated sampling pump installed June 17, 2011.
	2010	S	S	A	—	—	S ^{RDX-DP}	—	A	—	A	S	A	A	Reassigned to suites and frequencies for new TA-16 260 deep GW monitoring group. No changes.

Table D-6.0-3 (continued)

Location	Interim Plan	Metals ^a	VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate	Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
R-47i	2011	S	S	A	T	T	S ^{RDX-DP}	T	B	—	A	S	A	A	Completed characterization sampling. Assigned to routine suites and frequencies for intermediate wells in the TA-16 260 monitoring group. Well completed November 19, 2009.
	2010	Q	Q	S	S	S	Q ^{RDX-DP}	S	Q	—	Q	Q	Q	S	Newly completed well. Reassigned to characterization suites and frequencies applicable to new intermediate wells assigned to TA-16 260 deep GW monitoring group.
Regional (Pajarito)	2011	S	S	A	T	T	S ^{RDX-DP}	T	B	—	A	S	A	(A)	Rationale for suites and frequencies assigned to this monitoring group is provided in Table D-6.0-2.
	2010	S	S	—	—	—	S ^{RDX-DP}	—	A	—	A	S	S	A	New monitoring group. Rationale for suites and frequencies assigned to this monitoring group is provided in Table D-1.0-1.
R-18	2011	S	S	A	T	T	S ^{RDX-DP}	T	B	—	A	S	A	A	Changes reflect updated suites and frequencies for regional groundwater wells assigned to this monitoring group.
	2010	S	S	—	—	—	S ^{RDX-DP}	—	A	—	A	S	S	A	Reassigned to suites and frequencies for new TA-16 260 deep GW monitoring group. No change.
Regional (Water/CdV)	2011	S	S	A	T	T	S ^{RDX-DP}	T	B	—	A	S	A	(A)	Rationale for suites and frequencies assigned to this monitoring group is provided in Table D-6.0-2.
	2010	S	S	A	—	—	S ^{RDX-DP}	—	A	—	A	S	A	A	New monitoring group. Rationale for suites and frequencies assigned to this monitoring group is provided in Table D-1.0-1.

Table D-6.0-3 (continued)

Location	Interim Plan	Metals ^a	VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate	Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
CdV-R-15-3 screen 4	2011	—	—	—	—	—	—	—	—	—	—	—	—	—	Currently inactive. The Westbay sampling system was removed from Well CdV-R-15-3 as part of a reliability assessment study of wells containing Westbay sampling systems (LANL 2010, 109676). Well will be converted to a configuration with a purgeable sampling system; the final configuration will be determined based on the results of the Westbay reliability study and the TA-16 network evaluation due December 2011.
	2010	S	S	A	—	—	S ^{RDX-DP}	—	A	—	A	S	S	A	Reassigned to suites and frequencies for new TA-16 260 deep GW monitoring group. No change.
CdV-R-15-3 screen 5	2011	—	—	—	—	—	—	—	—	—	—	—	—	—	Currently inactive. The Westbay sampling system was removed from Well CdV-R-15-3 as part of a reliability assessment study of wells containing Westbay sampling systems (LANL 2010, 109676). Well will be converted to a configuration with a purgeable sampling system; the final configuration will be determined based on the results of the Westbay reliability study and the TA-16 network evaluation due December 2011.
	2010	—	—	—	—	—	A ^{RDX-DP}	—	—	—	—	A ^{IND}	—	—	Part of TA-16 260 deep GW monitoring group. Assigned to indicator suite because of residual effects of drilling.

Table D-6.0-3 (continued)

Location	Interim Plan	Metals ^a	VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate	Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
CdV-R-15-3 screen 6	2011	—	—	—	—	—	—	—	—	—	—	—	—	—	Currently inactive. The Westbay sampling system was removed from Well CdV-R-15-3 as part of a reliability assessment study of wells containing Westbay sampling systems (LANL 2010, 109676). Well will be converted to a configuration with a purgeable sampling system; the final configuration will be determined based on the results of the Westbay reliability study and the TA-16 network evaluation due December 2011.
	2010	—	A	—	—	—	A ^{RDX-DP}	—	—	—	—	A ^{IND}	—	—	Part of TA-16 260 deep GW monitoring group. Assigned to indicator suite because of residual effects of drilling.
CdV-R-37-2 screen 2	2011	—	—	—	—	—	—	—	—	—	—	—	—	—	Currently inactive. The Westbay sampling system was removed from Well CdV-R-37-2 as part of a reliability assessment study of wells containing Westbay sampling systems (LANL 2010, 109676). Well will be converted to a configuration with a purgeable sampling system; the final configuration will be determined based on the results of the Westbay reliability study and the TA-16 network evaluation due December 2011.
	2010	—	—	—	—	—	A ^{RDX-DP}	—	—	—	—	A ^{IND}	—	—	Part of TA-16 260 deep GW monitoring group. Assigned to indicator suite because of residual effects of drilling.

Table D-6.0-3 (continued)

Location	Interim Plan	Metals ^a	VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate	Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
CdV-R-37-2 screen 3	2011	—	—	—	—	—	—	—	—	—	—	—	—	—	Currently inactive. The Westbay sampling system was removed from Well CdV-R-37-2 as part of a reliability assessment study of wells containing Westbay sampling systems (LANL 2010, 109676). Well will be converted to a configuration with a purgeable sampling system; the final configuration will be determined based on the results of the Westbay reliability study and the TA-16 network evaluation due December 2011.
	2010	S	S	A	—	—	S ^{RDX-DP}	—	A	—	A	S	S	A	Reassigned to suites and frequencies for new TA-16 260 deep GW monitoring group. No changes.
CdV-R-37-2 screen 4	2011	—	—	—	—	—	—	—	—	—	—	—	—	—	Currently inactive. The Westbay sampling system was removed from Well CdV-R-37-2 as part of a reliability assessment study of wells containing Westbay sampling systems (LANL 2010, 109676). Well will be converted to a configuration with a purgeable sampling system; the final configuration will be determined based on the results of the Westbay reliability study and the TA-16 network evaluation due December 2011.
	2010	S	S	A	—	—	S ^{RDX-DP}	—	A	—	A	S	S	A	Assigned to suites and frequencies for new TA-16 260 deep GW monitoring group. Reduced sampling frequency to annual for SVOC suite, consistent with that for other intermediate wells assigned to this monitoring group.

Table D-6.0-3 (continued)

Location	Interim Plan	Metals ^a	VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate	Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
R-25 screen 5	2011	A	S	—	—	—	S ^{RDX-DP}	—	B	—	A	A	A	—	Assigned limited analytical suites because of concerns about the reliability and representativeness of water-quality data obtained from wells equipped with Westbay sampling systems (Appendix F).
	2010	S	S	A	—	—	S ^{RDX-DP}	—	A	—	A	S	S	A	Reassigned to suites and frequencies for new TA-16 260 deep GW monitoring group.
R-25 screen 6	2011	A	S	—	—	—	S ^{RDX-DP}	—	B	—	A	A	A	—	Assigned limited analytical suites because of concerns about the reliability and representativeness of water-quality data obtained from wells equipped with Westbay sampling systems (Appendix F).
	2010	S	S	A	—	—	S ^{RDX-DP}	—	A	—	A	S	S	A	Reassigned to suites and frequencies for new TA-16 260 deep GW monitoring group.
R-25 screen 7	2011	A	S	—	—	—	S ^{RDX-DP}	—	B	—	A	A	A	—	Assigned limited analytical suites because of concerns about the reliability and representativeness of water-quality data obtained from wells equipped with Westbay sampling systems (Appendix F).
	2010	S	S	A	—	—	S ^{RDX-DP}	—	A	—	A	S	S	A	Reassigned to suites and frequencies for new TA-16 260 deep GW monitoring group.
R-25 screen 8	2011	A	S	—	—	—	S ^{RDX-DP}	—	B	—	A	A	A	—	Assigned limited analytical suites because of concerns about the reliability and representativeness of water-quality data obtained from wells equipped with Westbay sampling systems (Appendix F).
	2010	S	S	A	—	—	S ^{RDX-DP}	—	A	—	A	S	S	A	Reassigned to suites and frequencies for new TA-16 260 deep GW monitoring group.

Table D-6.0-3 (continued)

Location	Interim Plan	Metals ^a	VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate	Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
R-26 screen 2	2011	—	—	—	—	—	—	—	—	—	—	—	—	—	Removed from Interim Plan. This screen was P&A when well R-26 was converted to a single-screen well.
	2010	—	—	—	—	—	—	—	—	—	—	—	—	—	No change. Continue to monitor for water-level only.
R-47	2011	—	—	—	—	—	—	—	—	—	—	—	—	—	Placeholder for possible new regional well (erroneously indicated as completed in the 2010 Interim Plan). The need for this well will be assessed in the TA-16 network evaluation due December 2011.
	2010	Q	Q	S	S	S	Q ^{RDX-DP}	S	Q	—	Q	Q	Q	S	Newly completed well. Assigned to characterization suites and frequencies applicable to new regional wells assigned to TA-16 260 deep GW monitoring group.
R-48	2011	S	S	A	T	T	S ^{RDX-DP}	T	B	—	A	S	A	A	Completed characterization sampling. Assigned to routine suites and frequencies for TA-16 260 monitoring group. Well completed December 26, 2009.
	2010	Q	Q	S	S	S	Q ^{RDX-DP}	S	Q	—	Q	Q	Q	S	Newly completed well. Assigned to characterization suites and frequencies applicable to new regional wells assigned to TA-16 260 deep GW monitoring group.

Table D-6.0-3 (continued)

Location	Interim Plan	Metals ^a	VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate	Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
R-63	2011	Q	Q	Q	S	S	Q ^{RDX-DP}	S	Q	—	Q	Q	Q	S	New single-screen well. Assigned to characterization suites and frequencies applicable to new regional wells assigned to TA-16 260 monitoring group. Completed February 9, 2011.

Notes: Watershed-specific and monitoring group-specific sampling suites and frequencies for individual water types are shown in shaded rows in order to set this information apart from that for the individual sampling locations that follow these rows.

Sampling suites and frequencies for last year's Interim Plan are shown in gray text in order to set this information apart from that for the current Interim Plan. Sampling frequency: Q = quarterly (4 times/yr); S = semiannual (2 times/yr); A = annual (1 time/yr); B = biennial (once every 2 yr); T = triennial (once every 3 yr). For simplicity, sample collection frequencies for analysis of suspended sediment concentrations and field parameters are not listed in this table. Field parameters are routinely collected for every sampling event at every type of location, and samples for suspended sediment concentrations are collected for every sampling event at base-flow stations and springs.

Nonfiltered and filtered samples will be collected for general inorganics (excluding anions) and metals. Anions and perchlorate samples will be filtered. Samples collected for radionuclide analysis will be nonfiltered only for all water media. Organic and HEXP constituents are nonfiltered for all water media. Stable isotope samples for nitrogen isotopes are filtered; stable isotope samples for deuterium and oxygen isotopes are not filtered.

^a Metals analysis includes the 23 TAL metals (Ag, Al, As, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, Hg, K, Mg, Mn, Na, Ni, Pb, Sb, Se, Ti, V, Zn), plus boron, molybdenum, silicon dioxide, strontium, tin, and uranium.

^b VOC = Volatile organic compounds; SVOC = semivolatile organic compounds.

^c PCB = Polychlorinated biphenyl [compound].

^d The analytical suite of explosive compounds (HEXP) includes the Consent Order list of the normal SW-846:8330 analytes plus PETN; TATB; 3,5-dinitroaniline; TOCP; 2,4-diamino-6-nitrotoluene; and 2,6-diamino-4-nitrotoluene. The superscript RDX-DP indicates the analysis of RDX-degradation products MNX; DNx; and TNX.

^e The radionuclide suite includes gross alpha, gross beta, alpha spectroscopy, gamma spectroscopy, and strontium-90.

^f Tritium samples may be submitted for analysis by liquid scintillation if average activities are anticipated to exceed 200 pCi/L. Low-level tritium is analyzed using electrolytic enrichment or direct counting.

^g General inorganic analysis includes major anions (bromide, chloride, fluoride, sulfate), major cations (calcium, magnesium, sodium, potassium), nitrate plus nitrite (as N), TKN, ammonia, total phosphorus, TOC, TDS, alkalinity, specific conductivity, pH, and hardness. IND indicates "indicator suite," which includes major anions and cations, nitrate (as N), metals, alkalinity, pH, TOC, and, as needed, sulfide, ammonia, TKN, and perchlorate. Indicator suite samples are submitted to the on-site EES-14 analytical laboratory, with the exception of samples for TKN and perchlorate analysis, which are submitted to an off-site analytical facility.

^h Analysis for stable isotopes of nitrogen, hydrogen, and oxygen. The collection of samples for stable isotope analysis is considered a special sampling campaign that is outside the scope of the regulatory process. In general, these samples are collected semiannually from "new" wells (those which completed construction, rehabilitation, or conversion on or after October 1, 2010) until at least four sets of data have been collected. Any subsequent sampling for stable isotope analysis will be decided on the basis of site-specific conditions. In the 2010 Interim Plan, the entry "(A)" for intermediate and regional wells signifies samples will be collected annually until four sets of nitrogen isotope data have been collected.

ⁱ — = This analytical suite is not scheduled to be collected for this type of water at locations assigned to this area-specific monitoring group. Some locations are assigned analytical suites or frequencies that differ from those shown in this table, for site-specific reasons as described in the text for this monitoring group, and as summarized in this table.

Table D-7.0-1
Analytes Detected Two or More Times above One-Half Standard in the MDA AB Monitoring Group

Analytical Suite	Analyte Exceeding One-Half Standard at Least Twice at the Same Location in This Monitoring Group	Intermediate Perched Groundwater Monitoring Location (Water Canyon/Cañon de Valle)	Regional Groundwater Monitoring Locations (Water Canyon/Cañon de Valle)	Regional Groundwater Monitoring Locations (Ancho Canyon)				
		R-27i	R-27	R-29	R-30	Test Well DT-5	Test Well DT-9	Test Well DT-10
Dioxins/Furans	—	—	—	—	—	—	—	—
General Inorganics	—	—	—	—	—	—	—	—
HEXP	—	—	—	—	—	—	—	—
Metals	Manganese	—	—	■	—	—	—	—
PCBs	—	—	—	—	—	—	—	—
Pesticides	—	—	—	—	—	—	—	—
Radionuclides	—	—	—	—	—	—	—	—
SVOC	Bis(2-ethylhexyl)phthalate	—	●	—	—	—	—	—
VOC	—	—	—	—	—	—	—	—

Source: Table B1-3 in Attachment B-1.

Notes: ● = Detected ≥ one-half standard more than once; ■ = detected ≥ standard at least once, as well as ≥ one-half standard more than once; — = not detected above one-half standard more than once at any location in this monitoring group. The term “standard” refers to the lowest applicable regulatory standard or other screening level.

Table D-7.0-2
Area-Specific Sampling Frequencies and Analytical Suites for the MDA AB Monitoring Group

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides ^e	Tritium ^f	Low-level Tritium ^f	Gen Inorganics ^g	Perchlorate	Stable Isotopes ^h	Rationale for Monitoring Group Suite and Frequency
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans							
Intermediate	2011	A	A	T	T	T	A ^{RDX-DP}	T	A	—	A	A	A	—	New hydrologic zone established for routine sampling of intermediate well R-27i assigned to this monitoring group. Assigned annual frequency for metals, general inorganics, and radionuclides, compared with semiannual frequency for regional groundwater, because of the far-field location of this well relative to MDA AB. Added triennial sampling for other organics as requested by NMED (2011, 201467).
Regional	2011	S	A	T	T	T	A ^{RDX-DP}	T	S	—	A	S	A	—	Increased sampling frequency for general inorganics to complement metals data. Increased frequency to semiannual for radionuclides because radionuclides are the primary COPCs for the MDA AB monitoring group. Added triennial sampling for other organics as requested by NMED (2011, 201467).
	2010	S	A	—	—	—	S	—	A	—	A	S	S	(A)	Groundwater monitoring for MDA AB has historically been conducted predominantly at the DT-series regional aquifer wells. The focused suite for the DT-series wells will be maintained. Reduced frequency from semiannual to annual for tritium because of history of nondetects.

Table D-7.0-2 (continued)

Notes: Sampling suites and frequencies for last year's Interim Plan are shown in gray text in order to set this information apart from that for the current Interim Plan. Sampling frequency: Q = quarterly (4 times/yr); S = semiannual (2 times/yr); A = annual (1 time/yr); B = biennial (once every 2 yr); T= triennial (once every 3 yr). For simplicity, sample collection frequencies for analysis of suspended sediment concentrations and field parameters are not listed in this table. Field parameters are routinely collected for every sampling event at every type of location, and samples for suspended sediment concentrations are collected for every sampling event at base-flow stations and springs. Nonfiltered and filtered samples will be collected for general inorganics (excluding anions) and metals. Anions and perchlorate samples will be filtered. Samples collected for radionuclide analysis will be nonfiltered only for all water media. Organic and HEXP constituents are nonfiltered for all water media. Stable isotope samples for nitrogen isotopes are filtered; stable isotope samples for deuterium and oxygen isotopes are not filtered.

^a Metals analysis includes the TAL metals (Ag, Al, As, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, Hg, K, Mg, Mn, Na, Ni, Pb, Sb, Se, Tl, V, Zn), plus boron, molybdenum, silicon dioxide, strontium, tin, and uranium.

^b VOC = Volatile organic compounds; SVOC = semivolatile organic compounds.

^c PCB = Polychlorinated biphenyl [compound].

^d The analytical suite of explosive compounds (HEXP) includes the Consent Order list of the normal SW-846:8330 analytes plus PETN; TATB; 3,5-dinitroaniline; TOCP; 2,4-diamino-6-nitrotoluene; and 2,6-diamino-4-nitrotoluene. The superscript RDX-DP indicates the analysis of RDX-degradation products MNX; DNX; and TNX.

^e The radionuclide suite includes gross alpha, gross beta, alpha spectroscopy, gamma spectroscopy, and strontium-90.

^f Tritium samples may be submitted for analysis by liquid scintillation if average activities are anticipated to exceed 200 pCi/L. Low-level tritium is analyzed using electrolytic enrichment or direct counting.

^g General inorganic analysis includes major anions (bromide, chloride, fluoride, sulfate), major cations (calcium, magnesium, sodium, potassium), nitrate plus nitrite (as N), TKN, ammonia, total phosphorus, TOC, TDS, alkalinity, specific conductivity, pH, and hardness.

^h Analysis for stable isotopes of nitrogen, hydrogen, and oxygen. The collection of samples for stable isotope analysis is considered a special sampling campaign that is outside the scope of the regulatory process. In general, these samples are collected semiannually from "new" wells (those which completed construction, rehabilitation, or conversion on or after October 1, 2010) until at least four sets of data have been collected. Any subsequent sampling for stable isotope analysis will be decided on the basis of site-specific conditions. In the 2010 Interim Plan, the entry "(A)" for intermediate and regional wells signifies samples will be collected annually until four sets of nitrogen isotope data have been collected.

ⁱ — = This analytical suite is not scheduled to be collected for this type of water at locations assigned to this area-specific monitoring group. Some locations are assigned analytical suites or frequencies that differ from those shown in this table, for site-specific reasons as described in the text for this monitoring group, and as summarized in Table D-7.0-3.

Table D-7.0-3
Sampling Frequencies and Analytical Suites Assigned to Locations in the MDA AB Monitoring Group

Location	Interim Plan	Metals ^a	VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans ^e	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate	Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
Intermediate (Water/CdV)	2011	A	A	T	T	T	A ^{RDX-DP}	T	A	— ⁱ	A	A	A	—	Rationale for suites and frequencies assigned to this monitoring group is provided in Table D-7.0-2.
	2010	S	A	—	—	—	S	—	A	—	A	S	S	(A)	New monitoring group. Rationale for suites and frequencies assigned to this monitoring group is provided in Table D-1.0-1.
R-27i	2011	A	A	T	T	T	A ^{RDX-DP}	T	A	—	A	A	A	—	Completed characterization sampling. Assigned to routine suites and frequencies for intermediate wells in the MDA AB monitoring group. Well completed October 17, 2009.
	2010	Q	Q	Q	S	S	Q ^{RDX-DP}	S	Q	—	Q	Q	Q	S	Newly completed well. Reassigned to characterization suites and frequencies applicable to new intermediate wells assigned to MDA AB monitoring group.
Regional (Ancho)	2011	S	A	T	T	T	A ^{RDX-DP}	T	S	—	A	S	A	—	Rationale for suites and frequencies assigned to this monitoring group is provided in Table D-7.0-2.
	2010	S	A	—	—	—	S	—	A	—	A	S	S	(A)	New monitoring group. Rationale for suites and frequencies assigned to this monitoring group is provided in Table D-1.0-1.
R-29	2011	S	A	T	T	T	A ^{RDX-DP}	T	S	—	A	S	A	—	Completed characterization sampling. Assigned to routine suites and frequencies for MDA AB monitoring group. Well completed March 12, 2010.
	2010	Q	Q	Q	S	S	Q	S	Q	—	Q	Q	Q	S	Newly completed well. Assigned to characterization suites and frequencies applicable to new regional wells assigned to MDA AB monitoring group.
R-30	2011	S	A	T	T	T	A ^{RDX-DP}	T	S	—	A	S	A	—	Completed characterization sampling. Assigned to routine suites and frequencies for MDA AB monitoring group. Well completed April 3, 2010.
	2010	Q	Q	Q	S	S	Q	S	Q	—	Q	Q	Q	S	Newly completed well. Assigned to characterization suites and frequencies applicable to new regional wells assigned to MDA AB monitoring group.

Table D-7.0-3 (continued)

Location	Interim Plan	Metals ^a	VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans ^e	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate	Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
Test Well DT-5A	2011	—	—	—	—	—	—	—	—	—	—	—	—	—	Removed from sampling because (a) the long well screen and use of galvanized casing do not meet RCRA requirements for monitoring well construction; (b) water-quality samples yield nonrepresentative data for some trace metals; (c) R-29 and R-30 provide adequate monitoring for MDA AB; and (d) contaminants have not been detected at this location (Table D-7.0-1), nor are contaminants expected to be present.
	2010	S	A	—	—	—	S	—	A	—	A	S	S	A	Reassigned to suites and frequencies for new MDA AB monitoring group.
Test Well DT-9	2011	—	—	—	—	—	—	—	—	—	—	—	—	—	Removed from sampling because (a) the long well screen and use of galvanized casing do not meet RCRA requirements for monitoring well construction; (b) water-quality samples yield nonrepresentative data for some trace metals; (c) R-29 and R-30 provide adequate monitoring for MDA AB; and (d) contaminants have not been detected at this location (Table D-7.0-1), nor are contaminants expected to be present.
	2010	S	A	—	—	—	S	—	A	—	A	S	S	A	Reassigned to suites and frequencies for new MDA AB monitoring group.
Test Well DT-10	2011	—	—	—	—	—	—	—	—	—	—	—	—	—	Removed from sampling because (a) the long well screen and use of galvanized casing do not meet RCRA requirements for monitoring well construction; (b) water-quality samples yield nonrepresentative data for some trace metals; (c) R-29 and R-30 provide adequate monitoring for MDA AB; and (d) contaminants have not been detected at this location (Table D-7.0-1), nor are contaminants expected to be present.
	2010	S	A	—	—	—	S	—	A	—	A	S	S	A	Reassigned to suites and frequencies for new MDA AB monitoring group.
Regional (Water/CdV)	2011	S	A	T	T	T	A ^{RDX-DP}	T	S	—	A	A	A	—	Rationale for suites and frequencies assigned to this monitoring group is provided in Table D-7.0-2.
	2010	S	S	A	—	—	S ^{RDX-DP}	—	A	—	A	S	S	(A)	New monitoring group. Rationale for suites and frequencies assigned to this monitoring group is provided in Table D-1.0-1.

Table D-7.0-3 (continued)

Location	Interim Plan	Metals ^a	VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans ^e	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate	Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
R-27	2011	A	A	T	T	T	A ^{RDX-DP}	T	A	—	A	A	A	—	Assigned annual frequency for metals, general inorganics, and radionuclides, as compared to semiannual frequency for regional wells in Ancho Canyon, because of the far-field location of this well relative to MDA AB. Background location in GBIR, R4 (LANL 2010, 110535).
	2010	S	S	A	—	—	S ^{RDX-DP}	—	A	—	A	S	S	A	Reassigned to suites and frequencies for new MDA AB monitoring group. No change. Background location approved for inclusion in GBIR, R4.

Notes: Watershed-specific and monitoring group-specific sampling suites and frequencies for individual water types are shown in shaded rows in order to set this information apart from that for the individual sampling locations that follow these rows.

Sampling suites and frequencies for last year's Interim Plan are shown in gray text in order to set this information apart from that for the current Interim Plan. Sampling frequency: Q = quarterly (4 times/yr); S = semiannual (2 times/yr); A = annual (1 time/yr); B = biennial (once every 2 yr); T = triennial (once every 3 yr). For simplicity, sample collection frequencies for analysis of suspended sediment concentrations and field parameters are not listed in this table. Field parameters are routinely collected for every sampling event at every type of location, and samples for suspended sediment concentrations are collected for every sampling event at base-flow stations and springs.

Nonfiltered and filtered samples will be collected for general inorganics (excluding anions) and metals. Anions and perchlorate samples will be filtered. Samples collected for radionuclide analysis will be nonfiltered only for all water media. Organic and HEXP constituents are nonfiltered for all water media. Stable isotope samples for nitrogen isotopes are filtered; stable isotope samples for deuterium and oxygen isotopes are not filtered.

^a Metals analysis includes the 23 TAL metals (Ag, Al, As, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, Hg, K, Mg, Mn, Na, Ni, Pb, Sb, Se, Ti, V, Zn), plus boron, molybdenum, silicon dioxide, strontium, tin, and uranium.

^b VOC = Volatile organic compounds; SVOC = semivolatile organic compounds.

^c PCB = Polychlorinated biphenyl [compound].

^d The analytical suite of explosive compounds (HEXP) includes the Consent Order list of the normal SW-846:8330 analytes plus PETN; TATB; 3,5-dinitroaniline; TOCP; 2,4-diamino-6-nitrotoluene; and 2,6-diamino-4-nitrotoluene. The superscript RDX-DP indicates the analysis of RDX-degradation products MNX; DNx; and TNX.

^e The radionuclide suite includes gross alpha, gross beta, alpha spectroscopy, gamma spectroscopy, and strontium-90.

^f Tritium samples may be submitted for analysis by liquid scintillation if average activities are anticipated to exceed 200 pCi/L. Low-level tritium is analyzed using electrolytic enrichment or direct counting.

^g General inorganic analysis includes major anions (bromide, chloride, fluoride, sulfate), major cations (calcium, magnesium, sodium, potassium), nitrate plus nitrite (as N), TKN, ammonia, total phosphorus, TOC, TDS, alkalinity, specific conductivity, pH, and hardness.

^h Analysis for stable isotopes of nitrogen, hydrogen, and oxygen. The collection of samples for stable isotope analysis is considered a special sampling campaign that is outside the scope of the regulatory process. In general, these samples are collected semiannually from "new" wells (those which completed construction, rehabilitation, or conversion on or after October 1, 2010) until at least four sets of data have been collected. Any subsequent sampling for stable isotope analysis will be decided on the basis of site-specific conditions. In the 2010 Interim Plan, the entry "(A)" for intermediate and regional wells signifies samples will be collected annually until four sets of nitrogen isotope data have been collected.

ⁱ — = This analytical suite is not scheduled to be collected for this type of water at locations assigned to this area-specific monitoring group. Some locations are assigned analytical suites or frequencies that differ from those shown in this table, for site-specific reasons as described in the text for this monitoring group, and as summarized in this table.

Table D-8.1-1
Analytical Suites and Frequencies for Characterization of New Deep Wells in the General Surveillance Monitoring Group

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	General Inorganics ^{f,g}	Perchlorate		
New deep wells ^j	2011	Q	Q	Q	S	S	S	S	Q	—	Q	Q	Q	S	Increased sampling frequency to quarterly for SVOCs to complement quarterly VOC data.
	2010	Q	Q	S	S	S	S	S	Q	—	Q	Q	Q	S	No change from characterization suites and frequencies specified in 2009 Interim Plan for new deep groundwater wells in Los Alamos/Pueblo, Sandia, and Mortandad Canyons (other than reduction in sampling frequency from quarterly to semiannual for stable isotopes).

Table D-8.1-1 (continued)

Notes: Sampling suites and frequencies for last year's Interim Plan are shown in gray text in order to set this information apart from that for the current Interim Plan. Sampling frequency: Q = quarterly (4 times/yr); S = semiannual (2 times/yr); A = annual (1 time/yr); B = biennial (once every 2 yr); T = triennial (once every 3 yr). For simplicity, sample collection frequencies for analysis of suspended sediment concentrations and field parameters are not listed in this table. Field parameters are routinely collected for every sampling event at every type of location, and samples for suspended sediment concentrations are collected for every sampling event at base-flow stations and springs.

Nonfiltered and filtered samples will be collected for general inorganics (excluding anions) and metals. Anions and perchlorate samples will be filtered. Samples collected for radionuclide analysis will be nonfiltered only for all water media. Organic and HEXP constituents are nonfiltered for all water media. Stable isotope samples for nitrogen isotopes are filtered; stable isotope samples for deuterium and oxygen isotopes are not filtered.

^a Metals analysis includes the 23 TAL metals (Ag, Al, As, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, Hg, K, Mg, Mn, Na, Ni, Pb, Sb, Se, Tl, V, Zn), plus boron, molybdenum, silicon dioxide, strontium, tin, and uranium.

^b VOC = Volatile organic compounds; SVOC = semivolatile organic compounds.

^c PCB = Polychlorinated biphenyl (compound).

^d The analytical suite of explosive compounds (HEXP) includes the Consent Order list of the normal SW-846:8330 analytes plus PETN; TATB; 3,5-dinitroaniline; TOCP; 2,4-diamino-6-nitrotoluene; and 2,6-diamino-4-nitrotoluene.

^e The radionuclide suite includes gross alpha, gross beta, alpha spectroscopy, gamma spectroscopy, and strontium-90.

^f Tritium samples may be submitted for analysis by liquid scintillation if average activities are anticipated to exceed 200 pCi/L. Low-level tritium is analyzed using electrolytic enrichment or direct counting.

^g General inorganic analysis includes major anions (bromide, chloride, fluoride, sulfate), major cations (calcium, magnesium, sodium, potassium), nitrate plus nitrite (as N), TKN, ammonia, total phosphorus, TOC, TDS, alkalinity, specific conductivity, pH, and hardness.

^h Analysis for stable isotopes of nitrogen, hydrogen, and oxygen. The collection of samples for stable isotope analysis is considered a special sampling campaign that is outside the scope of the regulatory process. In general, these samples are collected semiannually from "new" wells (those which completed construction, rehabilitation, or conversion on or after October 1, 2010) until at least four sets of data have been collected. Any subsequent sampling for stable isotope analysis will be decided on the basis of site-specific conditions.

ⁱ — = This analytical suite is not scheduled to be collected for this type of water at locations assigned to this area-specific monitoring group. Some locations are assigned analytical suites or frequencies that differ from those shown in this table, for site-specific reasons as described in the text for this monitoring group, and as summarized in Table D-8.2-3 through Table D-8.7-3.

^j Characterization suites and frequencies apply to new intermediate perched or regional groundwater wells. "New" wells are defined as those which are completed, rehabilitated, or converted on or after October 1, 2010. Any planned exceptions to this general protocol are documented in the table for the watershed in which the well is located.

Table D-8.2-1
Analytes Detected Two or More Times above One-Half Standard
in the General Surveillance Monitoring Group: Los Alamos and Pueblo Canyons

Analytical Suite	Analyte Exceeding One-Half Standard at Least Twice at the Same Location in This Monitoring Group	Base-Flow Locations, Upper Los Alamos Canyon						Base-Flow Locations, Pueblo Canyon					Base-Flow Location, Lower Los Alamos Canyon
		DP below Meadow at TA-21 (E039)	DP Canyon above TA-21 (E038)	Los Alamos above DP Canyon (E030)	Los Alamos above SR-4 (E042)	Los Alamos below LA Weir (E050)	Los Alamos below the Ice Rink (E026)	Acid Above Pueblo (E056)	Guaje above Rendija Canyon (E089)	Pueblo 3	Pueblo above Acid (E055)	Pueblo above SR 502 (E060)	Los Alamos Canyon near Otowi Bridge (E110)
Dioxins/Furans	—	—	—	—	—	—	—	—	—	—	—	—	—
General Inorganics	Chloride	—	—	—	—	—	—	—	—	—	—	—	—
General Inorganics	Fluoride	—	—	—	—	—	—	—	—	—	—	—	—
General Inorganics	Nitrate-Nitrite	—	—	—	—	—	—	—	—	—	—	—	—
General Inorganics	Perchlorate	—	—	—	—	—	—	—	—	—	—	—	—
General Inorganics	Total Dissolved Solids	—	—	—	—	—	—	—	—	—	—	—	—
HEXP	—	—	—	—	—	—	—	—	—	—	—	—	—
Metals	Aluminum	—	—	☐	—	—	☐	☐	—	—	—	—	—
Metals	Arsenic	—	—	—	—	—	—	—	—	—	—	●	—
Metals	Copper	—	—	—	—	—	—	●	—	☐	—	☐	—
Metals	Iron	—	—	—	—	—	—	—	—	—	—	—	—
Metals	Manganese	—	—	—	—	—	—	—	—	●	—	—	—
Metals	Nickel	—	—	—	—	—	—	—	—	—	—	—	—
Metals	Thallium	—	—	☐	—	—	☐	—	—	—	—	—	—
Metals	Zinc	—	—	—	—	●	—	—	—	—	—	—	—
PCBs	Total PCB	—	—	—	—	☐	—	—	—	—	—	—	—
Pesticides	—	—	—	—	—	—	—	—	—	—	—	—	—
Radionuclides	Gross alpha ^a	—	—	—	—	☐	—	—	—	—	—	—	☐
Radionuclides	Plutonium-239/240	—	—	—	—	—	—	—	—	—	—	—	—
Radionuclides	Strontium-90 ^b	—	—	—	—	—	—	—	—	—	—	—	—
SVOC	—	—	—	—	—	—	—	—	—	—	—	—	—
VOC	—	—	—	—	—	—	—	—	—	—	—	—	—

Table 8.2-1 (continued)

Analytical Suite	Analyte Exceeding One-Half Standard at Least Twice at the Same Location in This Monitoring Group	Upper Los Alamos Canyon																
		Spring	Alluvial Wells									Perched Intermediate Wells				Regional Wells		
		DP Spring	LAO-0.3	LAO-0.6	LAO-1	LAO-1.6g	LAO-2	LAO-3a	LAO-4.5c	LAO-5	LAO-B	LAOI-7	LAUZ-1	R-9i screen 1	R-9i screen 2	R-8 screen 1	R-8 screen 2	R-9
Dioxins/Furans	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Inorganics	Chloride	●	—	—	—	—	—	—	—	—	—	—	☐	—	—	—	—	—
General Inorganics	Fluoride	●	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Inorganics	Nitrate-Nitrite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Inorganics	Perchlorate	—	—	—	—	—	—	—	—	—	—	—	—	●	—	—	—	—
General Inorganics	Total Dissolved Solids	—	—	—	—	—	—	—	—	—	—	—	☐	—	—	—	—	—
HEXP	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Metals	Aluminum	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Metals	Copper	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Metals	Thallium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Metals	Zinc	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Metals	Arsenic	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Metals	Iron	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Metals	Manganese	—	—	—	—	—	—	—	—	—	—	—	☐	—	—	—	—	—
Metals	Nickel	—	—	—	—	—	—	—	—	—	—	—	—	●	—	—	—	—
PCBs	Total PCB	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Pesticides	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Radionuclides	Gross alpha ^a	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Radionuclides	Plutonium-239/240	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Radionuclides	Strontium-90 ^b	☐	—	—	☐	—	☐	☐	—	—	—	—	☐	—	—	—	—	—
SVOC	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
VOC	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Table D-8.2-1 (continued)

Analytical Suite	Analyte Exceeding One-Half Standard at Least Twice at the Same Location in This Monitoring Group	Pueblo Canyon											Lower Los Alamos Canyon				
		Alluvial Wells					Intermediate Wells		Regional Wells				Springs			Intermediate Wells	
		APCO-1	PAO-1	PAO-2	PAO-4	POI-4	R-3i	TW-2Ar	R-2	R-3	R-4	R-24	Basalt Spring	Los Alamos Spring	GU-0.01 Spring	LLAO-1b	LLAO-4
Dioxins/Furans	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Inorganics	Chloride	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Inorganics	Fluoride	—	—	—	—	—	—	—	—	—	—	—	—	●	—	—	—
General Inorganics	Nitrate-Nitrite	—	—	—	—	●	—	—	—	—	—	—	☐	☐	—	—	—
General Inorganics	Perchlorate	—	—	—	—	—	●	—	—	—	☐	—	☐	—	—	—	—
General Inorganics	Total Dissolved Solids	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
HEXP	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Metals	Aluminum	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Metals	Arsenic	☐	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Metals	Copper	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Metals	Iron	☐	●	☐	☐	—	—	—	—	—	—	—	—	—	—	—	—
Metals	Manganese	☐	—	—	☐	—	—	—	—	—	—	●	—	—	—	—	—
Metals	Nickel	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Metals	Thallium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Metals	Zinc	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
PCBs	Total PCB	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Pesticides	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Radionuclides	Gross alpha ^a	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Radionuclides	Plutonium-239/240	—	—	☐	—	—	—	—	—	—	—	—	—	—	—	—	—
Radionuclides	Strontium-90 ^b	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Table D-8.2-1 (continued)

Analytical Suite	Analyte Exceeding One-Half Standard at Least Twice at the Same Location in This Monitoring Group	Pueblo Canyon											Lower Los Alamos Canyon				
		Alluvial Wells					Intermediate Wells		Regional Wells				Springs			Intermediate Wells	
		APCO-1	PAO-1	PAO-2	PAO-4	POI-4	R-3i	TW-2Ar	R-2	R-3	R-4	R-24	Basalt Spring	Los Alamos Spring	GU-0.01 Spring	LLAO-1b	LLAO-4
SVOC	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
VOC	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Source: Tables B1-3 and B1-4 in Attachment B-1.

Notes: ● = Detected ≥ one-half standard more than once; ■ = detected at least once above standard; — = not detected above one-half standard more than once at this location, or there is no applicable standard. The term "standard" refers to the lowest applicable regulatory standard or other screening level.

^a Tables B1-3 and B1-4 in Attachment B-1 use the EPA MCL of 15 pCi/L for adjusted gross alpha as the screening level for gross alpha activities in water samples. This approach is conservative insofar as the EPA MCL for adjusted gross alpha excludes alpha-particle activity from radon and uranium. Data in Tables B1-3 and B1-4 have not been adjusted to subtract contributions from radon or uranium.

^b Tables B1-3 and B1-4 in Attachment B-1 use 8 pCi/L as a screening level for strontium-90 in water samples. This value is not an EPA MCL but rather the average annual concentration assumed to produce a dose of 4 mrem/yr (the EPA MCL for beta particle and photon radioactivity). If two or more radionuclides are present, the sum of their annual dose from beta particle and photon radioactivity must not exceed the MCL of 4 mrem/yr. The additive effect of other radionuclides is not addressed in Tables B1-3 and B1-4.

Table D-8.2-2
Analytical Suites and Frequencies for General Surveillance Monitoring in Los Alamos/Pueblo Canyon

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
Upper Los Alamos Canyon															
Base flow	2011	A	A	A	T	A ^{CN} GR	T	T	A	— ⁱ	—	A	A	—	Retained annual frequency for PCB congeners to continue to collect more accurate data with lower detection limits than obtained with EPA Method 608 or 8982. Added triennial sampling for additional organic suites as requested by NMED (2011, 201467).
	2010	A	A	A	—	A ^{CN} GR	—	—	A	—	—	A	A	—	No change
Springs	2011	A	A	A	T	A	T	T	A	—	A	A	A	—	Added triennial sampling for additional organic suites as requested by NMED (2011, 201467).
	2010	A	A	A	—	A	—	—	A	—	A	A	A	(A) ^h	Added VOC and SVOC suites for consistency with monitoring plans for base-flow and alluvial surveillance locations in this subwatershed.
Alluvial	2011	A	A	A	T	T	T	T	A	—	—	A	A	—	Added triennial sampling for additional organic suites as requested by NMED (2011, 201467). Suspended tritium sampling in alluvial wells, except as justified on a case-by-case basis as documented in this appendix. The conceptual model is mature for this portion of the watershed. Tritium trends in alluvial groundwater are well characterized and additional data are not needed for decision-making. With the exception of tritium, default analytical suites and frequencies are the same for all wells in this watershed.
	2010	A	A	A	—	—	—	—	A	—	A	A	A	—	No change

Table D-8.2-2 (continued)

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
Intermediate	2011	A	A	A	T	T	T	T	A	—	A	A	A	—	New subgroup created for this part of the watershed because intermediate wells previously assigned to the TA-21 monitoring group are moved to general surveillance. Added triennial sampling for additional organic suites as requested by NMED (2011, 201467). Retained annual sampling frequency for tritium in deep wells in this watershed. With the exception of tritium, default analytical suites and frequencies are the same for all wells in this watershed.
	2010	—	—	—	—	—	—	—	—	—	—	—	—	—	Not applicable. All intermediate wells in this subwatershed are presently assigned to the TA-21 monitoring group.
Regional	2011	A	A	A	T	T	T	T	A	—	A	A	A	—	New subgroup created for this part of the watershed because regional wells previously assigned to the TA-21 monitoring group were moved to general surveillance. Retained annual sampling frequency for tritium in deep wells in this watershed. With the exception of tritium, default analytical suites and frequencies are the same for all wells in this watershed.
	2010	—	—	—	—	—	—	—	—	—	—	—	—	—	Not applicable. All regional wells in this subwatershed are presently assigned to the TA-21 monitoring group.
Pueblo Canyon															
Base flow	2011	A	A	A	T	A ^{CNGR}	T	T	A	—	—	A	A	—	Retained annual frequency for PCB congeners to continue to collect more accurate data with lower detection limits than obtained with EPA Method 608 or 8982. Added triennial sampling for additional organic suites as requested by NMED (2011, 201467).
	2010	A	A	A	—	A ^{CNGR}	—	—	A	—	—	A	A	—	No change

Table D-8.2-2 (continued)

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
Alluvial	2011	A	A	A	T	T	T	T	A	—	—	A	A	—	Added triennial sampling for additional organic suites as requested by NMED (2011, 201467). Suspended tritium sampling in alluvial wells, except as justified on a case-by-case basis as documented in this appendix. The conceptual model is mature for this portion of the watershed. Tritium trends in alluvial groundwater are well characterized and additional data are not needed for decision-making. With the exception of tritium, default analytical suites and frequencies are the same for all wells in this watershed.
	2010	A	A	A	—	—	—	—	A	—	A	A	A	—	No change
Intermediate	2011	A	A	A	T	T	T	T	A	—	A	A	A	—	Added triennial sampling for other organics as requested by NMED (2011, 201467).
	2010	A	A	—	—	—	—	—	A	—	A	A	A	(A)	No change
Regional	2011	A	A	A	T	T	T	T	A	—	A	A	A	—	Added triennial sampling for other organics as requested by NMED (2011, 201467).
	2010	A	A	—	—	—	—	—	A	—	A	A	A	(A)	No change
Lower Los Alamos Canyon															
Base flow	2011	A	A	A	T	T	T	T	A	—	A	A	A	—	Retained annual sampling for tritium and reduced frequency to annual for metals, general inorganics, and perchlorate suites, consistent with the requirements specified in the 2011 Memorandum of Understanding (MOU) with the Pueblo of San Ildefonso. Added triennial sampling for other organics as requested by NMED (2011, 201467).
	2010	S	A	A	—	—	—	—	A	—	A	S	S	—	No change

Table D-8.2-2 (continued)

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
Springs	2011	A	A	T	T	T	T	T	A	—	A	A	A	—	Added triennial sampling for other organics as requested by NMED (2011, 201467).
	2010	A	A	T	—	—	—	—	A	—	A	A	A	(A)	Reduced frequency for SVOC suite and dropped PCBs and HEXP suites due to predominance of nondetects and generally low mobility of these constituents in groundwater. Additional suites or increased frequencies are assigned on a site-specific basis as needed to meet requirements specified in the 2010 memorandum of understanding (MOU) with the Pueblo of San Ildefonso.
Alluvial	2011	A	A	T	T	T	T	T	A	—	—	A	A	—	Added triennial sampling for additional organic suites as requested by NMED (2011, 201467). Suspended tritium sampling in alluvial wells, except as justified on a case-by-case basis as documented in this appendix. The conceptual model is mature for this portion of the watershed. Tritium trends in alluvial groundwater are well characterized and additional data are not needed for decision-making. With the exception of tritium, default analytical suites and frequencies are the same for all wells in this watershed.
	2010	A	A	T	—	—	—	—	A	—	A	A	A	—	Reduced frequency for SVOC suite and dropped PCBs and HEXP suites because of predominance of nondetects and generally low mobility of these constituents in groundwater. Additional suites or increased frequencies are assigned on a site-specific basis as needed to meet requirements specified in the 2010 MOU with the Pueblo of San Ildefonso.

Table D-8.2-2 (continued)

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
Upper Guaje Canyon (Off-site Background Location)															
Spring	2011	A	T	T	T	T	T	T	A	—	A	A	A	—	Separate category defined for Upper Guaje Canyon because this location is isolated from the rest of the Pajarito Plateau. Assigned annual sampling for naturally-occurring constituents and triennial sampling for additional organic suites as requested by NMED (2011, 201467).

Notes: Sampling suites and frequencies for last year's Interim Plan are shown in gray text in order to set this information apart from that for the current Interim Plan. Sampling frequency: Q = quarterly (4 times/yr); S = semiannual (2 times/yr); A = annual (1 time/yr); B = biennial (once every 2 yr); T = triennial (once every 3 yr). For simplicity, sample collection frequencies for analysis of suspended sediment concentrations and field parameters are not listed in this table. Field parameters are routinely collected for every sampling event at every type of location, and samples for suspended sediment concentrations are collected for every sampling event at base-flow stations and springs. Nonfiltered and filtered samples will be collected for general inorganics (excluding anions) and metals. Anions and perchlorate samples will be filtered. Samples collected for radionuclide analysis will be nonfiltered only for all water media. Organic and HEXP constituents are nonfiltered for all water media. Stable isotope samples for nitrogen isotopes are filtered; stable isotope samples for deuterium and oxygen isotopes are not filtered.

^a Metals analysis includes the 23 TAL metals (Ag, Al, As, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, Hg, K, Mg, Mn, Na, Ni, Pb, Sb, Se, Ti, V, Zn), plus boron, molybdenum, silicon dioxide, strontium, tin, and uranium.

^b VOC = Volatile organic compounds; SVOC = semivolatile organic compounds.

^c PCB = Polychlorinated biphenyl (compound). The superscript CNGR indicates the analysis of PCB congeners using U.S. Environmental Protection Agency (EPA) Method 1668A.

^d The analytical suite of explosive compounds (HEXP) includes the Consent Order list of the normal SW-846:8330 analytes plus PETN; TATB; 3,5-dinitroaniline; TOCP; 2,4-diamino-6-nitrotoluene; and 2,6-diamino-4-nitrotoluene.

^e The radionuclide suite includes gross alpha, gross beta, alpha spectroscopy, gamma spectroscopy, and strontium-90.

^f Tritium samples may be submitted for analysis by liquid scintillation if average activities are anticipated to exceed 200 pCi/L. Low-level tritium is analyzed using electrolytic enrichment or direct counting.

^g General inorganic analysis includes major anions (bromide, chloride, fluoride, sulfate), major cations (calcium, magnesium, sodium, potassium), nitrate plus nitrite (as N), TKN, ammonia, total phosphorus, TOC, TDS, alkalinity, specific conductivity, pH, and hardness.

^h Analysis for stable isotopes of nitrogen, hydrogen, and oxygen. The collection of samples for stable isotope analysis is considered a special sampling campaign that is outside the scope of the regulatory process. In general, these samples are collected semiannually from "new" wells (those which completed construction, rehabilitation, or conversion on or after October 1, 2010) until at least four sets of data have been collected. Any subsequent sampling for stable isotope analysis will be decided on the basis of site-specific conditions. In the 2010 Interim Plan, the entry "(A)" for intermediate and regional wells signifies samples will be collected annually until four sets of nitrogen isotope data have been collected.

ⁱ — = This analytical suite is not scheduled to be collected for this type of water at locations assigned to this area-specific monitoring group. Some locations are assigned analytical suites or frequencies that differ from those shown in this table, for site-specific reasons as described in the text for this monitoring group, and as summarized in Table D-8.2-3.

Table D-8.2-3
Sampling Frequencies and Analytical Suites Assigned to General Surveillance Locations in Los Alamos/Pueblo Canyons

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
Base flow (Upper Los Alamos Canyon)	2011	A	A	A	T	A ^{CN} GR	T	T	A	—	—	A	A	—	Rationale for suites and frequencies assigned to this monitoring group is provided in Table D-8.2-2.
	2010	A	A	A	—	A ^{CN} GR	—	—	A	—	—	A	A	—	No change. Watershed-specific suites and frequencies for 2010 Interim Plan.
DP below Meadow at TA-21 (E039)	2011	A	A	A	T	A ^{CN} GR	T	T	A	—	—	A	A	—	Changes reflect updated suites and frequencies for general surveillance at base-flow locations in this watershed.
	2010	A	A	A	—	A ^{CN} GR	—	—	A	—	—	A	A	—	No change. Remains assigned to watershed-specific suites and frequencies.
DP Canyon above TA-21 (E038)	2011	A	A	A	T	A ^{CN} GR	T	T	A	—	—	A	A	—	Changes reflect updated suites and frequencies for general surveillance at base-flow locations in this watershed.
	2010	A	A	A	—	A ^{CN} GR	—	—	A	—	—	A	A	—	Remains assigned to suites and frequencies for general surveillance of base-flow locations in this subwatershed. Discontinued diesel range organics (DRO) suite because data do not show evidence of off-site effects from past diesel spill.
Los Alamos above DP Canyon (E030)	2011	A	A	A	T	A ^{CN} GR	T	T	A	—	—	A	A	—	Changes reflect updated suites and frequencies for general surveillance at base-flow locations in this watershed.
	2010	A	A	A	—	A ^{CN} GR	—	—	A	—	—	A	A	—	No change. Remains assigned to watershed-specific suites and frequencies.
Los Alamos above SR-4 (E042)	2011	A	A	A	T	A ^{CN} GR	T	T	A	—	—	A	A	—	Changes reflect updated suites and frequencies for general surveillance at base-flow locations in this watershed.
	2010	A	A	A	—	A ^{CN} GR	—	—	A	—	—	A	A	—	No change. Remains assigned to watershed-specific suites and frequencies.

Table D-8.2-3 (continued)

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans ^e	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
Los Alamos below the Ice Rink (E026)	2011	A	A	A	T	A ^{CNGR}	T	T	A	—	—	A	A	—	Changes reflect updated suites and frequencies for general surveillance at base-flow locations in this watershed.
	2010	A	A	A	—	A ^{CNGR}	—	—	A	—	—	A	A	—	No change. Remains assigned to watershed-specific suites and frequencies.
Los Alamos below LA Weir (E050)	2011	A	A	A	T	A ^{CNGR}	T	T	A	—	—	A	A	—	Changes reflect updated suites and frequencies for general surveillance at base-flow locations in this watershed.
	2010	A	A	A	—	A ^{CNGR}	—	—	A	—	—	A	A	—	No change. Remains assigned to watershed-specific suites and frequencies.
Springs (Upper Los Alamos Canyon)	2011	A	A	A	T	A	T	T	A	—	A	A	A	—	Rationale for suites and frequencies assigned to this monitoring group is provided in Table D-8.2-2.
	2010	A	A	A	—	A	—	—	A	—	A	A	A	(A)	Rationale for changes to suites and frequencies for general surveillance locations in this subwatershed is provided in Table D-1.0-2.
DP Spring	2011	A	A	A	T	A	T	T	A	A	—	A	A	—	Changes reflect updated suites and frequencies for general surveillance at springs in this watershed. Not eligible for low-level tritium because average activity exceeds 200 pCi/L.
	2010	A	A	A	—	A	—	—	A	A	—	A	A	A	Changes reflect updated suites and frequencies for general surveillance at springs in this subwatershed.
Alluvial (Upper Los Alamos Canyon)	2011	A	A	A	T	T	T	T	A	—	—	A	A	—	Rationale for suites and frequencies assigned to this monitoring group is provided in Table D-8.2-2.
	2010	A	A	A	—	—	—	—	A	—	A	A	A	—	No change. Watershed-specific suites and frequencies for 2010 Interim Plan.
LAO-B	2011	A	A	A	T	T	T	T	A	—	—	A	A	—	Changes reflect updated suites and frequencies for general surveillance at alluvial wells in this watershed. Background location in GBIR, R3 (LANL 2007, 095817).
	2010	A	A	A	—	—	—	—	A	—	A	A	A	—	No change. Remains assigned to watershed-specific suites and frequencies. Background location in GBIR, R3.

Table D-8.2-3 (continued)

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans ^e	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
LAO-0.3	2011	A	A	A	T	T	T	T	A	A	—	A	A	—	Changes reflect updated suites and frequencies for general surveillance at alluvial wells in this watershed. Retained annual frequency for tritium to continue monitoring long-term trends. Not eligible for low-level tritium because average activity exceeds 200 pCi/L.
	2010	A	A	A	—	—	—	—	A	—	A	A	A	—	Remains assigned to suites and frequencies for general surveillance at alluvial wells in this subwatershed. Discontinued PCB suite; cumulative data for alluvial groundwater in this subwatershed show history of nondetects.
LAO-0.6	2011	A	A	A	T	T	T	T	A	—	—	A	A	—	Changes reflect updated suites and frequencies for general surveillance at alluvial wells in this watershed.
	2010	A	A	A	—	—	—	—	A	—	A	A	A	—	No change. Remains assigned to watershed-specific suites and frequencies.
LAO-1	2011	A	A	A	T	T	T	T	A	—	—	A	A	—	Changes reflect updated suites and frequencies for general surveillance at alluvial wells in this watershed.
	2010	A	A	A	—	—	—	—	A	—	A	A	A	—	No change. Remains assigned to watershed-specific suites and frequencies.
LAO-1.6g	2011	A	A	A	T	T	T	T	A	—	—	A	A	—	Changes reflect updated suites and frequencies for general surveillance at alluvial wells in this watershed.
	2010	A	A	A	—	—	—	—	A	—	A	A	A	—	No change. Remains assigned to watershed-specific suites and frequencies.
LAO-2	2011	A	A	A	T	T	T	T	A	—	—	A	A	—	Changes reflect updated suites and frequencies for general surveillance at alluvial wells in this watershed.
	2010	A	A	A	—	—	—	—	A	—	A	A	A	—	No change. Remains assigned to watershed-specific suites and frequencies.

Table D-8.2-3 (continued)

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans ^e	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
LAO-3a	2011	A	A	A	T	T	T	T	A	—	—	A	A	—	Changes reflect updated suites and frequencies for general surveillance at alluvial wells in this watershed.
	2010	A	A	A	—	—	—	—	A	—	A	A	A	—	Remains assigned to suites and frequencies for general surveillance at alluvial wells in this subwatershed. Discontinued PCB suite; cumulative data for alluvial groundwater in this subwatershed show history of nondetects.
LAO-4.5c	2011	A	A	A	T	T	T	T	A	A	—	A	A	—	Changes reflect updated suites and frequencies for general surveillance at alluvial wells in this watershed. Retained annual frequency for tritium to continue monitoring long-term trends. Not eligible for low-level tritium because average activity exceeds 200 pCi/L.
	2010	A	A	A	—	—	—	—	A	—	A	A	A	—	No change. Remains assigned to watershed-specific suites and frequencies.
LAO-6a / LAO-5	2011	A	A	A	T	T	T	T	A	A	—	A	A	—	Changes reflect updated suites and frequencies for general surveillance at alluvial wells in this watershed. Retained annual frequency for tritium to continue monitoring long-term trends. Not eligible for low-level tritium because average activity exceeds 200 pCi/L.
	2010	A	A	A	—	—	—	—	A	—	A	A	A	—	Remains assigned to suites and frequencies for general surveillance at alluvial wells in this subwatershed. Discontinued PCB suite; cumulative data for alluvial groundwater in this subwatershed show history of nondetects.
LAUZ-1	2011	A	A	A	T	T	T	T	A	—	—	A	A	—	Changes reflect updated suites and frequencies for general surveillance at alluvial wells in this watershed.
	2010	A	A	A	—	—	—	—	A	—	A	A	A	—	No change. Remains assigned to watershed-specific suites and frequencies.

Table D-8.2-3 (continued)

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans ^e	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
Intermediate (Upper Los Alamos Canyon)	2011	A	A	A	T	T	T	T	A	—	A	A	A	—	Rationale for suites and frequencies assigned to this monitoring group is provided in Table D-8.2-2.
	2010	—	—	—	—	—	—	—	—	—	—	—	—	—	Not applicable. All intermediate wells in this subwatershed are presently assigned to the TA-21 monitoring group.
LAOI-7	2011	A	A	A	T	T	T	T	A	A	—	A	A	—	Reassigned from TA-21 monitoring group to general surveillance monitoring group. Changes reflect updated suites and frequencies for general surveillance at deep wells in this watershed. Not eligible for low-level tritium because average activity exceeds 200 pCi/L.
	2010	A	A	A	—	—	—	—	A	—	S	S	S	—	Reassigned to suites and frequencies for new TA-21 monitoring group (far-field).
R-9i screen 1	2011	A	A	—	—	—	T	—	A	—	A	A	A	—	Reassigned from TA-21 monitoring group to general surveillance monitoring group with an annual frequency for key analytical suites. R-9i is considered unlikely to be affected by TA-21 COPCs because of its distance from that source. Assigned limited analytical suites because of concerns about the reliability and representativeness of water-quality data obtained from wells equipped with Westbay sampling systems (Appendix F). This upper screen is proposed for retention following well conversion to a single-screen well (LANL 2011, 204372). Proposed start date for well conversion is fiscal year 2012 with the selected sampling system to be installed in screen 1 by October 11, 2012.
	2010	A	A	A	—	—	—	—	A	—	S	S	S	A	Reassigned to suites and frequencies for new TA-21 monitoring group (far-field).

Table D-8.2-3 (continued)

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans ^e	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
R-9i screen 2	2011	A	A	—	—	—	T	—	A	—	A	A	A	—	Reassigned from TA-21 monitoring group to general surveillance monitoring group with an annual frequency for key analytical suites. R-9i is considered unlikely to be affected by TA-21 COPCs because of its distance from that source. Assigned limited analytical suites because of concerns about the reliability and representativeness of water-quality data obtained from wells equipped with Westbay sampling systems (Appendix F). This lower screen is proposed for P&A following well conversion to a single-screen well (LANL 2011, 204372). Proposed start date for well conversion is fiscal year 2012 with the selected sampling system to be installed in screen 1 by October 11, 2012.
	2010	A	A	A	—	—	—	—	A	—	S	S	S	A	Reassigned to suites and frequencies for new TA-21 monitoring group (far-field).

Table D-8.2-3 (continued)

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans ^e	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
Regional (Upper Los Alamos Canyon)	2011	A	A	A	T	T	T	T	A	—	A	A	A	—	Rationale for suites and frequencies assigned to this monitoring group is provided in Table D-8.2-2.
	2010	—	—	—	—	—	—	—	—	—	—	—	—	—	Not applicable. All regional wells in this subwatershed are presently assigned to the TA-21 monitoring group.
R-8 screen 1	2011	A	A	—	—	—	T	—	A	—	A	A	A	—	Reassigned from TA-21 monitoring group to general surveillance monitoring group with an annual frequency for key analytical suites. R-8 is considered unlikely to be affected by TA-21 COPCs because of its distance from that source. Assigned limited analytical suites because of concerns about the reliability and representativeness of water-quality data obtained from wells equipped with Westbay sampling systems (Appendix F). This upper screen is proposed for P&A following well conversion to a single-screen well (LANL 2011, 204372). Proposed start date for well conversion is fiscal year 2012 with the selected sampling system to be installed in screen 2 by October 11, 2012.
	2010	A	A	—	—	—	—	—	A	—	A	A	A	A	Reassigned to suites and frequencies for new TA-21 monitoring group.

Table D-8.2-3 (continued)

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
R-8 screen 2	2011	A	A	—	—	—	T	—	A	—	A	A	A	—	Reassigned from TA-21 monitoring group to general surveillance monitoring group with an annual frequency for key analytical suites. R-8 is considered unlikely to be affected by TA-21 COPCs because of its distance from that source. Assigned limited analytical suites because of concerns about the reliability and representativeness of water-quality data obtained from wells equipped with Westbay sampling systems (Appendix F). This lower screen is proposed for retention following well conversion to a single-screen well (LANL 2011, 204372). Proposed start date for well conversion is fiscal year 2012 with the selected sampling system to be installed in screen 2 by October 11, 2012.
	2010	A	A	—	—	—	—	—	A	—	A	A	A	A	Reassigned to suites and frequencies for new TA-21 monitoring group.
R-9	2011	A	A	A	T	T	T	T	A	—	A	A	A	—	Reassigned from TA-21 monitoring group to general surveillance monitoring group with an annual frequency for key analytical suites. R-9 is considered unlikely to be affected by TA-21 COPCs because of its distance from that source. Changes reflect updated suites and frequencies for general surveillance at deep wells in this watershed.
	2010	A	A	—	—	—	—	—	A	—	A	A	A	A	Reassigned to suites and frequencies for new TA-21 monitoring group.

Table D-8.2-3 (continued)

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics					Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans ^e	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate	
TW-3	2011	—	—	—	—	—	—	—	—	—	—	—	—	Removed from Interim Plan. Well is scheduled to be plugged and abandoned in FY11 (LANL 2011, 111605). Replaced by well R-66, which is assigned to the TA-21 monitoring group (Table D-2.0-3).
	2010	—	A	—	—	—	—	—	—	—	A	—	—	Reassigned to suites and frequencies for new TA-21 monitoring group. Assigned restricted list of suites and frequencies because well is affected by casing corrosion. Transducer removed February 9, 2006, in preparation for plugging and abandoning this well. Well was reopened and sampled in July 2009 and January 2010.
Base flow (Pueblo Canyon)	2011	A	A	A	T	A ^{CNCR}	T	T	A	—	—	A	A	Rationale for suites and frequencies assigned to this monitoring group is provided in Table D-8.2-2.
	2010	A	A	A	—	A ^{CNCR}	—	—	A	—	—	A	A	No change. Watershed-specific suites and frequencies for 2010 Interim Plan.
Acid Above Pueblo (E056)	2011	A	A	A	T	A ^{CNCR}	T	T	A	—	—	A	A	Changes reflect updated suites and frequencies for general surveillance at base-flow locations in this watershed.
	2010	A	A	A	—	A ^{CNCR}	—	—	A	—	—	A	A	No change. Remains assigned to watershed-specific suites and frequencies.
Guaje above Rendija Canyon (E089)	2011	A	A	A	T	A ^{CNCR}	T	T	A	—	—	A	A	Changes reflect updated suites and frequencies for general surveillance at base-flow locations in this watershed.
	2010	A	A	A	—	A ^{CNCR}	—	—	A	—	—	A	A	No change. Remains assigned to watershed-specific suites and frequencies.

Table D-8.2-3 (continued)

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics					Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan	
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g			Perchlorate
Pueblo 3	2011	A	A	A	T	A ^{CNGR}	T	A	A	—	—	A	A	—	Retained annual monitoring for dioxins/furans because of sporadic detections of these analytes. Other changes reflect updated suites and frequencies for general surveillance at base-flow locations in this watershed.
	2010	A	A	A	—	A ^{CNGR}	—	A	A	—	—	A	A	—	No change. Retained annual monitoring for dioxins/furans because of sporadic detections of these analytes.
Pueblo above Acid (E055)	2011	A	A	A	T	A ^{CNGR}	T	T	A	—	—	A	A	—	Changes reflect updated suites and frequencies for general surveillance at base-flow locations in this watershed.
	2010	A	A	A	—	A ^{CNGR}	—	—	A	—	—	A	A	—	No change. Remains assigned to watershed-specific suites and frequencies.
Pueblo above SR-502 (E060)	2011	A	A	A	T	A ^{CNGR}	T	A	A	—	—	A	A	—	Retained annual monitoring for dioxins/furans because of sporadic detections of these analytes. Other changes reflect updated suites and frequencies for general surveillance at base-flow locations in this watershed.
	2010	A	A	A	—	A ^{CNGR}	—	A	A	—	—	A	A	—	No change. Retained annual monitoring for dioxins/furans because of sporadic detections of these analytes.
Alluvial (Pueblo Canyon)	2011	A	A	A	T	T	T	T	A	—	—	A	A	—	Rationale for suites and frequencies assigned to this monitoring group is provided in Table D-8.2-2.
	2010	A	A	A	—	—	—	—	A	—	A	A	A	—	No change. Watershed-specific suites and frequencies for 2010 Interim Plan.
APCO-1	2011	A	A	A	T	A	T	A	A	—	—	A	A	—	Retained annual monitoring of PCBs to continue to establish baseline data for this location. Retained annual monitoring for dioxins/furans because of sporadic detections of these analytes. Other changes reflect updated suites and frequencies for general surveillance at alluvial wells in this watershed.
	2010	A	A	A	—	A	—	A	A	—	A	A	A	—	No change. Retained PCB suite to continue to build baseline data for this location.

Table D-8.2-3 (continued)

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
PAO-1	2011	A	A	A	T	A	T	T	A	—	—	A	A	—	Retained annual monitoring of PCBs to continue to establish baseline data for this location. Changes reflect updated suites and frequencies for general surveillance at alluvial wells in this watershed.
	2010	A	A	A	—	A	—	—	A	—	A	A	A	—	Remains assigned to suites and frequencies for general surveillance at alluvial wells in this subwatershed. Added PCB suite to establish baseline data for this location.
PAO-2	2011	A	A	A	T	A	T	T	A	—	—	A	A	—	Retained annual monitoring of PCBs to continue to establish baseline data for this location. Changes reflect updated suites and frequencies for general surveillance at alluvial wells in this watershed.
	2010	A	A	A	—	A	—	—	A	—	A	A	A	—	No change. Retained PCB suite to continue to build baseline data for this location.
PAO-4	2011	A	A	A	T	A	T	T	A	—	—	A	A	—	Retained annual monitoring of PCBs to continue to establish baseline data for this location. Changes reflect updated suites and frequencies for general surveillance at alluvial wells in this watershed.
	2010	A	A	A	—	—	—	A	A	A		A	A	—	Remains assigned to suites and frequencies for general surveillance at alluvial wells in this subwatershed. Added PCB suite to establish baseline data for this location.
Intermediate (Pueblo Canyon)	2011	A	A	A	T	T	T	T	A	—	A	A	A	—	Rationale for suites and frequencies assigned to this monitoring group is provided in Table D-8.2-2.
	2010	A	A	—	—	—	—	—	A	—	A	A	A	(A)	No change. Watershed-specific suites and frequencies for 2010 Interim Plan.

Table D-8.2-3 (continued)

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans ^e	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
POI-4	2011	A	A	A	T	T	T	T	A	—	A	A	A	—	Changes reflect updated suites and frequencies for general surveillance at deep wells in this watershed.
	2010	A	A	—	—	—	—	—	A	—	A	A	A	A	No change. Remains assigned to watershed-specific suites and frequencies.
R-3i	2011	A	A	A	T	T	T	T	A	—	A	A	A	—	Changes reflect updated suites and frequencies for general surveillance at deep wells in this watershed.
	2010	A	A	A	—	—	—	—	A	—	A	A	A	A	No change. Remains assigned to watershed-specific suites and frequencies, with annual monitoring of SVOCs because of sporadic detections of 1,4-dioxane at this location (2 detections out of 7 samples).
TW-2Ar	2011	A	A	A	T	T	T	T	A	A	—	A	A	—	Completed characterization sampling. Reassigned to watershed-specific suites and frequencies for general surveillance at deep wells in this watershed. Well completed March 4, 2010.
	2010	Q	Q	S	S	S	S	S	Q	—	Q	Q	Q	S	New well assigned to characterization suites and frequencies for general surveillance wells. Replaces TW-2A.
Regional (Pueblo Canyon)	2011	A	A	A	T	T	T	T	A	—	A	A	A	—	Rationale for suites and frequencies assigned to this monitoring group is provided in Table D-8.2-2.
	2010	A	A	—	—	—	—	—	A	—	A	A	A	(A)	No change. Watershed-specific suites and frequencies for 2010 Interim Plan.
R-2	2011	A	A	A	T	T	T	T	A	—	A	A	A	—	Changes reflect updated suites and frequencies for general surveillance at deep wells in this watershed. Background location in GBIR, R4 (LANL 2010, 110535).
	2010	A	A	—	—	—	—	—	A	—	A	A	A	A	No change. Remains assigned to watershed-specific suites and frequencies. Background location approved for inclusion in GBIR, R4.

Table D-8.2-3 (continued)

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans ^e	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
R-3	2011	A	A	A	T	T	T	T	A	—	A	A	A	—	Completed characterization sampling. Reassigned to watershed-specific suites and frequencies for general surveillance at deep wells in this watershed. Well completed June 21, 2010.
	2010	Q	Q	S	S	S	S	S	Q	—	Q	Q	Q	S	New well assigned to characterization suites and frequencies for general surveillance at deep groundwater wells.
R-4	2011	A	A	A	T	T	T	T	A	—	A	A	A	—	Changes reflect updated suites and frequencies for general surveillance at deep wells in this watershed.
	2010	A	A	—	—	—	—	—	A	—	A	A	A	A	No change. Remains assigned to watershed-specific suites and frequencies.
R-24	2011	A	A	A	T	T	T	T	A	—	A	A	A	—	Changes reflect updated suites and frequencies for general surveillance at deep wells in this watershed. Background location in GBIR, R4.
	2010	A	A	—	—	—	—	—	A	—	A	A	A	A	No change. Background location approved for inclusion in GBIR, R4.
Base flow (Lower Los Alamos Canyon)	2011	A	A	A	T	T	T	T	A	—	—	A	A	—	Rationale for suites and frequencies assigned to this monitoring group is provided in Table D-8.2-2.
	2010	S	A	A	—	—	—	—	A	—	A	S	S	—	No change. Watershed-specific suites and frequencies for 2010 Interim Plan.
Los Alamos Canyon near Otowi Bridge (E110)	2011	A	A	A	T	T	T	T	A	—	A	A	A	—	Changes reflect updated suites and frequencies for general surveillance at base-flow locations in this watershed. Retained annual frequency for tritium consistent with requirements for this location in the 2011 MOU with the Pueblo de San Ildefonso.
	2010	S	A	A	—	—	—	—	A	—	A	S	S	—	No change. Remains assigned to watershed-specific suites and frequencies.

Table D-8.2-3 (continued)

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans ^e	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
Springs (Lower Los Alamos Canyon)	2011	A	A	T	T	T	T	T	A	—	A	A	A	—	Rationale for suites and frequencies assigned to this monitoring group is provided in Table D-8.2-2.
	2010	A	A	T	—	—	—	—	A	—	A	A	A	(A)	Rationale for changes to suites and frequencies for general surveillance locations in this subwatershed is provided in Table D-1.0-2.
Basalt Spring/Vine Tree Spring	2011	S	S	T	T	T	T	T	S	—	S	S	S	—	Changes reflect updated suites and frequencies for general surveillance at springs in this watershed, with semiannual frequencies specified for some suites consistent with requirements for this location in the 2011 MOU with the Pueblo of San Ildefonso. Specified Vine Tree Spring as an alternate sampling location when Basalt Spring is dry.
	2010	A	A	T	—	T	T	—	A	—	A	A	A	A	Reduced SVOC frequency reflects updated suites and frequencies for general surveillance at springs in this part of the watershed. Retained triennial sampling for PCB and HEXP suites consistent with requirements for this location in the 2010 MOU with the Pueblo of San Ildefonso.
Los Alamos Spring	2011	A	A	T	T	T	T	T	A	—	A	A	A	—	Changes reflect updated suites and frequencies for general surveillance at springs in this watershed.
	2010	A	A	T	—	T	T	—	A	—	A	A	A	A	Reduced SVOC frequency reflects updated suites and frequencies for general surveillance at springs in this part of the watershed. Retained triennial sampling for PCB and HEXP suites consistent with requirements for this location in the 2010 MOU with the Pueblo of San Ildefonso.

Table D-8.2-3 (continued)

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans ^e	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
Alluvial (Lower Los Alamos Canyon)	2011	A	A	T	T	T	T	T	A	—	—	A	A	—	Rationale for suites and frequencies assigned to this monitoring group is provided in Table D-8.2-2.
	2010	A	A	T	—	—	—	—	A	—	A	A	A	—	Rationale for changes to suites and frequencies for general surveillance locations in this subwatershed is provided in Table D-1.0-2.
LLAO-1b	2011	A	A	T	T	T	T	T	A	—	A	A	A	—	Changes reflect updated suites and frequencies for general surveillance at alluvial wells in this watershed.
	2010	A	A	T	—	T	T	—	A	—	A	A	A	—	Reduced SVOC frequency reflects updated suites and frequencies for general surveillance at alluvial wells in this part of the watershed. Retained triennial sampling for PCB and HEXP suites consistent with requirements for this well in the 2010 MOU with the Pueblo of San Ildefonso.
LLAO-4	2011	A	A	T	T	T	T	T	A	—	A	A	A	—	Changes reflect updated suites and frequencies for general surveillance at alluvial wells in this watershed.
	2010	A	A	T	—	T	T	—	A	—	A	A	A	—	Reduced SVOC frequency reflects updated suites and frequencies for general surveillance at alluvial wells in this part of the watershed. Retained triennial sampling for PCB and HEXP suites consistent with requirements for this well in the 2010 MOU with the Pueblo of San Ildefonso.
Spring (Guaje Canyon)	2011	A	T	T	T	T	T	T	A	—	A	A	A	—	Rationale for suites and frequencies assigned to this monitoring group is provided in Table D-8.2-2.
Campsite Spring	2011	A	T	T	T	T	T	T	A	—	A	A	A	—	Changes reflect updated suites and frequencies for general surveillance at springs in this watershed. Background location in GBIR R3 and GBIR, R4.
	2010	A	—	—	—	—	—	—	A	—	A	A	A	(A)	Background location in GBIR, R3 and approved for inclusion in GBIR, R4. Assigned analytical suites for naturally occurring constituents.

Table D-8.2-3 (continued)

Notes: Watershed-specific and monitoring group-specific sampling suites and frequencies for individual water types are shown in shaded rows in order to set this information apart from that for the individual sampling locations that follow these rows. Sampling suites and frequencies for last year's Interim Plan are shown in gray text in order to set this information apart from that for the current Interim Plan. Sampling frequency: Q = quarterly (4 times/yr); S = semiannual (2 times/yr); A = annual (1 time/yr); B = biennial (once every 2 yr); T = triennial (once every 3 yr). For simplicity, sample collection frequencies for analysis of suspended sediment concentrations and field parameters are not listed in this table. Field parameters are routinely collected for every sampling event at every type of location, and samples for suspended sediment concentrations are collected for every sampling event at base-flow stations and springs.

Nonfiltered and filtered samples will be collected for general inorganics (excluding anions) and metals. Anions and perchlorate samples will be filtered. Samples collected for radionuclide analysis will be nonfiltered only for all water media. Organic and HEXP constituents are nonfiltered for all water media. Stable isotope samples for nitrogen isotopes are filtered; stable isotope samples for deuterium and oxygen isotopes are not filtered.

^a Metals analysis includes the 23 TAL metals (Ag, Al, As, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, Hg, K, Mg, Mn, Na, Ni, Pb, Sb, Se, Tl, V, Zn), plus boron, molybdenum, silicon dioxide, strontium, tin, and uranium.

^b VOC = Volatile organic compounds; SVOC = semivolatile organic compounds.

^c PCB = Polychlorinated biphenyl (compound). The superscript CNGR indicates the analysis of PCB congeners using EPA Method 1668A.

^d The analytical suite of explosive compounds (HEXP) includes the Consent Order list of the normal SW-846:8330 analytes plus PETN; TATB; 3,5-dinitroaniline; TOCP; 2,4-diamino-6-nitrotoluene; and 2,6-diamino-4-nitrotoluene.

^e The radionuclide suite includes gross alpha, gross beta, alpha spectroscopy, gamma spectroscopy, and strontium-90.

^f Tritium samples may be submitted for analysis by liquid scintillation if average activities are anticipated to exceed 200 pCi/L. Low-level tritium is analyzed using electrolytic enrichment or direct counting.

^g General inorganic analysis includes major anions (bromide, chloride, fluoride, sulfate), major cations (calcium, magnesium, sodium, potassium), nitrate plus nitrite (as N), TKN, ammonia, total phosphorus, TOC, TDS, alkalinity, specific conductivity, pH, and hardness.

^h Analysis for stable isotopes of nitrogen, hydrogen, and oxygen. The collection of samples for stable isotope analysis is considered a special sampling campaign that is outside the scope of the regulatory process. In general, these samples are collected semiannually from "new" wells (those which completed construction, rehabilitation, or conversion on or after October 1, 2010) until at least four sets of data have been collected. Any subsequent sampling for stable isotope analysis will be decided on the basis of site-specific conditions. In the 2010 Interim Plan, the entry "(A)" for intermediate and regional wells signifies samples will be collected annually until four sets of nitrogen isotope data have been collected.

ⁱ — = This analytical suite is not scheduled to be collected for this type of water at locations assigned to this area-specific monitoring group. Some locations are assigned analytical suites or frequencies that differ from those shown in this table, for site-specific reasons as described in the text for this monitoring group, and as summarized in this table.

Table D-8.3-1
Analytes Detected Two or More Times above One-Half Standard in the General Surveillance Monitoring Group: Sandia Canyon

Analytical Suite	Analyte Exceeding One-Half Standard at Least Twice at the Same Location in This Monitoring Group	Base-Flow Locations				Alluvial Wells					Intermediate Wells		Regional Wells		
		Middle Sandia Canyon at Terminus of Persistent Base Flow	Sandia below Wetlands (E123)	Sandia Right Fork at Power Plant (E121)	South Fork of Sandia Canyon at E122	SCA-1	SCA-1-DP	SCA-2	SCA-4	SCA-5	R-12 Screen 1 (PR)	R-12 Screen 2 (PR)	R-10a	R-10 Screen 1	R-10 Screen 2
Dioxins/Furans	—	ND	ND	ND	ND	ND	ND	ND	ND	ND	—	—	ND	ND	ND
General Inorganics	Chloride	—	—	—	—	●	—	■	—	—	—	—	—	—	—
General Inorganics	Fluoride	—	—	—	—	—	—	—	●	●	—	—	—	—	—
General Inorganics	Total Dissolved Solids	—	—	—	—	●	—	●	—	—	—	—	—	—	—
HEXP	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Metals	Arsenic	●	●	—	■	—	—	●	■	—	—	—	—	—	—
Metals	Beryllium	—	—	—	—	—	—	—	●	—	—	—	—	—	—
Metals	Copper	—	●	●	■	—	—	—	—	—	—	—	—	—	—
Metals	Iron	—	—	—	—	■	■	—	—	—	●	—	—	—	—
Metals	Lead	—	—	—	—	—	—	■	■	—	—	—	—	—	—
Metals	Manganese	—	—	—	—	■	■	—	—	—	■	—	—	—	—
Metals	Selenium	—	—	—	■	—	—	—	—	—	—	—	—	—	—
Metals	Thallium	■	■	—	—	—	—	—	—	—	—	—	—	—	—
Metals	Zinc	—	—	●	—	—	—	—	—	—	—	—	—	—	—
PCBs	Aroclor-1254	—	■	—	—	—	—	—	—	—	—	—	—	—	—
PCBs	Aroclor-1260	—	■	—	—	—	—	—	—	—	—	—	—	—	—
Pesticides	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Radionuclides	Radium-228	—	—	—	—	—	—	—	●	—	—	—	—	—	—
SVOC	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
VOC	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Source: Tables B1-3 and B1-4 in Attachment B-1.

Notes: ● = Detected ≥ one-half standard more than once; ■ = detected at least once above standard; — = not detected above one-half standard more than once at this location, or there is no applicable standard. The term “standard” refers to the lowest applicable regulatory standard or other screening level. ND = no data for period of record included in Tables B1-3 and B1-4 of Attachment B-1; (PR) = postrehabilitation.

Table D-8.3-2
Analytical Suites and Frequencies for General Surveillance Monitoring in Sandia Canyon

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
Base flow	2011	A	A	A	T	A ^{CN_{GR}}	T	T	B	—	—	A	A	—	Base-flow stations in Sandia Canyon moved from chromium investigation monitoring group and reassigned to General Surveillance because primary contaminants of concern have already migrated into the deep vadose zone and groundwater and present-day base-flow chemistry is not representative of deep groundwater in the chromium plume. Thus monitoring locations are not directly relevant to the chromium investigation. Annual frequencies established for metals, PCBs, general inorganics, and perchlorate are consistent with annual sampling frequencies for watershed. Added triennial sampling for other organic suites as requested by NMED (2011, 201467) with annual sampling for PCBs because Aroclor-1254 and Aroclor-1260 have been detected in the past at Station E123 (Sandia below wetlands). Reduced sampling to biennial for radionuclides because these are well characterized, are not COPCs for this watershed, and additional data are not needed for decision-making.
	2010	S	A	A	—	S ^{CN_{GR}}	—	—	A	—	—	S	S	—	All base-flow locations in this watershed are presently assigned to the chromium investigation monitoring group.

Table D-8.3-2 (continued)

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
Alluvial	2011	A	A	A	T	T	T	T	B	—	—	A	A	—	Alluvial wells in Sandia Canyon moved from chromium investigation monitoring group and reassigned to general surveillance monitoring group because primary contaminants of concern have already migrated into the deep vadose zone and groundwater and present-day base-flow chemistry is not representative of deep groundwater in the chromium plume. Thus monitoring locations are not directly relevant to the chromium investigation. Annual frequencies established for metals, PCBs, general inorganics, and perchlorate are consistent with annual sampling frequencies for watershed. Added triennial sampling for additional organic suites as requested by NMED (2011, 201467). Reduced sampling to biennial for radionuclides because these are well characterized, are not COPCs for this watershed, and additional data are not needed for decision-making. Suspended tritium sampling because tritium trends in alluvial groundwater are well characterized in this watershed and additional data are not needed for decision-making.
	2010	S	A	A	—	—	—	—	A	—	A	S	S	—	All alluvial locations in this watershed are presently assigned to the chromium investigation monitoring group.

Table D-8.3-2 (continued)

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
Intermediate	2011	A	A	A	T	T	T	T	A	—	A	A	A	—	New category needed because well R-12 was moved from the TA-21 monitoring group and reassigned to General Surveillance. Suites and frequencies for deep wells in this portion of Sandia watershed are similar to those for alluvial wells with the exception of annual frequencies for radionuclides and tritium.
	2010	—	—	—	—	—	—	—	—	—	—	—	—	—	Not applicable. All intermediate locations in this watershed are presently assigned to the chromium investigation monitoring group.
Regional	2011	A	A	A	T	T	T	T	A	—	A	A	A	—	Suites and frequencies for deep wells in this portion of Sandia watershed are similar to those for alluvial wells with the exception of annual frequencies for radionuclides and tritium.

Table D-8.3-2 (continued)

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
	2010	Q	A	A	—	—	—	—	A	—	S	Q	S	(A)	Reduced frequency of VOC suite to annual because of the predominance of nondetects at general surveillance locations. Reduced frequencies to semiannual for tritium and perchlorate because of the adequacy of data set to characterize baseline conditions in regional groundwater in this part of the watershed.

Notes: Sampling suites and frequencies for last year's Interim Plan are shown in gray text in order to set this information apart from that for the current Interim Plan. Sampling frequency: Q = quarterly (4 times/yr); S = semiannual (2 times/yr); A = annual (1 time/yr); B = biennial (once every 2 yr); T = triennial (once every 3 yr). For simplicity, sample collection frequencies for analysis of suspended sediment concentrations and field parameters are not listed in this table. Field parameters are routinely collected for every sampling event at every type of location, and samples for suspended sediment concentrations are collected for every sampling event at base-flow stations and springs. Nonfiltered and filtered samples will be collected for general inorganics (excluding anions) and metals. Anions and perchlorate samples will be filtered. Samples collected for radionuclide analysis will be nonfiltered only for all water media. Organic and HEXP constituents are nonfiltered for all water media. Stable isotope samples for nitrogen isotopes are filtered; stable isotope samples for deuterium and oxygen isotopes are not filtered.

^a Metals analysis includes the 23 TAL metals (Ag, Al, As, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, Hg, K, Mg, Mn, Na, Ni, Pb, Sb, Se, Ti, V, Zn), plus boron, molybdenum, silicon dioxide, strontium, tin, and uranium.

^b VOC = Volatile organic compounds; SVOC = semivolatile organic compounds.

^c PCB = Polychlorinated biphenyl (compound). The superscript CNGR indicates the analysis of PCB congeners using EPA Method 1668A.

^d The analytical suite of explosive compounds (HEXP) includes the Consent Order list of the normal SW-846:8330 analytes plus PETN; TATB; 3,5-dinitroaniline; TOCP; 2,4-diamino-6-nitrotoluene; and 2,6-diamino-4-nitrotoluene..

^e The radionuclide suite includes gross alpha, gross beta, alpha spectroscopy, gamma spectroscopy, and strontium-90.

^f Tritium samples may be submitted for analysis by liquid scintillation if average activities are anticipated to exceed 200 pCi/L. Low-level tritium is analyzed using electrolytic enrichment or direct counting.

^g General inorganic analysis includes major anions (bromide, chloride, fluoride, sulfate), major cations (calcium, magnesium, sodium, potassium), nitrate plus nitrite (as N), TKN, ammonia, total phosphorus, TOC, TDS, alkalinity, specific conductivity, pH, and hardness.

^h Analysis for stable isotopes of nitrogen, hydrogen, and oxygen. The collection of samples for stable isotope analysis is considered a special sampling campaign that is outside the scope of the regulatory process. In general, these samples are collected semiannually from "new" wells (those which completed construction, rehabilitation, or conversion on or after October 1, 2010) until at least four sets of data have been collected. Any subsequent sampling for stable isotope analysis will be decided on the basis of site-specific conditions. In the 2010 Interim Plan, the entry "(A)" for intermediate and regional wells signifies samples will be collected annually until four sets of nitrogen isotope data have been collected.

ⁱ — = This analytical suite is not scheduled to be collected for this type of water at locations assigned to this area-specific monitoring group. Some locations are assigned analytical suites or frequencies that differ from those shown in this table, for site-specific reasons as described in the text for this monitoring group, and as summarized in Table D-8.3-3.

Table D-8.3-3
Sampling Frequencies and Analytical Suites Assigned to General Surveillance Locations in Sandia Canyon

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/ Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
Base flow	2011	A	A	A	T	A ^{CNGR}	T	T	B	— ⁱ	—	A	A	—	Rationale for suites and frequencies assigned to this monitoring group is provided in Table D-8.3-2.
	2010	S	A	A	—	S ^{CNGR}	—	—	A	—	—	S	S	—	All base-flow locations in this watershed are currently assigned to the chromium investigation monitoring group.
Middle Sandia Canyon at terminus of persistent base flow	2011	A	A	A	T	A ^{CNGR}	T	T	B	—	—	A	A	—	Reassigned from chromium investigation monitoring group to general surveillance monitoring group. Changes reflect updated suites and frequencies for general surveillance at base-flow locations in this watershed.
	2010	S	A	A	—	S ^{CNGR}	—	—	A	—	—	S	A	—	Reassigned to suites and frequencies for new chromium investigation monitoring group.
Sandia below Wetlands (E123)	2011	A	A	A	T	A ^{CNGR}	T	T	B	—	—	A	A	—	Reassigned from chromium investigation monitoring group to general surveillance monitoring group. Changes reflect updated suites and frequencies for general surveillance at base-flow locations in this watershed.
	2010	S	A	A	—	S ^{CNGR}	—	—	A	—	—	S	S	—	Reassigned to suites and frequencies for new chromium investigation monitoring group.
Sandia right fork at Power Plant (E121)	2011	A	A	A	T	A ^{CNGR}	T	T	B	—	—	A	A	—	Reassigned from chromium investigation monitoring group to general surveillance monitoring group. Changes reflect updated suites and frequencies for general surveillance at base-flow locations in this watershed.
	2010	S	A	A	—	S ^{CNGR}	—	—	A	—	—	S	S	—	Reassigned to suites and frequencies for new chromium investigation monitoring group.

Table D-8.3-3 (continued)

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans ^e	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
South fork of Sandia Canyon at E122	2011	A	A	A	T	A ^{CNG} _R	T	T	B	—	—	A	A	—	Reassigned from chromium investigation monitoring group to general surveillance monitoring group. Changes reflect updated suites and frequencies for general surveillance at base-flow locations in this watershed.
	2010	S	A	A	—	S ^{CNG} _R	—	—	A	—	—	S	S	—	Reassigned to suites and frequencies for new chromium investigation monitoring group.
Alluvial	2011	A	A	A	T	T	T	T	B	—	—	A	A	—	Rationale for suites and frequencies assigned to this monitoring group is provided in Table D-8.3-2.
	2010	S	A	A	—	—	—	—	A	—	A	S	S	—	All alluvial wells in this watershed are currently assigned to the chromium investigation monitoring group.
SCA-1	2011	—	—	—	—	—	—	—	—	—	—	—	—	—	Reassigned from chromium investigation monitoring group to general surveillance monitoring group. Water-level only (Table 1.10-1). Installation of SCA-1 and SCA-1-DP in a wetland environment characterized by 100% fines and vegetative debris causes unavoidable recurring siltation of the screens. To address this problem, the screens will be inspected annually and cleaned as needed.
	2010	—	—	—	—	—	—	—	—	—	—	—	—	—	No change. Water level only.
SCA-1- DP	2011	A	A	A	T	T	T	T	B	—	—	A	A	—	Reassigned from chromium investigation monitoring group to general surveillance monitoring group. Changes reflect updated suites and frequencies for general surveillance at alluvial wells in this watershed. Installation of SCA-1 and SCA-1-DP in a wetland environment characterized by 100% fines and vegetative debris causes unavoidable recurring siltation of the screens. To address this problem, the screens will be inspected annually and cleaned as needed.
	2010	S	A	A	—	—	—	—	A	A	—	S	S	—	Reassigned SCA-1-DP to suites and frequencies for new chromium investigation monitoring group.

Table D-8.3-3 (continued)

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans ^e	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
SCA-2	2011	A	A	A	T	T	T	T	B	—	—	A	A	—	Reassigned from chromium investigation monitoring group to general surveillance monitoring group. Changes reflect updated suites and frequencies for general surveillance at alluvial wells in this watershed.
	2010	S	A	A	—	—	—	—	A	A	—	S	S	—	Reassigned to suites and frequencies for new chromium investigation monitoring group.
SCA-3	2011	A	A	A	T	T	T	T	B	—	—	A	A	—	Reassigned from chromium investigation monitoring group to general surveillance monitoring group. Changes reflect updated suites and frequencies for general surveillance at alluvial wells in this watershed.
	2010	S	A	A	—	—	—	—	A	A	—	S	S	—	Reassigned to suites and frequencies for new chromium investigation monitoring group.
SCA-4	2011	A	A	A	T	T	T	T	B	—	—	A	A	—	Placeholder for flood-damaged well scheduled for repair or replacement in 2011. Reassigned from chromium investigation monitoring group to general surveillance monitoring group. Changes reflect updated suites and frequencies for general surveillance at alluvial wells in this watershed.
	2010	S	A	A	—	—	—	—	A	A	—	S	S	—	Reassigned to suites and frequencies for new chromium investigation monitoring group.
SCA-5	2011	A	A	A	T	T	T	T	B	—	—	A	A	—	Reassigned from chromium investigation monitoring group to general surveillance monitoring group. Changes reflect updated suites and frequencies for general surveillance at alluvial wells in this watershed.
	2010	S	A	A	—	—	—	—	A	A	—	S	S	—	Reassigned to suites and frequencies for new chromium investigation monitoring group.

Table D-8.3-3 (continued)

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans ^e	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
SCP-1abc	2011	—	—	—	—	—	—	—	—	—	—	—	—	—	Removed from Interim Plan because of flood damage. Scheduled for P&A.
	2010	—	—	—	—	—	—	—	—	—	—	—	—	—	No change. Continue monitoring this triple-nested piezometer for water levels only.
SCP-2a	2011	—	—	—	—	—	—	—	—	—	—	—	—	—	Reassigned from chromium investigation monitoring group to general surveillance monitoring group. Water level only (Table 1.10-1).
	2010	—	—	—	—	—	—	—	—	—	—	—	—	—	No change. Continue monitoring this piezometer for water levels only.
SCP-2b	2011	—	—	—	—	—	—	—	—	—	—	—	—	—	Reassigned from chromium investigation monitoring group to general surveillance monitoring group. Water level only (Table 1.10-1).
	2010	—	—	—	—	—	—	—	—	—	—	—	—	—	No change. Continue monitoring this piezometer for water levels only.
Intermediate	2011	A	A	A	T	T	T	T	A	—	A	A	A	—	Rationale for suites and frequencies assigned to this monitoring group is provided in Table D-8.3-2.
	2010	—	—	—	—	—	—	—	—	—	—	—	—	—	Not applicable. All intermediate wells in this watershed are currently assigned to the chromium investigation monitoring group or to the TA-21 monitoring group.

Table D-8.3-3 (continued)

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans ^e	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
R-12 screen 1	2011	A	A	A	T	T	T	T	A	—	A	A	A	—	Reassigned from TA-21 monitoring group to general surveillance monitoring group. R-12 is considered unlikely to be affected by TA-21 COPCs because of its distance from that source. Changes reflect updated suites and frequencies for general surveillance at deep wells in this watershed.
	2010	S	A	A	—	—	—	—	A	—	S	S	S	—	Completed postconversion characterization sampling. Reassigned to suites and frequencies for new TA-21 monitoring group, augmented by semiannual frequency for metals because of the proximity of this well to the new chromium investigation monitoring group.
R-12 screen 2	2011	A	A	A	T	T	T	T	A	—	A	A	A	—	Reassigned from TA-21 monitoring group to general surveillance monitoring group. R-12 is considered unlikely to be affected by TA-21 COPCs because of its distance from that source. Changes reflect updated suites and frequencies for general surveillance at deep wells in this watershed.
	2010	S	A	A	—	—	—	—	A	—	S	S	S	—	Completed postconversion characterization sampling. Reassigned to suites and frequencies for new TA-21 monitoring group, augmented by semiannual frequency for metals because of the proximity of this well to the new chromium investigation monitoring group.
Regional	2011	A	A	A	T	T	T	T	A	—	A	A	A	—	Rationale for suites and frequencies assigned to this monitoring group is provided in Table D-8.3-2.
	2010	Q	A	A	—	—	—	—	A	—	S	Q	S	(A)	Rationale for changes to suites and frequencies for general surveillance locations in this subwatershed is provided in Table D-1.0-2.

Table D-8.3-3 (continued)

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans ^e	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
R-10 screen 1	2011	A	A	A	T	T	T	T	A	—	A	A	A	—	Changes reflect updated suites and frequencies for general surveillance at deep wells in this watershed and are consistent with requirements of the 2011 MOU with Pueblo of San Ildefonso. Background location in GBIR, R4 (LANL 2010, 110535).
	2010	Q	A	A	—	T	T	—	A	—	S	Q	S	A	Reduced frequencies for VOCs, tritium and perchlorate suites reflect updated suites and frequencies for general surveillance locations in this part of the watershed and are consistent with requirements of the 2010 MOU with Pueblo of San Ildefonso. Background location approved for inclusion in GBIR, R4.
R-10 screen 2	2011	A	A	A	T	T	T	T	A	—	A	A	A	—	Changes reflect updated suites and frequencies for general surveillance at deep wells in this watershed and are consistent with requirements of the 2011 MOU with Pueblo of San Ildefonso. Background location in GBIR, R4.
	2010	Q	A	A	—	T	T	—	A	—	S	Q	S	A	Reduced frequencies for VOCs, tritium and perchlorate suites reflect updated suites and frequencies for general surveillance locations in this part of the watershed and are consistent with requirements of the 2010 MOU with Pueblo of San Ildefonso. Background location approved for inclusion in GBIR, R4.
R-10a	2011	A	A	A	T	T	T	T	A	—	A	A	A	—	Changes reflect updated suites and frequencies for general surveillance at deep wells in this watershed and are consistent with requirements of the 2010 MOU with Pueblo of San Ildefonso.
	2010	Q	A	A	—	T	T	—	A	—	S	Q	S	A	Reduced frequencies for VOCs, tritium, and perchlorate suites reflect updated suites and frequencies for general surveillance locations in this part of the watershed and are consistent with requirements of the 2010 MOU with Pueblo of San Ildefonso.

Table D-8.3-3 (continued)

Notes: Watershed-specific and monitoring group-specific sampling suites and frequencies for individual water types are shown in shaded rows in order to set this information apart from that for the individual sampling locations that follow these rows. Sampling suites and frequencies for last year's Interim Plan are shown in gray text in order to set this information apart from that for the current Interim Plan. Sampling frequency: Q = quarterly (4 times/yr); S = semiannual (2 times/yr); A = annual (1 time/yr); B = biennial (once every 2 yr); T = triennial (once every 3 yr). For simplicity, sample collection frequencies for analysis of suspended sediment concentrations and field parameters are not listed in this table. Field parameters are routinely collected for every sampling event at every type of location, and samples for suspended sediment concentrations are collected for every sampling event at base-flow stations and springs.

Nonfiltered and filtered samples will be collected for general inorganics (excluding anions) and metals. Anions and perchlorate samples will be filtered. Samples collected for radionuclide analysis will be nonfiltered only for all water media. Organic and HEXP constituents are nonfiltered for all water media. Stable isotope samples for nitrogen isotopes are filtered; stable isotope samples for deuterium and oxygen isotopes are not filtered.

- ^a Metals analysis includes the 23 TAL metals (Ag, Al, As, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, Hg, K, Mg, Mn, Na, Ni, Pb, Sb, Se, Tl, V, Zn), plus boron, molybdenum, silicon dioxide, strontium, tin, and uranium.
- ^b VOC = Volatile organic compounds; SVOC = semivolatile organic compounds.
- ^c PCB = Polychlorinated biphenyl (compound). The superscript CNGR indicates the analysis of PCB congeners using U.S. Environmental Protection Agency (EPA) Method 1668A.
- ^d The analytical suite of explosive compounds (HEXP) includes the Consent Order list of the normal SW-846:8330 analytes plus PETN; TATB; 3,5-dinitroaniline; TOCP; 2,4-diamino-6-nitrotoluene; and 2,6-diamino-4-nitrotoluene.
- ^e The radionuclide suite includes gross alpha, gross beta, alpha spectroscopy, gamma spectroscopy, and strontium-90.
- ^f Tritium samples may be submitted for analysis by liquid scintillation if average activities are anticipated to exceed 200 pCi/L. Low-level tritium is analyzed using electrolytic enrichment or direct counting.
- ^g General inorganic analysis includes major anions (bromide, chloride, fluoride, sulfate), major cations (calcium, magnesium, sodium, potassium), nitrate plus nitrite (as N), TKN, ammonia, total phosphorus, TOC, TDS, alkalinity, specific conductivity, pH, and hardness.
- ^h Analysis for stable isotopes of nitrogen, hydrogen, and oxygen. The collection of samples for stable isotope analysis is considered a special sampling campaign that is outside the scope of the regulatory process. In general, these samples are collected semiannually from "new" wells (those which completed construction, rehabilitation, or conversion on or after October 1, 2010) until at least four sets of data have been collected. Any subsequent sampling for stable isotope analysis will be decided on the basis of site-specific conditions. In the 2010 Interim Plan, the entry "(A)" for intermediate and regional wells signifies samples will be collected annually until four sets of nitrogen isotope data have been collected.
- ⁱ — = This analytical suite is not scheduled to be collected for this type of water at locations assigned to this area-specific monitoring group. Some locations are assigned analytical suites or frequencies that differ from those shown in this table, for site-specific reasons as described in the text for this monitoring group, and as summarized in this table.

Table D-8.4-1

Analytes Detected Two or More Times above One-Half Standard in the General Surveillance Monitoring Group: Mortandad Canyon

Analytical Suite	Analyte Exceeding One-Half Standard at Least Twice at the Same Location in This Monitoring Group	Base-Flow Locations								
		E-1E	E-1FW	E-1W	M-1E	M-1W	M-2E	Mortandad below Effluent Canyon (E200)	TS-1W	TS-2E
Dioxins/Furans	—	—	—	—	—	—	—	—	—	—
General Inorganics	Chloride	—	—	—	—	—	—	—	—	—
General Inorganics	Fluoride	—	—	—	—	—	—	—	—	—
General Inorganics	Perchlorate	—	—	—	—	—	—	—	—	—
General Inorganics	Total Dissolved Solids	—	—	—	—	—	—	—	—	—
HEXP	—	—	—	—	—	—	—	—	—	—
Metals	Aluminum	—	☐	—	☐	☐	—	☐	☐	—
Metals	Arsenic	—	●	—	—	—	—	—	—	—
Metals	Barium	—	—	—	—	—	—	—	—	—
Metals	Beryllium	—	—	—	—	—	—	—	—	—
Metals	Cadmium	—	—	—	—	☐	—	—	—	—
Metals	Chromium	—	—	—	—	—	—	—	—	—
Metals	Cobalt	—	—	—	—	—	—	—	—	—
Metals	Copper	☐	☐	—	—	☐	—	☐	—	●
Metals	Iron	—	—	—	—	—	—	—	—	—
Metals	Lead	—	—	—	—	—	—	—	—	—
Metals	Manganese	—	—	—	—	—	—	—	—	—
Metals	Thallium	—	—	—	—	☐	—	—	—	—
Metals	Zinc	—	—	—	—	☐	—	—	—	—
PCBs/Pesticides	—	— ^a	— ^a	— ^a	— ^a	— ^a	— ^a	— ^a	— ^a	— ^a
Radionuclides	Gross alpha ^b	☐	☐	—	—	●	—	●	—	—
Radionuclides	Cesium-137	☐	—	—	—	—	—	☐	—	—
Radionuclides	Radium-228	—	—	—	—	—	—	—	—	—
Radionuclides	Strontium-90 ^c	—	—	—	—	—	—	—	—	—
SVOC	—	—	—	—	—	—	—	—	—	—
VOC	—	—	—	—	—	—	—	—	—	—

Table D-8.4-1 (continued)

Analytical Suite	Analyte Exceeding One-Half Standard at Least Twice at the Same Location in This Monitoring Group	Alluvial Wells												Regional Wells					
		MCA-1	MCA-2	MCO-0.6	MCO-2	MCO-3	MCO-4B	MCO-5	MCO-6	MCO-7	MCO-7.5	MT-3	MT-4	R-16r	R-16 Screen 2 (PR)	R-16 Screen 4 (PR)	R-33 (PR)	R-34	Test Well 8 ^d
Dioxins/Furans	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Inorganics	Chloride	—	—	☐	☐	●	—	—	—	—	—	—	—	—	—	—	—	—	—
General Inorganics	Fluoride	—	●	—	—	—	●	●	●	●	☐	☐	●	—	—	—	—	—	—
General Inorganics	Perchlorate	—	☐	—	—	☐	☐	☐	☐	☐	☐	☐	☐	—	—	—	—	—	—
General Inorganics	Total Dissolved Solids	—	—	☐	☐	☐	—	—	—	—	—	—	—	—	—	—	—	—	—
HEXP	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Metals	Aluminum	☐	—	—	☐	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Metals	Arsenic	—	—	—	☐	—	—	—	—	—	—	—	—	●	—	—	—	—	—
Metals	Barium	—	—	●	☐	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Metals	Beryllium	—	—	—	☐	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Metals	Cadmium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Metals	Chromium	—	—	—	●	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Metals	Cobalt	—	—	●	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Metals	Copper	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Metals	Iron	☐	—	☐	☐	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Metals	Lead	●	—	—	☐	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Metals	Manganese	—	—	☐	☐	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Metals	Thallium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Metals	Zinc	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
PCBs/Pesticides	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Pesticides	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Radionuclides	Gross alpha ^b	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Radionuclides	Cesium-137	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Radionuclides	Radium-228	—	—	—	☐	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Radionuclides	Strontium-90 ^c	—	☐	—	—	☐	☐	☐	☐	—	—	—	—	—	—	—	—	—	—

Table D-8.4-1 (continued)

Analytical Suite	Analyte Exceeding One-Half Standard at Least Twice at the Same Location in This Monitoring Group	Alluvial Wells												Regional Wells					
		MCA-1	MCA-2	MCO-0.6	MCO-2	MCO-3	MCO-4B	MCO-5	MCO-6	MCO-7	MCO-7.5	MT-3	MT-4	R-16r	R-16 Screen 2 (PR)	R-16 Screen 4 (PR)	R-33 (PR)	R-34	Test Well 8 ^d
SVOC	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
VOC	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Source: Tables B1-3 and B1-4 in Attachment B-1.

Notes: ● = Detected $\geq$ one-half standard more than once; ■ = detected at least once above standard; — = not detected above one-half standard more than once at this location, or there is no applicable standard. The term “standard” refers to the lowest applicable regulatory standard or other screening level. (PR) = postrehabilitation.

^a Only one set of data are included in the screening tables for the PCB suite at these base-flow locations. Aroclor-1260 was detected above one-half standard at TS-1W.

^b Tables B1-3 and B1-4 in Attachment B-1 use the EPA MCL of 15 pCi/L for adjusted gross alpha as the screening level for gross alpha activities in water samples. This approach is conservative insofar as the EPA MCL for adjusted gross alpha excludes alpha-particle activity from radon and uranium. Data in Tables B1-3 and B1-4 have not been adjusted to subtract contributions from radon or uranium.

^c Tables B1-3 and B1-4 in Attachment B-1 use 8 pCi/L as a screening level for strontium-90 in water samples. This value is not an EPA MCL but rather the average annual concentration assumed to produce a dose of 4 mrem/yr (the EPA MCL for beta particle and photon radioactivity). If two or more radionuclides are present, the sum of their annual dose from beta particle and photon radioactivity must not exceed the MCL of 4 mrem/yr. The additive effect of other radionuclides is not addressed in Tables B1-3 and B1-4.

^d Analytical data from Test Well 8 may not be representative of groundwater because of casing corrosion.

Table D-8.4-2
Analytical Suites and Frequencies for General Surveillance Monitoring in Mortandad Canyon

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
Base flow	2011	A	A	A	T	T	T	T	A	—	—	A	A	—	Added triennial sampling for additional organic suites as requested by NMED (2011, 201467).
	2010	A	A	A	—	—	—	A	A	—	—	A	A	—	No change
Alluvial (excluding Cañada del Buey)	2011	A	A	A	T	T	T	T	A	A	—	A	A	—	Retained annual frequency for tritium to monitor trends in Radioactive Liquid Waste Treatment Facility (RLWTF) discharges. Added triennial sampling for additional organic suites as requested by NMED (2011, 201467).
	2010	A	A	A	—	—	—	—	A	A	—	A	A	—	Combined alluvial groups A and B (defined in 2009 Interim Plan) after Cañada del Buey locations were reassigned to the monitoring plan for Pajarito Canyon watershed for logistical sampling purposes. Specified annual frequencies for all alluvial locations. Reduction in sampling frequencies for VOCs, tritium, and perchlorate (relative to 2009 sampling plan) reflects adequacy of data record to demonstrate nature and extent of contaminants in groundwater and the maturation of the site conceptual model (LANL 2009, 107453).
Alluvial (Cañada del Buey)	2011	A	A	A	T	T	T	T	A	—	—	A	A	—	Moved documentation for alluvial wells in Cañada del Buey to the Mortandad watershed in which they are physically located. Suspended tritium sampling because sufficient data have been collected to characterized trends in this shallow aquifer. Added triennial sampling for additional organic suites as requested by NMED (2011, 201467).
	2010	A	A	A	—	—	A	—	A	—	A	A	A	—	No change. Alluvial wells in Cañada del Buey reassigned to Pajarito Canyon sampling for logistical sampling purposes.

Table D-8.4-2 (continued)

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
Intermediate	2011	—	—	—	—	—	—	—	—	—	—	—	—	—	No change. No wells in this subgroup.
	2010	—	—	—	—	—	—	—	—	—	—	—	—	—	Not applicable. All intermediate wells in this watershed are presently assigned to the new chromium investigation monitoring group.
Regional	2011	A	A	A	T	T	T	T	A	—	A	A	A	—	Reduced sampling to annual for key analytical suites, consistent with annual sampling frequency at most other general surveillance locations. Added triennial sampling for additional organic suites as requested by NMED (2011, 201467).
	2010	Q	A	A	—	—	—	—	A	—	S	Q	S	(A)	Most regional wells in this watershed have been reassigned to one of the area-specific monitoring groups for which suites and frequencies have been tailored to meet each group's monitoring objectives. For regional wells that remain in the general surveillance category, quarterly frequencies are specified for metals and general inorganics and semiannual frequencies for tritium and perchlorate because these contaminants have been detected above background values or screening levels at other regional wells.

Table D-8.4-2 (continued)

Notes: Sampling suites and frequencies for last year's Interim Plan are shown in gray text in order to set this information apart from that for the current Interim Plan. Sampling frequency: Q = quarterly (4 times/yr); S = semiannual (2 times/yr); A = annual (1 time/yr); B = biennial (once every 2 yr); T = triennial (once every 3 yr). For simplicity, sample collection frequencies for analysis of suspended sediment concentrations and field parameters are not listed in this table. Field parameters are routinely collected for every sampling event at every type of location, and samples for suspended sediment concentrations are collected for every sampling event at base-flow stations and springs.

Nonfiltered and filtered samples will be collected for general inorganics (excluding anions) and metals. Anions and perchlorate samples will be filtered. Samples collected for radionuclide analysis will be nonfiltered only for all water media. Organic and HEXP constituents are nonfiltered for all water media. Stable isotope samples for nitrogen isotopes are filtered; stable isotope samples for deuterium and oxygen isotopes are not filtered.

^a Metals analysis includes the 23 TAL metals (Ag, Al, As, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, Hg, K, Mg, Mn, Na, Ni, Pb, Sb, Se, Tl, V, Zn), plus boron, molybdenum, silicon dioxide, strontium, tin, and uranium.

^b VOC = Volatile organic compounds; SVOC = semivolatile organic compounds.

^c PCB = Polychlorinated biphenyl (compound).

^d The analytical suite of explosive compounds (HEXP) includes the Consent Order list of the normal SW-846:8330 analytes plus PETN; TATB; 3,5-dinitroaniline; TOCP; 2,4-diamino-6-nitrotoluene; and 2,6-diamino-4-nitrotoluene.

^e The radionuclide suite includes gross alpha, gross beta, alpha spectroscopy, gamma spectroscopy, and strontium-90.

^f Tritium samples may be submitted for analysis by liquid scintillation if average activities are anticipated to exceed 200 pCi/L. Low-level tritium is analyzed using electrolytic enrichment or direct counting.

^g General inorganic analysis includes major anions (bromide, chloride, fluoride, sulfate), major cations (calcium, magnesium, sodium, potassium), nitrate plus nitrite (as N), TKN, ammonia, total phosphorus, TOC, TDS, alkalinity, specific conductivity, pH, and hardness.

^h Analysis for stable isotopes of nitrogen, hydrogen, and oxygen. The collection of samples for stable isotope analysis is considered a special sampling campaign that is outside the scope of the regulatory process. In general, these samples are collected semiannually from "new" wells (those which completed construction, rehabilitation, or conversion on or after October 1, 2010) until at least four sets of data have been collected. Any subsequent sampling for stable isotope analysis will be decided on the basis of site-specific conditions. In the 2010 Interim Plan, the entry "(A)" for intermediate and regional wells signifies samples will be collected annually until four sets of nitrogen isotope data have been collected.

ⁱ — = This analytical suite is not scheduled to be collected for this type of water at locations assigned to this area-specific monitoring group. Some locations are assigned analytical suites or frequencies that differ from those shown in this table, for site-specific reasons as described in the text for this monitoring group, and as summarized in Table D-8.4-3.

Table D-8.4-3
Sampling Frequencies and Analytical Suites Assigned to Locations in Mortandad Canyon

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
Base flow	2011	A	A	A	T	T	T	T	A	—	—	A	A	—	Rationale for suites and frequencies assigned to this monitoring group is provided in Table D-8.4-2.
	2010	A	A	A	—	—	—	A	A	—	—	A	A	—	No change. Watershed-specific suites and frequencies for 2010 Interim Plan.
E-1FW	2011	A	A	A	T	T	T	A	A	—	—	A	A	—	Changes reflect updated suites and frequencies for general surveillance at base-flow locations in this watershed.
	2010	S	S	A	—	—	—	S	S	—	—	S	S	—	Remains assigned to suites for general surveillance at base-flow stations in this watershed. Retained semiannual frequency for most suites because of the importance of this location for monitoring effluent discharged from the RLWTF. Reduced frequency for SVOC suite to annual because of history of nondetects.
M-1W	2011	A	A	A	T	T	T	A	A	—	—	A	A	—	Changes reflect updated suites and frequencies for general surveillance at base-flow locations in this watershed.
	2010	A	A	A	—	—	—	A	A	—	—	A	A	—	No change. Remains assigned to watershed-specific suites and frequencies.
M-1E	2011	A	A	A	T	T	T	A	A	—	—	A	A	—	Changes reflect updated suites and frequencies for general surveillance at base-flow locations in this watershed.
	2010	A	A	A	—	—	—	A	A	—	—	A	A	—	No change. Remains assigned to watershed-specific suites and frequencies.
M-2E	2011	A	A	A	T	T	T	A	A	—	—	A	A	—	Changes reflect updated suites and frequencies for general surveillance at base-flow locations in this watershed.
	2010	A	A	A	—	—	—	A	A	—	—	A	A	—	No change. Remains assigned to watershed-specific suites and frequencies.

Table D-8.4-3 (continued)

Location	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
Mortandad below Effluent Canyon (E200)	2011	A	A	A	T	T	T	A	A	A	—	A	A	—	Retained annual sampling for tritium because of historically elevated tritium activities at this location. Not eligible for low-level tritium because average activity exceeds 200 pCi/L. Changes reflect updated suites and frequencies for general surveillance at base-flow locations in this watershed.
	2010	A	A	A	—	—	—	A	A	A	—	A	A	—	Remains assigned to suites for general surveillance at base-flow stations in this watershed, augmented by tritium because of historically elevated tritium activities at this location.
TS-1W	2011	A	A	A	T	T	T	A	A	—	—	A	A	—	Changes reflect updated suites and frequencies for general surveillance at base-flow locations in this watershed.
	2010	A	A	A	—	—	—	A	A	—	—	A	A	—	No change. Remains assigned to watershed-specific suites and frequencies.
TS-2E	2011	A	A	A	T	T	T	A	A	—	—	A	A	—	Changes reflect updated suites and frequencies for general surveillance at base-flow locations in this watershed.
	2010	A	A	A	—	—	—	A	A	—	—	A	A	—	No change. Remains assigned to watershed-specific suites and frequencies.
Alluvial (Cañada del Buey)	2011	A	A	A	T	T	T	T	A	—	—	A	A	—	Rationale for suites and frequencies assigned to this monitoring group is provided in Table D-8.4-2.
	2010	A	A	A	—	—	A	—	A	—	A	A	A	—	Combined subgroups A and B after moving Cañada del Buey locations to Pajarito watershed monitoring plan for logistical sampling purposes. Rationale for changes to suites and frequencies for general surveillance locations in this watershed is provided in Table D-1.0-2.

Table D-8.4-3 (continued)

Location	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
CDBO-4 CDBO-5 CDBO-8 CDBO-9	2011	—	—	—	—	—	—	—	—	—	—	—	—	—	Removed from sampling because these wells have been dry consistently since installation (Koch and Schmeer 2011, 201566).
	2010	—	—	—	—	—	—	—	—	—	—	—	—	—	Documentation moved to sampling table for Pajarito Canyon watershed. Although located in the Mortandad Canyon watershed, these wells in the Cañada del Buey subwatershed are treated as part of the Pajarito Canyon watershed for logistical sampling purposes.
CDBO-6	2011	A	A	A	T	T	A	T	A	—	—	Q	Q	—	Retained quarterly sampling for general inorganics and perchlorate as required for Sanitary Wastewater Systems (SWWS) discharge permit. Other changes reflect updated suites and frequencies for general surveillance at alluvial wells in Canada del Buey.
	2010	A	A	A	—	—	—	—	A	A	A	A	A	—	No change. Remains assigned to suites and frequencies for general surveillance at alluvial wells in Cañada del Buey. Although technically in Mortandad Canyon watershed, this well is considered to be in the Pajarito Canyon watershed for logistical sampling purposes.

Table D-8.4-3 (continued)

Location	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
CDBO-7	2011	A	A	A	T	T	A	T	A	—	—	A	A	—	Although dry seasonally, this well is retained for sampling because it has yielded samples several times over the last 3 yr. Changes reflect updated suites and frequencies for general surveillance at alluvial wells in Cañada del Buey. Note: Last year's entry for this well was in error insofar as monitoring is not required at this location for the SWWS permit as stated below.
	2010	A	A	A	—	—	—	A	A	A	A	Q	Q	—	Remains assigned to suites and frequencies for general surveillance at alluvial wells in Cañada del Buey. Retained quarterly sampling for general inorganics and perchlorate as required by SWWS discharge permit. Retained annual sampling for dioxins/furans in response to sporadic detections of low concentrations of dioxins/furans at base-flow stations in the past. Although technically in Mortandad Canyon watershed, this well is considered to be in the Pajarito Canyon watershed for logistical sampling purposes.
Alluvial (Upper Mortandad Canyon)	2011	A	A	A	T	T	T	T	T	A	—	A	A	—	Rationale for suites and frequencies assigned to this monitoring group is provided in Table D-8.4-2.
	2010	A	A	A	—	—	—	—	A	A	A	A	A	—	Combined subgroups A and B after moving Cañada del Buey locations to Pajarito watershed monitoring plan for logistical sampling purposes. Rationale for changes to suites and frequencies for general surveillance locations in this watershed is provided in Table D-1.0-2.

Table D-8.4-3 (continued)

Location	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
MCA-1	2011	A	A	A	T	T	T	T	A	A	—	A	A	—	Changes reflect updated suites and frequencies for general surveillance at alluvial wells in this watershed. Not eligible for low-level tritium because average activity exceeds 200 pCi/L.
	2010	A	A	A	—	—	—	A	A	A	—	A	A	—	Changes reflect revised suites and frequencies for general surveillance at alluvial wells in this part of the watershed. Retained sampling for dioxins/furans to continue to establish baseline for alluvial groundwater in response to sporadic detections of dioxins/furans at base-flow stations in the past.
MCO-0.6	2011	A	A	A	T	T	T	T	A	A	—	A	A	—	Changes reflect updated suites and frequencies for general surveillance at alluvial wells in this watershed. Not eligible for low-level tritium because average activity exceeds 200 pCi/L.
	2010	A	A	A	—	—	—	—	A	A	—	A	A	—	No change. Remains assigned to watershed-specific suites and frequencies.
MCO-2	2011	A	A	A	T	T	T	T	A	A	—	A	A	—	Changes reflect updated suites and frequencies for general surveillance at alluvial wells in this watershed. Not eligible for low-level tritium because average activity exceeds 200 pCi/L.
	2010	A	A	A	—	—	—	—	A	A	—	A	A	—	Changes reflect revised suites and frequencies for general surveillance at alluvial wells in this part of the watershed.

Table D-8.4-3 (continued)

Location	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
MCO-3	2011	A	A	A	T	T	T	T	A	A	—	Q	Q	—	Retained quarterly sampling for general inorganics and perchlorate as required for RLWTF discharge permit. Other changes reflect updated suites and frequencies for general surveillance at alluvial wells in this part of the Mortandad watershed. Not eligible for low-level tritium because average activity exceeds 200 pCi/L. Note: Last year's entry for this well was in error insofar as monitoring at this location is required for the RLWTF discharge permit, not the SWWS permit as stated below.
	2010	A	A	A	—	—	—	—	A	A	—	Q	Q	—	Changes reflect revised suites and frequencies for general surveillance at alluvial wells in this part of the watershed, with quarterly sampling of general inorganics and perchlorate as required by SWWS discharge permit.
MCO-4B	2011	A	A	A	T	T	T	T	A	A	—	Q	Q	—	Retained quarterly sampling for general inorganics and perchlorate as required for RLWTF discharge permit. Other changes reflect updated suites and frequencies for general surveillance at alluvial wells in this part of the Mortandad watershed. Not eligible for low-level tritium because average activity exceeds 200 pCi/L. Note: Last year's entry for this well was in error insofar as monitoring at this location is required for the RLWTF discharge permit, not the SWWS permit as stated below.
	2010	A	A	A	—	—	—	—	A	A	—	Q	Q	—	Changes reflect revised suites and frequencies for general surveillance at alluvial wells in this part of the watershed, with quarterly sampling of general inorganics and perchlorate as required by SWWS discharge permit.

Table D-8.4-3 (continued)

Location	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
MCO-5	2011	A	A	A	T	T	T	T	A	A	—	A	A	—	Changes reflect updated suites and frequencies for general surveillance at alluvial wells in this watershed.
	2010	A	A	A	—	—	—	—	A	A	—	A	A	—	Changes reflect revised suites and frequencies for general surveillance at alluvial wells in this part of the watershed.
MCO-6	2011	A	A	A	T	T	T	T	A	A	—	Q	Q	—	Retained quarterly sampling for general inorganics and perchlorate as required for RLWTF discharge permit. Other changes reflect updated suites and frequencies for general surveillance at alluvial wells in this part of the Mortandad watershed. Not eligible for low-level tritium because average activity exceeds 200 pCi/L. Note: Last year's entry for this well was in error insofar as monitoring at this location is required for the RLWTF discharge permit, not the SWWS permit as stated below.
	2010	A	A	A	—	—	—	—	A	A	—	Q	Q	—	Changes reflect revised suites and frequencies for general surveillance at alluvial wells in this part of the watershed, with quarterly sampling of general inorganics and perchlorate as required by SWWS discharge permit.

Table D-8.4-3 (continued)

Location	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
MCO-7	2011	A	A	A	T	T	T	T	A	A	—	Q	Q	—	Retained quarterly sampling for general inorganics and perchlorate as required for RLWTF discharge permit. Other changes reflect updated suites and frequencies for general surveillance at alluvial wells in this part of the Mortandad watershed. Not eligible for low-level tritium because average activity exceeds 200 pCi/L. Note: Last year's entry for this well was in error insofar as monitoring at this location is required for the RLWTF discharge permit, not the SWWS permit as stated below.
	2010	A	A	A	—	—	—	—	A	A	—	Q	Q	—	Changes reflect revised suites and frequencies for general surveillance at alluvial wells in this part of the watershed, with quarterly sampling of general inorganics and perchlorate as required by SWWS discharge permit.
MCO-7.5	2011	A	A	A	T	T	T	T	A	A	—	A	A	—	Changes reflect updated suites and frequencies for general surveillance at alluvial wells in this watershed.
	2010	A	A	A	—	—	—	—	A	A	—	A	A	—	Changes reflect revised suites and frequencies for general surveillance at alluvial wells in this part of the watershed.
MCWB-5 MCWB-5.5b MCWB-6.2a MCWB-6.5e MCWB-7a MCWB-7.4b MCWB-7.7b	2011	—	—	—	—	—	—	—	—	—	—	—	—	—	No change. Continue to monitor water levels only.
	2010	—	—	—	—	—	—	—	—	—	—	—	—	—	No change. Continue to monitor water levels only.
MT-3	2011	A	A	A	T	T	T	T	A	A	—	A	A	—	Changes reflect updated suites and frequencies for general surveillance at alluvial wells in this watershed.
	2010	A	A	A	—	—	—	—	A	A	—	A	A	—	Changes reflect revised suites and frequencies for general surveillance at alluvial wells in this part of the watershed.

Table D-8.4-3 (continued)

Location	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
MT-4	2011	—	—	—	—	—	—	—	—	—	—	—	—	—	No change. Continue to monitor water levels only.
	2010	—	—	—	—	—	—	—	—	—	—	—	—	—	No change. Continue to monitor water levels only.
TSCA-6	2011	—	—	—	—	—	—	—	—	—	—	—	—	—	Removed from sampling because it is dry seasonally and has been dry since May 2008 (Koch and Schmeer 2011, 201566).
	2010	A	A	A	—	—	—	—	A	A	—	A	A	—	No change. Remains assigned to watershed-specific suites and frequencies.
Regional	2011	A	A	A	T	T	T	T	A	—	A	A	A	—	Rationale for suites and frequencies assigned to this monitoring group is provided in Table D-8.4-2.
	2010	Q	A	A	—	—	—	—	A	—	S	Q	S	(A)	Rationale for changes to suites and frequencies for general surveillance locations in this subwatershed is provided in Table D-1.0-2.
R-16 screen 2	2011	A	A	A	T	T	T	T	A	—	A	A	A	—	Changes reflect updated suites and frequencies for general surveillance at alluvial wells in this watershed.
	2010	Q	Q	S	—	—	—	—	A	—	S	Q	Q	S	Post-conversion sampling completed. Upgraded to suites and frequencies for general surveillance at regional wells in this watershed, augmented by quarterly sampling for VOCs because of the location of this well downgradient from TA-54. Retained higher sampling frequencies for SVOCs and perchlorate to continue to evaluate reestablishment of representative water chemistry in this screen.

Table D-8.4-3 (continued)

Location	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
R-16 screen 4	2011	A	A	A	T	T	T	T	A	—	A	A	A	—	Changes reflect updated suites and frequencies for general surveillance at alluvial wells in this watershed.
	2010	Q	Q	S	—	—	—	—	A	—	S	Q	Q	S	Postconversion sampling completed. Upgraded to suites and frequencies for general surveillance at regional wells in this watershed, augmented by quarterly sampling for VOCs because of the location of this well downgradient of TA-54. Retained higher sampling frequencies for SVOCs and perchlorate to continue to evaluate reestablishment of representative water chemistry in this screen.
R-16r	2011	A	A	A	T	T	T	T	A	—	A	A	A	—	Background location in GBIR, R4 (LANL 2010, 110535).
	2010	Q	Q	A	—	—	—	—	A	—	S	Q	Q	A	No change. Remains assigned to suites and frequencies for general surveillance at regional wells in this watershed, augmented by quarterly sampling for VOCs because of its location downgradient of TA-54. Background location approved for inclusion in GBIR, R4.
R-33 screen 1	2011	A	A	A	T	T	T	T	A	—	A	A	A	—	Changes reflect updated suites and frequencies for general surveillance at alluvial wells in this watershed. Background location in GBIR, R4
	2010	Q	Q	S	—	—	—	—	A	—	S	Q	S	A	Completed postconversion characterization sampling. Changes reflect updated suites and frequencies for general surveillance at regional wells in this watershed. Retained quarterly sampling for VOC suite because of the proximity of this well to MDA C monitoring group. Retained semiannual sampling for SVOC suite because of the proximity of this well to locations where 1,4-dioxane is detected in perched-intermediate groundwater. Background location approved for inclusion in GBIR, R4.

Table D-8.4-3 (continued)

Location	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
R-33 screen 2	2011	A	A	A	T	T	T	T	A	—	A	A	A	—	Changes reflect updated suites and frequencies for general surveillance at alluvial wells in this watershed. Background location in GBIR, R4
	2010	Q	Q	S	—	—	—	—	A	—	S	Q	S	A	Completed postconversion characterization sampling. Changes reflect updated suites and frequencies for general surveillance at regional wells in this watershed. Retained quarterly sampling for VOC suite because of the proximity of this well to MDA C monitoring group. Retained semiannual sampling for SVOC suite because of the proximity of this well to locations where 1,4-dioxane is detected in perched-intermediate groundwater. Background location approved for inclusion in GBIR, R4.
R-34	2011	Q	A	A	T	T	T	T	A	—	A	Q	A	—	Retained quarterly frequency for metals and general inorganics and triennial sampling for PCB and HEXP suites consistent with requirements for this location in the 2011 MOU with the Pueblo of San Ildefonso. Other changes reflect updated suites and frequencies for general surveillance at alluvial wells in this watershed. Background location in GBIR, R4
	2010	Q	A	A	—	T	T	—	A	—	S	Q	S	A	Changes reflect updated suites and frequencies for general surveillance at regional wells in this watershed. Retained triennial sampling for PCBs and HEXP suites consistent with requirements for this location in the 2010 MOU with the Pueblo of San Ildefonso.

Table D-8.4-3 (continued)

Notes: Watershed-specific and monitoring group-specific sampling suites and frequencies for individual water types are shown in shaded rows in order to set this information apart from that for the individual sampling locations that follow these rows. Sampling suites and frequencies for last year's Interim Plan are shown in gray text in order to set this information apart from that for the current Interim Plan. Sampling frequency: Q = quarterly (4 times/yr); S = semiannual (2 times/yr); A = annual (1 time/yr); B = biennial (once every 2 yr); T = triennial (once every 3 yr). For simplicity, sample collection frequencies for analysis of suspended sediment concentrations and field parameters are not listed in this table. Field parameters are routinely collected for every sampling event at every type of location, and samples for suspended sediment concentrations are collected for every sampling event at base-flow stations and springs.

Nonfiltered and filtered samples will be collected for general inorganics (excluding anions) and metals. Anions and perchlorate samples will be filtered. Samples collected for radionuclide analysis will be nonfiltered only for all water media. Organic and HEXP constituents are nonfiltered for all water media. Stable isotope samples for nitrogen isotopes are filtered; stable isotope samples for deuterium and oxygen isotopes are not filtered.

^a Metals analysis includes the 23 TAL metals (Ag, Al, As, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, Hg, K, Mg, Mn, Na, Ni, Pb, Sb, Se, Tl, V, Zn), plus boron, molybdenum, silicon dioxide, strontium, tin, and uranium.

^b VOC = Volatile organic compounds; SVOC = semivolatile organic compounds.

^c PCB = Polychlorinated biphenyl (compound).

^d The analytical suite of explosive compounds (HEXP) includes the Consent Order list of the normal SW-846:8330 analytes plus PETN; TATB; 3,5-dinitroaniline; TOCP; 2,4-diamino-6-nitrotoluene; and 2,6-diamino-4-nitrotoluene.

^e The radionuclide suite includes gross alpha, gross beta, alpha spectroscopy, gamma spectroscopy, and strontium-90.

^f Tritium samples may be submitted for analysis by liquid scintillation if average activities are anticipated to exceed 200 pCi/L. Low-level tritium is analyzed using electrolytic enrichment or direct counting.

^g General inorganic analysis includes major anions (bromide, chloride, fluoride, sulfate), major cations (calcium, magnesium, sodium, potassium), nitrate plus nitrite (as N), TKN, ammonia, total phosphorus, TOC, TDS, alkalinity, specific conductivity, pH, and hardness.

^h Analysis for stable isotopes of nitrogen, hydrogen, and oxygen. The collection of samples for stable isotope analysis is considered a special sampling campaign that is outside the scope of the regulatory process. In general, these samples are collected semiannually from "new" wells (those which completed construction, rehabilitation, or conversion on or after October 1, 2010) until at least four sets of data have been collected. Any subsequent sampling for stable isotope analysis will be decided on the basis of site-specific conditions. In the 2010 Interim Plan, the entry "(A)" for intermediate and regional wells signifies samples will be collected annually until four sets of nitrogen isotope data have been collected.

ⁱ — = This analytical suite is not scheduled to be collected for this type of water at locations assigned to this area-specific monitoring group. Some locations are assigned analytical suites or frequencies that differ from those shown in this table, for site-specific reasons as described in the text for this monitoring group, and as summarized in this table.

Table D-8.5-1

Analytes Detected Two or More Times above One-Half Standard in the General Surveillance Monitoring Group: Pajarito Canyon

Analytical Suite	Analyte Exceeding One-Half Standard at Least Twice at the Same Location in This Monitoring Group	Base-Flow Locations						Springs									
		Pajarito 0.5 mi above SR-501 (PBF-B)	Pajarito above Two Mile (E243)	Pajarito below confluence of South and North Anchor East Basin (PBF-1)	Pajarito Below TA-18 (PBF-5)	Two Mile above Pajarito (E244)	Two Mile Canyon below TA-59 (PBF-2)	Anderson Spring	Bulldog Spring	Charlie's Spring	Homestead Spring	Kieling Spring	PC Spring	Stammer Spring	TA-18 Spring	Threemile Spring	TW-1.72 Spring
Dioxins/Furans	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Inorganics	Chloride	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Inorganics	Total Dissolved Solids	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
HEXP	RDX	—	—	—	—	—	—	—	☐	—	—	—	—	—	—	—	—
Metals	Aluminum	☐	☐	☐	—	☐	☐	●	●	●	☐	☐	—	☐	—	—	☐
Metals	Antimony	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	☐
Metals	Barium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Metals	Beryllium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Metals	Iron	—	—	—	—	—	—	☐	☐	☐	☐	☐	●	☐	☐	—	☐
Metals	Copper	—	—	—	—	—	●	—	—	—	—	—	—	—	—	—	—
Metals	Lead	☐	—	☐	—	—	—	—	—	—	—	—	—	—	—	—	●
Metals	Manganese	—	—	—	—	—	—	—	—	—	—	—	—	—	●	—	—
Metals	Thallium	☐	—	☐	—	—	☐	—	—	—	—	—	—	—	—	—	—
PCBs	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Pesticides	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Radionuclides	Gross alpha ^a	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
SVOC	Dioxane[1,4-]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
VOC	Dichloroethene[1,1-]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
VOC	Trichloroethane[1,1,1-]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Table D-8.5-1 (continued)

Analytical Suite	Analyte Exceeding One-Half Standard at Least Twice at the Same Location in This Monitoring Group	Alluvial Wells																	
		18-BG-1	18-BG-4	18-MW-8	18-MW-9	18-MW-11	18-MW-18	3MAO-2	CDBO-6	CDBO-7	PCAO-5	PCAO-7a	PCAO-7b2	PCAO-7c	PCAO-8	PCAO-9	PCO-2	PCO-3	TMO-1
Dioxins/Furans	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Inorganics	Chloride	—	—	—	—	—	☐	—	—	—	—	●	☐	—	●	—	●	☐	—
General Inorganics	Total Dissolved Solids	—	—	—	—	—	●	—	—	—	—	—	☐	—	●	—	—	●	—
HEXP	RDX	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Metals	Aluminum	●	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Metals	Antimony	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Metals	Barium	—	—	—	—	—	—	—	—	—	●	—	☐	—	—	—	—	—	—
Metals	Beryllium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Metals	Copper	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Metals	Iron	☐	—	—	—	—	—	—	—	—	☐	—	—	—	—	—	—	—	—
Metals	Lead	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Metals	Manganese	—	—	—	—	—	—	—	—	—	☐	—	—	—	—	—	—	☐	—
Metals	Thallium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
PCBs	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Pesticides	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Radionuclides	Gross alpha ^a	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
SVOC	Dioxane[1,4-]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
VOC	Dichloroethene[1,1-]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
VOC	Trichloroethane[1,1,1-]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Table D-8.5-1 (continued)

Analytical Suite	Analyte Exceeding One-Half Standard at Least Twice at the Same Location in This Monitoring Group	Intermediate Wells					Regional Wells							
		03-B-9	03-B-10	03-B-13	PCI-2	R-19 Screen 1	R-17 Screen 1	R-17 Screen 2	R-19 Screen 2	R-19 Screen 3	R-19 Screen 4	R-19 Screen 5 ^a	R-19 Screen 6 ^a	R-19 Screen 7 ^a
Dioxins/Furans	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Inorganics	Chloride	—	■	■	—	—	—	—	—	—	—	—	—	—
General Inorganics	Total Dissolved Solids	—	■	■	—	—	—	—	—	—	—	—	—	—
HEXP	RDX	—	—	—	—	—	—	—	—	—	—	—	—	—
Metals	Aluminum	—	■	■	—	—	—	—	—	—	—	—	—	—
Metals	Antimony	—	—	—	—	—	—	—	—	—	—	—	—	—
Metals	Barium	—	—	—	—	—	—	—	—	—	—	—	—	—
Metals	Beryllium	—	—	●	—	—	—	—	—	—	—	—	—	—
Metals	Copper	—	—	—	—	—	—	—	—	—	—	—	—	—
Metals	Iron	—	■	■	—	—	—	—	—	—	—	—	—	—
Metals	Lead	—	■	■	—	—	—	—	—	—	—	—	—	—
Metals	Manganese	■	—	■	—	—	—	—	—	—	—	—	—	—
Metals	Thallium	—	—	—	—	—	—	—	—	—	—	—	—	—
PCBs	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Pesticides	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Radionuclides	Gross alpha ^b	●	—	—	—	—	—	—	—	—	—	—	—	—
SVOC	Dioxane[1,4-]	—	■	■	—	—	—	—	—	—	—	—	—	—
VOC	Dichloroethene[1,1-]	—	■	■	—	—	—	—	—	—	—	—	—	—
VOC	Trichloroethane[1,1,1-]	■	■	■	—	—	—	—	—	—	—	—	—	—

Source: Tables B1-3 and B1-4 in Attachment B-1.

Notes: ● = Detected ≥ one-half standard more than once; ■ = detected at least once above standard; — = not detected above one-half standard more than once at this location, or there is no applicable standard. The term “standard” refers to the lowest applicable regulatory standard or other screening level.

^a Analytical data from R-19 screens 5, 6 and 7 may not be representative of in-situ water quality because of residual effects of drilling (Appendix F).

^b Tables B1-3 and B1-4 in Attachment B-1 use the EPA MCL of 15 pCi/L for adjusted gross alpha as the screening level for gross alpha activities in water samples. This approach is conservative insofar as the EPA MCL for adjusted gross alpha excludes alpha-particle activity from radon and uranium. Data in Tables B1-3 and B1-4 have not been adjusted to subtract contributions from radon or uranium.

Table D-8.5-2
Analytical Suites and Frequencies for General Surveillance Monitoring in Pajarito Canyon

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
Base flow	2011	A	A	A	T	T	A	T	A	—	—	A	A	—	Retained annual frequency for HEXP because high-explosive compounds are COPCs for this watershed. Added triennial sampling for additional organic suites as requested by NMED (2011, 201467).
	2010	A	A	A	—	—	A	—	A	—	—	A	A	—	No change
Springs	2011	A	A	A	T	T	A	T	A	—	A	A	A	—	Retained annual frequency for HEXP suite because high-explosive compounds are COPCs for this watershed. Added triennial sampling for additional organic suites as requested by NMED (2011, 201467).
	2010	A	A	A	—	—	A	—	A	—	A	A	A	(A)	No change
Alluvial	2011	A	A	A	T	T	A	T	A	—	—	A	A	—	Retained annual frequency for HEXP because high-explosive compounds are COPCs for this watershed. Added triennial sampling for additional organic suites as requested by NMED (2011, 201467). Note: Documentation for alluvial wells in Cañada del Buey is moved to Mortandad Canyon (section D-8.4) in which they are physically located.
	2010	A	A	A	—	—	A	—	A	—	A	A	A	—	No change. Alluvial wells in Cañada del Buey reassigned to Pajarito Canyon sampling for logistical sampling purposes.

Table D-8.5-2 (continued)

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
Intermediate	2011	A	A	A	T	T	A	T	A	—	A	A	A	—	Reduced sampling to annual for key analytical suites, consistent with annual sampling frequency at most other general surveillance locations. Added annual sampling for SVOCs because of the presence of 1,4-dioxane in perched-intermediate wells higher up in this watershed (at TA-03) and to complement annual data for VOCs. Added triennial sampling for additional organic suites as requested by NMED (2011, 201467).
	2010	S	S	—	—	—	S	—	A	—	S	S	S	(A)	Several intermediate wells in this watershed have been reassigned to one of the area-specific monitoring groups for which suites and frequencies have been tailored to meet each group's monitoring objectives. For intermediate wells that remain in the general surveillance category, annual frequency is retained for the radionuclide and stable isotope suites, and semiannual frequencies are specified for the remaining suites. Additional suites or increased frequencies are assigned on a site-specific basis as appropriate.
Regional	2011	A	A	A	T	T	A	T	A	—	A	A	A	—	Reduced sampling to annual for key analytical suites, consistent with annual sampling frequency at most other general surveillance locations. Added annual sampling for SVOCs complement annual data for VOCs. Added triennial sampling for additional organic suites as requested by NMED (2011, 201467).
	2010	S	S	—	—	—	S	—	A	—	A	S	S	(A)	All but two regional wells in this watershed have been reassigned to one of the area-specific monitoring groups for which suites and frequencies have been tailored to meet each group's monitoring objectives. For the two regional wells that remain in the general surveillance category, annual frequencies are specified for tritium and radionuclides because of the history of nondetects and background levels for these analytes are these locations. Semiannual frequencies are specified for the remaining suites because these contaminants have been detected above background values or screening levels at other regional wells.

Table D-8.5-2 (continued)

Notes: Sampling suites and frequencies for last year's Interim Plan are shown in gray text in order to set this information apart from that for the current Interim Plan. Sampling frequency: Q = quarterly (4 times/yr); S = semiannual (2 times/yr); A = annual (1 time/yr); B = biennial (once every 2 yr); T= triennial (once every 3 yr). For simplicity, sample collection frequencies for analysis of suspended sediment concentrations and field parameters are not listed in this table. Field parameters are routinely collected for every sampling event at every type of location, and samples for suspended sediment concentrations are collected for every sampling event at base-flow stations and springs. Nonfiltered and filtered samples will be collected for general inorganics (excluding anions) and metals. Anions and perchlorate samples will be filtered. Samples collected for radionuclide analysis will be nonfiltered only for all water media. Organic and HEXP constituents are nonfiltered for all water media. Stable isotope samples for nitrogen isotopes are filtered; stable isotope samples for deuterium and oxygen isotopes are not filtered.

- ^a Metals analysis includes the 23 TAL metals (Ag, Al, As, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, Hg, K, Mg, Mn, Na, Ni, Pb, Sb, Se, Tl, V, Zn), plus boron, molybdenum, silicon dioxide, strontium, tin, and uranium.
- ^b VOC = Volatile organic compounds; SVOC = semivolatile organic compounds.
- ^c PCB = Polychlorinated biphenyl (compound).
- ^d The analytical suite of explosive compounds (HEXP) includes the Consent Order list of the normal SW-846:8330 analytes plus PETN; TATB; 3,5-dinitroaniline; TOCP; 2,4-diamino-6-nitrotoluene; and 2,6-diamino-4-nitrotoluene.
- ^e The radionuclide suite includes gross alpha, gross beta, alpha spectroscopy, gamma spectroscopy, and strontium-90.
- ^f Tritium samples may be submitted for analysis by liquid scintillation if average activities are anticipated to exceed 200 pCi/L. Low-level tritium is analyzed using electrolytic enrichment or direct counting.
- ^g General inorganic analysis includes major anions (bromide, chloride, fluoride, sulfate), major cations (calcium, magnesium, sodium, potassium), nitrate plus nitrite (as N), TKN, ammonia, total phosphorus, TOC, TDS, alkalinity, specific conductivity, pH, and hardness.
- ^h Analysis for stable isotopes of nitrogen, hydrogen, and oxygen. The collection of samples for stable isotope analysis is considered a special sampling campaign that is outside the scope of the regulatory process. In general, these samples are collected semiannually from "new" wells (those which completed construction, rehabilitation, or conversion on or after October 1, 2010) until at least four sets of data have been collected. Any subsequent sampling for stable isotope analysis will be decided on the basis of site-specific conditions. In the 2010 Interim Plan, the entry "(A)" for intermediate and regional wells signifies samples will be collected annually until four sets of nitrogen isotope data have been collected.
- ⁱ — = This analytical suite is not scheduled to be collected for this type of water at locations assigned to this area-specific monitoring group. Some locations are assigned analytical suites or frequencies that differ from those shown in this table, for site-specific reasons as described in the text for this monitoring group, and as summarized in Table D-8.5-3.

Table D-8.5-3
Sampling Frequencies and Analytical Suites Assigned to Locations in Pajarito Canyon

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
Base flow	2011	A	A	A	T	T	A	T	A	—	—	A	A	—	Rationale for suites and frequencies assigned to this monitoring group is provided in Table D-8.5-2.
	2010	A	A	A	—	—	A	—	A	—	—	A	A	—	No change. Watershed-specific suites and frequencies for 2010 Interim Plan.
Pajarito 0.5 mi above SR-501 (PBF-B)	2011	A	A	A	T	T	A	T	A	—	—	A	A	—	Changes reflect updated suites and frequencies for general surveillance at base-flow locations in this watershed.
	2010	A	A	A	—	—	A	—	A	—	—	A	A	—	No change. Assigned to watershed-specific suites and frequencies.
Pajarito above Two Mile (E243)	2011	A	A	A	T	T	A	T	A	—	—	A	A	—	Changes reflect updated suites and frequencies for general surveillance at base-flow locations in this watershed.
	2010	A	A	A	—	—	S	—	A	—	—	S	A	—	Remains assigned to suites and frequencies for general surveillance at base-flow locations in this watershed, augmented by semiannual sampling for HEXP. Increased frequency for general inorganics suite to the same as that for the HEXP suite to support interpretation of trends.
Pajarito below confluence of South and North Anchor East Basin (PBF-1)	2011	A	A	A	T	T	A	T	A	—	—	A	A	—	Changes reflect updated suites and frequencies for general surveillance at base-flow locations in this watershed.
	2010	A	A	A	—	—	S	—	A	—	—	S	A	—	Remains assigned to suites and frequencies for general surveillance at base-flow locations in this watershed, augmented by semiannual sampling for HEXP. Increased frequency for general inorganics suite to the same as that for the HEXP suite to support interpretation of trends.

Table D-8.5-3 (continued)

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
Pajarito below TA-18 (PBF-5)	2011	A	A	A	T	T	A	T	A	—	—	A	A	—	Changes reflect updated suites and frequencies for general surveillance at base-flow locations in this watershed.
	2010	A	A	A	—	—	S	—	A	—	—	S	A	—	Remains assigned to suites and frequencies for general surveillance at base-flow locations in this watershed, augmented by semiannual sampling for HEXP. Increased frequency for general inorganics suite to the same as that for the HEXP suite to support interpretation of trends.
Two Mile above Pajarito (E244)	2011	A	A	A	T	T	A	T	A	—	—	A	A	—	Changes reflect updated suites and frequencies for general surveillance at base-flow locations in this watershed.
	2010	A	A	A	—	—	A	—	A	—	—	A	A	—	No change. Assigned to watershed-specific suites and frequencies.
Two Mile Canyon below TA-59 (PBF-2)	2011	A	A	A	T	T	A	T	A	—	—	A	A	—	Changes reflect updated suites and frequencies for general surveillance at base-flow locations in this watershed.
	2010	A	A	A	—	—	A	—	A	—	—	A	A	—	No change. Assigned to watershed-specific suites and frequencies.
Springs	2011	A	A	A	T	T	A	T	A	—	A	A	A	—	Rationale for suites and frequencies assigned to this monitoring group is provided in Table D-8.5-2.
	2010	A	A	A	—	—	A	—	A	—	A	A	A	(A)	No change. Watershed-specific suites and frequencies for 2010 Interim Plan.
Anderson Spring	2011	A	A	A	T	T	A	T	A	—	A	A	A	—	Changes reflect updated suites and frequencies for general surveillance at springs in this watershed.
	2010	A	A	A	—	—	A	—	A	—	A	A	A	A	No change. Assigned to watershed-specific suites and frequencies.

Table D-8.5-3 (continued)

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
Bulldog Spring	2011	A	A	A	T	T	A	T	A	—	A	A	A	—	Changes reflect updated suites and frequencies for general surveillance at springs in this watershed.
	2010	A	A	A	—	—	S	—	A	—	A	S	A	A	Remains assigned to for general surveillance at springs in this watershed, augmented by semiannual sampling for HEXP. Increased frequency for general inorganics suite to the same as that for the HEXP suite to support interpretation of trends.
Charlie's Spring	2011	A	A	A	T	T	A	T	A	—	A	A	A	—	Changes reflect updated suites and frequencies for general surveillance at springs in this watershed.
	2010	A	A	A	—	—	A	—	A	—	A	A	A	A	No change. Assigned to watershed-specific suites and frequencies.
Homestead Spring	2011	A	A	A	T	T	A	T	A	—	A	A	A	—	Changes reflect updated suites and frequencies for general surveillance at springs in this watershed.
	2010	A	A	A	—	—	A	—	A	—	A	A	A	A	No change. Assigned to watershed-specific suites and frequencies.
Kieling Spring	2011	A	A	A	T	T	A	T	A	—	A	A	A	—	Changes reflect updated suites and frequencies for general surveillance at springs in this watershed.
	2010	A	A	A	—	—	S	—	A	—	A	S	A	A	Remains assigned to suites and frequencies for general surveillance at springs in this watershed, augmented by semiannual sampling for HEXP. Increased frequency for general inorganics suite to the same as that for the HEXP suite to support interpretation of trends.
PC Spring	2011	A	A	A	T	T	A	T	A	—	A	A	A	—	Changes reflect updated suites and frequencies for general surveillance at springs in this watershed. Background location in GBIR, R4 (LANL 2010, 110535).
	2010	A	A	A	—	—	A	—	A	—	A	A	A	A	No change. Assigned to watershed-specific suites and frequencies. Background location approved for inclusion in GBIR, R4.

Table D-8.5-3 (continued)

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
Starmer Spring	2011	A	A	A	T	T	A	T	A	—	A	A	A	—	Changes reflect updated suites and frequencies for general surveillance at springs in this watershed.
	2010	A	A	A	—	—	A	—	A	—	A	A	A	A	No change. Assigned to watershed-specific suites and frequencies.
TA-18 Spring	2011	A	A	A	T	T	A	T	A	—	A	A	A	—	Changes reflect updated suites and frequencies for general surveillance at springs in this watershed.
	2010	A	A	A	—	—	A	—	A	—	A	A	A	A	No change. Assigned to watershed-specific suites and frequencies.
Threemile Spring	2011	A	A	A	T	T	A	T	A	—	A	A	A	—	Changes reflect updated suites and frequencies for general surveillance at springs in this watershed.
	2010	A	A	A	—	—	A	—	A	—	A	A	A	A	No change. Assigned to watershed-specific suites and frequencies.
TW-1.72 Spring	2011	A	A	A	T	T	A	T	A	—	A	A	A	—	Changes reflect updated suites and frequencies for general surveillance at springs in this watershed.
	2010	A	A	A	—	—	A	—	A	—	A	A	A	A	No change. Assigned to watershed-specific suites and frequencies.
Alluvial	2011	A	A	A	T	T	A	T	A	—	—	A	A	—	Rationale for suites and frequencies assigned to this monitoring group is provided in Table D-8.5-2.
	2010	A	A	A	—	—	A	—	A	—	A	A	A	—	No change. Watershed-specific suites and frequencies for 2010 Interim Plan.
3MAO-2	2011	A	A	A	T	T	A	T	A	—	—	A	A	—	Changes reflect updated suites and frequencies for general surveillance at alluvial wells in this watershed.
	2010	S	S	A	—	—	A	—	A	—	A	S	A	—	Remains assigned to suites and frequencies for general surveillance at alluvial wells in this watershed, augmented by semiannual frequencies for metals, VOCs, and general inorganics because this location monitors baseline water quality relative to the TA-18 complex.

Table D-8.5-3 (continued)

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
18-BG-1	2011	A	A	A	T	T	A	T	A	—	—	A	A	—	Changes reflect updated suites and frequencies for general surveillance at alluvial wells in this watershed.
	2010	A	A	A	—	—	A	—	A	—	A	A	A	—	Remains assigned to suites for general surveillance at alluvial wells in this watershed. Reduced frequencies to annual for all suites, consistent with frequencies for general surveillance at other alluvial wells, to reflect maturity of conceptual model for this part of the watershed and the adequacy of the cumulative data set.
18-MW-8	2011	A	A	A	T	T	A	T	A	—	—	A	A	—	Changes reflect updated suites and frequencies for general surveillance at alluvial wells in this watershed.
	2010	A	A	A	—	—	A	—	A	—	A	A	A	—	No change. Assigned to watershed-specific suites and frequencies.
18-MW-9	2011	A	A	A	T	T	A	T	A	—	—	A	A	—	Changes reflect updated suites and frequencies for general surveillance at alluvial wells in this watershed.
	2010	A	A	A	—	—	A	—	A	—	A	A	A	—	No change. Assigned to watershed-specific suites and frequencies.
18-MW-11	2011	A	A	A	T	T	A	T	A	—	—	A	A	—	Changes reflect updated suites and frequencies for general surveillance at alluvial wells in this watershed.
	2010	A	A	A	—	—	A	—	A	—	A	A	A	—	No change. Assigned to watershed-specific suites and frequencies.
18-MW-18	2011	A	A	A	T	T	A	T	A	—	—	A	A	—	Changes reflect updated suites and frequencies for general surveillance at alluvial wells in this watershed.
	2010	A	A	A	—	—	A	—	A	—	A	A	A	—	No change. Assigned to watershed-specific suites and frequencies.

Table D-8.5-3 (continued)

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
CDBO-4 CDBO-5 CDBO-6	2011	—	—	—	—	—	—	—	—	—	—	—	—	—	Documentation moved to sampling table for Mortandad Canyon watershed, in which these wells are physically located.
CDBO-7 CDBO-8 CDBO-9	2010	—	—	—	—	—	—	—	—	—	—	—	—	—	Documentation moved to sampling table for Pajarito Canyon watershed. Although located in the Mortandad Canyon watershed, this well in the Cañada del Buey subwatershed is treated as part of the Pajarito Canyon watershed for logistical sampling purposes.
PCAO-5	2011	A	A	A	T	T	A	T	A	—	—	A	A	—	Changes reflect updated suites and frequencies for general surveillance at alluvial wells in this watershed.
	2010	S	A	A	—	—	A	—	A	—	A	S	A	A	Characterization sampling completed. Changes reflect assignment to suites and frequencies for general surveillance at alluvial wells in this watershed. Retained semiannual frequencies for metals and general inorganics to collect additional baseline data for these suites.
PCAO-6	2011	A	A	A	T	T	A	T	A	—	—	A	A	—	Changes reflect updated suites and frequencies for general surveillance at alluvial wells in this watershed. Note: This well only shows water in the summer.
	2010	S	A	A	—	—	A	—	A	—	A	S	A	A	Characterization sampling completed. Changes reflect assignment to suites and frequencies for general surveillance at alluvial wells in this watershed. Retained semiannual frequencies for metals and general inorganics to collect additional baseline data for these suites.

Table D-8.5-3 (continued)

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
PCAO-7a	2011	A	A	A	T	T	A	T	A	—	—	A	A	—	Changes reflect updated suites and frequencies for general surveillance at alluvial wells in this watershed.
	2010	S	A	A	—	—	A	—	A	—	A	S	A	A	Characterization sampling completed. Changes reflect assignment to suites and frequencies for general surveillance at alluvial wells in this watershed. Retained semiannual frequencies for metals and general inorganics to collect additional baseline data for these suites.
PCAO-7b1	2011	—	—	—	—	—	—	—	—	—	—	—	—	—	Removed from Interim Plan. Well bailed dry during drilling, and water has not risen above sump since then (Koch and Schmeer 2011, 201566).
	2010	—	—	—	—	—	—	—	—	—	—	—	—	—	No change. Continue to monitor for water-level only. Well bailed dry during drilling, and water has not risen above sump since then.
PCAO-7b2	2011	A	A	A	T	T	A	T	A	—	—	A	A	—	Changes reflect updated suites and frequencies for general surveillance at alluvial wells in this watershed.
	2010	S	A	A	—	—	A	—	A	—	A	S	A	A	Characterization sampling completed. Changes reflect assignment to suites and frequencies for general surveillance at alluvial wells in this watershed. Retained semiannual frequencies for metals and general inorganics to collect additional baseline data for these suites.

Table D-8.5-3 (continued)

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
PCAO-7c	2011	A	A	A	T	T	A	T	A	—	—	A	A	—	Changes reflect updated suites and frequencies for general surveillance at alluvial wells in this watershed.
	2010	S	A	A	—	—	A	—	A	—	A	S	A	A	Characterization sampling completed. Changes reflect assignment to suites and frequencies for general surveillance at alluvial wells in this watershed. Retained semiannual frequencies for metals and general inorganics to collect additional baseline data for these suites.
PCAO-8	2011	A	A	A	T	T	A	T	A	—	—	A	A	—	Changes reflect updated suites and frequencies for general surveillance at alluvial wells in this watershed.
	2010	S	A	A	—	—	A	—	A	—	A	S	A	A	Characterization sampling completed. Changes reflect assignment to suites and frequencies for general surveillance at alluvial wells in this watershed. Retained semiannual frequencies for metals and general inorganics to collect additional baseline data for these suites.
PCAO-9	2011	A	A	A	T	T	A	T	A	—	—	A	A	—	Changes reflect updated suites and frequencies for general surveillance at alluvial wells in this watershed.
	2010	S	A	A	—	—	A	—	A	—	A	S	A	A	Characterization sampling completed. Changes reflect assignment to suites and frequencies for general surveillance at alluvial wells in this watershed. Retained semiannual frequencies for metals and general inorganics to collect additional baseline data for these suites.

Table D-8.5-3 (continued)

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
PCO-2	2011	A	A	A	T	T	A	T	A	—	—	A	A	—	Changes reflect updated suites and frequencies for general surveillance at alluvial wells in this watershed.
	2010	S	A	A	—	—	A	—	A	—	A	S	A	A	Characterization sampling completed. Changes reflect assignment to suites and frequencies for general surveillance at alluvial wells in this watershed. Retained semiannual frequencies for metals and general inorganics to collect additional baseline data for these suites.
PCO-3	2011	—	—	—	—	—	—	—	—	—	—	—	—	—	No change. Water-level monitoring only (Table 1.10-1).
	2010	—	—	—	—	—	—	—	—	—	—	—	—	—	No change. Water-level monitoring only.
TMO-1	2011	A	A	A	T	T	A	T	A	—	—	A	A	—	Changes reflect updated suites and frequencies for general surveillance at alluvial wells in this watershed.
	2010	S	A	A	—	—	A	—	A	—	A	S	A	A	Characterization sampling completed. Changes reflect assignment to suites and frequencies for general surveillance at alluvial wells in this watershed. Retained semiannual frequencies for metals and general inorganics to collect additional baseline data for these suites.
Intermediate	2011	A	A	A	T	T	A	T	A	—	A	A	A	—	Rationale for suites and frequencies assigned to this monitoring group is provided in Table D-8.5-2.
	2010	S	S	—	—	—	S	—	A	—	S	S	S	(A)	Rationale for changes to suites and frequencies for general surveillance locations in this subwatershed is provided in Table D-1.0-2.

Table D-8.5-3 (continued)

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
03-B-13	2011	S	S	S	T	T	A	T	A	A	—	S	A	—	Retained higher frequencies for metals, VOCs, SVOCs, and general inorganics (compared with updated frequencies in Table D-8.5-2) in support of the Twomile work plan. Reduction from quarterly to semiannual justified because water-quality at this well is well characterized. Other changes reflect updated suites and frequencies for general surveillance at deep wells in this watershed.
	2010	Q	Q	Q	—	—	Q	—	—	—	Q	Q	Q	A	No change (other than addition of stable isotope suite). Continued quarterly monitoring of assigned analytical suites as requested by NMED to provide data in support of investigation at Solid Waste Management Unit 03-010(a).
PCI-2	2011	A	A	A	T	T	T	T	A	—	A	A	A	—	Moved from MDA C monitoring group to general surveillance monitoring group. Triennial frequency for HEXP because of history of nondetects. Other changes reflect updated suites and frequencies for general surveillance at deep wells in this watershed. Background location in GBIR, R4.
	2010	S	Q	A	—	—	T	—	A	—	S	Q	A	A	Completed characterization sampling. Assigned to suites and frequencies for new MDA C monitoring group. Background location approved for inclusion in GBIR, R4.
R-19 screen 1	2011	—	—	—	—	—	—	—	—	—	—	—	—	—	No change. Historically dry. Continue to monitor for water-level only (Table 1.10-1).
	2010	—	—	—	—	—	—	—	—	—	—	—	—	—	No change. Continue to monitor for water-level only.

Table D-8.5-3 (continued)

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
R-19 screen 2	2011	A	A	—	—	—	A	—	A	—	A	A	A	—	Changes to frequencies reflect updated frequencies for general surveillance at deep wells in this watershed. Assigned limited analytical suites because of concerns about the reliability and representativeness of water-quality data obtained from wells equipped with Westbay sampling systems (Appendix F).
	2010	S	S	—	—	—	S	—	A	—	S	S	S	A	Changes reflect updated suites and frequencies for general surveillance at regional wells in this watershed.
Regional	2011	A	A	A	T	T	A	T	A	—	A	A	A	—	Rationale for suites and frequencies assigned to this monitoring group is provided in Table D-8.5-2.
	2010	S	S	—	—	—	S	—	A	—	A	S	S	(A)	Rationale for changes to suites and frequencies for general surveillance locations in this subwatershed is provided in Table D-1.0-2.
R-17 screen 1	2011	A	A	A	T	T	A	T	A	—	A	A	A	—	Moved from MDA C monitoring group to general surveillance monitoring group. Changes reflect updated suites and frequencies for general surveillance at deep wells in this watershed. Background location in GBIR, R4.
	2010	S	Q	A	—	—	S	—	A	—	S	Q	A	A	Reassigned to suites and frequencies for new MDA C monitoring group. Background location approved for inclusion in GBIR, R4.

Table D-8.5-3 (continued)

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
R-17 screen 2	2011	A	A	A	T	T	A	T	A	—	A	A	A	—	Moved from MDA C monitoring group to general surveillance monitoring group. Changes reflect updated suites and frequencies for general surveillance at deep wells in this watershed. Background location in GBIR, R4.
	2010	S	Q	A	—	—	S	—	A	—	S	Q	A	A	Reassigned to suites and frequencies for new MDA C monitoring group. Background location approved for inclusion in GBIR, R4.
R-19 screen 3	2011	A	A	—	—	—	A	—	A	—	A	A	A	—	Changes to frequencies reflect updated frequencies for general surveillance at deep wells in this watershed. Assigned limited analytical suites because of concerns about the reliability and representativeness of water-quality data obtained from wells equipped with Westbay sampling systems (Appendix F).
	2010	Q	Q	—	—	—	S	—	A	—	A	Q	Q	A	No change. Assigned to watershed-specific suites and frequencies.
R-19 screen 4	2011	A	A	—	—	—	A	—	A	—	A	A	A	—	Changes to frequencies reflect updated frequencies for general surveillance at deep wells in this watershed. Assigned limited analytical suites because of concerns about the reliability and representativeness of water-quality data obtained from wells equipped with Westbay sampling systems (Appendix F).
	2010	Q	Q	—	—	—	S	—	A	—	A	Q	Q	A	No change. Assigned to watershed-specific suites and frequencies.

Table D-8.5-3 (continued)

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
R-19 screen 5 R-19 screen 6 R-19 screen 7	2011	—	—	—	—	—	—	—	—	—	—	—	—	—	Removed from sampling under the Interim Plan because of persistent geochemical impacts from drilling (Appendix F). Monitor water-levels only (Table 1.10-1).
	2010	—	—	—	—	—	—	—	—	—	—	A ^{IND}	—	—	Well screens continue to show residual effects from drilling and remain assigned to indicator suite.

Notes: Watershed-specific and monitoring group-specific sampling suites and frequencies for individual water types are shown in shaded rows in order to set this information apart from that for the individual sampling locations that follow these rows. Sampling suites and frequencies for last year's Interim Plan are shown in gray text in order to set this information apart from that for the current Interim Plan. Sampling frequency: Q = quarterly (4 times/yr); S = semiannual (2 times/yr); A = annual (1 time/yr); B = biennial (once every 2 yr); T = triennial (once every 3 yr). For simplicity, sample collection frequencies for analysis of suspended sediment concentrations and field parameters are not listed in this table. Field parameters are routinely collected for every sampling event at every type of location, and samples for suspended sediment concentrations are collected for every sampling event at base-flow stations and springs.

Nonfiltered and filtered samples will be collected for general inorganics (excluding anions) and metals. Anions and perchlorate samples will be filtered. Samples collected for radionuclide analysis will be nonfiltered only for all water media. Organic and HEXP constituents are nonfiltered for all water media. Stable isotope samples for nitrogen isotopes are filtered; stable isotope samples for deuterium and oxygen isotopes are not filtered.

^a Metals analysis includes the 23 TAL metals (Ag, Al, As, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, Hg, K, Mg, Mn, Na, Ni, Pb, Sb, Se, Ti, V, Zn), plus boron, molybdenum, silicon dioxide, strontium, tin, and uranium.

^b VOC = Volatile organic compounds; SVOC = semivolatiles organic compounds.

^c PCB = Polychlorinated biphenyl (compound).

^d The analytical suite of explosive compounds (HEXP) includes the Consent Order list of the normal SW-846:8330 analytes plus PETN; TATB; 3,5-dinitroaniline; TOCP; 2,4-diamino-6-nitrotoluene; and 2,6-diamino-4-nitrotoluene.

^e The radionuclide suite includes gross alpha, gross beta, alpha spectroscopy, gamma spectroscopy, and strontium-90.

^f Tritium samples may be submitted for analysis by liquid scintillation if average activities are anticipated to exceed 200 pCi/L. Low-level tritium is analyzed using electrolytic enrichment or direct counting.

^g General inorganic analysis includes major anions (bromide, chloride, fluoride, sulfate), major cations (calcium, magnesium, sodium, potassium), nitrate plus nitrite (as N), TKN, ammonia, total phosphorus, TOC, TDS, alkalinity, specific conductivity, pH, and hardness. IND indicates "indicator suite," which includes major anions and cations, nitrate (as N), metals, alkalinity, pH, TOC, and, as needed, sulfide, ammonia, TKN, and perchlorate. Indicator suite samples are submitted to the on-site EES-14 analytical laboratory, with the exception of samples for TKN and perchlorate analysis, which are submitted to an off-site analytical facility.

^h Analysis for stable isotopes of nitrogen, hydrogen, and oxygen. The collection of samples for stable isotope analysis is considered a special sampling campaign that is outside the scope of the regulatory process. In general, these samples are collected semiannually from "new" wells (those which completed construction, rehabilitation, or conversion on or after October 1, 2010) until at least four sets of data have been collected. Any subsequent sampling for stable isotope analysis will be decided on the basis of site-specific conditions. In the 2010 Interim Plan, the entry "(A)" for intermediate and regional wells signifies samples will be collected annually until four sets of nitrogen isotope data have been collected.

ⁱ — = This analytical suite is not scheduled to be collected for this type of water at locations assigned to this area-specific monitoring group. Some locations are assigned analytical suites or frequencies that differ from those shown in this table, for site-specific reasons as described in the text for this monitoring group, and as summarized in this table.

Table D-8.6-1
Analytes Detected Two or More Times above One-Half Standard
in the General Surveillance Monitoring Group: Water Canyon/Cañon de Valle

Analytical Suite	Analyte Exceeding One-Half Standard at Least Twice at the Same Location in This Monitoring Group	Base-Flow Locations			Springs				Alluvial Wells		
		Base flow station between E252 and Water at Beta	Water Above SR-501 (E252)	Water at Beta	CdV-5.0 Spring	CdV-5.29 Spring	WA-625 spring	Water Canyon Gallery	WCO-1r	WCO-2	WCO-3r
Dioxins/Furans	—	—	—	—	—	—	—	—	—	—	—
General Inorganics	—	—	—	—	—	—	—	—	—	—	—
HEXP	—	—	—	—	—	—	—	—	—	—	—
Metals	Aluminum	■	■	■	—	—	—	—	—	—	—
Metals	Iron	—	—	—	—	—	—	■	—	—	—
Metals	Thallium	■	●	■	—	—	—	—	—	—	—
PCBs	—	—	—	—	—	—	—	—	—	—	—
Pesticides	—	—	—	—	—	—	—	—	—	—	—
Radionuclides	—	—	—	—	—	—	—	—	—	—	—
SVOC	—	—	—	—	—	—	—	—	—	—	—
VOC	—	—	—	—	—	—	—	—	—	—	—

Source: Tables B1-3 and B1-4 in Attachment B-1.

Notes: ● = Detected $\geq$ one-half standard more than once; ■ = detected at least once above standard; — = not detected above one-half standard more than once at this location, or there is no applicable standard. The term "standard" refers to the lowest applicable regulatory standard or other screening level.

Table D-8.6-2
Analytical Suites and Frequencies for General Surveillance Monitoring in Water Canyon/Cañon de Valle

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^g	Gen Inorganics ^g	Perchlorate		
Base flow	2011	A	A	A	T	T	A ^{RDX-DP}	T	A	— ⁱ	—	A	A	—	Reduced sampling to annual for key analytical suites, consistent with annual sampling frequency at most other general surveillance locations. Added triennial sampling for other organics as requested by NMED (2011, 201467).
	2010	S	S	A	—	—	S ^{RDX-DP}	—	A	—	—	A	A	—	No change
Springs	2011	A	A	A	T	T	A ^{RDX-DP}	T	A	—	A	A	A	—	Reduced sampling to annual for key analytical suites, consistent with annual sampling frequency at most other general surveillance locations. Added triennial sampling for other organics as requested by NMED (2011, 201467).
	2010	S	S	A	—	—	S ^{RDX-DP}	—	A	—	A	A	A	A	No change
Alluvial	2011	A	A	A	T	T	A ^{RDX-DP}	T	A	—	—	A	A	—	Reduced sampling to annual for key analytical suites, consistent with annual sampling frequency at most other general surveillance locations. Suspended tritium sampling. Added triennial sampling for other organics as requested by NMED (2011, 201467).
	2010	S	S	A	—	—	S ^{RDX-DP}	—	A	—	A	A	A	—	No change
Intermediate	2011	—	—	—	—	—	—	—	—	—	—	—	—	—	Not applicable. No change
	2010	—	—	—	—	—	—	—	—	—	—	—	—	—	Not applicable. All intermediate wells in this watershed are presently assigned to the TA-16-260 deep groundwater or MDA AB monitoring groups.
Regional	2011	—	—	—	—	—	—	—	—	—	—	—	—	—	Not applicable. No change
	2010	—	—	—	—	—	—	—	—	—	—	—	—	—	Not applicable. All regional wells in this watershed are presently assigned to the TA-16-260 deep groundwater or MDA AB monitoring groups.

Table D-8.6-2 (continued)

Notes: Sampling suites and frequencies for last year's Interim Plan are shown in gray text in order to set this information apart from that for the current Interim Plan. Sampling frequency: Q = quarterly (4 times/yr); S = semiannual (2 times/yr); A = annual (1 time/yr); B = biennial (once every 2 yr); T= triennial (once every 3 yr). For simplicity, sample collection frequencies for analysis of suspended sediment concentrations and field parameters are not listed in this table. Field parameters are routinely collected for every sampling event at every type of location, and samples for suspended sediment concentrations are collected for every sampling event at base-flow stations and springs. Nonfiltered and filtered samples will be collected for general inorganics (excluding anions) and metals. Anions and perchlorate samples will be filtered. Samples collected for radionuclide analysis will be nonfiltered only for all water media. Organic and HEXP constituents are nonfiltered for all water media. Stable isotope samples for nitrogen isotopes are filtered; stable isotope samples for deuterium and oxygen isotopes are not filtered.

- ^a Metals analysis includes the 23 TAL metals (Ag, Al, As, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, Hg, K, Mg, Mn, Na, Ni, Pb, Sb, Se, Tl, V, Zn), plus boron, molybdenum, silicon dioxide, strontium, tin, and uranium.
- ^b VOC = Volatile organic compounds; SVOC = semivolatile organic compounds.
- ^c PCB = Polychlorinated biphenyl (compound).
- ^d The analytical suite of explosive compounds (HEXP) includes the Consent Order list of the normal SW-846:8330 analytes plus PETN; TATB; 3,5-dinitroaniline; TOCP; 2,4-diamino-6-nitrotoluene; and 2,6-diamino-4-nitrotoluene. The superscript RDX-DP indicates the analysis of RDX-degradation products MNX; DNx; and TNX.
- ^e The radionuclide suite includes gross alpha, gross beta, alpha spectroscopy, gamma spectroscopy, and strontium-90.
- ^f Tritium samples may be submitted for analysis by liquid scintillation if average activities are anticipated to exceed 200 pCi/L. Low-level tritium is analyzed using electrolytic enrichment or direct counting.
- ^g General inorganic analysis includes major anions (bromide, chloride, fluoride, sulfate), major cations (calcium, magnesium, sodium, potassium), nitrate plus nitrite (as N), TKN, ammonia, total phosphorus, TOC, TDS, alkalinity, specific conductivity, pH, and hardness.
- ^h Analysis for stable isotopes of nitrogen, hydrogen, and oxygen. The collection of samples for stable isotope analysis is considered a special sampling campaign that is outside the scope of the regulatory process. In general, these samples are collected semiannually from "new" wells (those which completed construction, rehabilitation, or conversion on or after October 1, 2010) until at least four sets of data have been collected. Any subsequent sampling for stable isotope analysis will be decided on the basis of site-specific conditions.
- ⁱ — = This analytical suite is not scheduled to be collected for this type of water at locations assigned to this area-specific monitoring group. Some locations are assigned analytical suites or frequencies that differ from those shown in this table, for site-specific reasons as described in the text for this monitoring group, and as summarized in Table D-8.6-3.

Table D-8.6-3
Sampling Frequencies and Analytical Suites Assigned to Locations in Water Canyon/Cañon de Valle

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
Base flow	2011	A	A	A	T	T	A ^{RDX-DP}	T	A	—	—	A	A	—	Rationale for suites and frequencies assigned to this monitoring group is provided in Table D-8.6-2.
	2010	S	S	A	—	—	S ^{RDX-DP}	—	A	—	—	A	A	—	No change. Watershed-specific suites and frequencies for 2010 Interim Plan.
Between E252 and Water at Beta	2011	A	A	A	T	T	A ^{RDX-DP}	T	A	—	—	A	A	—	Changes reflect updated suites and frequencies for general surveillance at base-flow locations in this portion of the watershed.
	2010	S	S	A	—	—	S ^{RDX-DP}	—	A	—	—	A	A	—	No change. Assigned to watershed-specific suites and frequencies.
Water above SR-501 (E252)	2011	A	A	A	T	T	A ^{RDX-DP}	T	A	—	—	A	A	—	Changes reflect updated suites and frequencies for general surveillance at base-flow locations in this portion of the watershed.
	2010	S	S	A	—	—	S ^{RDX-DP}	—	A	—	—	A	A	—	No change. Assigned to watershed-specific suites and frequencies.
Water at Beta	2011	A	A	A	T	T	A ^{RDX-DP}	T	A	—	—	A	A	—	Changes reflect updated suites and frequencies for general surveillance at base-flow locations in this portion of the watershed.
	2010	S	S	A	—	—	S ^{RDX-DP}	—	A	—	—	A	A	—	No change. Assigned to watershed-specific suites and frequencies.
Springs	2011	A	A	A	T	T	A ^{RDX-DP}	T	A	—	A	A	A	—	Rationale for suites and frequencies assigned to this monitoring group is provided in Table D-8.6-2.
	2010	S	S	A	—	—	S ^{RDX-DP}	—	A	—	A	A	A	A	No change. Watershed-specific suites and frequencies for 2010 Interim Plan.

Table D-8.6-3 (continued)

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
CdV-5.0 Spring	2011	A	A	A	T	T	A ^{RDX-DP}	T	A	—	A	A	A	—	Changes reflect updated suites and frequencies for general surveillance at springs in this portion of the watershed. Background location in GBIR, R3 (LANL 2007, 095817) and GBIR, R4 (LANL 2010, 110535).
	2010	S	S	A	—	—	S ^{RDX-DP}	—	A	—	A	A	A	A	No change. Assigned to watershed-specific suites and frequencies. Background location in GBIR, R3 and approved for inclusion in GBIR, R4.
Water Canyon Gallery	2011	A	A	A	T	T	A ^{RDX-DP}	T	A	—	A	A	A	—	Changes reflect updated suites and frequencies for general surveillance at springs in this portion of the watershed. Background location in GBIR, R3 and GBIR, R4.
	2010	S	S	A	—	—	S ^{RDX-DP}	—	A	—	A	A	A	A	No change. Assigned to watershed-specific suites and frequencies. Background location in GBIR, R3 and approved for inclusion in GBIR, R4.
Alluvial	2011	A	A	A	T	T	A ^{RDX-DP}	T	A	—	—	A	A	—	Rationale for suites and frequencies assigned to this monitoring group is provided in Table D-8.6-2.
	2010	S	S	A	—	—	S ^{RDX-DP}	—	A	—	A	A	A	—	No change. Watershed-specific suites and frequencies for 2010 Interim Plan.
WCO-1r	2011	A	A	A	T	T	A ^{RDX-DP}	T	A	—	—	A	A	—	Completed characterization sampling. Assigned suites and frequencies for general surveillance at alluvial wells in this portion of the watershed.
	2010	Q	Q	Q	Q	Q	Q ^{RDX-DP}	—	Q	—	Q	Q	Q	S	Assigned to characterization suites and frequencies applicable to new alluvial wells assigned to general surveillance in this watershed.

Table D-8.6-3 (continued)

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
WCO-2	2011	A	A	A	T	T	A ^{RDX-DP}	T	A	—	—	A	A	—	Changes reflect updated suites and frequencies for general surveillance at alluvial wells in this portion of the watershed.
	2010	A	A	A	—	—	A ^{RDX-DP}	—	A	—	A	A	A	—	Reduced frequencies to annual for all suites because this well is only sampled in the spring; it is dry the rest of the year.
WCO-3r	2011	A	A	A	T	T	A ^{RDX-DP}	T	A	—	—	A	A	—	Completed characterization sampling. Assigned suites and frequencies for general surveillance at alluvial wells in this portion of the watershed.
	2010	Q	Q	Q	Q	Q	Q ^{RDX-DP}	—	Q	—	Q	Q	Q	S	Assigned to characterization suites and frequencies applicable to new alluvial wells assigned to general surveillance in this watershed.

Table D-8.6-3 (continued)

Notes: Watershed-specific and monitoring group-specific sampling suites and frequencies for individual water types are shown in shaded rows in order to set this information apart from that for the individual sampling locations that follow these rows. Sampling suites and frequencies for last year's Interim Plan are shown in gray text in order to set this information apart from that for the current Interim Plan. Sampling frequency: Q = quarterly (4 times/yr); S = semiannual (2 times/yr); A = annual (1 time/yr); B = biennial (once every 2 yr); T = triennial (once every 3 yr). For simplicity, sample collection frequencies for analysis of suspended sediment concentrations and field parameters are not listed in this table. Field parameters are routinely collected for every sampling event at every type of location, and samples for suspended sediment concentrations are collected for every sampling event at base-flow stations and springs.

Nonfiltered and filtered samples will be collected for general inorganics (excluding anions) and metals. Anions and perchlorate samples will be filtered. Samples collected for radionuclide analysis will be nonfiltered only for all water media. Organic and HEXP constituents are nonfiltered for all water media. Stable isotope samples for nitrogen isotopes are filtered; stable isotope samples for deuterium and oxygen isotopes are not filtered.

^a Metals analysis includes the 23 TAL metals (Ag, Al, As, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, Hg, K, Mg, Mn, Na, Ni, Pb, Sb, Se, Ti, V, Zn), plus boron, molybdenum, silicon dioxide, strontium, tin, and uranium.

^b VOC = Volatile organic compounds; SVOC = semivolatile organic compounds.

^c PCB = Polychlorinated biphenyl (compound).

^d The analytical suite of explosive compounds (HEXP) includes the Consent Order list of the normal SW-846:8330 analytes plus PETN; TATB; 3,5-dinitroaniline; TOCP; 2,4-diamino-6-nitrotoluene; and 2,6-diamino-4-nitrotoluene. The superscript RDX-DP indicates the analysis of RDX-degradation products MNX; DNX; and TNX.

^e The radionuclide suite includes gross alpha, gross beta, alpha spectroscopy, gamma spectroscopy, and strontium-90.

^f Tritium samples may be submitted for analysis by liquid scintillation if average activities are anticipated to exceed 200 pCi/L. Low-level tritium is analyzed using electrolytic enrichment or direct counting.

^g General inorganic analysis includes major anions (bromide, chloride, fluoride, sulfate), major cations (calcium, magnesium, sodium, potassium), nitrate plus nitrite (as N), TKN, ammonia, total phosphorus, TOC, TDS, alkalinity, specific conductivity, pH, and hardness.

^h Analysis for stable isotopes of nitrogen, hydrogen, and oxygen. The collection of samples for stable isotope analysis is considered a special sampling campaign that is outside the scope of the regulatory process. In general, these samples are collected semiannually from "new" wells (those which completed construction, rehabilitation, or conversion on or after October 1, 2010) until at least four sets of data have been collected. Any subsequent sampling for stable isotope analysis will be decided on the basis of site-specific conditions.

ⁱ — = This analytical suite is not scheduled to be collected for this type of water at locations assigned to this area-specific monitoring group. Some locations are assigned analytical suites or frequencies that differ from those shown in this table, for site-specific reasons as described in the text for this monitoring group, and as summarized in this table.

Table D-8.7-1
Analytes Detected Two or More Times above One-Half Standard
in the General Surveillance Monitoring Group: Ancho/Frijoles Canyons

Analytical Suite	Analyte Exceeding One- Half Standard at Least Twice at the Same Location in This Monitoring Group	Base- Flow Locations	Spring	Regional Wells			
		Rio de los Frijoles at Bandeiler (E350)	Barbara Spring	R-31 Screen 2*	R-31 Screen 3*	R-31 Screen 4	R-31 Screen 5
Dioxins/Furans	—	ND	ND	ND	ND	ND	ND
General Inorganics	—	—	—	—	—	—	—
HEXP	—	—	—	—	—	—	—
Metals	Iron	—	—	■	■	—	—
Metals	Manganese	—	—	■	■	—	—
PCBs	—	—	—	—	—	—	—
Pesticides	—	—	—	—	—	—	—
Radionuclides	—	—	—	—	—	—	—
SVOC	—	—	—	—	—	—	—
VOC	—	—	—	—	—	—	—

Source: Tables B1-3 and B1-4 in Attachment B-1

Notes: ● = Detected ≥ one-half standard more than once at any location in this monitoring group; ■ = detected at least once above standard; — = not detected above one-half standard more than once at this location, or there is no applicable standard; ND = no data for period of record included in Tables B1-3 and B1-4 of Attachment B-1. The term “standard” refers to the lowest applicable regulatory standard or other screening level.

* Analytical data from R-31 screens 2 and 3 may not be representative of in-situ conditions or reliable because of residual effects from drilling (Appendix F).

Table D-8.7-2
Analytical Suites and Frequencies for General Surveillance Monitoring in Ancho/Frijoles Canyon

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
Base flow (Ancho)	2011	—	—	—	—	—	—	—	—	—	—	—	—	—	No change
	2010	—	—	—	—	—	—	—	—	—	—	—	—	—	Reassigned to White Rock Canyon/Rio Grande sampling plan.
Base flow (Frijoles)	2011	A	T	T	T	T	T	T	A	—	—	A	A	—	Added triennial sampling for all organics as requested by NMED (2011, 201467).
	2010	A	—	—	—	—	—	—	A	—	—	A	A	—	Monitoring for VOCs and tritium eliminated from 2010 Interim Plan because of a history of nondetects for these constituents.
Spring (Frijoles)	2011	A	T	T	T	T	T	T	A	—	A	A	A	—	Added triennial sampling for all organics as requested by NMED (2011, 201467).
	2010	A	—	—	—	—	—	—	A	—	A	A	A	(A)	This subgroup was not defined explicitly in the 2010 Interim Plan. Suites and frequencies shown are those for Barbara Spring, an off-site background location and the only location in this subgroup. Assigned analytical suites for naturally-occurring constituents.
Intermediate (Ancho)	2011	—	—	—	—	—	—	—	—	—	—	—	—	—	No change. The only location in this subgroup, R-31 screen 1, is historically dry. Water level only (Table 1.10-1).
	2010	—	—	—	—	—	—	—	—	—	—	—	—	—	Water level only.
Regional (Ancho)	2011	A	A	T	T	T	A	T	A	—	A	A	A	—	Retained annual sampling for HEXP to monitor for high-explosive COPCs in Ancho Canyon. Added triennial sampling for other organics as requested by NMED (2011, 201467).
	2010	A	A	—	—	—	A	—	A	—	A	A	A	(A)	Separate monitoring group created for wells supporting MDA AB investigation. Frequency reduced to annual for remaining multiscreen well used for general surveillance because of the predominance of nondetects for contaminants.

Table D-8.7-2 (continued)

Notes: Sampling suites and frequencies for last year's Interim Plan are shown in gray text in order to set this information apart from that for the current Interim Plan. Sampling frequency: Q = quarterly (4 times/yr); S = semiannual (2 times/yr); A = annual (1 time/yr); B = biennial (once every 2 yr); T = triennial (once every 3 yr). For simplicity, sample collection frequencies for analysis of suspended sediment concentrations and field parameters are not listed in this table. Field parameters are routinely collected for every sampling event at every type of location, and samples for suspended sediment concentrations are collected for every sampling event at base-flow stations and springs. Nonfiltered and filtered samples will be collected for general inorganics (excluding anions) and metals. Anions and perchlorate samples will be filtered. Samples collected for radionuclide analysis will be nonfiltered only for all water media. Organic and HEXP constituents are nonfiltered for all water media. Stable isotope samples for nitrogen isotopes are filtered; stable isotope samples for deuterium and oxygen isotopes are not filtered.

^a Metals analysis includes the 23 TAL metals (Ag, Al, As, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, Hg, K, Mg, Mn, Na, Ni, Pb, Sb, Se, Tl, V, Zn), plus boron, molybdenum, silicon dioxide, strontium, tin, and uranium.

^b VOC = Volatile organic compounds; SVOC = semivolatile organic compounds.

^c PCB = Polychlorinated biphenyl (compound).

^d The analytical suite of explosive compounds (HEXP) includes the Consent Order list of the normal SW-846:8330 analytes plus PETN; TATB; 3,5-dinitroaniline; TOCP; 2,4-diamino-6-nitrotoluene; and 2,6-diamino-4-nitrotoluene.

^e The radionuclide suite includes gross alpha, gross beta, alpha spectroscopy, gamma spectroscopy, and strontium-90.

^f Tritium samples may be submitted for analysis by liquid scintillation if average activities are anticipated to exceed 200 pCi/L. Low-level tritium is analyzed using electrolytic enrichment or direct counting.

^g General inorganic analysis includes major anions (bromide, chloride, fluoride, sulfate), major cations (calcium, magnesium, sodium, potassium), nitrate plus nitrite (as N), TKN, ammonia, total phosphorus, TOC, TDS, alkalinity, specific conductivity, pH, and hardness.

^h Analysis for stable isotopes of nitrogen, hydrogen, and oxygen. The collection of samples for stable isotope analysis is considered a special sampling campaign that is outside the scope of the regulatory process. In general, these samples are collected semiannually from "new" wells (those which completed construction, rehabilitation, or conversion on or after October 1, 2010) until at least four sets of data have been collected. Any subsequent sampling for stable isotope analysis will be decided on the basis of site-specific conditions. In the 2010 Interim Plan, the entry "(A)" for intermediate and regional wells signifies samples will be collected annually until four sets of nitrogen isotope data have been collected.

ⁱ — = This analytical suite is not scheduled to be collected for this type of water at locations assigned to this area-specific monitoring group. Some locations are assigned analytical suites or frequencies that differ from those shown in this table, for site-specific reasons as described in the text for this monitoring group, and as summarized in Table D-8.7-3.

Table D-8.7-3
Sampling Frequencies and Analytical Suites Assigned to General Surveillance Locations in Ancho, Frijoles, and Chaquihui Canyons

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
Intermediate (Ancho)	2011	—	—	—	—	—	—	—	—	—	—	—	—	—	Rationale for suites and frequencies assigned to this monitoring group is provided in Table D-8.7-2.
	2010	—	—	—	—	—	—	—	—	—	—	—	—	—	No change
R-31 screen 1	2011	—	—	—	—	—	—	—	—	—	—	—	—	—	No change. Monitor water levels only (Table 1-10.1).
	2010	—	—	—	—	—	—	—	—	—	—	—	—	—	Historically dry. Monitor water levels only.
Regional (Ancho)	2011	A	A	T	T	T	A	T	A	—	A	A	A	—	Rationale for suites and frequencies assigned to this monitoring group is provided in Table D-8.7-2.
	2010	A	A	—	—	—	A	—	A	—	A	A	A	(A)	Rationale for changes to suites and frequencies for general surveillance locations in this watershed is provided in Table D-1.0-2.
R-31 screen 2	2011	—	—	—	—	—	—	—	—	—	—	—	—	—	Well R-31 is equipped with a Westbay sampling system. Removed this screen from sampling under the Interim Plan because of persistent geochemical impacts from drilling (Appendix F). Monitor water-levels only (Table 1.10-1).
	2010	—	—	—	—	—	A	—	—	—	A	A ^{IND}	—	A	Assigned to indicator suite because of residual effects of drilling. Retained sampling for HEXP and tritium as watershed-specific analytes.
R-31 screen 3	2011	—	—	—	—	—	—	—	—	—	—	—	—	—	Well R-31 is equipped with a Westbay sampling system. Removed this screen from sampling under the Interim Plan because of persistent geochemical impacts from drilling (Appendix F). Monitor water-levels only (Table 1.10-1).
	2010	—	—	—	—	—	A	—	—	—	A	A ^{IND}	—	A	Assigned to indicator suite because of residual effects of drilling. Retained sampling for HEXP and tritium as watershed-specific analytes.

Table D-8.7-3 (continued)

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
R-31 screen 4	2011	A	A	—	—	—	A	—	A	—	A	A	A	—	No change. Well R-31 is equipped with a Westbay sampling system. Retained limited analytical suites because of concerns about the reliability and representativeness of water-quality data obtained from wells with Westbay sampling systems (Appendix F).
	2010	A	A	—	—	—	A	—	A	—	A	A	A	A	Changes reflect updated suites and frequencies for general surveillance at regional wells in this part of the watershed.
R-31 screen 5	2011	A	A	—	—	—	A	—	A	—	A	A	A	—	No change. Well R-31 is equipped with a Westbay sampling system. Retained limited analytical suites because of concerns about the reliability and representativeness of water-quality data obtained from wells with Westbay sampling systems (Appendix F).
	2010	A	A	—	—	—	A	—	A	—	A	A	A	A	Changes reflect updated suites and frequencies for general surveillance at regional wells in this part of the watershed.
Base flow (Frijoles)	2011	A	T	T	T	T	T	T	A	—	—	A	A	—	Rationale for suites and frequencies assigned to this monitoring group is provided in Table D-8.7-2.
	2010	A	—	—	—	—	—	—	A	—	—	A	A	—	Rationale for changes to suites and frequencies for general surveillance locations in this watershed is provided in Table D-1.0-2.
Rio de los Frijoles (E350)	2011	A	T	T	T	T	T	T	A	—	—	A	A	—	Changes reflect updated suites and frequencies for general surveillance at base-flow locations in this watershed.
	2010	A	—	—	—	—	—	—	A	—	—	A	A	—	Changes reflect updated suites and frequencies for general surveillance at base-flow locations in this watershed.
Spring (Frijoles)	2011	A	T	T	T	T	T	T	A	—	A	A	A	—	Rationale for suites and frequencies assigned to this monitoring group is provided in Table D-8.7-2.
	2010	A	—	—	—	—	—	—	A	—	A	A	A	(A)	This subgroup was not defined explicitly in the 2010 Interim Plan. Suites and frequencies shown are those for Barbara Spring, the only location in this subgroup.

Table D-8.7-3 (continued)

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
Barbara Spring	2011	A	T	T	T	T	T	T	A	—	A	A	A	—	Changes reflect updated suites and frequencies for general surveillance at springs in this part of the watershed. Background location in GBIR, R3 (LANL 2007, 095817) and GBIR, R4 (LANL 2010, 110535).
	2010	A	—	—	—	—	—	—	A	—	A	A	A	(A)	Background location approved for inclusion in the GBIR, R4. Assigned analytical suites for naturally occurring constituents.

Notes: Watershed-specific and monitoring group-specific sampling suites and frequencies for individual water types are shown in shaded rows in order to set this information apart from that for the individual sampling locations that follow these rows. Sampling suites and frequencies for last year's Interim Plan are shown in gray text in order to set this information apart from that for the current Interim Plan. Sampling frequency: Q = quarterly (4 times/yr); S = semiannual (2 times/yr); A = annual (1 time/yr); B = biennial (once every 2 yr); T = triennial (once every 3 yr). For simplicity, sample collection frequencies for analysis of suspended sediment concentrations and field parameters are not listed in this table. Field parameters are routinely collected for every sampling event at every type of location, and samples for suspended sediment concentrations are collected for every sampling event at base-flow stations and springs. Nonfiltered and filtered samples will be collected for general inorganics (excluding anions) and metals. Anions and perchlorate samples will be filtered. Samples collected for radionuclide analysis will be nonfiltered only for all water media. Organic and HEXP constituents are nonfiltered for all water media. Stable isotope samples for nitrogen isotopes are filtered; stable isotope samples for deuterium and oxygen isotopes are not filtered.

^a Metals analysis includes the 23 TAL metals (Ag, Al, As, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, Hg, K, Mg, Mn, Na, Ni, Pb, Sb, Se, Ti, V, Zn), plus boron, molybdenum, silicon dioxide, strontium, tin, and uranium.

^b VOC = Volatile organic compounds; SVOC = semivolatile organic compounds.

^c PCB = Polychlorinated biphenyl (compound).

^d The analytical suite of explosive compounds (HEXP) includes the Consent Order list of the normal SW-846:8330 analytes plus PETN; TATB; 3,5-dinitroaniline; TOCP; 2,4-diamino-6-nitrotoluene; and 2,6-diamino-4-nitrotoluene.

^e The radionuclide suite includes gross alpha, gross beta, alpha spectroscopy, gamma spectroscopy, and strontium-90.

^f Tritium samples may be submitted for analysis by liquid scintillation if average activities are anticipated to exceed 200 pCi/L. Low-level tritium is analyzed using electrolytic enrichment or direct counting.

^g General inorganic analysis includes major anions (bromide, chloride, fluoride, sulfate), major cations (calcium, magnesium, sodium, potassium), nitrate plus nitrite (as N), TKN, ammonia, total phosphorus, TOC, TDS, alkalinity, specific conductivity, pH, and hardness. IND indicates "indicator suite," which includes major anions and cations, nitrate (as N), metals, alkalinity, pH, TOC, and, as needed, sulfide, ammonia, TKN, and perchlorate. Indicator suite samples are submitted to the on-site EES-14 analytical laboratory, with the exception of samples for TKN and perchlorate analysis, which are submitted to an off-site analytical facility.

^h Analysis for stable isotopes of nitrogen, hydrogen, and oxygen. The collection of samples for stable isotope analysis is considered a special sampling campaign that is outside the scope of the regulatory process. In general, these samples are collected semiannually from "new" wells (those which completed construction, rehabilitation, or conversion on or after October 1, 2010) until at least four sets of data have been collected. Any subsequent sampling for stable isotope analysis will be decided on the basis of site-specific conditions. In the 2010 Interim Plan, the entry "(A)" for intermediate and regional wells and springs signifies samples will be collected annually until four sets of nitrogen isotope data have been collected.

ⁱ — = This analytical suite is not scheduled to be collected for this type of water at locations assigned to this area-specific monitoring group. Some locations are assigned analytical suites or frequencies that differ from those shown in this table, for site-specific reasons as described in the text for this monitoring group, and as summarized in this table.

Table D-8.8-1
Analytes Detected Two or More Times above One-Half Standard
in the General Surveillance Monitoring Group: White Rock Canyon/Rio Grande Watershed

Analytical Suite	Analyte Exceeding One-Half Standard at Least Twice at the Same Location in This Monitoring Group	Base-Flow Locations						Springs (Subgroup A)				
		Ancho at Rio Grande	Frijoles at Rio Grande	Mortandad at Rio Grande	Pajarito at Rio Grande	Rio Grande at Frijoles	Rio Grande at Otowi Bridge	La Mesita Spring	Sacred Spring	Sandia Spring	Spring 1	Spring 2
Dioxins/Furans	—	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
General Inorganics	—	—	—	—	—	—	—	—	—	—	—	—
HEXP	—	—	—	—	—	—	—	—	—	—	—	—
Metals	Arsenic	—	—	—	—	—	—	—	—	—	—	■
Metals	Copper	—	—	■	—	—	—	—	—	—	—	—
Metals	Manganese	—	—	—	—	—	—	—	■	—	—	—
PCBs	—	—	—	—	—	—	—	—	—	—	—	—
Pesticides	—	—	—	—	—	—	—	—	—	—	—	—
Radionuclides	Gross alpha*	—	—	—	—	—	—	●	—	—	—	—
SVOC	—	—	—	—	—	—	—	—	—	—	—	—
VOC	—	—	—	—	—	—	—	—	—	—	—	—

Table D-8.8-1 (continued)

Analytical Suite	Analyte Exceeding One-Half Standard at Least Twice at the Same Location in This Monitoring Group	Springs (Subgroup B)			Springs (Subgroup C)																	
		Spring 3	Spring 3A	Spring 3AA	Ancho Spring	Spring 4	Spring 4A	Spring 4AA	Spring 4B	Spring 4C	Spring 5	Spring 5A	Spring 5B	Spring 6	Spring 6A	Spring 6AAA	Spring 7	Spring 8A	Spring 9	Spring 9A	Spring 9B	Spring 10
Dioxins/Furans	—	ND	ND	ND	ND	ND	—	—	ND	ND	—	ND	—	—	ND	ND	ND	ND	ND	ND	ND	ND
General Inorganics	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
HEXP	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Metals	Arsenic	—	—	—	—	●	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Metals	Copper	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Metals	Manganese	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
PCBs	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Pesticides	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Radionuclides	Gross alpha*	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
SVOC	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
VOC	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Source: Tables B1-3 and B1-4 in Attachment B-1.

Notes: ● = Detected ≥ one-half standard more than once; ■ = detected ≥ one-half standard more than once and at least once above standard; — = not detected above one-half standard more than once at this location, or there is no applicable standard; ND = no data for period of record included in Tables B1-3 or B1-4. The term “standard” refers to the lowest applicable regulatory standard or other screening level.

* Tables B1-3 and B1-4 in Attachment B-1 use the EPA MCL of 15 pCi/L for adjusted gross alpha as the screening level for gross alpha activities in water samples. This approach is conservative insofar as the EPA MCL for adjusted gross alpha excludes alpha-particle activity from radon and uranium. Data in Tables B1-3 and B1-4 have not been adjusted to subtract contributions from radon or uranium.

Table D-8.8-2
Analytical Suites and Frequencies for General Surveillance Monitoring in White Rock Canyon/Rio Grande Watershed

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/ Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
Base flow	2011	A	A	T	T	T	T	T	A	—	—	A	A	—	Added triennial sampling for other organics as requested by NMED (2011, 201467).
	2010	A	A	—	—	—	—	—	A	—	—	A	A	—	No change
Spring Subgroup A	2011	A	A	T	T	T	T	T	A	—	A	A	A	—	Added triennial sampling for other organics as requested by NMED (2011, 201467). Increased frequencies for some suites are assigned on a site-specific basis as needed to meet requirements specified in the 2011 MOU with the Pueblo of San Ildefonso.
	2010	A	A	T	—	—	T	—	A	—	A	A	A	(A)	Applies to springs upgradient of TA-54 Area G, above the confluence of Mortandad Canyon with the Rio Grande. Reduced frequency for SVOC suite annual to triennial and dropped PCB suites because of the predominance of nondetects and generally low mobility of these constituents in groundwater. Additional suites or increased frequencies are assigned on a site-specific basis as needed to meet requirements specified in the 2010 MOU with the Pueblo of San Ildefonso.
Spring Subgroup B	2011	A	A	A	T	T	A	T	A	—	A	A	A	—	Added annual sampling for HEXP and triennial sampling for other organics as requested by NMED (2011, 201467).
	2010	A	A	A	—	—	—	—	A	—	A	A	A	(A)	Applies to springs downgradient of TA-54 Area G, between the confluences of Mortandad and Water Canyons with the Rio Grande. No change

Table D-8.8-2 (continued)

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/ Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
Spring Subgroup C	2011	A	A	A	T	T	A	T	A	—	A	A	A	—	Increased HEXP sampling to annual and added triennial sampling for other organics as requested by NMED (2011, 201467).
	2010	A	A	A	—	—	T	—	A	—	A	A	A	(A)	Applies to springs in or downgradient of Pajarito and Ancho Canyons. Added annual sampling for SVOCs in support of VOC data. HEXP reduced from annual to triennial because of the predominance of nondetects.

Notes: Sampling suites and frequencies for last year's Interim Plan are shown in gray text in order to set this information apart from that for the current Interim Plan. Sampling frequency: Q = quarterly (4 times/yr); S = semiannual (2 times/yr); A = annual (1 time/yr); B = biennial (once every 2 yr); T = triennial (once every 3 yr). For simplicity, sample collection frequencies for analysis of suspended sediment concentrations and field parameters are not listed in this table. Field parameters are routinely collected for every sampling event at every type of location, and samples for suspended sediment concentrations are collected for every sampling event at base-flow stations and springs. Nonfiltered and filtered samples will be collected for general inorganics (excluding anions) and metals. Anions and perchlorate samples will be filtered. Samples collected for radionuclide analysis will be nonfiltered only for all water media. Organic and HEXP constituents are nonfiltered for all water media. Stable isotope samples for nitrogen isotopes are filtered; stable isotope samples for deuterium and oxygen isotopes are not filtered.

^a Metals analysis includes the 23 TAL metals (Ag, Al, As, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, Hg, K, Mg, Mn, Na, Ni, Pb, Sb, Se, Tl, V, Zn), plus boron, molybdenum, silicon dioxide, strontium, tin, and uranium.

^b VOC = Volatile organic compounds; SVOC = semivolatile organic compounds.

^c PCB = Polychlorinated biphenyl (compound).

^d The analytical suite of explosive compounds (HEXP) includes the Consent Order list of the normal SW-846:8330 analytes plus PETN; TATB; 3,5-dinitroaniline; TOCP; 2,4-diamino-6-nitrotoluene; and 2,6-diamino-4-nitrotoluene.

^e The radionuclide suite includes gross alpha, gross beta, alpha spectroscopy, gamma spectroscopy, and strontium-90.

^f Tritium samples may be submitted for analysis by liquid scintillation if average activities are anticipated to exceed 200 pCi/L. Low-level tritium is analyzed using electrolytic enrichment or direct counting.

^g General inorganic analysis includes major anions (bromide, chloride, fluoride, sulfate), major cations (calcium, magnesium, sodium, potassium), nitrate plus nitrite (as N), TKN, ammonia, total phosphorus, TOC, TDS, alkalinity, specific conductivity, pH, and hardness.

^h Analysis for stable isotopes of nitrogen, hydrogen, and oxygen. The collection of samples for stable isotope analysis is considered a special sampling campaign that is outside the scope of the regulatory process. In general, these samples are collected semiannually from "new" wells (those which completed construction, rehabilitation, or conversion on or after October 1, 2010) until at least four sets of data have been collected. Any subsequent sampling for stable isotope analysis will be decided on the basis of site-specific conditions. In the 2010 Interim Plan, the entry "(A)" for springs signifies samples will be collected annually until four sets of nitrogen isotope data have been collected.

ⁱ — = This analytical suite is not scheduled to be collected for this type of water at locations assigned to this area-specific monitoring group. Some locations are assigned analytical suites or frequencies that differ from those shown in this table, for site-specific reasons as described in the text for this monitoring group, and as summarized in Table D-8.8-3.

Table D-8.8-3
Sampling Frequencies and Analytical Suites Assigned to Locations in White Rock Canyon

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
Base flow	2011	A	A	T	T	T	T	T	A	—	—	A	A	—	Rationale for suites and frequencies assigned to this monitoring group is provided in Table D-8.8-2.
	2010	A	A	—	—	—	—	—	A	—	—	A	A	—	Rationale for changes to suites and frequencies for general surveillance locations in this subwatershed is provided in Table D-1.0-2.
Ancho at Rio Grande	2011	A	A	T	T	T	T	T	A	—	—	A	A	—	Changes reflect updated suites and frequencies for general surveillance at base-flow stations in this watershed.
	2010	A	A	—	—	—	—	—	A	—	—	A	A	—	Changes reflect updated suites and frequencies for general surveillance at base-flow stations in this watershed.
Frijoles at Rio Grande	2011	A	A	T	T	T	T	T	A	—	—	A	A	—	Changes reflect updated suites and frequencies for general surveillance at base-flow stations in this watershed.
	2010	A	A	—	—	—	—	—	A	—	—	A	A	—	Changes reflect updated suites and frequencies for general surveillance at base-flow stations in this watershed.

Table D-8.8-3 (continued)

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
Mortandad at Rio Grande	2011	A	A	A	T	A	A	T	A	—	A	A	A	—	Changes reflect updated suites and frequencies for general surveillance at base-flow stations in this watershed. Retained annual sampling for SVOC, PCB, HEXP, and tritium suites as required by 2011 MOU with Pueblo of San Ildefonso.
	2010	A	A	A	—	A	A	—	A	—	A	A	A	—	No change. Retained annual sampling for PCB and HEXP suites as required by 2010 MOU with Pueblo of San Ildefonso.
Pajarito at Rio Grande	2011	A	A	T	T	T	T	T	A	—	—	A	A	—	Changes reflect updated suites and frequencies for general surveillance at base-flow stations in this watershed.
	2010	A	A	—	—	—	—	—	A	—	—	A	A	—	No change. Remains assigned to watershed-specific suites and frequencies.
Rio Grande at Frijoles	2011	A	A	T	T	T	T	T	A	—	—	A	A	—	Changes reflect updated suites and frequencies for general surveillance at base-flow stations in this watershed.
	2010	A	A	—	—	—	—	—	A	—	—	A	A	—	No change. Remains assigned to watershed-specific suites and frequencies.

Table D-8.8-3 (continued)

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
Rio Grande at Otowi Bridge	2011	A	A	A	T	A	A	T	A	—	A	A	A	—	Changes reflect updated suites and frequencies for general surveillance at base-flow stations in this watershed. Retained annual sampling for PCB, HEXP, and tritium suites as required by 2011 MOU with Pueblo of San Ildefonso.
	2010	A	A	A	—	A	A	—	A	—	A	A	A	—	Assigned to suites and frequencies for general surveillance at base-flow stations in this watershed. Added annual sampling for HEXP and PCB suites as required by 2010 MOU with Pueblo of San Ildefonso.
Spring Subgroup A: Springs Upgradient of TA-54 Area G	2011	A	A	T	T	T	T	T	A	—	A	A	A	—	Rationale for suites and frequencies assigned to this monitoring group is provided in Table D-8.8-2.
	2010	A	A	T	—	—	T	—	A	—	A	A	A	(A)	Rationale for changes to suites and frequencies for general surveillance locations in this subwatershed is provided in Table D-1.0-2.

Table D-8.8-3 (continued)

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
La Mesita Spring	2011	A	A	T	T	T	T	T	A	—	A	A	A	—	Changes reflect updated suites and frequencies for general surveillance at springs in this portion of the watershed. Suites and frequencies are consistent with requirements in 2011 MOU with Pueblo of San Ildefonso.
	2010	A	A	T	—	T	T	—	A	—	A	A	A	A	Reduction in frequency from annual to triennial for SVOC suite reflects updated frequency for general surveillance spring locations in this part of the watershed. Retained triennial sampling for PCBs as required by 2010 MOU with Pueblo of San Ildefonso.
Sacred Spring	2011	A	A	T	T	T	T	T	A	—	A	A	A	—	Changes reflect updated suites and frequencies for general surveillance at springs in this portion of the watershed. Suites and frequencies are consistent with requirements in 2011 MOU with Pueblo of San Ildefonso. Background location in GBIR, R3 (LANL 2007, 095817) and GBIR, R4 (LANL 2010, 110535).
	2010	A	A	T	—	T	T	—	A	—	A	A	A	A	Reduction in frequency from annual to triennial for SVOC suite reflects updated frequency for general surveillance spring locations in this part of the watershed. Retained triennial sampling for PCBs as required by 2010 MOU with Pueblo of San Ildefonso. Background location in GBIR, R3 and approved for inclusion in GBIR, R4.

Table D-8.8-3 (continued)

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
Sandia Spring	2011	A	A	T	T	T	T	T	A	—	A	A	A	—	Changes reflect updated suites and frequencies for general surveillance at springs in this portion of the watershed. Suites and frequencies are consistent with requirements in 2011 MOU with Pueblo of San Ildefonso. Background location in GBIR, R4.
	2010	A	A	T	—	T	T	—	A	—	A	A	A	A	Reduction in frequency from annual to triennial for SVOC suite reflects updated frequency for general surveillance spring locations in this part of the watershed. Retained triennial sampling for PCBs as required by 2010 MOU with Pueblo of San Ildefonso. Background location approved for inclusion in GBIR, R4.
Spring 1	2011	A	A	T	T	T	T	T	A	—	A	A	A	—	Changes reflect updated suites and frequencies for general surveillance at springs in this portion of the watershed. Suites and frequencies are consistent with requirements in 2011 MOU with Pueblo of San Ildefonso. Background location in GBIR, R3 and GBIR, R4.
	2010	A	A	T	—	T	T	—	A	—	A	A	A	A	Reduction in frequency from annual to triennial for SVOC suite reflects updated frequency for general surveillance spring locations in this part of the watershed. Retained triennial sampling for PCBs as required by 2010 MOU with Pueblo of San Ildefonso. Background location in GBIR, R3 and approved for inclusion in GBIR, R4.

Table D-8.8-3 (continued)

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
Spring 2	2011	A	A	T	T	T	T	T	A	—	A	A	A	—	Changes reflect updated suites and frequencies for general surveillance at springs in this portion of the watershed. Suites and frequencies are consistent with requirements in 2011 MOU with Pueblo of San Ildefonso.
	2010	A	A	T	—	T	T	—	A	—	A	A	A	A	Reduction in frequency from annual to triennial for SVOC suite reflects updated frequency for general surveillance spring locations in this part of the watershed. Retained triennial sampling for PCBs as required by 2010 MOU with Pueblo of San Ildefonso.
Spring Subgroup B Springs downgradient of TA-54 Area G	2011	A	A	A	T	T	A	T	A	—	A	A	A	—	Rationale for suites and frequencies assigned to this monitoring group is provided in Table D-8.8-2.
	2010	A	A	A	—	—	—	—	A	—	A	A	A	(A)	Rationale for changes to suites and frequencies for general surveillance locations in this subwatershed is provided in Table D-1.0-2.
Spring 2B	2011	A	A	A	T	T	A	T	A	—	A	A	A	—	Added back to Interim Plan at request of NMED (2011, 201467). Assigned suites and frequencies for general surveillance at springs in this portion of the watershed. Sample during low-flow conditions to minimize potential mixing with river water.
	2010	—	—	—	—	—	—	—	—	—	—	—	—	—	Removed from Interim Plan because flow from this spring is often mixed with river water.

Table D-8.8-3 (continued)

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
Spring 3	2011	A	A	A	T	T	A	T	A	—	A	A	A	—	Changes reflect updated suites and frequencies for general surveillance at springs in this portion of the watershed.
	2010	A	A	A	—	—	—	—	A	—	A	A	A	A	No change. Remains assigned to watershed-specific suites and frequencies.
Spring 3A	2011	A	A	A	T	T	A	T	A	—	A	A	A	—	Changes reflect updated suites and frequencies for general surveillance at springs in this portion of the watershed.
	2010	A	A	A	—	—	—	—	A	—	A	A	A	A	No change. Remains assigned to watershed-specific suites and frequencies.
Spring 3AA	2011	A	A	A	T	T	A	T	A	—	A	A	A	—	Changes reflect updated suites and frequencies for general surveillance at springs in this portion of the watershed.
	2010	A	A	A	—	—	—	—	A	—	A	A	A	A	No change. Remains assigned to watershed-specific suites and frequencies.
Spring Subgroup C: Springs in or downgradient of Pajarito Canyon and Ancho Canyon	2011	A	A	A	T	T	A	T	A	—	A	A	A	—	Rationale for suites and frequencies assigned to this monitoring group is provided in Table D-8.8-2.
	2010	A	A	A	—	—	T	—	A	—	A	A	A	(A)	Rationale for changes to suites and frequencies for general surveillance locations in this subwatershed is provided in Table D-1.0-2.

Table D-8.8-3 (continued)

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
Ancho Spring	2011	A	A	A	T	T	A	T	A	—	A	A	A	—	Changes reflect updated suites and frequencies for general surveillance at springs in this portion of the watershed. Background location in GBIR, R3 and GBIR, R4.
	2010	A	A	A	—	—	A	—	A	—	A	A	A	A	Addition of SVOC suite reflects updated suites for general surveillance spring locations in this part of the watershed. Background location in GBIR, R3 and approved for inclusion in GBIR, R4.
Spring 4	2011	A	A	A	T	T	A	T	A	—	A	A	A	—	Changes reflect updated suites and frequencies for general surveillance at springs in this portion of the watershed.
	2010	A	A	A	—	—	A	—	A	—	A	A	A	A	Assigned to revised general surveillance suites and frequencies for spring subgroup C. Frequencies for all assigned suites are reduced to annual because the conceptual model is mature for this portion of the watershed, and sufficient data have been collected for these analytical suites to justify monitoring on an annual basis.

Table D-8.8-3 (continued)

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
Spring 4A	2011	A	A	A	T	T	A	T	A	—	A	A	A	—	Changes reflect updated suites and frequencies for general surveillance at springs in this portion of the watershed.
	2010	A	A	A	—	—	A	—	A	—	A	A	A	A	Assigned to revised general surveillance suites and frequencies for spring subgroup C. Frequencies for all assigned suites are reduced to annual because the conceptual model is mature for this portion of the watershed, and sufficient data have been collected for these analytical suites to justify monitoring on an annual basis.
Spring 4AA	2011	A	A	A	T	T	A	T	A	—	A	A	A	—	Changes reflect updated suites and frequencies for general surveillance at springs in this portion of the watershed.
	2010	A	A	A	—	—	A	—	A	—	A	A	A	A	Assigned to revised general surveillance suites and frequencies for spring subgroup C. Frequencies for all assigned suites are reduced to annual because the conceptual model is mature for this portion of the watershed, and sufficient data have been collected for these analytical suites to justify monitoring on an annual basis.

Table D-8.8-3 (continued)

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
Spring 4B	2011	A	A	A	T	T	A	T	A	—	A	A	A	—	Changes reflect updated suites and frequencies for general surveillance at springs in this portion of the watershed.
	2010	A	A	A	—	—	A	—	A	—	A	A	A	A	Assigned to revised general surveillance suites and frequencies for spring subgroup C. Frequencies for all assigned suites are reduced to annual because the conceptual model is mature for this portion of the watershed, and sufficient data have been collected for these analytical suites to justify monitoring on an annual basis.
Spring 5	2011	A	A	A	T	T	A	T	A	—	A	A	A	—	Changes reflect updated suites and frequencies for general surveillance at springs in this portion of the watershed.
	2010	A	A	A	—	—	A	—	A	—	A	A	A	A	No change. Remains assigned to watershed-specific suites defined for spring subgroups A and B.
Spring 5A	2011	A	A	A	T	T	A	T	A	—	A	A	A	—	Sample during low-flow conditions to minimize potential mixing with river water (NMED 2011, 201467).
	2010	A	A	A	—	—	A	—	A	—	A	A	A	A	No change. Remains assigned to watershed-specific suites defined for spring subgroups A and B.

Table D-8.8-3 (continued)

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
Spring 5B	2011	A	A	A	T	T	A	T	A	—	A	A	A	—	Added back to Interim Plan at request of NMED (2011, 201467). Sample during low-flow conditions to minimize potential mixing with river water. Background location in GBIR, R3.
	2010	—	—	—	—	—	—	—	—	—	—	—	—	—	Removed from Interim Plan because flow from this spring is often mixed with river water.
Spring 6	2011	A	A	A	T	T	A	T	A	—	A	A	A	—	Changes reflect updated suites and frequencies for general surveillance at springs in this portion of the watershed. Background location in GBIR, R3 and GBIR, R4.
	2010	A	A	A	—	—	A	—	A	—	A	A	A	A	Addition of SVOC suite reflects updated suites for general surveillance spring locations in this part of the watershed. Background location in GBIR, R3 and approved for inclusion in GBIR, R4.
Spring 6A	2011	A	A	A	T	T	A	T	A	—	A	A	A	—	Changes reflect updated suites and frequencies for general surveillance at springs in this portion of the watershed. Background location in GBIR, R3 and GBIR, R4.
	2010	A	A	A	—	—	A	—	A	—	A	A	A	A	Addition of SVOC suite reflects updated suites for general surveillance spring locations in this part of the watershed. Background location in GBIR, R3 and approved for inclusion in GBIR R4.

Table D-8.8-3 (continued)

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
Spring 7	2011	—	—	—	—	—	—	—	—	—	—	—	—	—	Removed from sampling because it is located east of the Rio Grande and likely recharged by the Española Basin.
	2010	A	A	A	—	—	A	—	A	—	A	A	A	A	Addition of SVOC suite reflects updated suites for general surveillance spring locations in this part of the watershed. Because Springs 7 and 8 are located close to one another on the east side of the Rio Grande, only one will be sampled. Spring 7 is the preferred sampling location, with Spring 8 as an alternative. These springs are frequently dry, or flow from the springs is mixed with river water.
Spring 8	2011	—	—	—	—	—	—	—	—	—	—	—	—	—	Alternative sampling location for Spring 7. Removed from sampling because it is located east of the Rio Grande and likely recharged by the Española Basin.
	2010	—	—	—	—	—	—	—	—	—	—	—	—	—	Alternative sampling location for Spring 7 if it cannot be sampled.
Spring 8A	2011	A	A	A	T	T	A	T	A	—	A	A	A	—	Changes reflect updated suites and frequencies for general surveillance at springs in this portion of the watershed. Background location in GBIR, R3.
	2010	A	A	A	—	—	A	—	A	—	A	A	A	A	Addition of SVOC suite reflects updated suites for general surveillance spring locations in this part of the watershed. Background location in GBIR, R3.

Table D-8.8-3 (continued)

Surface-Water Body or Source Aquifer	Interim Plan	Metals ^a	Organics						Radionuclides			General Inorganics		Stable Isotopes ^h	Rationale for Changes Relative to Previous Interim Plan
			VOCs ^b	SVOCs ^b	Pesticides	PCBs ^c	HEXP ^d	Dioxins/Furans	Radionuclides ^e	Tritium ^f	Low-Level Tritium ^f	Gen Inorganics ^g	Perchlorate		
Spring 9	2011	A	A	A	T	T	A	T	A	—	A	A	A	—	Changes reflect updated suites and frequencies for general surveillance at springs in this portion of the watershed. Background location in GBIR, R3 and GBIR, R4.
	2010	A	A	A	—	—	A	—	A	—	A	A	A	A	Addition of SVOC suite reflects updated suites for general surveillance spring locations in this part of the watershed. Background location in GBIR, R3 and approved for inclusion in GBIR, R4.
Spring 9A	2011	A	A	A	T	T	A	T	A	—	A	A	A	—	Changes reflect updated suites and frequencies for general surveillance at springs in this portion of the watershed. Background location in GBIR, R3 and GBIR, R4.
	2010	A	A	A	—	—	A	—	A	—	A	A	A	A	Addition of SVOC suite reflects updated suites for general surveillance spring locations in this part of the watershed. Background location in GBIR, R3 and approved for inclusion in GBIR, R4.
Spring 9B	2011	A	A	A	T	T	A	T	A	—	A	A	A	—	Changes reflect updated suites and frequencies for general surveillance at springs in this portion of the watershed. Background location in GBIR, R3 and GBIR, R4.
	2010	A	A	A	—	—	A	—	A	—	A	A	A	A	Addition of SVOC suite reflects updated suites for general surveillance spring locations in this part of the watershed. Background location in GBIR, R3 and approved for inclusion in GBIR, R4.

Table D-8.8-3 (continued)

Notes: Watershed-specific and monitoring group-specific sampling suites and frequencies for individual water types are shown in shaded rows in order to set this information apart from that for the individual sampling locations that follow these rows. Sampling suites and frequencies for last year's Interim Plan are shown in gray text in order to set this information apart from that for the current Interim Plan. Sampling frequency: Q = quarterly (4 times/yr); S = semiannual (2 times/yr); A = annual (1 time/yr); B = biennial (once every 2 yr); T = triennial (once every 3 yr). For simplicity, sample collection frequencies for analysis of suspended sediment concentrations and field parameters are not listed in this table. Field parameters are routinely collected for every sampling event at every type of location, and samples for suspended sediment concentrations are collected for every sampling event at base-flow stations and springs.

Nonfiltered and filtered samples will be collected for general inorganics (excluding anions) and metals. Anions and perchlorate samples will be filtered. Samples collected for radionuclide analysis will be nonfiltered only for all water media. Organic and HEXP constituents are nonfiltered for all water media. Stable isotope samples for nitrogen isotopes are filtered; stable isotope samples for deuterium and oxygen isotopes are not filtered.

^a Metals analysis includes the 23 TAL metals (Ag, Al, As, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, Hg, K, Mg, Mn, Na, Ni, Pb, Sb, Se, Tl, V, Zn), plus boron, molybdenum, silicon dioxide, strontium, tin, and uranium.

^b VOC = Volatile organic compounds; SVOC = semivolatile organic compounds.

^c PCB = Polychlorinated biphenyl (compound).

^d The analytical suite of explosive compounds (HEXP) includes the Consent Order list of the normal SW-846:8330 analytes plus PETN; TATB; 3,5-dinitroaniline; TOCP; 2,4-diamino-6-nitrotoluene; and 2,6-diamino-4-nitrotoluene.

^e The radionuclide suite includes gross alpha, gross beta, alpha spectroscopy, gamma spectroscopy, and strontium-90.

^f Tritium samples may be submitted for analysis by liquid scintillation if average activities are anticipated to exceed 200 pCi/L. Low-level tritium is analyzed using electrolytic enrichment or direct counting.

^g General inorganic analysis includes major anions (bromide, chloride, fluoride, sulfate), major cations (calcium, magnesium, sodium, potassium), nitrate plus nitrite (as N), TKN, ammonia, total phosphorus, TOC, TDS, alkalinity, specific conductivity, pH, and hardness.

^h Analysis for stable isotopes of nitrogen, hydrogen, and oxygen. The collection of samples for stable isotope analysis is considered a special sampling campaign that is outside the scope of the regulatory process. In general, these samples are collected semiannually from "new" wells (those which completed construction, rehabilitation, or conversion on or after October 1, 2010) until at least four sets of data have been collected. Any subsequent sampling for stable isotope analysis will be decided on the basis of site-specific conditions. In the 2010 Interim Plan, the entry "(A)" for springs signifies samples will be collected annually until four sets of nitrogen isotope data have been collected.

ⁱ — = This analytical suite is not scheduled to be collected for this type of water at locations assigned to this area-specific monitoring group. Some locations are assigned analytical suites or frequencies that differ from those shown in this table, for site-specific reasons as described in the text for this monitoring group, and as summarized in this table.

Appendix E

Field Quality Assurance/Quality Control Samples

Sample Type	Summary
General	<p>This appendix summarizes field quality assurance/quality control (QA/QC) samples to be collected during interim facility-wide groundwater monitoring activities. Field QA/QC samples are collected in accordance with the Compliance Order on Consent, Section IX.B, and include field blanks, equipment rinsate blanks, performance evaluation blanks, field duplicates, and field trip blanks.</p> <p>Field QA/QC samples are used to detect possible field or analytical laboratory contamination and to track analytical laboratory performance. Differences in analytical results between field-duplicate samples, for example, may indicate the samples were not uniform or significant variation occurred during analyses. Detection of analytes in deionized water field blanks may indicate contamination of the deionized water source or sample bottles or contamination from the analytical laboratory.</p> <p>This summary also addresses how field QA/QC results are used and the types of corrective actions that may be taken to address exceedances of target measures for each QA/QC sample type.</p>
Field Blanks	<p>Field blanks are used to monitor for contamination during sampling and are collected at a minimum frequency of 10% of all samples collected in a monitoring group sampling campaign. Field blanks are collected by filling sample containers in the field with deionized water to check for sources of sample contamination in the field. Field blanks are analyzed for the organic constituents sampled for in the monitoring group, with the exception of high explosive compounds, which are not analyzed in field or equipment rinsate blanks.</p> <p>Field-blank results are evaluated as part of the secondary data validation process by using the results to validate the associated sample results. If any analytes are detected in the field blank, the result from the associated sample is qualified as undetected if the result is less than 5 times the amount for the analyte found in the associated field blank. A validation reason code is also assigned to describe why the data were qualified.</p>
Equipment Rinsate Blanks	<p>Equipment rinsate blanks are used to detect any contamination resulting from contaminated equipment or poor decontamination techniques. The equipment rinsate blank is prepared by passing deionized water through unused or decontaminated sampling equipment, including Westbay sample bottles.</p> <p>Equipment rinsate blanks are collected before a well is sampled with a nondedicated pump. An equipment rinsate blank is also collected before sampling each well equipped with a Westbay sampling system for which samples are being collected for off-site analysis. Equipment rinsate blanks are not required for wells equipped with Westbay sampling systems from which samples are being collected only for on-site analysis.</p> <p>Equipment rinsate blanks are analyzed for the organic constituents sampled for in the associated well, with the exception of high explosive compounds, which are not analyzed in rinsate blanks. During the secondary data validation process, equipment rinsate blanks are evaluated in the same manner as field blanks, and any detected analytes are qualified in the samples associated with the equipment rinsate blank.</p>
Performance Evaluation Blanks	<p>Performance evaluation blanks (PEBs) are deionized water blanks submitted as regular samples, without any indication that they are QC samples. PEBs are used to evaluate the reagent-grade deionized water used to decontaminate sampling equipment and to prepare the blank samples discussed above.</p> <p>One PEB is collected per monitoring group sampling campaign and analyzed for total organic carbon and for the full suite of constituents analyzed during the watershed sampling campaign, including metals, organic chemicals, general inorganics, and radionuclides. PEBs are not analyzed for stable isotopes or specialized analytes that may be requested for the sampling campaign.</p>

Sample Type	Summary
Field Duplicates	<p>Field duplicates are split samples that provide information about field variation of sampling results as well as analytical laboratory variation. They may reveal sampling techniques with poor reproducibility and provide information on the reproducibility of the sampling process. Field duplicates are collected at a rate of 10% of all samples collected in a monitoring group sampling campaign. Field-duplicate samples should be distributed proportionally among surface water, alluvial groundwater, and intermediate/regional groundwater to the relative number of samples collected for each type of media.</p> <p>Field-duplicate samples are selected from robust sampling locations requiring full analytical suites and yielding plenty of sample volume. Field-duplicate samples should be analyzed for the same suite of analytes for which the primary samples are analyzed. However, field-duplicate samples need not be analyzed for specialized nonroutine analytes that may be requested for a sampling campaign, unless directed by the project leader. These analytes include stable isotopes and parameters for which microfiltration is requested.</p> <p>Field-duplicate results are compared with the associated sample results, and a relative percent difference is calculated. The acceptable threshold for relative percent differences is 20% for data greater than 5 times the reporting limit.</p>
Field Trip Blanks	<p>Field trip blanks accompany samples collected for volatile organic compound (VOC) analyses and are used to identify potential VOC contamination that may occur during sample handling, shipping, and storage or at the analytical laboratory. Field trip blanks consist of organic-free deionized water prepared by an independent off-site laboratory and are analyzed only for VOCs. A minimum of one trip blank is required for each cooler containing samples for VOC analyses. However, to facilitate data validation and verification, one trip blank may be included with each sample submitted for VOC analysis.</p> <p>During the secondary data validation process, field trip blanks are evaluated the same as field blanks, and any detected analytes are qualified in the samples associated with the trip blank. If any analytes are detected in the field trip blank, the result from the associated sample is qualified as undetected if the result is less than 5 times the amount of the concentration of the analyte found in the associated field blank. These results are given a validation reason code to describe why the data were qualified.</p>
QA/QC Corrective Actions	<p>Exceedances of target measures for each of the QA/QC sections summarized above triggers any number of potential corrective actions. Potential corrective actions are considered on a case-by-case basis and generally follow a graded approach. Corrective actions to be considered include the following.</p> <p>Data review/focused validation:</p> <p>A typical first step is to review field paperwork (e.g., chains-of-custody, sample collection logs) to ensure sample identifiers align with analytical results. Detailed data review and focused validation may also provide insights into improper use of sample preservatives and other similar errors in sample collection.</p> <p>Reanalysis:</p> <p>Review of QA/QC results sometimes detects problems that occur with sample analysis. In these instances, reanalysis of an aliquot of the original sample may be requested of the analytical laboratory, assuming no holding-time issues are associated with the sample aliquot.</p> <p>Resampling:</p> <p>If the QA/QC problem is not resolved using the approaches described above, resampling may be necessary. The decision to resample depends largely on the schedule for the subsequent sampling round. For instance, if a site is sampled quarterly, the sample collected for that round should suffice in filling the data gap. If the site is sampled annually, it may be necessary to resample after the discovery of a QA/QC concern if it would result in an important data gap.</p> <p>If an unacceptable QA/QC condition persists, then determining the source of the problem and making root-level corrections in a specific portion of the process will be initiated. For example, corrections or modifications may be made to an equipment decontamination process.</p>

Appendix F

*Protocols for Assessing
the Performance of Deep Groundwater Monitoring Wells*

F-1.0 OBJECTIVES AND SCOPE

This appendix describes approaches for tracking the performance of perched-intermediate and regional groundwater monitoring wells (hereafter referred to as the deep monitoring wells) at Los Alamos National Laboratory (the Laboratory) under the Interim Facility-Wide Groundwater Monitoring Plan.

- Section F-2.0 identifies deep monitoring wells that are purged less than 3 casing volumes (CVs).
- Section F-3.0 defines a protocol for assigning deep monitoring wells to “Watch Lists” with appropriate follow-up actions when questions arise concerning the reliability and representativeness of water-quality data from those wells.
- Section F-4.0 outlines an approach for conducting reliability assessments of deep monitoring wells to determine their capability for producing representative water-quality samples and to identify any potential effects of well installation, rehabilitation, or sampling protocol on data quality.

Updates to the list of wells purged less than 3 CVs or to wells assigned to the Watch Lists during the monitoring year that starts October 1, 2011 will be presented in periodic monitoring reports (PMRs). Results of reliability assessments may be presented in PMRs, investigation reports, monitoring network evaluation reports, corrective measures evaluation (CME) reports, or corrective measures implementation (CMI) reports, as appropriate.

F-2.0 DEEP WELLS WITH LIMITED PURGE VOLUMES

Water that remains in a monitoring well for a period of time may not be representative of formation water because of physical, chemical, or biological changes that may occur as the water remains in contact with the well casing, dedicated sampling equipment, and the air space in the upper casing. This stagnant water may not represent formation water at the time of sampling. To ensure that samples collected from a monitoring well are representative of formation water, stagnant water in the casing is generally removed (i.e., purged) from the sampling zone within the well before sampling is conducted. As prescribed in Standard Operating Procedure (SOP) 5232, Groundwater Sampling, the Laboratory’s standard practice is to purge perched-intermediate and regional wells a minimum of 3 CVs plus the volume of the drop pipe, and to continue purging until water-quality parameters stabilize. Once the parameters stabilize, it is presumed that all stagnant water has been removed from the well, and that fresh formation water is available for sampling.

However, purging 3 CVs is not always possible or feasible, particularly in low-producing monitoring wells which purge dry at low pumping rates. SOP-5232 allows deviation from the 3-CV purge requirement for such conditions. However, data users may want to be aware of deep wells at which the 3-CV purge requirement generally cannot be met in order to consider potential impacts for data reliability.

Table F-2.0-1 lists deep well screens which cannot meet the 3-CV purge requirement and describes the reason for this condition. For completeness, Table F-2.0-2 lists the seven remaining wells in which a nonpurgeable Westbay sampling system is installed as of August 1, 2011.

F-3.0 WATCH LIST ASSIGNMENTS

This appendix section establishes two “watch lists” identifying deep monitoring wells in this Interim Plan for which the representativeness of water-quality data for certain constituents has issues or has not yet been established. Well screens known or suspected not to produce representative water-quality data and are no longer being evaluated for representativeness are also included in these lists if they are scheduled for water-quality sampling under the 2011 Interim Plan.

The first watch list (Table F-3.0-1) gives deep well screens for which field parameters monitored during purging consistently fail to meet stability criteria as well as deep well screens completed before October 1, 2010, which show anomalous chemistry data suggesting groundwater in the screened interval may not be fully equilibrated following construction or rehabilitation. This table also provides the rationale for each listed well screen and a description of follow-up actions.

- Frequently, the recommended follow-up action may be to continue to monitor water-quality trends, sometimes in concert with site-specific adjustments to the sampling protocol, such as changing the pump rate or conducting an extended purge before samples are collected. For example, this action may be the most appropriate for relatively new wells or for converted wells for which water-quality trends indicate groundwater is reequilibrating as expected for a particular geologic setting.
- Another follow-up action may be to collect additional water-quality samples during purging that may provide additional insights on performance issues. For this purpose, a time-series suite is defined that involves collecting water-quality samples at 1-CV increments during purging for analyses of major anions and cations, including nitrate and nitrite, metals, alkalinity, pH, and total organic carbon (TOC). Time-series samples are submitted for analysis at the Laboratory's on-site laboratory that resides in the Earth Systems Observations (EES-14) group.
- Limited analytical suites to be collected may be defined for impacted screens with performance issues that cannot be addressed in the near-term such as wells equipped with Westbay sampling systems or screens in tight formations with limited purge capability.
- A reliability assessment may be conducted to assess the performance of the well screen relative to the water-quality data objectives of the specific monitoring group to which it is assigned and to identify water-quality data which may not be representative (section F-4.0).

The second watch list (Table F-3.0-2) lists deep wells completed, rehabilitated, redeveloped, or converted to configurations with purgeable sampling systems on or after October 1, 2010. For these wells, the time-series suite will be collected at 1-CV increments during purging for at least one characterization sampling event.

Inclusion of a well on either watch list is intended to be used as a general indicator of data quality and should not be construed as a definitive identification of data usability. These watch lists are also dynamic insofar as they will be continually updated as conditions evolve. Changes will occur when additional water-quality data justify the removal or addition of wells from the list, when wells equipped with Westbay sampling systems are converted, and when newly completed or converted wells finish characterization sampling.

F-4.0 RELIABILITY ASSESSMENT PROTOCOL

The specific objective of a reliability assessment is to determine the current reliability of a well (including its sampling system) as it relates to the water-quality data objectives of the specific monitoring network to which it is assigned. In general, reliability assessments may be conducted for a subset of the wells assigned to the watch lists described in the preceding section or for deep wells within the context of a specific monitoring network.

Data examined for the assessment includes field parameters monitored during purging before sample collection, field parameters associated with samples at the time of collection, major-ion concentrations, trace-metal concentrations, and detections of organic constituents. The assessments are based on site-specific geochemical criteria and generally focus on data obtained for the four most recent sampling events. The assessment results may result in recommendations concerning the well's configuration, sampling protocols (such as purging volumes), extension or limitation of the analytical suites to be collected from the well screen, or caveats about data usability.

Field parameters. Time-series data for field parameters monitored during purging before sample collection are examined for attainment of stable values by the end of purging. Stabilization criteria are prescribed in SOP 5232, Groundwater Sampling, and are derived from the stabilization criteria recommended by EPA (Yeskis and Zavala 2002, 204429) and from the Compliance Order on Consent (the Consent Order). The most sensitive indicator parameters are dissolved oxygen (DO) and turbidity. Other parameters such as water temperature, specific conductance, pH, and oxidation-reduction potential (ORP) are also monitored but are considered less sensitive indicators of formation water.

Field parameters are examined for stability during individual sampling events, and trends are compared for a sequence of events at the same location. Final field-parameter values associated with the sample at the time of collection are compared with the range observed in background locations for intermediate perched groundwater and regional groundwater.

Inorganic analytes. Analytical data for common inorganic ions and trace metals are examined for stability and for excursions from background concentrations as follows:

- trends in concentrations of key indicators for the presence of the specific materials used in the screened interval, such as sodium, sulfate, and total organic carbon (TOC);
- trends in relative concentrations of major ions; and
- comparison of concentrations for major ions and selected trace metals with lower and upper concentration ranges for plateau-scale and site-specific background groundwater, as described below.

Concentration trends may be depicted using time-series plots, standard trilinear diagrams, or modified Schoeller plots.

- Trilinear diagrams, also called Piper plots, show major ions as percentages of milliequivalents (meq) in two base triangles. The total cations and the total anions are set equal to 100% and the data points in the two triangles are projected onto an adjacent grid. The main purpose of the Piper diagram is to show clustering of data points to indicate samples that have similar compositions.
- Schoeller plots are semi-logarithmic diagrams originally developed to represent major ion analyses in meq/L and to demonstrate different hydrochemical water types on the same diagram. This type of graphical representation has the advantage that, unlike the trilinear diagrams, actual sample concentrations are displayed and compared. The modified Schoeller plot used for the reliability assessment represents analyses as mg/L or µg/L to avoid the need to make assumptions about ion speciation, which may be particularly problematic for trace metals.

Organic analytes. Detections of volatile and semivolatile organic compounds are compiled for examination of temporal trends and comparison against area-specific chemicals of potential concern.

Field documentation. As appropriate, field notes, groundwater sampling logs, and sample collection logs for each sampling event are also examined for observations about unusual odors, colors, or other indications of impacted water samples.

Plateau-scale background values for assessment. For naturally occurring analytes, statistical summaries of water-quality data for background groundwater locations establish a range of concentrations against which data from the assessed wells are compared for a preliminary assessment step. Lower and upper bounds of Plateau-scale background ranges used in the reliability assessments are derived primarily from statistical tables in the most recent New Mexico Environment Department– (NMED–) approved Groundwater Background Investigation Report.

Site-specific background values for assessment. Representativeness may be assessed with greater specificity by comparing analytical concentrations with those in groundwater from other deep wells in sufficiently similar hydrogeologic settings and at which effects from downhole materials or local contaminants are known to be absent or negligible. The approach allows for the inclusion of wells not hydraulically upgradient of the well being assessed. This is similar to the interwell comparison approach described in sections 5.2.4 and 6.3.2 of the EPA guidance document, “Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities” (“Unified Guidance”) (EPA 2009, 110369). The development and use of site-specific background values is illustrated in the Reliability Assessment of Well R-47i (LANL 2011, 201564).

Under some conditions, some or all of the constituents measured in the sample collected at the end of development may also be appropriate to use as the basis of site-specific background values or to augment the background dataset compiled for the interwell comparison. This is similar to the intrawell comparison approach described in sections 5.2.4 and 6.3.2 of EPA’s Unified Guidance (EPA 2009, 110369).

F-5.0 REFERENCES

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

Copies of the master reference set are maintained at the NMED Hazardous Waste Bureau and the Directorate. The set was developed to ensure that the administrative authority has all material needed to review this document, and it is updated with every document submitted to the administrative authority. Documents previously submitted to the administrative authority are not included.

EPA (U.S. Environmental Protection Agency), March 2009. “Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities Unified Guidance,” EPA 530-R-09-007, Office of Resource Conservation and Recovery, Washington, D.C. (EPA 2009, 110369)

Koch, R.J., and S. Schmeer, March 2011. “Groundwater Level Status Report for 2010, Los Alamos National Laboratory,” Los Alamos National Laboratory report LA-14437-PR, Los Alamos, New Mexico. (Koch and Schmeer 2010, 201566)

LANL (Los Alamos National Laboratory), May 2010. “Work Plan to Conduct Reliability Assessment of Multiscreened Westbay Wells,” Los Alamos National Laboratory document LA-UR-10-1422, Los Alamos, New Mexico. (LANL 2010, 109676)

LANL (Los Alamos National Laboratory), March 2011. “Reliability Assessment for Well R-47i,” Los Alamos National Laboratory document LA-UR-11-0933, Los Alamos, New Mexico. (LANL 2011, 201564)

LANL (Los Alamos National Laboratory), July 2011. “Work Plan for the Technical Area 21 Monitoring Well Network Reconfiguration,” Los Alamos National Laboratory document LA-UR-11-3674, Los Alamos, New Mexico. (LANL 2011, 204372)

Yeskis, D., and B. Zavala, May 2002. “Ground-Water Sampling Guidelines for Superfund and RCRA Project Managers,” a *Ground Water Forum Issue Paper*, EPA 542-S-02-001, Office of Solid Waste and Emergency Response, Washington, D.C. (Yeskis and Zavala 2002, 204429)

Table F-2.0-1
Deep Monitoring Wells with Limited Purge Volumes

Location*	Monitoring Group	Watershed	Reason for Limited Purge Volume
MCOI-4	Cr Investigation	Mortandad	Well cannot yield 3 CV purge volume because standing water level is near top of sump (Koch and Schmeer 2010, 201566) .
R-3	General Surveillance	Los Alamos/ Pueblo	300-ft water column above screen generates large volume of wastewater for disposal (>1000 gal. for 3 CV). Stability of field parameters is still attained with less than 3 CV purge.
R-26 PZ-2	TA-16 260	Water/Cañon de Valle	Sampled with bailer because pump not feasible in 1-in. PVC screen. Often bails dry.

Notes: CV = casing volume; PVC = polyvinyl chloride; TA = technical area.

* Deep well screens that are purged less than 3 CVs on a routine basis. Locations that are historically dry (Table 1.10-1 of the Interim Plan) and those in which Westbay systems are installed (Table F-2.0-2) are not included. Inclusion of a well screen on this table is intended to be used as a general indicator of data quality and should not be construed as a definitive identification of data usability.

Table F-2.0-2
Deep Monitoring Wells with Westbay Sampling Systems

Location ^a	Number of Screens ^b	Monitoring Group	Watershed	Status in 2011 Interim Plan
R-5	3	TA-21	Los Alamos (Pueblo)	Limited sampling. Scheduled for rehabilitation and conversion to a configuration equipped with a purgeable sampling system
R-7	1	TA-21	Los Alamos (Upper)	Sampling suspended. Scheduled for conversion to single-screen well equipped with a purgeable sampling system
R-8	2	TA-21	Los Alamos (Upper)	Limited sampling. Scheduled for rehabilitation and conversion to a configuration equipped with a purgeable sampling system
R-9i	2	General Surveillance	Los Alamos (Upper)	Limited sampling. Scheduled for rehabilitation and conversion to a configuration equipped with a purgeable sampling system
R-19	6	General Surveillance	Pajarito	Limited sampling of minimally-impacted screens; sampling suspended for severely-impacted screens. Disposition to be determined.
R-25	7	TA-16 260	Water/Cañon de Valle	Limited sampling. Disposition to be determined.
R-31	4	General Surveillance	Ancho	Limited sampling of minimally impacted screens; sampling suspended for severely-impacted screens. Disposition to be determined.

^a Wells in which Westbay sampling systems are installed as of October 1, 2011. Westbay screens on this table that are known or suspected not to produce representative samples but which are scheduled for water-quality sampling under this Interim Plan are also included on the Watch List presented in Table F-3.0-1.

^b Number of screens in a zone of saturation (perched intermediate or regional). Screens that are historically dry are not included in this number.

Table F-3.0-1
Preliminary Watch List of Deep Monitoring Wells in the 2011 Interim Plan

Location ^a	Monitoring Group	Watch List Rationale	Description of Condition	Action
MCOI-4	Cr Investigation	Field parameters; well construction issues	Unstable field parameters; limited purge capability (Table F-2.0-1)	Prioritize analytical suites for collection. Watch to ensure representativeness of water-quality data.
R-25 screen 1	TA-16 260	Water/Cañon de Valle	Nonpurgeable Westbay screen (Table F-2.0-2). Unreliable trace metal data due to steel corrosion	Final disposition of this well will be proposed in the TA-16 monitoring well network evaluation.
R-25 screen 2	TA-16 260	Water/Cañon de Valle	Nonpurgeable Westbay screen (Table F-2.0-2). Unreliable trace metal data due to steel corrosion	Final disposition of this well will be proposed in the TA-16 monitoring well network evaluation.
R-25 screen 4	TA-16 260	Water/Cañon de Valle	Nonpurgeable Westbay screen (Table F-2.0-2). Unreliable trace metal data due to steel corrosion	Final disposition of this well will be proposed in the TA-16 monitoring well network evaluation.
R-25 screen 5	TA-16 260	Water/Cañon de Valle	Nonpurgeable Westbay screen (Table F-2.0-2). Unreliable trace metal data due to steel corrosion	Final disposition of this well will be proposed in the TA-16 monitoring well network evaluation.
R-5 screen 4	TA-21	Los Alamos (Pueblo)	Nonpurgeable Westbay screen (Table F-2.0-2). Data quality TBD.	Convert well to purgeable sampling system; track performance thereafter.
R-8 screen 1	TA-21	Los Alamos (Upper)	Nonpurgeable Westbay screen (Table F-2.0-2). Data quality to be determined.	Convert well to purgeable sampling system; if screen is retained, track performance thereafter.
R-8 screen 2	TA-21	Los Alamos (Upper)	Nonpurgeable Westbay screen (Table F-2.0-2). Data quality to be determined..	Convert well to purgeable sampling system; if screen is retained, track performance thereafter.
R-9i screen 1	General Surveillance	Los Alamos (Upper)	Nonpurgeable Westbay screen (Table F-2.0-2). Data quality to be determined.	Convert well to purgeable sampling system; if screen is retained, track performance thereafter.
R-9i screen 2	General Surveillance	Los Alamos (Upper)	Nonpurgeable Westbay screen (Table F-2.0-2). Data quality to be determined.	Convert well to purgeable sampling system; if screen is retained, track performance thereafter.
R-20 screen 1	TA-54	Sampling issues; field parameters	Sulfurous odor prior to extended purge in Jan-11	Track performance and propose action if appropriate
R-20 screen 2	TA-54	Field parameters	Sulfurous odor prior to extended purge in Jan-11	Track performance and propose action if appropriate

Table F-3.0-1 (continued)

Location ^a	Monitoring Group	Watch List Rationale	Description of Condition	Action
R-27	MDA AB	Field parameters	Sulfide odor	Track performance and propose action if appropriate
R-29	MDA AB	Field parameters	Elevated turbidity, total aluminum and iron	Track performance and propose action if appropriate
R-34	General Surveillance	Field parameters	Effervescence	Track performance and propose action if appropriate
R-37 screen 1	TA-54	Minor drilling-related issues	Residual drilling effects; not reequilibrated	Track performance and propose action if appropriate
R-40i	TA-54	Drilling-related issues	Residual drilling effects (sudsy, odor)	Conduct extended purge and collect EES-14 time-series suite ^b ; include results in pending report
R-52 screen 2	TA-54	Field parameters	Odors	Collect EES-14 times-series suite; monitor trends for reequilibration
R-54 screen 1	TA-54	Field parameters	Specific conductivity	Conduct EES-14 time-series suite during 12-CV purge; monitor trends for reequilibration

^a Well screens that meet at least one of the criteria in section F-3.0 as of August 1, 2011. Inclusion of a well on the watch list is intended to be used as a general indicator of data quality and should not be construed as a definitive identification of data usability. The watch list is also dynamic insofar as it will be continually updated as additional water-quality data are obtained that may justify the removal or addition of wells from the list.

^b The EES-14 time-series analytical suite is a one-time event in which samples are collected at established intervals during purging. This suite includes major anions and cations, metals, alkalinity, pH, and total organic carbon. Samples are submitted to the on-site EES-14 laboratory.

Table F-3.0-2
Newly Completed or Rehabilitated Deep Monitoring Wells

Location	Number of Screens	Monitoring Group	Watershed	Well Completion Date
Newly Completed Wells^a				
R-55i	Single screen	TA-54	Mortandad (Cañada del Buey)	18-Jan-11
R-60	Single screen	MDA C	Pajarito	18-Oct-10
R-61	Dual screen	Cr investigation	Mortandad	3-May-11
R-62	Dual screen	Cr investigation	Mortandad	16-Sep-11 ^b
R-63	Single screen	TA-16-260	Water/Cañon de Valle	9-Feb-11
R-64	Single screen	TA-21	Los Alamos (Upper)	15-Jul-11
R-65	Single screen	TA-21	Los Alamos (Upper)	30-Oct-11 ^b
SCI-3	Single screen	Cr investigation	Sandia	30-Sep-11 ^b
Newly Rehabilitated or Converted Wells^c				
CdV-16-4(i)p	TBD ^d	TA-16-260	Water/Cañon de Valle	See table note e
CdV-R-15-3	TBD	TA-16-260	Water/Cañon de Valle	See table note f
CdV-R-37-2	TBD	TA-16-260	Water/Cañon de Valle	See table note f
R-5	TBD	TA-21	Los Alamos (Pueblo)	See table note g
R-7	TBD	TA-21	Los Alamos (Upper)	See table note g
R-8	TBD	TA-21	Los Alamos (Upper)	See table note g
R-9i	TBD	General Surveillance	Los Alamos (Upper)	See table note g
R-26	Single screen	TA-16-260	Water/Cañon de Valle	17-Jun-11 ^h

^a "Newly completed" includes well screens completed on or after October 1, 2010 or scheduled to be completed before November 1, 2011.

^b Scheduled completion date.

^c "Newly rehabilitated" includes well screens rehabilitated after October 1, 2010, or scheduled to be rehabilitated or converted during the monitoring year beginning October 1, 2011.

^d TBD = To be determined.

^e CdV-16-4i(i)p was completed as a two-screen hydrotest well August 23, 2010. A final configuration will be recommended for this well in the TA-16 network evaluation report due December 2011.

^f The Westbay sampling systems were removed from wells CdV-R-15 and CdV-R-37-2 as part of a reliability assessment study of wells containing Westbay sampling systems (LANL 2010, 109676). These wells will be converted to a configuration with a purgeable sampling system; the final configuration will be determined based on the results of the Westbay reliability study and the TA-16 network evaluation due December 2011.

^g Wells R-5, R-7, R-8, and R-9i are equipped with Westbay sampling systems and are proposed for conversion to purgeable systems on or before October 11, 2012 (LANL 2011, 204372). Final well configurations are pending approval.

^h Completion date for installation of dedicated pump.

Appendix G

Geologic Cross-Sections

This appendix presents six east-west and three north-south geologic cross-sections that show the relationship of sampling locations in this Interim Facility-Wide Groundwater Monitoring Plan (the Interim Plan) to the hydrogeologic setting of the Los Alamos National Laboratory (the Laboratory) site. Figure G-1 is an overview of the cross-section locations.

The east-west cross-sections follow the stream channel in the following canyons:

- A–A' Water Canyon/Cañon de Valle (Figure G-2)
- B–B' Pajarito Canyon (Figure G-3)
- C–C' Mortandad Canyon (Figure G-4)
- D–D' Sandia Canyon (Figure G-5)
- E–E' Los Alamos Canyon (Figure G-6)
- F–F' Pueblo Canyon (Figure G-7)

The north-south cross-sections are distributed across the Laboratory site and include the following:

- G–G' in the eastern part of the Laboratory (Figure G-8)
- H–H' in the central part of the Laboratory (Figure G-9)
- I–I' in the western part of the Laboratory (Figure G-10)

The cross-sections are based on the three-dimensional geologic framework model (GFM) for the Laboratory that was developed using borehole and outcrop map data. The geologic model used in this report is an updated version of the Laboratory's fiscal year (FY) 2009 three-dimensional geologic framework model (Cole et al. 2010, 106101). The GFM was developed using the geospatial modeling software EarthVision, developed by Dynamic Graphics, Inc., in 2008. The updated GFM model is designated WC11a and incorporates new regional and perched intermediate wells installed since 2009, reinterpretation of stratigraphic contacts in a few existing well logs, and the addition of shallow Technical Area 21 (TA-21) and data that were not incorporated into the FY2009 model. The cross-sections were generated using the updated WC11a model to best represent the current conceptual understanding of the Laboratory's hydrogeology.

No faults are presented on the cross-sections because no known or mapped faults lie within the GFM domain used to develop these geologic cross-sections. Buried, inferred, and possible faults have not yet been incorporated into the WC11a model.

The cross-sections show sampling locations that fall within a 1500-ft buffer on both sides of the respective transect lines. Perched-intermediate and regional monitoring wells are shown as vertical lines, and the locations of well screens are shown as boxes presented to actual scale. Wells located within 500 ft of transects are indicated by solid lines, and wells offset more than 500 ft are demarcated by a dashed pattern. Because of their offset from the transect, some well screens in the outer portions of the buffer zones may not appear to plot within the proper geologic unit because of dipping geologic contacts. The relative positions of alluvial wells, surface-water sampling stations, and springs located along the transects are arrayed horizontally above the cross-sections to show the spatial relationship between the shallow, intermediate, and deep water-quality monitoring network and the GFM. Only sampling locations in the 2011 Interim Plan are shown on the cross-sections.

REFERENCE

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

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Cole, G., D. Coblenz, E. Jacobs, D. Koning, D. Broxton, D. Vaniman, F. Goff, and G. WoldeGabriel, April 2010. "The 2009 Three-Dimensional Geologic Models of the Los Alamos National Laboratory Site, Southern Española Basin, and Española Basin," Los Alamos National Laboratory document LA-UR-09-3701, Los Alamos, New Mexico. (Cole et al. 2010, 106101)

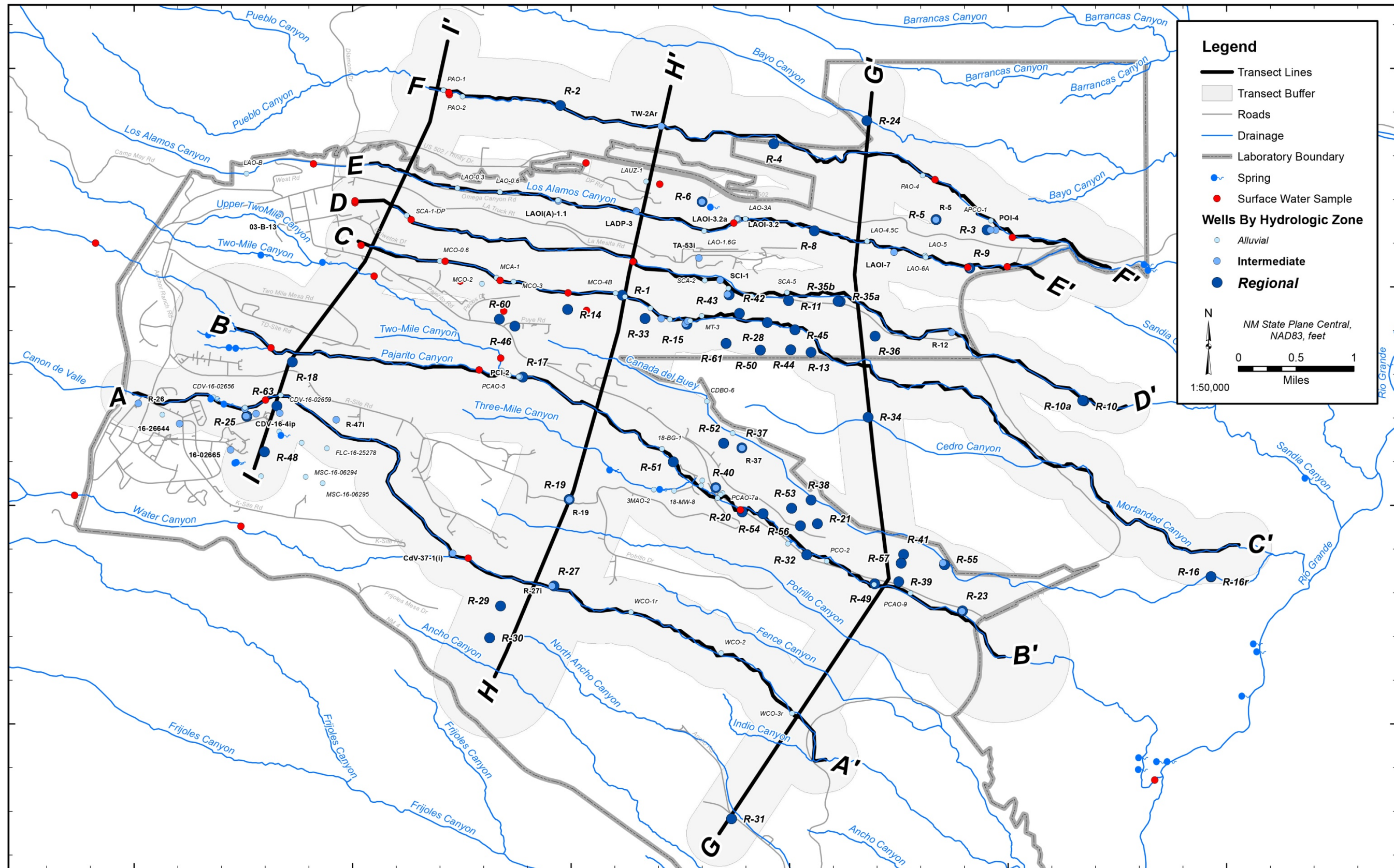


Figure G-1 Transect location map

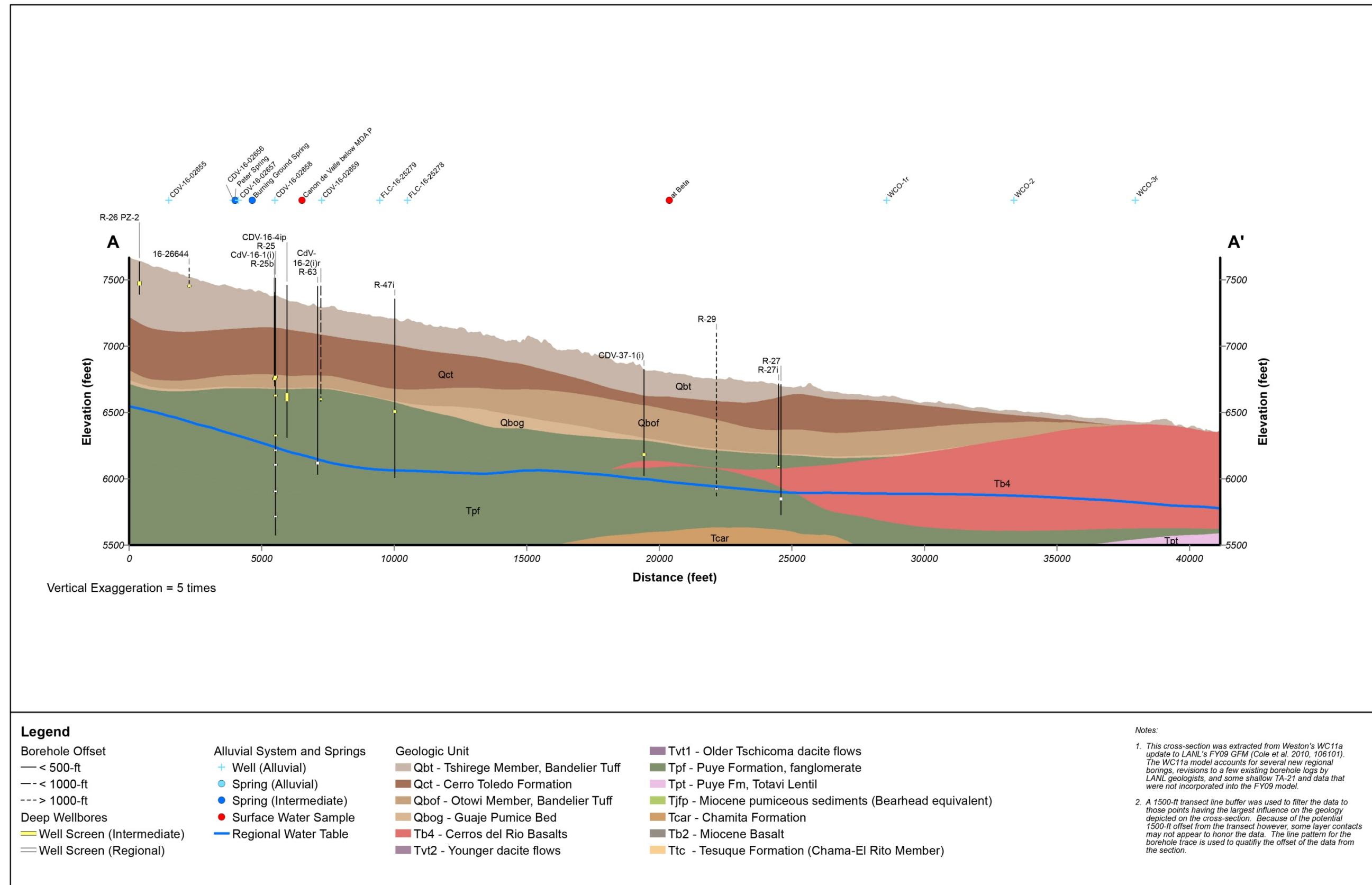


Figure G-2 Cross-section A-A' Water Canyon/Cañon de Valle

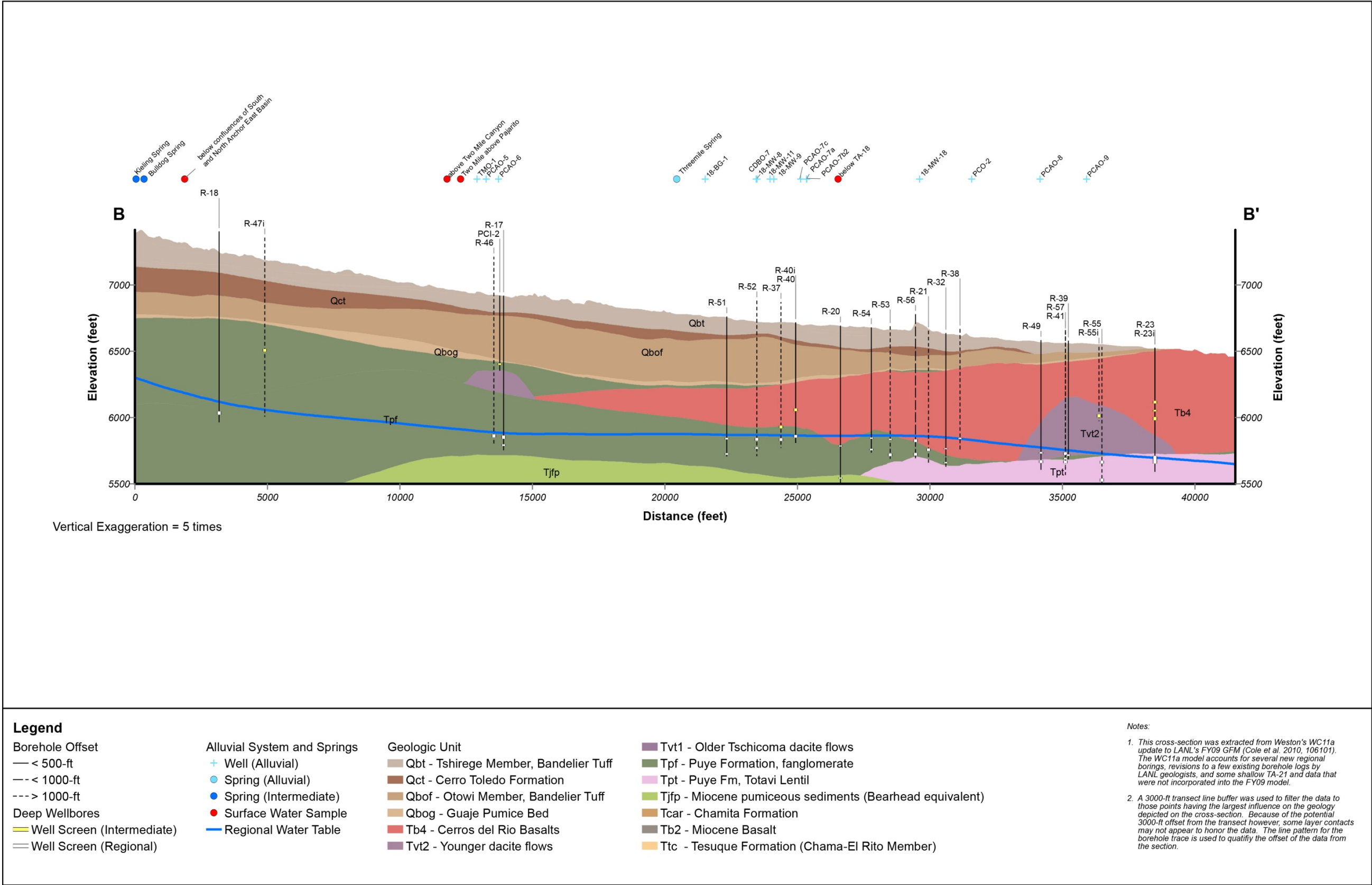


Figure G-3 Cross-section B-B' Pajarito Canyon

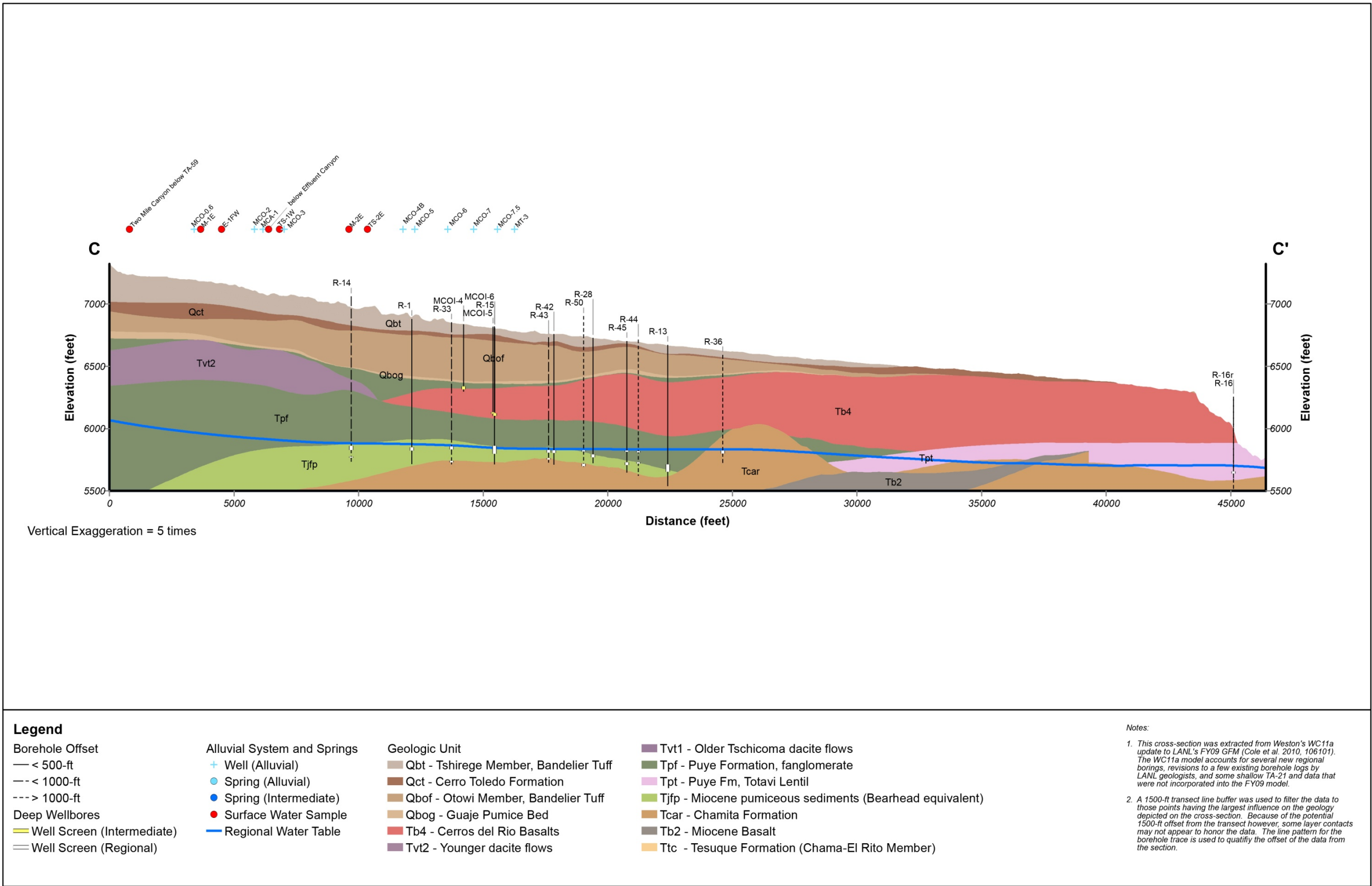


Figure G-4 Cross-section C–C' Mortandad Canyon

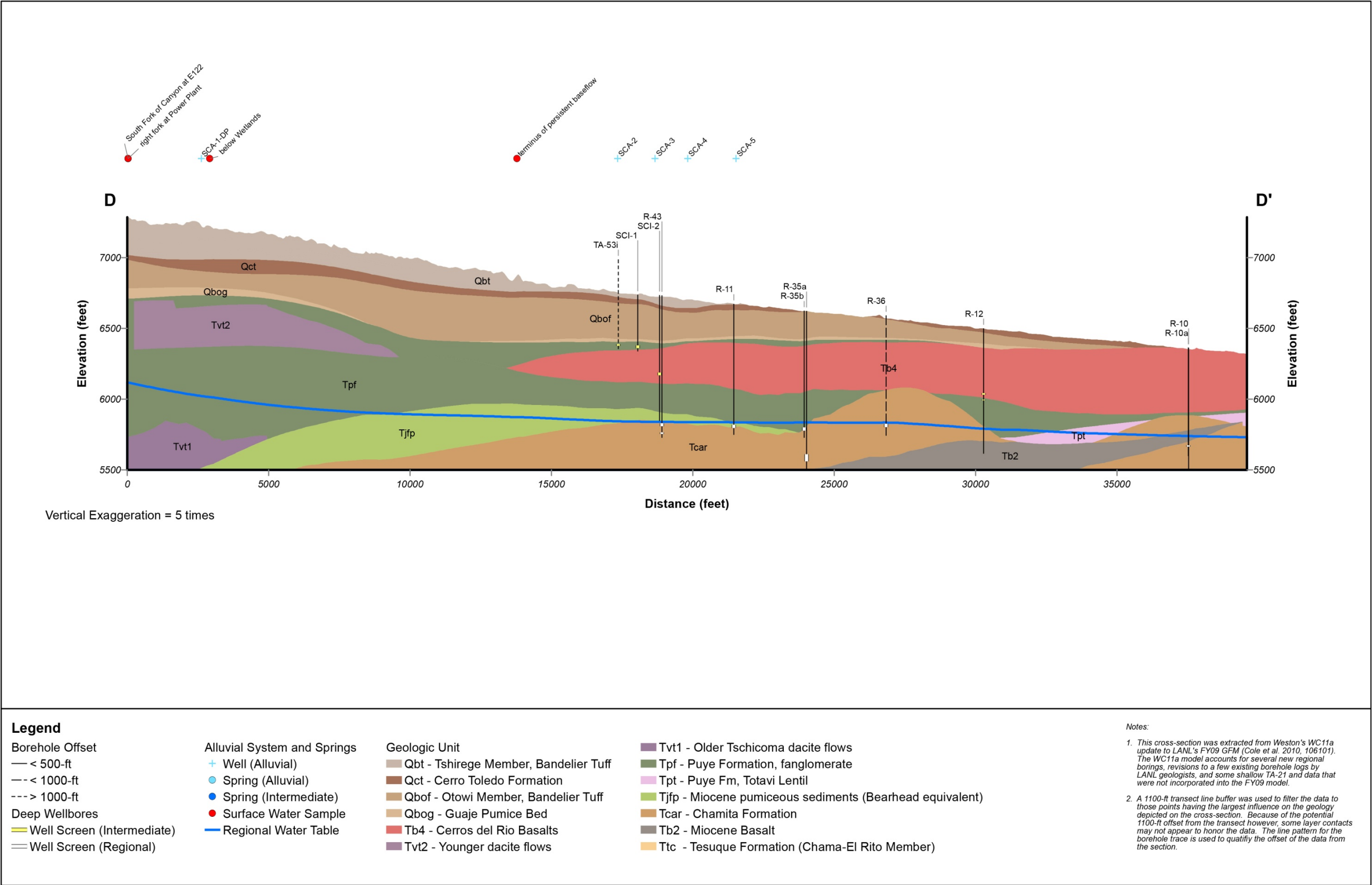


Figure G-5 Cross-section D–D' Sandia Canyon

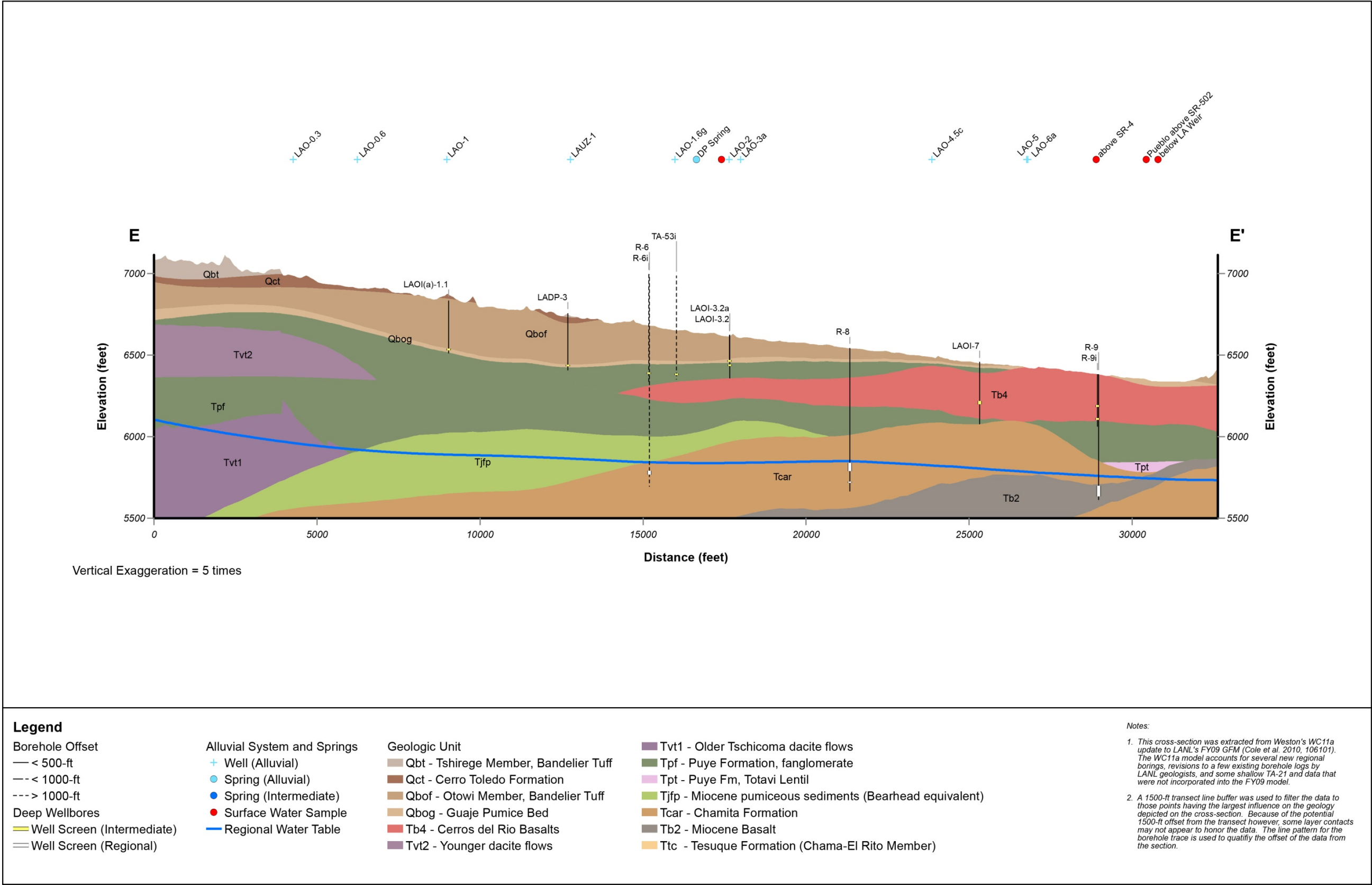


Figure G-6 Cross-section E–E' Los Alamos Canyon

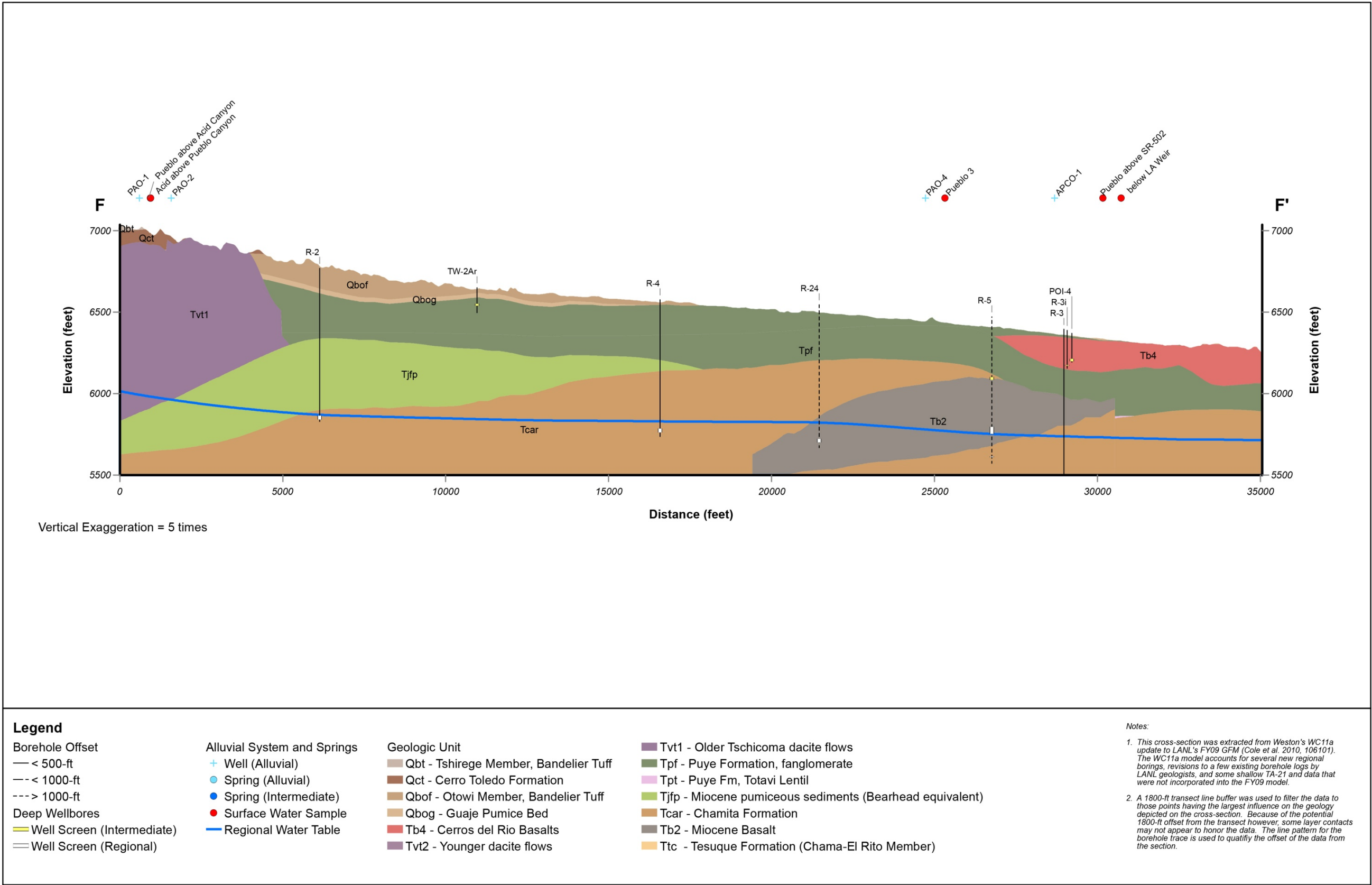


Figure G-7 Cross-section F–F' Pueblo Canyon

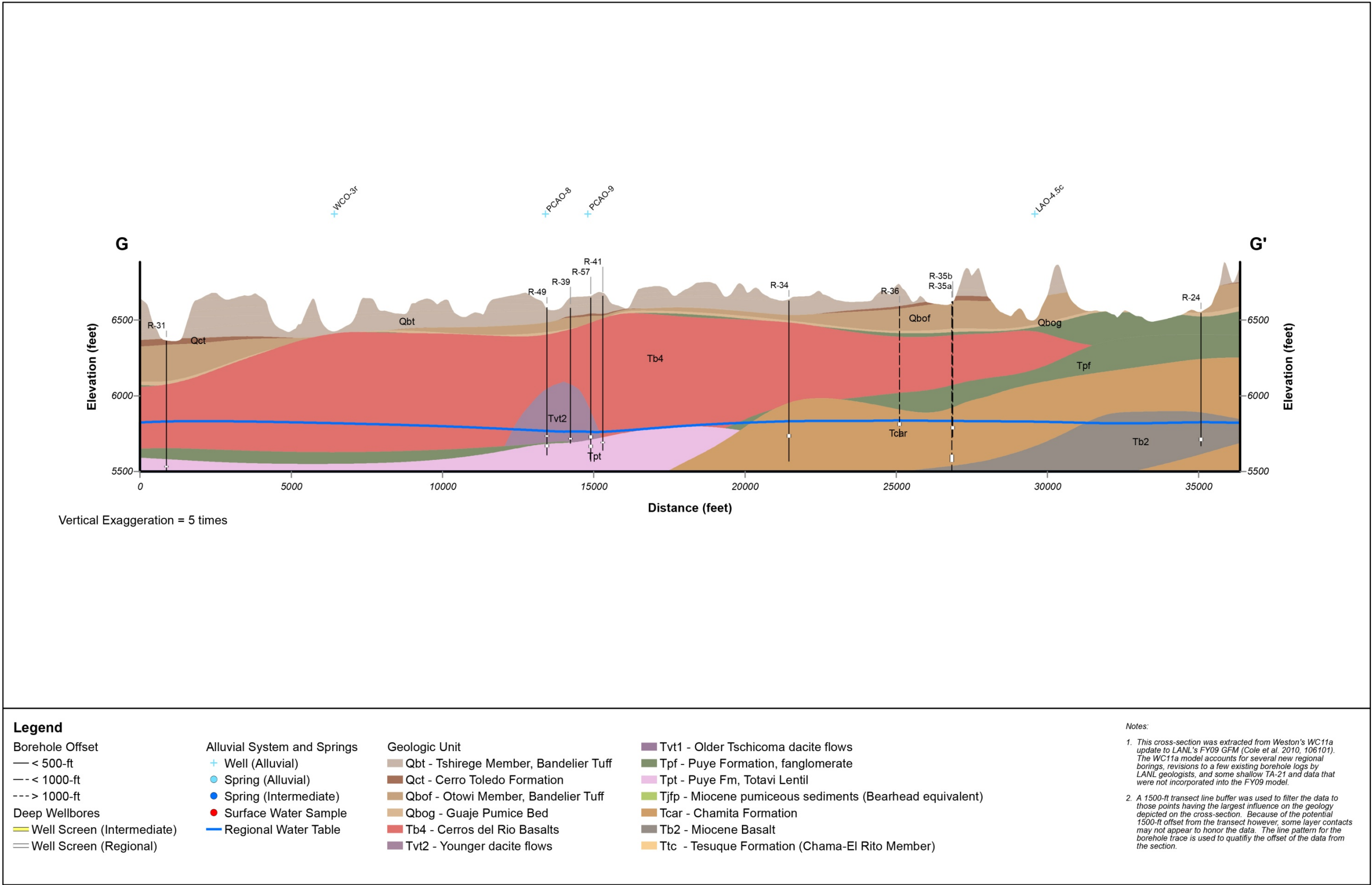


Figure G-8 Cross-section G–G' in the eastern part of the Laboratory (north-south)

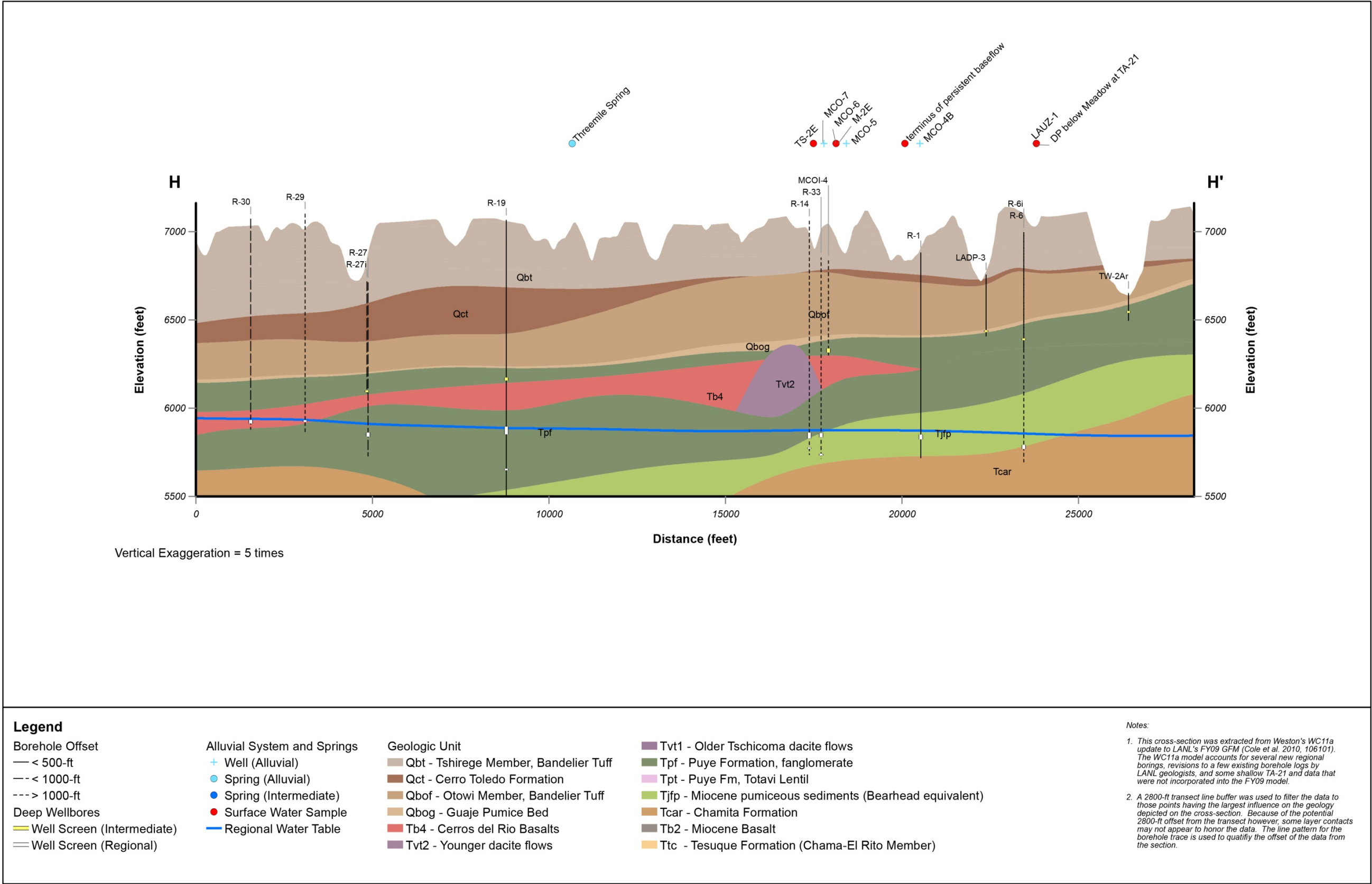
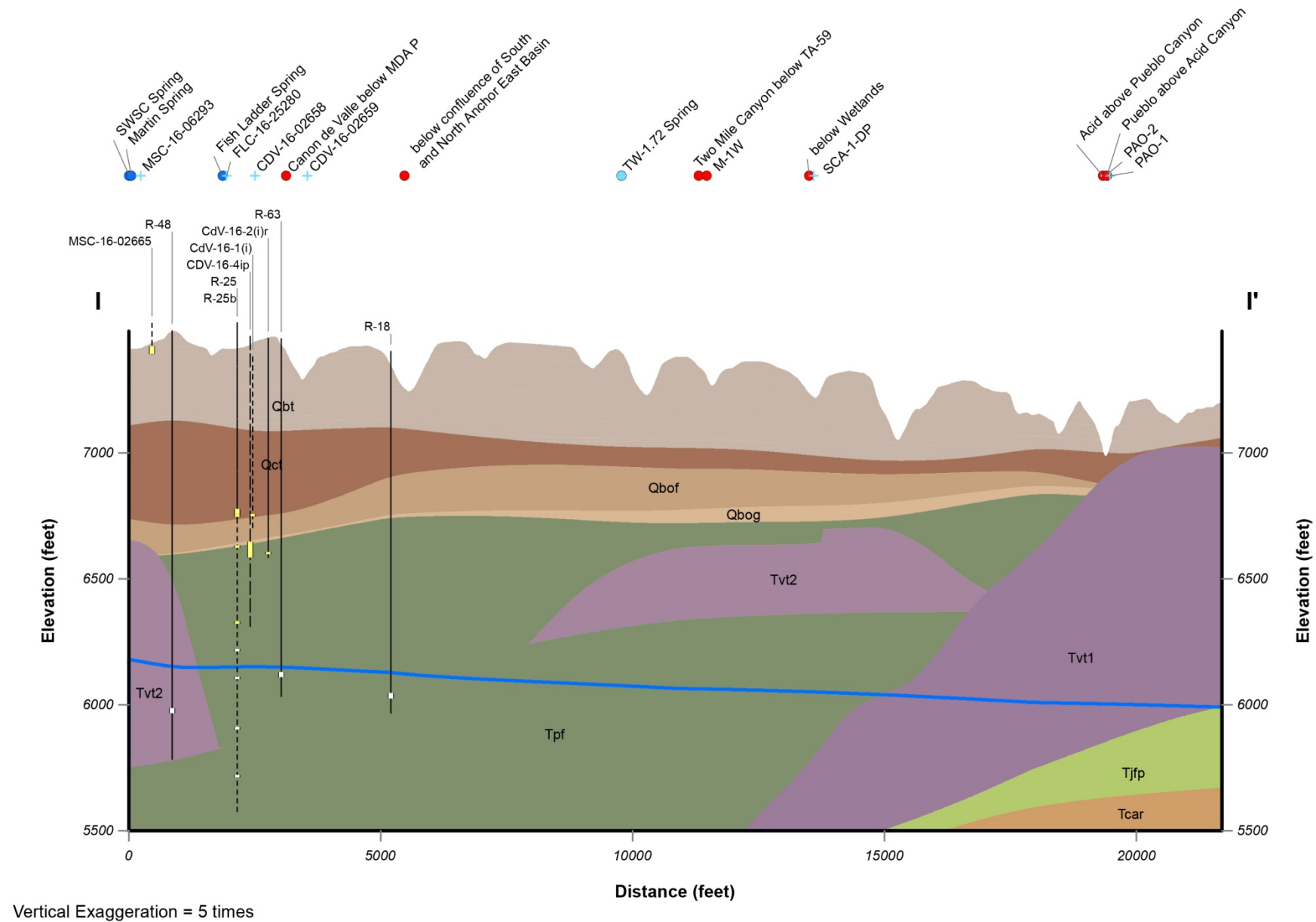


Figure G-9 Cross-section H-H' in the central part of the Laboratory (north-south)



Legend

Borehole Offset

- < 500-ft
- - < 1000-ft
- - - > 1000-ft

Deep Wellbores

- Well Screen (Intermediate)
- Well Screen (Regional)

Alluvial System and Springs

- Well (Alluvial)
- Spring (Alluvial)
- Spring (Intermediate)
- Surface Water Sample
- Regional Water Table

Geologic Unit

- Qbt - Tshirege Member, Bandelier Tuff
- Qct - Cerro Toledo Formation
- Qbof - Otowi Member, Bandelier Tuff
- Qbog - Guaje Pumice Bed
- Tb4 - Cerros del Rio Basalts
- Tv2 - Younger dacite flows

Geologic Unit

- Tv1 - Older Tschicoma dacite flows
- Tpf - Puye Formation, fanglomerate
- Tpt - Puye Fm, Totavi Lentil
- Tjfp - Miocene pumiceous sediments (Bearhead equivalent)
- Tcar - Chamita Formation
- Tb2 - Miocene Basalt
- Ttc - Tesuque Formation (Chama-El Rito Member)

Notes:

- This cross-section was extracted from Weston's WC11a update to LANL's FY09 GFM (Cole et al. 2010, 106101). The WC11a model accounts for several new regional borings, revisions to a few existing borehole logs by LANL geologists, and some shallow TA-21 and data that were not incorporated into the FY09 model.
- A 1500-ft transect line buffer was used to filter the data to those points having the largest influence on the geology depicted on the cross-section. Because of the potential 1500-ft offset from the transect however, some layer contacts may not appear to honor the data. The line pattern for the borehole trace is used to qualify the offset of the data from the section.

Figure G-10 Cross-section I-I' in the western part of the Laboratory (north-south)